

HISMN201

Core Course	23HISMN201
Course Title	Indian Freedom Movement (1857-1947)
Credits	4
Hours/Week	60
Category	Minor Course (M.C.)
Semester	2
Regulations	2023

Course Objectives

1. To provide detailed knowledge about the first mass resistance against the Company Raj during the Revolt of 1857.
2. To help the students evaluate the success and limitations of various socio-religious movements in 19th-century India.
3. To help the students to know about the formation of Indian National Congress and Muslim League.
4. To make the students able to analyze the historical journey of the Indian Freedom Struggle.
5. To understand the student Gandhian strategies and programme in the freedom struggle.
6. To help the students understand Netaji's role and formation of INA.

Course Learning Outcomes

After completion of the course, the students will be able

1. To gain detailed knowledge about the first mass resistance against the Company Raj during the Revolt of 1857.
2. To evaluate the success and limitations of various socio-religious movements in 19th-century India.
3. To help the students to know about the formation of the Indian National Congress and Muslim League.
4. To make the students able to analyse the historical journey of the Indian Freedom Struggle.
5. To understand the student Gandhian strategies and programme in the freedom struggle.
6. To help the students understand Netaji's role and formation of INA.

Prerequisites: Understanding the significant historical events ,key figures ,and socio-political developments that marked India’s struggle for independence from British Colonial rule.

UNITS	CONTENT	LECTURE HOURS	Cos	CLs
1	THE REVOLT OF 1857 a. Background b. Nature and Interpretations c. Results	15	CO1 CO2	U
2	SOCIO-RELIGIOUS MOVEMENT OF THE 19TH CENTURY a. Strengths and weaknesses of the movement. b. Raja Rammohan Roy c. Ishwar Chandra Vidyasagar d. Sayed Ahmed Khan e. Savitri Bai Phule	15	CO3	U A1
3	GROWTH OF INDIAN NATIONALISM AND POLITICAL ORGANISATIONS a. Formation of the Indian National Congress and Muslim League b. Partition of Bengal and Swadeshi Movement c. Home Rule Movement	15	CO4 CO5	U A1
4	FREEDOM STRUGGLE IN THE 20TH CENTURY a. Non-Co-operation Movement b. Civil-Disobedience Movement c. Netaji Subhas Chandra Bose and the INA d. Quit India Movement and		CO6	U A1

	Partition of India			

References

1. Bandhopadhyaya, Sekhar, *Plassey to Partition*, Orient Blackswan, New Delhi, 2015.
2. Chandra, Bipan, *History of Modern India and the world*, Scholar Books, Kolkata, 2012.
3. Majumdar R.C., Raychaudhuri H.C. and Datta Kalikinkar, *An Advanced History of India*, Macmillan & Co, United Kingdom, 1950.
4. Mukhopadhyaya, Jiban, *History of India and the World*, Scholar Books, Kolkata, 2012.
5. Sarkar, Sumit, *Modern India 1885-1947*, Pearson, Delhi, 2014.

COURSE OBJECTIVES	STATEMENTS	REVISED BLOOM'S TAXONOMY
CO1	a) Describe the various causes of Revolt of 1857. b) Discuss the nature of 1857 Revolt. c) Explain the consequences of 1857 Revolt.	R U
CO2	a) Elucidate the contribution of Raja Rammohan Roy as a social reformer. b) "Vidyasagar, the traditional moderniser". Explain. a) Discuss the contribution of Sayed Ahmed Khan.	R & U
CO3	b) Write an essay on the growth and development of Indian National Congress. c) Explain the partition of Bengal 1905 led to	U, R & E

	the Swadeshi Movement in Bengal. a) Define Swadeshi and Boycott. b) Examine the differences between Moderates and Extremists.	
CO4	c) Examine the role of Mahatma Gandhi in the freedom struggle of India. d) Compare and Contrast between Non-Cooperation and Khilafat Movements. e) Describe the role of Netaji in Indian Freedom Struggle	A2, E & U

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Course Faculty (prepared by)	Head of the Department (Checked and verified)	Dean (Approved by)	Subject Expert (Approved by)
Name- Dr. Satarupa Saha Signature	Name- Dr. Gouri Dey Signature	Name- Mr. Ravi Bhushan Singh Signature-	Name- 1. Prof Madhab Chandra Adhikary- 2. Dr. Sudash Lama- 3. Dr. Binayak Sundas 4. Mr. Soumendra Prosad Saha 5. Dr. Malay Saha



Salesian College

(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Business Administration

Department of Management Studies

Curriculum Document
2023 – 2024

Vision

Excel towards an esteemed centre for pursuing holistic education and grooming of prospective management professionals to become part of the corporate houses at the domestic and international levels.

Mission

Emphasise and create academic excellence, social intelligence and globally competitive skills to comply with the corporate requirement.

1. Programme Overview

Bachelor of Business Administration is a four-year honour degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Acquaint themselves with the essentials of Management theories and its application in problem solving activities.
	PO02: Develop comprehensive knowledge of the tactical process and inculcate inspiration and revolution among students.
	PO03: Provide knowledge and requisite skills in different areas of management like human resource, finance, operations and marketing to give a holistic understanding of a business system.
	PO04: Gain awareness about the various contemporary issues in business management.
Skills	PO05: Build problem-solving capacities through experiential learning and advanced pedagogy to ensure application of knowledge in proficient careers.
	PO06: Develop IT skills in the areas of information search, word processing, office management software, and presentation software needed to excel in business.
	PO07: Develop business and entrepreneurial aptitude among the students.
	PO08: Aid students in choosing and applying suitable tools for decision making required for solving multifaceted managerial problems.
Competence	PO09: Produce industry-ready graduates who have the highest concerns for Personal & Institutional Honour, Social Concerns, Teamwork and Constant Learning.
	PO10: Develop positive attitudes to develop a multi-faceted personality with a sense of environmental awareness and moral values.
	PO11: Inculcate global view of the industrial and organizational establishments and their functions for taking viable decisions in international business setting.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student understands concepts and principles of management; recognize opportunities in the corporate environment and tackle challenges
	PSO2: A student Acquire practical learning through summer internship programme, industrial visit, industrial trips, educational trips, exchange programmes, business development plan etc.
	PSO3: A student understands and develops new dimensions of knowledge through open electives to cater to the need of the industry.
	PSO3: A student acquires the ability to analyse various functional issues affecting the organization
	PSO4: A student demonstrates the ability to frame strategies for organizational benefits
	PSO5: A student develops the ability to analysis and interpretation of data which is used in decision making
	PSO6: A student understand the way to analyse global environment and its Impact on business
	PSO7: A student understands the ecosystem of start-ups in the country
Skills	PSO1: A student will Demonstrate analytical and problem-solving skills through specialization in Finance, Human Resource and Marketing to solve the business issues.
	PSO2: A student will demonstrate the ability to create business plans
	PSO3: A student will acquire the ability to work in groups and achieve common objectives during every organizational crisis situation
	PSO4: A student will demonstrate managerial knowledge to achieve corporate objectives using limited resources
	PSO5: A student will demonstrate managerial competencies by identifying business opportunities, plans and implement revolutions in the workplace.
	PSO6: A student will exhibit managerial skills in the areas of creativity, operations, business process and overall risk-taking activities
	PSO7: A learner will operate effectively as a leader and as an individual member in diverse teams, and in multidisciplinary settings in the areas of marketing, finance and HR
Competence	PSO1: A learner demonstrates competencies required to analyze various functional issues affecting the organization
	PSO2: A student will demonstrate the ability to develop models / frameworks to reflect critically on specific business contexts
	PSO3: A student will demonstrate Effective Oral and Written Communication
	PSO4: A student will correlate various qualitative and quantitative data for management research.
	PSO5: A student will demonstrate extensive ability to work in Groups
	PSO6: A student will develop ethical practices and imbibe values for better Corporate Governance.
	PSO7: A student will understand ethical challenges and choices in a business setting

Programme Matrix

BBA 1st Year

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23BBAMAJ101	Major	Principles of Management	4	3+1+0	60	100
	23BBAMAJ102	Major	Financial Accounting for Managers	4	3+1+0	60	100
	23BBAMIN101	Minor	Managerial Economics	4	3+1+0	60	100
	23BBAMDC101	MDC	Fundamentals of Management	3	3+0+0	45	100
	23ENGAEC101	AEC	Compulsory English	2	2+0+0	30	50
	23BBASEC101	SEC	Business Communication	3	2+0+1	45	100
	23SCSVED101	VAC	Value Education	1	1+0+0	15	50
	23BBAVAC101	VAC	Introduction to Tourism	1	1+0+0	15	50
	Total			22	18+3+1	330	650
II	23BBAMAJ103	Major	Business Regulatory Framework	4	3+1+0	60	100
	23BBAMAJ104	Major	Business Mathematics	4	3+1+0	60	100
	23BBAMIN102	Minor	Business Environment	4	3+1+0	60	100
	23BBAMDC102	MDC	Human Resource Management	3	3+0+0	45	100
	23ENGAEC102	AEC	Alternative English	2	2+0+0	30	50
	23BBASEC102	SEC	Entrepreneurship Development	3	2+0+1	45	100
	23SCSVED102	VAC	Value Education	1	1+0+0	15	50
	23BBAVAC102	VAC	Tourism Products	1	1+0+0	15	50
	Total			22	18+3+1	330	650

Total credits = 22+22 = 44 Credits

Note: Students exiting the programme after securing 44 credits will be awarded UG Certificate in Bachelor of Business Administration provided they secure 4 credits in Internship/Industrial Training in addition to 6 credits from skill-based courses earned during first and second semester.

BBA 2nd Year

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	23BBAMAJ201	Major	Cost Accounting	4	3+1+0	60	100
	23BBAMAJ202	Major	Organizational Behaviour	4	3+1+0	60	100
	23BBAMIN201	Minor	Income Tax Laws & Practices	4	3+1+0	60	100
	23BBAMDC201	MDC	Fundamentals of Marketing	3	3+0+0	45	100
	23GEOAEC201	AEC	Environmental Science	2	2+0+0	30	50
	23BBASEC201	SEC	E-Commerce	3	2+0+1	45	100
	23SCSVED201	VAC	Value Education	1	1+0+0	15	50
	23BBAVAC201	VAC	Time Management	1	1+0+0	15	50
	Total			22	18+3+1	330	650
IV	23BBAMAJ203	Major	Marketing Management	4	3+1+0	60	100
	23BBAMAJ204	Major	Financial Management	4	3+1+0	60	100
	23BBAMAJ205	Major	Human Resource Management	4	3+1+0	60	100
	23BBAMIN202	Minor	Quantitative Techniques in Management	4	3+1+0	60	100
	23GEOAEC202	AEC	Environmental Science	2	2+0+0	30	50
	23SCSVED202	VAC	Value Education	1	1+0+0	15	50
	23BBAVAC202	VAC	Stress Management	1	1+0+0	15	50
	Total			20	16+4+0	300	550

Total credits = 42

Note: Students exiting the programme after securing 86 credits (44 + 42) will be awarded UG Diploma in Bachelor of Business Administration provided they secure additional 4 credits in Internship/Industrial Training.

BBA 3rd Year

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
V	23BBAMAJ301M/ 23BBAMAJ301F/ 23BBAMAJ301H	Major	Marketing of Services/ Corporate Accounting/ Labor Laws	4	3+1+0	60	100
	23BBAMAJ302M/ 23BBAMAJ302F/ 23BBAMAJ302H	Major	Consumer Behavior/ Financial Markets & Institutions/ Organization Development	4	3+1+0	60	100
	23BBAMAJ303M/ 23BBAMAJ303F/ 23BBAMAJ303H	Major	Product & Brand Management/ Microfinance and Financial Inclusion/ Human Resource Development	4	3+1+0	60	100
	23BBAMAJ304	Major	Business Statistics	4	3+1+0	60	100
	23BBAMIN301	Minor	Macroeconomics	4	3+1+0	60	100
	23SCSVED301	VAC	Value Education	1	1+0+0	15	50
	23BBAVAC301	VAC	(To be finalised by the BoS)	1	1+0+0	15	50
	Total			22	17+5+0	330	600
VI	23BBAMAJ305	Major	Production Management	4	3+1+0	60	100
	23BBAMAJ306	Major	Indian Financial System	4	3+1+0	60	100
	23BBAMAJ307	Major	Management Accounting	4	3+1+0	60	100
	23BBAMIN302	Minor	Goods & Services Tax & Customs Duty	4	3+1+0	60	100
	Internship			4	0+0+4	60	100
	Total			20	12+4+4	300	500

Total credits = 42

Note: Students exiting the programme after securing 128 credits (86 + 42) will be awarded UG Degree in Bachelor of Business Administration.

BBA 4th Year (Honours) without Research

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
VII	23BBAMAJ401M/ 23BBAMAJ401F/ 23BBAMAJ401H	Major	Advertising & Sales Promotion/ Security Analysis and Portfolio Management/ Training and Development	4	3+1+0	60	100
	23BBAMAJ402M/ 23BBAMAJ402F/ 23BBAMAJ402H	Major	Distribution & Retail Management/ Financial Statement Analysis/ Grievance Handling and Discipline Management	4	3+1+0	60	100
	23BBAMAJ403M/ 23BBAMAJ403F/ 23BBAMAJ403H	Major	International Marketing/ Investment Banking & Financial Services/ Labor Welfare and Compensation Management	4	3+1+0	60	100
	23BBAMAJ404	Major	Corporate Governance & Business Ethics	4	3+1+0	60	100
	23BBAMIN401	Minor	International Business	4	3+1+0	60	100
	Total			20	15+5+0	300	500
VIII	23BBAMAJ405	Major	Strategic Management	4	3+1+0	60	100
	23BBAMAJ406	Major	(To be finalised by the BoS)	4	3+1+0	60	100
	23BBAMAJ407	Major	(To be finalised by the BoS)	4	3+1+0	60	100
	23BBAMAJ408	Major	(To be finalised by the BoS)	4	3+1+0	60	100
	23BBAMIN402	Minor	Management Information System	4	3+1+0	60	100
	Total			20	15+5+0	300	500

Total credits = 40

Note: Students securing 168 credits (128 + 40) will be awarded UG Degree (Honours) in Bachelor of Business Administration.

BBA 4th Year (Honours) with Research

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
VII	23BBAMAJ401M/ 23BBAMAJ401F/ 23BBAMAJ401H	Major	Advertising & Sales Promotion/ Security Analysis and Portfolio Management/ Training and Development	4	3+1+0	60	100
	23BBAMAJ402M/ 23BBAMAJ402F/ 23BBAMAJ402H	Major	Distribution & Retail Management/ Financial Statement Analysis/ Grievance Handling and Discipline Management	4	3+1+0	60	100
	23BBAMAJ403M/ 23BBAMAJ403F/ 23BBAMAJ403H	Major	International Marketing/ Investment Banking & Financial Services/ Labor Welfare and Compensation Management	4	3+1+0	60	100
	23BBAMIN401	Minor	International Business	4	3+1+0	60	100
	Research Project/ Dissertation			4	4+0+0	60	100
	Total			20	16+4+0	300	500
VIII	23BBAMAJ404	Major	Strategic Management	4	3+1+0	60	100
	23BBAMAJ405	Major	(To be finalised by the BoS)	4	3+1+0	60	100
	23BBAMIN402	Minor	Management Information System	4	3+1+0	60	100
	Research Project/ Dissertation			8	8+0+0	120	100
	Total			20	17+3+0	300	400

Total credits = 40

Note: Students securing 168 credits (128 + 40) will be awarded UG Degree (Honours) with Research in Bachelor of Business Administration.

Semester I

1. Course Description

Course Code	23BBAMAJ101	
Course Title	PRINCIPLES OF MANAGEMENT	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Managerial planning, decision making, organizing, staffing, directing, controlling, and coordinating.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Covers the basic concepts of management along with traditional and modern theories b) Explains the process of planning and decision making. c) Describes the importance of organizing and staffing. d) Covers the significance of directing and communication. e) Explains the concepts and essentials of co-ordinating and controlling	
Prerequisite	Basic knowledge about management concepts and functions.	
Course Objectives	A student will be able to: a) To explain the evolution of Management and its principles. b) Acquaint with the fundamentals of managing business. c) Understand individual and group behaviour at the workplace so as to improve the effectiveness of an organisation. d) Create and evaluate different leadership styles. e) Understand the concept of controlling and coordination as an essence of management.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the primary contributors and their contributions to the development of management thought.	R
CO2	Explain the concept of MBO and MBE. Discuss the planning process	U

CO3	Classify the different organizational structures.	A1		
CO4	Outline the different motivational theories.	A2		
CO5	Recommend the best styles of leadership.	E		
CO6	Develop the steps in controlling and techniques of control.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Management a) Introduction –Meaning, Evolution of management thought Management Theory b) Approaches to management; Fayol’s Process Management theory; Neo-Classical theories - human relations era -Hawthorne studies c) Nature and Characteristics of Management - Scope and Functional areas of Management d) Management as a Science, Art or Profession; Management and Administration	12	CO1	R U A1 A2 E C
Unit II	Planning and Decision Making a) Nature, Importance, Objectives and Purpose of Planning b) Planning Process; Types of plans (Meaning only) c) Decision making- Importance and steps d) MBO and MBE (Meaning only)	12	CO2	R U A1 A2 E C
Unit III	Organizing and Staffing: a) Nature, purpose and principles of Organizing b) Delegation of Authority c) Types of Organization - Departmentation, Committees d) Centralization vs. Decentralization of Authority and Responsibility e) Nature and importance of Staffing	12	CO3	R U A1 A2 E C
Unit IV	Directing & Communicating: a) Meaning and Nature of Direction, Principles of Direction b) Motivation theories – Maslow’s Need Hierarchy Theory, Herzberg’s Two Factor Theory, Mc.Gregor’s X and Y theory c) Leadership – Meaning, Formal and Informal Leadership, Characteristics of Leadership; Leadership Styles – Autocratic Style, Democratic Style, Participative Style, Laissez Faire Leadership Styles, Transition Leadership, Charismatic Leadership Style.	12	CO4 CO5	R U A1 A2 E C

Unit V	Co-ordinating and Controlling: a) Coordination–Meaning, Importance and Principles b) Controlling–Meaning and steps in controlling c) Essentials of Effective Control system, Techniques of Control (in brief).	12	CO6	R U A1 A2 E C
Learning Resources: 1. Sharma, R.K. and Gupta, S.K. (2009). <i>Principles of Management</i> . Kalyani Publication. 2. Rudani, R. B. (2020). <i>Principles of management</i> . McGraw-Hill Education. 3. Gupta, C.B. and Mathur, S. (2020). <i>Management Principles & Applications</i> . MKM Publishers Pvt. Ltd. 4. Agarwal, N.K. (2010). <i>Principles of Management</i> . DND Publication, Jaipur, 2010. 5. Prasad, L.M. (2009). <i>Principle & Practice of Management</i> . Sultan Chand & Sons Publication.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rajeev Dutraj Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMAJ102	
Course Title	FINANCIAL ACCOUNTING FOR MANAGERS	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Book-keeping and Accounting	
Course Offered to	BBA	
Regulation	2023	
Course Overview	This course: a) Recognizes the need to understand the framework of accounting as well accounting standards for passing journal entries and preparing financial statements. b) Equips with the ability of demonstrating various treatments for dependent branches. c) Introduces the concept of hire purchase payment system and describes the various methods of accounting for recording such transactions.	
Prerequisite	Basic knowledge of accounting.	
Course Objectives (total 5)	A student will be able to: a) Explain the theoretical framework as well as different accounting terms and the concept of GAAP. b) Explain the different methods of charging depreciation. c) Construct ledger accounts from journal entries, produce a trial balance and prepare the final accounts of a sole proprietorship firm. d) Describe different types of branches and demonstrate various accounting treatments for dependent branches. e) Construct the books of accounts using different systems under Hire Purchase and demonstrate accounting treatments in case of partial and full repossession.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the theoretical framework as well as different accounting terms and the concept of GAAP.	R
CO2	Explain the different methods of charging depreciation.	U

CO3	Demonstrate various accounting treatments for dependent branches.	A1		
CO4	Differentiate between Hire Purchase and Instalment Purchase System.	A2		
CO5	Recommend accounting treatments in case of partial and full repossession and maintain the books of accounts using different systems under Hire Purchase.	E		
CO6	Construct ledger accounts from journal entries, produce a trial balance and prepare the final accounts of a sole proprietorship firm.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Financial Accounting a) Introduction, scope, importance, objectives and limitations of accounting. b) Users of Accounting Information, Accounting terms and Generally Accepted Accounting Principles. c) Basic Accounting Concepts and Accounting Conventions; Accounting Standards.	12	CO1	R U A1 A2 E C
Unit II	Accounting Process and Business Income a) Process of Accounting; Meaning of Double entry system; Accounting Rules; Accounting Equation. Posting entries in Journal, Ledger and preparation of Trial Balance. b) Recording of transactions in Cash Book and in Subsidiary Books – Purchase Book, Purchase Returns Book, Sales Book, and Sales Returns Book; Opening and Closing Entries. c) (i) Capital and revenue expenditures and receipts (ii) Reserves and provisions: meaning, objective and types (iii) Depreciation: concept of depreciation; factors in the measurement of depreciation; methods of computing depreciation: straight line method and diminishing balance method; change of methods.	12	CO2 CO6	R U A1 A2 E C
Unit III	Final Accounts of a Sole Proprietor Preparing Trading Account, Profit & Loss Account and Balance Sheet for a Sole Proprietor with important adjustments.	12	CO6	R U A1 A2 E C

Unit IV	Branch Accounting a) Meaning, Objectives and Types of Branches-Dependent Branches, Independent Branches and Foreign Branches. b) Methods of maintaining books of accounts of Dependent Branches by Head Office under Debtor System, Stock & Debtors System, Wholesale Branch System and Final Account System.	12	CO3	R U A1 A2 E C
Unit V	Accounting for Hire Purchase a) Meaning and features of Hire Purchase. Important Definitions – Hire Purchase Agreement, Hire Purchase Price Cash Price, Hire Purchase Charges and Down Payment. Differences between Hire Purchase and Instalment Purchase System. b) Problems on calculation of interest and ascertainment of Cash Price under Reverse Calculation Method. c) Preparation of accounts under Hire purchase trading and stock and debtors system; Accounting treatments in case of Partial and full repossession.	12	CO4 CO5	R U A1 A2 E C
Learning Resources: 1. Hanif, M., & Mukherjee, A. (2018). <i>Financial Accounting-II, 4e</i> . McGraw-Hill Education. 2. Amitabha Basu. (2021), <i>Financial Accounting</i> . Tee Dee Publications. 3. Basu and Das (2021), <i>Selected Problems on Financial Accounting (volume I)</i> (19th Edition) <i>Rabindra Library</i> . 4. Maheshwari, S.N and Maheshwari, S.K. (2018). <i>Financial Accounting</i> (6th Edition). Vikas Publishing House, New Delhi.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short	Group activity, Subjective-type questions, or viva-voce carrying 20	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5

(10 questions of 2 marks each).	questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	marks.	marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study/ financial interpretation	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMIN101	
Course Title	MANAGERIAL ECONOMICS	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Economic tools and techniques used to address managerial issues.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Provides introduction to Managerial Economics enabling the students to become better decision-makers in market economies. b) Equips with the ability of demonstrating demand and supply theory with an analytical approach. c) Introduces the production, cost, and revenue analysis to make better economic decisions.	
Prerequisite	Basic knowledge of Introductory Economics.	
Course Objectives	A student will be able to: a) Identify the basic principles of Managerial Economics and demonstrate the theory of consumer behaviour. b) Understand the concepts of demand and supply, its laws, and classify the different degrees of price elasticity of demand. c) Describe production function and demonstrate the three stages of production. d) Explain the behaviour of long-run and short-run cost curves and total, average, and marginal revenue curves. e) Identify the different forms of market economies and determine the market equilibrium.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define utility and describe the cardinal and ordinal utility approach.	R
CO2	Summarise the theory of demand and supply and explain the different degrees of elasticity.	U
CO3	Classify the different forms of market structure	A1

CO4	Analyse the short-run and long-run cost curves as well as the total, average and marginal revenue curves	A2		
CO5	Estimate the short-run and long-run equilibrium of firms under different market structures.	E		
CO6	Construct diagrams to explain the Law of Variable Proportions and Law of Returns to Scale	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	A. Introduction to Managerial Economics a) Definition of economics and branch of economics b) Managerial Economics – Meaning, nature and scope; basic economic tools in Managerial Economics. B. Theory of Consumer Behaviour a) Meaning, approaches, and measures of Utility b) Relationship between Total and Marginal Utility c) Law of Diminishing Marginal Utility and Law of Equi-Marginal Utility d) Indifference curves and budget constraints e) Marginal Rate of Substitution f) Consumer Equilibrium and Consumer Surplus (concept only)	10	CO1	R
Unit II	A. Introduction to Demand and Supply a) Introduction to Demand and Supply b) Law of Demand- assumptions, reasons for downward slope and exceptions c) Demand schedule and Demand Curve d) Supply curve; determinants of supply; and Law of Supply- assumptions, reasons for upward slope and exceptions e) Movement along the Demand & Supply Curve and Shift in Demand & Supply Curve B. Elasticity of Demand and Supply a) Meaning and Types of Elasticity of demand- Price, Income and Cross Elasticity. b) Factors affecting Price Elasticity and degrees of price elasticity of demand. c) Income Elasticity of Demand & Cross Elasticity of Demand d) Price elasticity of Supply e) Equilibrium price and its concept	14	CO2	U
Unit III	Production Theory a) Meaning of Production and factors of production b) Production Function: short-run and long-run	12	CO6	C

	c) Law of Variable Proportions d) Three stages of Production e) Concept of Isoquant and Iso-cost Line f) Law of Returns to Scale			
Unit IV	Cost and Revenue Analysis a) Cost concepts b) Variable, fixed and total cost curves c) Long-run Cost and Short-run Cost Curves d) Economies of scales and economies of scope e) Revenue Concepts: Total, Average and Marginal Revenue curves	12	CO4	A2
Unit V	Market Structure a) Meaning and forms of market b) Perfect Competition: meaning, features, Short-run and Long-run Equilibrium c) Monopoly: meaning, features, Short-run and Long-run Equilibrium, price discrimination (types and degrees) d) Monopolistic competition: meaning, features, Short-run and Long-run Equilibrium e) Oligopoly: meaning, features, Non-collusive (Cournot's model, and Sweezy's model (kinked demand curve) and Collusive Oligopoly (cartels and price leadership theory)	12	CO3 CO5	A1 E
Learning Resources: 1. Salvatore, D. (2009). <i>Principles of Microeconomics</i> (5th ed.). Oxford University Press 2. Roy, D. (2021). <i>Managerial Microeconomics</i> (1st ed.). Abhijeet Publications 3. Lipsey, R., & Chrystal, A. (2008). <i>Economics</i> (11th ed.). Oxford University Press 4. Koutosyannis, A. (1979). <i>Modern Micro Economics</i> (2nd ed.). Palgrave Macmillan. 5. Pindyck, R. Rubinfeld, D. & Mehta, P. (2009). <i>MicroEconomics</i> (7th ed.). Pearson				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks

	15 marks. Total marks: 50		
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMDC101	
Course Title	FUNDAMENTALS OF MANAGEMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	MDC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Managerial planning, organizing, staffing, directing and controlling.	
Course Offered to	All courses (excluding BBA, BBA in Tourism & Hospitality & Commerce)	
Regulation	2023	
Course Overview	This course: a) Covers understanding of management concepts and administration process b) Depicts importance of organizing in business and different theories c) Covers objectives, process and techniques of control mechanism in organization.	
Prerequisite	Basic knowledge of business management.	
Course Objectives	A student will be able to: a) Understand fundamental management concepts, including its definition, scope, functions and the roles managers play in organizations. b) Explore the organizational structure, span of control, and functions of line and staff roles, authority, responsibility, centralization, decentralization, and delegation in organizational settings. c) Examine staffing and its role in organizations, including selection and career planning. d) Delve into the nature of directing, leadership styles, motivation, morale, and discipline. e) Learn the objectives and process of control, the role of information, and methods for measuring performance.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Recall management concepts, evolution, and the roles of managers.	R
CO2	Comprehend the importance of management, differences between management and administration, and the nature of planning.	U
CO3	Apply planning techniques, understand	A1

	organizational structures, and discuss centralization vs. decentralization			
CO4	Analyse the features and types of planning, assess line & staff functions, and evaluate the impact of delegation of authority.	A2		
CO5	Evaluate leadership qualities and styles, and critically assess the role of information in control.	E		
CO6	Create integrated control systems, formulate effective career plans, and design strategies for motivating employees.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a) Management concepts & Evolution: Definition - nature - scope and functions of management. b) Importance of management, role of manager c) Management and administration.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit II	Planning a) Meaning, features, nature and importance of planning b) Procedure, types of planning c) Planning Techniques d) Planning and control e) MBO.	12	CO1 CO2	R U A1 A2 E C
Unit III	Organizing a) Nature - purpose - organizational structure b) Span of control c) Line & staff functions d) Authority & Responsibility e) Centralization and decentralization f) Delegation of authority.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit IV	Staffing and Directing a) Staffing- nature and purpose, b) Selection, c) Career planning. d) Nature of directing, e) Leadership qualities and styles, f) Motivation - morale and discipline	12	CO1 CO2 CO4 CO5	R U A1 A2 E C
Unit V	Controlling a) The objectives and process of control b) Role of information in control c) Performance standard – Measurement of performance.	12	CO1 CO2 CO5 CO6	R U A1 A2 E C

	d) Integrated control system in an organisation.			
Learning Resources: 1. Robbins, S. P., Coulter, M., Sidani, Y., Jamali, D., & Robbins, S. P. (2011). <i>Management (Arab World Editions)</i>. Pearson Education UK. 2. Koontz, H., O'Donnell, C., & Weihrich, H. (1980). <i>Management</i>. McGraw-Hill Book Company. New York, 514-15. 3. Prasad, L. M. (2020). <i>Principles and practice of management</i>. Sultan Chand & Sons. 4. Rao, V. S. P., & Krishna, V. H. (2009). <i>Management: Text and cases</i>. Excel Books India.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBASEC101	
Course Title	BUSINESS COMMUNICATION	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	SEC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Clarity, conciseness, tone, professionalism, relevance, audience, format, feedback, context, accuracy.	
Course Offered to	BBA & BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Recognizes the need to enhance written as well as oral communication skills. b) States the importance of effective communication in a globalized economy. c) Describes the importance of effectively drafting business reports and letters.	
Prerequisite	Verbal and non-verbal communication, drafting letters and short presentations.	
Course Objectives (total 5)	A Student will be able to: a) Define and explain the nature and significance of communication. They will grasp the process and principles of communication, b) Recognize various communication models, and identify different communication channels. c) Learn about effective communication, including recognizing barriers and employing strategies to overcome them. d) Understand the importance of listening, types of listening, and methods to enhance listening skills. e) Develop skills in report writing, business correspondence, and oral presentations, including PowerPoint presentations, to effectively communicate in various professional scenarios.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the meaning, nature, and objectives of communication	R
CO2	Explain the principles and process of communication, and identify different models.	U
CO3	Differentiate and analyse various channels of communication,	A1

	including formal, informal, verbal, and non-verbal.			
CO4	Recognize barriers to effective communication and propose strategies to overcome them.	A2		
CO5	Evaluate the significance of listening, identify barriers, and implement techniques for effective listening.	E		
CO6	Compose business reports, letters, and emails, adhering to appropriate formats and etiquettes. Also develop effective oral presentations with well-structured content, applying presentation essentials.	C		
Course Content				
Units	Content	Lecture Hours	COs	RB T
Unit I	Introduction a) Meaning, definition, nature, objectives, and importance of communication. b) Principles of communication and process of communication. c) Models of Communication.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit II	Communication Channels a) Channels of communication. b) Types of communication: Formal, Informal, Verbal, Non- Verbal, Written, Visual communication. c) Levels of communication and direction of communication	12	CO1 CO2	R U A1 A2 E C
Unit III	Effective Communication a) Meaning and barriers to effective communication. b) Ways to overcome barriers to effective communication. c) Meaning, importance, process and types of Listening. d) Barriers to effective Listening and steps to overcome such barriers	12	CO1 CO2 CO4	R U A1 A2 E C
Unit IV	Report Writing and Business Correspondence a) Types, formats, importance, and process of preparing Business reports. b) Drafting minutes, agenda, inquiry letter, complaint letter, persuasive letter, and proposal. c) Writing Resume, letters, office memorandum, office circulars, notices, and orders. d) Technology for communication. Electronic mail: advantages, safety, and smartness in email. E-mail etiquettes.	12	CO1 CO2 CO4 CO5	R U A1 A2 E C
Unit V	Oral and PowerPoint Presentation a) Importance, features, and essentials of effective oral presentation. b) Making presentations: content and organizing.	12	CO1 CO2 CO5 CO6	R U A1 A2 E

	Delivering a presentation			C
Learning Resources: 1. Kaul, A. (2016). <i>Effective Business Communication</i>, 2nd ed. PHI learning. 2. C.B. Gupta (2019). <i>Essentials of Business Communication</i>. Sultan Chand & Sons. 3. Kumar, V., Raj, B., Kapurthala, & Jalandhar. (2017). <i>Comprehension and Communication Skills in English</i>. Kalyani Publishers. 4. Kumar, V., Raj, B., Kapurthala, & Jalandhar. (2017). <i>Comprehension and Communication Skills in English</i>. Kalyani Publishers. 5. Rizvi, M. A. (2005). <i>Effective technical communication</i>. Tata McGraw-Hill. 6. Chanda, S. M. (2010). <i>An Introduction to Critical Thinking</i>. Pearson, Delhi.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAVAC101	
Course Title	INTRODUCTION TO TOURISM	
Credits	1	
Total Session Hours	30	
Number of Sessions	15	
Course Type	VAC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Growth, development, and recent trends in tourism.	
Course Offered to	BBA	
Regulation	2023	
Course Overview	This course: a) Introduces tourism business, its forms and typologies. b) Enhance the knowledge of students in various areas of tourism industry. c) Equips with the understanding of impact of various factors in tourism	
Prerequisite	Basic knowledge of tourism and tourists.	
Course Objectives	A student will be able to: a) Understand the concept, importance, and types of tourism. b) Identify the composition and typology of tourism. c) Describe the recent trends in domestic and international tourism. d) Explain the growth and development of Tourism in India. e) Identify the economic, social, physical, and environmental impact in tourism	
Course Content		
Session	Session Details	Session Hours
Session I	Introduction to Tourism	2
Session II	Introduction to Tourism: Definitions, Nature and Scope of Tourism	2
Session III	Importance and Components of Tourism.	2
Session IV	Typology of Tourism: Domestic Tourism	2
Session V	International Tourism	2
Session VI	Tourism as an industry.	2
Session VII	Concepts of Tourist, visitor and excursionist	2
Session VIII	Concepts of recent tourism trends.	2
Session IX	Growth and development of tourism business in India	2
Session X	Impacts of Tourism (Social, Economic, Physical and Environmental)	2

Session XI	Field Trip (Eco-Village/Tourism)	2
Session XII	Field Trip	2
Session XIII	Field Report and Discussion	2
Session XIV	Project Submission & Presentation	2
Session XV	Evaluation (Viva-Voce)	2

Learning Resources:

1. Seth, P. N., Seth, P. N., & Bhat, S. S. (2003). *An Introduction to Travel and Tourism*. Sterling Publishers Pvt. Ltd.
2. Sinha, R. K. (1999). *Travel and Tourism Management*. Dominant Publishers & Distributors.
3. Chawla, R. (2004). *Tourism Management*, Sonali Publishers, Delhi.
4. Sharma, S. P. (2004). *Tourism Education: Principles, Theories and Practices*. Kanishka Publishers.
5. Kamra, K. K., & Chand, M. (2004). *Basics of Tourism: Theory, Operation and Practice*.
6. Negi, J. (1990). *Tourism and Travel: Concepts & Principles*.
7. Jayapalan, N. (2001). *Introduction to Tourism*. Atlantic Publishers & Dist.
8. Nigam, S. C. (2008). *Eco-Tourism and Sustainable Development*, Rajat Publications.

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sradha Pradhan Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

Semester II

1. Course Description

Course Code	23BBAMAJ103	
Course Title	BUSINESS REGULATORY FRAMEWORK	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Business and Company Laws	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Covers the basics of Indian Contract Act,1872 b) Covers the basics of Sale of Goods Act, 1930 c) Covers the fundamental elements of Companies Act, 2013 and Consumer Protection Act, 1986 d) Covers the elements of Right to Information Act, 2005	
Prerequisite	Elementary knowledge and understanding of business and company laws	
Course Objectives	A student will be able to: a) Understand the Indian Contract Act 1872: the meaning, essentials and kinds of contract. b) Develop basic understanding of Sale of Goods Act 1930 and Negotiable Instruments Act 1881. c) Understand various aspects of the Companies Act 2013 and the Limited Liability Partnership Act 2008. d) To build concept regarding the Consumer Protection Act 1986	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define and recall the meaning, essentials, and kinds of contract.	R
CO2	State the meanings and types of negotiable instruments; define ‘Goods’ as per the Sale of Goods Act 1930 and explain the concept of sale and agreement to sell.	U
CO3	Illustrate the meanings and types of companies, shares and documents required for the incorporation	A1

	of a company under the Companies Act 2013; explain the meaning, nature, types and formation of partnership.			
CO4	State the objectives and machinery for consumer protection and illustrate the rights of consumers.	A2		
CO5	Explain the features and define various terms under the Right to Information Act 2005.	E		
CO6	Construct a Memorandum of Association & Article of Association.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	The Indian Contract Act, 1872 a) Meaning and Essentials of contract; b) Kinds of contract Based on: validity, formation & performance, law relating to offer and acceptance, consideration, competency to contract, free consent, Void agreements, performance of contracts. c) Discharge of contracts, breach of contracts and quasi contract, Special contracts: contract of indemnity and guarantee, bailment and pledge, and agency	10	CO1	R
Unit II	Sale of Goods Act 1930 a) Meaning of Sale and agreement to sell, b) Implied conditions and warranties, sale by non-owners, rights of unpaid seller. c) Negotiable Instruments Act 1881: Meaning of negotiable instruments, type of negotiable instruments, promissory note, bill of exchange, cheque	14	CO2	U
Unit III	The Companies Act 2013 a) Meaning and types, Incorporation, b) Memorandum & Articles of Association, Prospectus, c) Issue of shares and bonus shares, rights issue, sweat equity, role of directors, share qualification, company meetings. d) The Limited Liability Partnership Act 2008: Meaning and nature of limited partnership, formation, partners & their relations, extent and limitation of liability.	12	CO3 CO6	C
Unit IV	Consumer Protection Act, 1986 a) Objectives and machinery for consumer protection, defects and deficiency removal, rights of consumers. b) Amendments in Consumer Protection Act 2019.	12	CO4	A2

Unit V	The Right to Information Act 2005: Salient features and coverage of the act, definition of terms information, right, record, public authority; obligations of public authorities, requesting information and functions of PIO.	12	CO5	A1 E
Learning Resources: 1. Kuchhal, M. C., & Kuchhal, V. (2013). <i>Business law</i> . Vikas Publishing House. 2. Kuchhal, M. C., & Kuchhal, V. (2010). <i>Business Legislation for Management</i> . Vikas Publishing House. 3. Anand, K., & Suremya, S. L. (2021). <i>External and Internal Rules of Corporate Governance</i> . Issue 4 Int'l JL Mgmt. & Human., 4, 2887. 4. Singh, A. (n.d). <i>Principles of Mercantile Law</i> . Eastern Book Company. 5. Kapoor, G. K. & Gulshan. S.S. (2008). <i>Business Law Including Company Law</i> . New Age International.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMAJ104	
Course Title	BUSINESS MATHEMATICS	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Mathematics tools & techniques	
Course Offered to	BBA	
Regulation	2023	
Course Overview	This course: a) The ability to explain the concepts and use of equations, formulae, and mathematical expressions and relationships in a variety of contexts b) The ability to analyze and demonstrate skills required in mathematically intensive areas in economics and business c) The ability to integrate mathematical concept in international business scenario.	
Prerequisite	Basic knowledge about mathematics and its application in business and economics.	
Course Objectives	A student will be able to: a) Define basic terms in the areas of business calculus and financial mathematics, b) Explain basic methods of business calculus, types and methods of interest account and their basic applications in practice, c) Solve problems in the areas of business calculus, simple and Compound interest account, use of compound interest account, d) Apply knowledge of mathematics with emphasis on management applications, and e) Connect acquired knowledge and skills with practical problems in business and economic practice.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	State the meaning of matrix, limit, continuity, derivatives, compound interest, integration and indices	R

CO2	Summarize 2 nd ordered derivatives, properties of indices, logarithm	U
CO3	Classify different types of matrices, various techniques of integration for definite and indefinite series	A1
CO4	Analyze maximum and minimum of a function & point of inflexion using derivatives, partial derivatives of functions of several variables using Euler's theorem from their formulas and use them to approximate function values, linear systems with matrices - Matrix inverses - Matrix determinants and Cramer's Rule up to (3x3) matrix.	A2
CO5	Estimate the second derivative function using the derivative rules, consumers' surplus and producers' surplus and interest rates and discount factors. Application of these concepts to the pricing of simple, fixed-income financial instruments and the assessment of investment projects	E
CO6	Construct quadratic equation when the values of the roots are given and to calculate the value of new roots from the existing value of the roots.	C

Course Content

Units	Content	Lecture Hours	COs	RBT
Unit I	Matrices a) Definition of a matrix. b) Types of matrices; Algebra of matrices. c) Calculation of values of determinants up to third order; Adjoint of a matrix; Finding inverse of a matrix through adjoint; d) Applications of matrices to solution of simple business and economic problems	12	CO1 CO3 CO4	R U A1 A2 E C
Unit II	Differential Calculus a) Concepts of limit and continuity of a function; b) Concept of differentiation; Rules of differentiation – simple standard forms. Applications of differentiation – elasticity of demand and supply; c) Maxima and Minima of functions (involving second order derivatives) relating to cost,	24	CO1 CO2 CO4 CO5	R U A1 A2 E C

	revenue and profit, d) Partial Derivatives: Euler's theorem and its application			
Unit III	Integration a) Integration as a reverse process of Differentiation, b) Integration by Substitution and by parts c) Integration by partial fraction d) Differential equations, Definite integrals, applications of Integrals	12	CO1 CO3	R U A1 A2 E C
Unit IV	Basic Mathematics of Finance a) Simple and compound interest Rates of interest – nominal, effective and continuous – their inter-relationships; b) Annuities c) Quadratic Equation d) Logarithm e) Theory of Indices	12	CO1 CO2 CO6	R U A1 A2 E C
Learning Resources: 1. Nag, N.K. (2019). <i>Business Mathematics and Statistics</i> . Kalyani Publishers. 2. Padmalochan, H. (2017). <i>Business Mathematics</i> . Springer. 3. Gupta, S.P. & Gupta, P.K. (2022). <i>Business Mathematics and Statistics</i> . Sultan Chand & Sons.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory question of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks

Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 20 marks	Higher-order level
GROUP D	1 compulsory question	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rupam Majumdar Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23 BBAMIN102	
Course Title	BUSINESS ENVIRONMENT	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Political, Socio-cultural, legal, economic, and technological environmental issues.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Covers different elements of Business environment and the effects of internal and external factors of business environment. b) Describes the current economic condition and its impact on business. c) Explains the positive and negative impact of technology in modern business.	
Prerequisite	Basic knowledge of business, its nature and objectives.	
Course Objectives (total 5)	A student will be able to: a) Explain the concept, nature, and importance of business environment. b) Analyse the relationships between government and business and evaluate the political, economic, legal, and social policies of the country. c) Enumerate the concept and features of Intellectual Property Rights. d) Analyse how business is affected by different macro-economic variables. e) Give observation as to how technology has helped modern business	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the concept, nature and importance of business environment.	R
CO2	Explain the concept and features of Intellectual Property Rights.	U
CO3	Give observation as to how technology has helped modern business.	A1
CO4	Analyse how business is affected by different macro-economic variable.	A2
CO5	Evaluate the political, economic, legal and social policies of the country.	E

CO6	Propose different modes of entering into International Business	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Business Environment a) Concept, nature, and importance of business environment. b) Types of environments: general, task environment, internal and external environment, c) Basic elements of environment: socio-cultural, political, legal, economic, and technological elements	12	CO1	R U A1 A2 E C
Unit II	Socio-cultural Environment a) Social environment - Cultural heritage - social attitudes b) Impact of foreign culture, castes, and communities – joint family systems - linguistic and religious groups c) Types of social organization -Corporate Social Responsibilities of business	12	CO5	R U A1 A2 E C
Unit III	Political and Legal Environment a) Fundamental Rights and Directive Principles of State Policy b) State intervention in economic affairs: role of the government in creating a proper business environment. c) The changing legal environment of business, IPR- key concepts and features.	12	CO2 CO5	R U A1 A2 E C
Unit IV	Economic and Technological Environment a) Economic systems and their impact on business b) Macro-economic parameters like GDP, growth rate, population - Urbanisation - Fiscal deficit - Plan investment - Per capita income and their impact on business decisions c) Technological Environment – choice of Technology - Problems in Selecting Appropriate Technology. Importance of technology to Business.	12	CO3 CO4 CO5	R U A1 A2 E C
Unit V	International Environment of Business a) Globalization: concept and nature, merits and demerits of globalisation. b) Strategies for entering foreign markets: exporting, licensing and c) Franchising, contract manufacturing,	12	CO6	R U A1 A2 E C

	management contracting, joint venture, merger and acquisition, strategic alliance and counter trade. d) Multinational corporations: concept, features, merits and demerits.			
Learning Resources: 1. Aswathappa, K. (2009). <i>Essentials of business environment</i>. Karnataka: Himalaya Publishing House. 2. Cherunllam, F. (2019). <i>Business Environment</i> (27th Revised Edition). Himalaya Publishing House. 3. Pustin, P. (2009). <i>Business Environment-Text and Cases</i>. New Delhi-110008. 4. Gupta, C. B. (2022). <i>Business Environment</i>. Sultan Chand & Sons.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMDC102	
Course Title	HUMAN RESOURCE MANAGEMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Addresses the issues related to human resources in an organisation.	
Course Offered to	All courses (excluding BBA & BBA in Tourism & Hospitality)	
Regulation	2023	
Course Overview	This course: a) Examines HRM's role in effective people management and goal achievement and HR managers' responsibilities including strategic planning, policy formulation, and employee relations. b) Performs job analysis and emphasizes the importance of a fair, objective, and legal recruitment and selection process. c) Highlights the significance of improving skills and performance and explores the objectives and benefits of appraisal systems.	
Prerequisite	Basic knowledge about Human Resource Management.	
Course Objectives	A student will be able to: a) Recognize the essential qualities and characteristics required for effective HR management. b) Identify the premises of effective HR planning and discuss the process involved in HR planning. c) Acquire knowledge of job analysis, description, and specification to effectively define job roles and requirements. d) Discover various training and development methods and their application in different contexts. e) Identify and evaluate different methods of performance appraisal, including conventional and non-conventional approaches.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the importance, objectives, and functions of HRM and state the role and qualities of an HR Manager.	R
CO2	Explain the objectives, importance, and process of HR Planning.	U

CO3	Classify the different sources of recruitment and demonstrate the process of selection.	A1		
CO4	Distinguish between job description and job specification and outline the concept of job design, job rotation, job enlargement, job enrichment, promotion, and demotion.	A2		
CO5	Evaluate the performance of employees using different conventional and non-conventional methods of performance appraisal.	E		
CO6	Propose the best training methods to be applied in different managerial context.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to HRM a) HRM – Meaning, Scope and Importance b) Nature of HRM – Objectives and Functions of HRM c) Role of HR Manager d) Qualities and characteristics necessary for a good HR Manager	8	CO1	R U A1 A2 E C
Unit II	Human Resource Planning a) Human Resource Planning – meaning, Objectives and importance b) Premises of planning – Process of Planning c) Control and review mechanisms	8	CO2	R U A1 A2 E C
Unit III	Recruitment and Selection a) Recruitment and Selection – Concept and meaning; sources of recruitment; Selection procedure b) Job design, Job rotation, job enlargement, job enrichment, c) Job Analysis – job description and job specification d) Promotion – demotion – separation.	10	CO3 CO4	R U A1 A2 E C
Unit IV	Training and Development a) Training and Development – meaning, difference and significance b) Training Methods – On-the-job and Off-the-job. c) Executive development – Methods of executive development.	9	CO6	R U A1 A2 E C
Unit V	Performance Appraisal a) Performance Appraisal – meaning, purpose of performance appraisal – Methods of appraisal b) Conventional and non-conventional methods	10	CO5	R U A1 A2 E

	c) Morale – meaning and significance – measurement of morale – measures to tone up morale			C
Learning Resources: 1. Gary, D. (2011). <i>Human Resource Management</i>. Pearson Education India. 2. Jeffrey, A. M. (2015). <i>Strategic Human Resource Management</i>. South-Western College Publishing. 3. Khanka, S. S. (2007). <i>Human Resource Management</i>. S. Chand Publishing. 4. Bratton, J., & Gold, J. (2001). <i>Human Resource Management Theory and Practice</i>. Hound Mills. 5. Aswathappa, K., & Dash, S. (2021). <i>Human Resource Management</i>. McGraw-Hill Education. 6. Noe, R., Hollenbeck, J., Gerhart, B., & Wright, P. (2006). <i>Human Resources Management: Gaining a Competitive Advantage</i>. New York, MA: McGraw-Hill Education.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBASEC102	
Course Title	ENTREPRENEURSHIP DEVELOPMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Skill Enhancement Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Issues of start-ups, family businesses, mobilisation of resources, and feasibility of plans.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Discusses the concept, role and functions of business incubators, angel investors, venture capital and private equity funds. c) c. Recognises the significance of writing the business plan/ project proposal.	
Prerequisite	Basic knowledge about the concept of entrepreneur.	
Course Objectives	A student will be able to: a) Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Discuss the concept of business groups and role of business houses and family business in India; c) Describe the concept, role and functions of business incubators, angel investors, venture capital and private equity fund. d) Prepare the contents of a business plan/ project proposal. e) Evaluate the basic problems faced by start-ups.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the concept, role and functions of business incubators, angel investors, venture capital and private equity fund.	R
CO2	Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour.	U
CO3	Demonstrate Public and private system of stimulation.	A1
CO4	Examine the concept of business groups and role of business houses and family business in India.	A2

CO5	Evaluate the basic problems faced by start-ups.	E		
CO6	Prepare the contents of a business plan/ project proposal.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a) Meaning, elements, determinants and importance of entrepreneurship and creative behaviour; b) Entrepreneurship and creative response to the society problems and at work. c) Dimensions of entrepreneurship: intrapreneurship, technopreneurship, cultural entrepreneurship, international entrepreneurship, netpreneurship, ecopreneurship, and social entrepreneurship	12	CO2	R U A1 A2 E C
Unit II	Entrepreneurship and Micro, Small and Medium Enterprises a) Concept of business groups and role of business houses and family business in India; b) The contemporary role models in Indian business: their values, business philosophy and behavioural orientations; c) Conflict in family business and its resolution	12	CO4	R U A1 A2 E C
Unit III	Entrepreneurial Finance a) Public and private system of stimulation, support and sustainability of entrepreneurship. b) Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur’s associations and self-help groups. c) The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.	12	CO1 CO3	R U A1 A2 E C
Unit IV	Sources of business ideas and tests of feasibility. a) Significance of writing the business plan/ project proposal; Contents of business plan/ project proposal; b) Designing business processes, location, layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered); c) Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions.	12	CO6	R U A1 A2 E C

Unit V	Mobilising Resources a) Mobilising resources for start-up b) Accommodation and utilities; Preliminary contracts with the vendors, suppliers, bankers, principal customers; c) Contract management: Basic start-up problems.	12	CO5	R U A1 A2 E C
Learning Resources: 1. Kuratko, D. F., & Rao, T. V. (2012). <i>Entrepreneurship: A South-Asian Perspective</i>. Cengage Learning. 2. Desai, V. (2009). <i>Dynamics of Entrepreneurial Development and Management</i>. Himalaya Publishing House. 3. Holt, D. H. (1992). <i>Entrepreneurship: New venture creation</i>. Prentice Hall of India. 4. Plsek, Paul E. (1997). <i>Creativity, Innovation and Quality. (Eastern Economic Edition)</i>. New Delhi: Prentice-Hall of India. 5. Singh, N. P. (1985). <i>Emerging Trends in Entrepreneurship Development</i>. New Delhi: ASEED. 6. Khanka, S. S. (2006). <i>Entrepreneurial development</i>. S. Chand Publishing. 7. Ramachandran, K. (2009). <i>Entrepreneurship Development: Indian Cases on Change Agents</i>. Tata McGraw-Hill Pub.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAVAC102	
Course Title	TOURISM PRODUCTS	
Credits	1	
Total Session Hours	30	
Number of Sessions	15	
Course Type	VAC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Tourism products.	
Course Offered to	BBA	
Regulation	2023	
Course Overview	This course: a) Familiarize students with different types of tourism products. b) Provides an understanding of cultural tourism resources of India. c) Provides knowledge about the social and cultural set up in India and its contribution to tourism.	
Prerequisite	Basic knowledge of tourism products in tourism products.	
Course Objectives	A student will be able to: a) Understand the importance and types of Tourism Products. b) Identify the popular religious shrines, classical dance styles, and different school of Indian Music. c) Identify the different potential tourist resources. d) Explain the growth and development of Himalayan Region, Dessert and Coastal areas as tourist resources. e) Identify any one tourism product and submit a report.	
Course Content		
Session	Session Details	Session Hours
Session I	Introduction: Tourism Products	2
Session II	Socio-cultural resources: Important historical and archaeological sites	2
Session III	Popular religious shrines: Hindu/Buddhist/Jain/Muslim/Christian and Others	2
Session IV	Classical Dances and dance styles of India	2
Session V	Music and instruments – Different school of Indian Music	2
Session VI	Handicrafts as potential tourist resources	2
Session VII	Important Fair and Festivals	2

Session VIII	Himalayan region as major tourist resource (Sikkim, Darjeeling & Kalimpong Hills)	2
Session IX	Development of Desert Tourism	2
Session X	Coastal areas/ beaches and islands.	2
Session XI	Presentation on various dance forms/folk musical instruments/folk songs.	2
Session XII	Field Visit (Any popular religious shrines/historical/archaeological sites)	2
Session XIII	Field Report and Discussion.	2
Session XIV	Project Submission on any topic of tourism products.	2
Session XV	Evaluation (Viva-Voce)	2

Learning Resources:

1. Chawla, R. (2006). *Tourism: The Cultural Heritage*. Arise Publishers.
2. Mukherjee, R. K. (2012). *Cultural Art of India*. Radha Publications.
3. Pradhan, G. K. (1976). *Towards the silver crests of the Himalayas*. Bharatiya Vidya Bhavan.
4. Jhala, L. S. (2017). *Tourism Development in Desert and Humid Zones*, Himanshu Publication.
5. Kumar R. & Ram, S. (2013). *Tourism in North-East India*, Arpan Publications.
6. Robinet, J. P. & Mahadevan, S. J. (2012). *Tourism Products of India*, Abhijeet Publications.
7. Rajaval, N. (1998). *Tourism in Andaman and Nicobar Islands*, Manas Publications

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sradha Pradhan Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

Semester III

1. Course Description

Course Code	23BBAMAJ201	
Course Title	COST ACCOUNTING	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Costs incurred by a company – its classifications, methods, and accounting.	
Course Offered to	BBA	
Regulation	2023	
Course Overview	This course: a) Primarily helps the students to understand the concept of costing as a decision-making tool in business operations. b) Equips with the ability to classify costs and overheads under different category. c) Analyses emerging concepts of cost accounting and its relevance in industry. d) Equips with the ability to apply the concept and techniques of costing to determine the cost under different methods.	
Prerequisite	Basic knowledge of accounting, cost, and its types.	
Course Objectives	The students will be able to: a) Monitor costs of raw materials, labour, transportation, administrative costs, overheads etc. in an industry. b) Advise ways to bring economy by analyzing costs and implications of different production methods. c) Prepare regular cost reports and accounts under different methods. d) Monitor performance and efficiency to locate and report various problems in different departments. e) Learn about pricing, budgeting, and performance analysis to determine overall success based on predetermined objectives.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the concept of cost accounting, cost centre, profit centre, and classify cost on different basis.	R
CO2	Differentiate among the various methods of costing.	U
CO3	Apply the payroll procedures; calculate remuneration	A1

	and incentive plans for preparing the labour cost statement.			
CO4	Analyse the different classes of overheads; allocation, absorption and apportionment of overheads.	A2		
CO5	Evaluate the inventory control techniques, incentive plans in preparation of labour cost statement.	E		
CO6	Construct cost statements under unit, job, and service costing and construct cost accounts under contract and process accounts.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Cost Accounting: (a) Meaning, objectives, nature, scope and importance of Cost Accounting. (b) Difference between Cost Accounting and Financial Accounting. (c) Cost concepts and classifications; cost centre and profit centre. (d) Installation of a costing system; Role of a cost accountant in an organization.	8	CO1	R U A1 A2 E C
Unit II	Material Costing: (a) Inventory control techniques; (b) Purchase of materials – procedure; (c) Stock levels of Materials and EOQ; (d) Storage of materials (bin card and stores ledger); (e) Issue of materials and Methods of pricing of materials issues — FIFO, LIFO, Simple Average, and Weighted Average.	10	CO5	R U A1 A2 E C
Unit III	Labour Costing: (a) Accounting and Control of labour cost; (b) Time keeping and time booking; (c) Concept and treatment of idle time, over time, labour turnover and fringe benefits; (d) Methods of wage payment and the Incentive schemes – Halsey plan, Rowan plan, and Taylor’s Differential piece wage system.	10	CO3	
Unit IV	Overheads Costing: (a) Classification of Overheads; (b) Allocation, Apportionment and Absorption of overheads;	10	CO4	

	(c) Preparation of Overheads Distribution Statements; (d) Computation of Machine Hour Rate. (e) Activity Based Costing.			
Unit V	Methods of Costing: (a) Unit costing; (b) Job Costing; (c) Contract costing (including escalation clause); (d) Process costing (process losses and valuation of work-in-progress); (e) Service Costing (only transport).	22	CO2 CO6	R U A1 A2 E C

Learning Resources:

1. Charles T. Horngren, Srikant M. Datar, Madhav V. Rajan, Cost Accounting: A Managerial Emphasis, *Pearson Education*.
2. Jawahar Lal, Cost Accounting. *McGraw Hill Education*.
3. Nigam, B.M. Lall and I.C. Jain. Cost Accounting: Principles and Practice. *PHI Learning*.
4. M. Haniff, Modern Cost & Management Accounting
5. Goel, R. Cost Accounting. *International Book House*
6. Singh, S. Cost Accounting, *Scholar Tech Press*, New Delhi.
7. Jain, S.P. and K.L. Narang. Cost Accounting: Principles and Methods. *Kalyani Publishers*
8. Arora, M.N. Cost Accounting – Principles and Practice. *Vikas Publishing House*, New Delhi.
9. Maheshwari, S.N. and Mittal S.N. Cost Accounting: Theory and Problems. *ShriMahavir Book Depot*, New Delhi.
10. Jain & Narang, Cost & Management Accounting, *Kalyani Publishers*

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	FA2 - Mid-Semester Exams (25 weightage)	FA3 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory long question (financial interpretation) of 15 marks. Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS	MARKS	RBT (level)

	TO ATTEMPT		
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (financial interpretation)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMAJ202	
Course Title	ORGANIZATIONAL BEHAVIOUR	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Individual and group behaviour, attitude, job satisfaction and workplace dynamics.	
Course Offered to	BBA and BBA (Tourism & Hospitality Management)	
Regulation	2023	
Course Overview	This course: a. This course explores the impact of individual, group, and organizational dynamics on behaviour within organizations. b. By examining theories and practical applications, students will gain insights into managing and leading effectively in various organizational settings. c. Key topics include individual differences, team dynamics, leadership, conflict resolution, organizational change, and stress management.	
Prerequisite	Basic knowledge of the concept of Management and its functions.	
Course Objectives	The students will be able to: a. Understand fundamental concepts and theories of organizational behaviour. b. Analyze the impact of diversity, personality, and values on individual behaviour. c. Explore group dynamics, teamwork, and leadership. d. Examine conflict management strategies and negotiation techniques. e. Understand the processes and challenges of organizational change and stress management.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define Organizational Behaviour and articulate its significance in the context of various contributing disciplines, emphasizing its role in understanding individual and group behaviour within organizations.	R
CO2	Examine and analyze the foundations of individual behaviour, including biographical characteristics, to comprehend the factors influencing behaviour in organizational settings.	U
CO3	Investigate conflict management strategies within organizations, covering causes of conflict, communication, negotiation, and various methods of conflict resolution.	A1

	while also exploring organizational change and stress management concepts and their practical applications.			
CO4	Analyze the concepts of personality and values, including the Myers-Briggs Type Indicator (MBTI) and Big Five model, and explore their relevance in the workplace, focusing on person-job fit and person-organization fit.	A2		
CO5	Evaluate the concepts of learning, attitude, and job satisfaction, and their impact on workplace dynamics, emphasizing the causation of job satisfaction and its organizational implications.	E		
CO6	Construct specific strategies, tools, and communication methods that can be employed, considering the nuances of the technology industry and the need for a smooth transition to the new project management framework.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Organizational Behaviour: a. Definition of Organizational Behaviour, its significance, and contributing disciplines to OB. b. Challenges and Opportunities c. Developing an OB Model	12	CO1	R U A1 A2 E C
Unit II	Individual Behaviour: a. Diversity of Organisation: Diversity, Discrimination, Biographic Characteristics, Ability. b. Attidue & Job Satisfaction: Attidue & Behaviour, Job Satisfaction, Cause, Outcome and Impact of Job Disatisfaction c. Personality and Values: Concept of personality; Myers-Briggs Type Indicator (MBTI); Big Five model. Relevance of values; Indian values; Linking personality and values to the workplace (person-job fit, person organization fit) d. Perception, Decision Making and Emotions: Perception and Judgements; Factors; Linking perception to individual decision making: Decision making in organizations, Ethics in decision making. Emotional labour; Emotional Intelligence. e. Motivation: Theories (Hierarchy of needs, x and Y, Two factor, McClelland Goal Setting, Self-efficacy, Reinforcement Theory), Job Redesign and Alternative Work Arrangement.	12	CO2 CO4	R U A1 A2 E C
Unit III	Group Behaviour: a. Groups and Work Teams: Concept of Groups and Teams; Five Stage model of group development; Group think and shift; Indian perspective on group norms. Group and teams;	12	CO1	

	Types of teams; Creating team players from individuals building and team-based work (TBW) b. Leadership: Concept; Trait theories; Behavioural theories (Ohio and Michigan studies); Contingency theories (Fiedler, Hersey and Blanchard, Path-Goal); Authentic leadership; Mentoring, self-leadership, online leadership: Inspirational Approaches (transformational, charismatic). Comparison of Indian leadership styles with other countries.			
Unit IV	Conflict Management in Organization: a. Causes of Conflict— Communication and Conflict Resolution—Negotiating to solve Conflict; Programme on Negotiation. b. Organizing Conflicts—Types of Conflicts, Interpersonal and Inter-group Conflicts. c. Methods of Conflict Resolution—Regulating Conflicts in Organization.	12	CO3	R U A1 A2 E C
Unit V	Organizational Change and Stress Management: a. Organizational Change: Concept and Nature; Need and Process; Force field Analysis; Resistance to change -Causes and Remedies, Management of Planned change. b. Stress Management: Meaning and Causes of Stress; Physical and Psychological impacts of Stress, Measures to overcome stress, Drive towards effective stress management.	12	CO6	
Learning Resources: 1. Fred Luthans, <i>Organizational Behaviour</i> (12 th Edition) McGraw Hill 2. Khanka S.S, <i>Organizational Behaviour</i> (Standard Edition) S. Chand 3. Stephen Robbins, <i>Organizational Behaviour</i> (18 th Edition) Pearson 4. Steven L McShane, Mary, Himanshu Rai, <i>Organizational Behaviour</i> (9 th Edition) McGraw Hill Note: Latest edition of text books may be used.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory long question/case study of 15 marks. Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question/case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMIN201	
Course Title	INCOME TAX LAW AND PRACTICE	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Minor	
Semester	I	
Intended Level	Diploma	
Issue(s) Addressed	Concept of Income tax and computation of income under different heads, Total Income and Tax Liability.	
Course Offered to	BBA	
Regulation	2024	
Course Overview	This course: a) Recognizes the need to understand the income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, maximum marginal rate of tax; Permanent Account Number (PAN) Residential status; Scope of total income on the basis of residential status Exempted income under section 10 b) Equips with the ability to compute incomes under different heads. c) Explains the concept of Total Income and Tax Liability as well as computation of the same.	
Prerequisite	Basic knowledge of Tax.	
Course Objectives	A student will be able to: a) Explain the basic concepts of income tax. b) Explain the difference between sources and heads of income. c) Compute income under different heads. d) Describe the basics of Total Income and Tax Liability. e) Compute the total income and tax liability of an individual and a firm.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the basic concept of Income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, maximum marginal rate of tax as per Income Tax Act,1961.	R
CO2	Explain the Scope of total income on the basis of residential status Exempted income under section 10.	U
CO3	Compute income under different heads.	A1
CO4	Differentiate between Short term and long-term capital	A2

	gain.			
CO5	Determine the residential status of an individual, firm and a company.	E		
CO6	Compute total income and tax liability of an individual and firms.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Income Tax: a) Basic concepts: Income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, maximum marginal rate of tax; Permanent Account Number (PAN) b) Residential status; Scope of total income on the basis of residential status, Exempted income under section 10. c) Tax Evasion, tax avoidance and tax planning: concept and differences	12	CO1 CO2 CO5	R U A1 A2 E C
Unit II	Computation of Income under different heads: a) Income from Salaries b) Income from House Property	22	CO3	R U A1 A2 E C
Unit III	Computation of Income under different heads: Profits and Gains from businesses & professions.	10	CO3	R U A1 A2 E C
Unit IV	Computation of Income under different heads: Capital gains; Income from other sources.	12	CO3 CO4	R U A1 A2 E C
Unit V	Computation of Total Income and Tax Liability: a) Income of other persons included in assessee’s total income; Advance Payment of Tax. b) Aggregation of income and set-off and carry forward of losses; c) Deductions from gross total income; Rebates and reliefs	12	CO6	R U A1 A2 E C

	d) Computation of total income of individuals and firms; Tax liability of an individual and a firm			

Learning Resources:

1. Singhanian, Vinod K. and Monica Singhanian. *Students' Guide to Income Tax*, University Edition. Taxmann Publications Pvt. Ltd., New Delhi..
2. Dr. C.H. Sengupta(2023-24), *Law and Practice of Direct and Indirect Taxes*, Dey Book Concern,Kolkata.
3. Ahuja, Girish and Ravi Gupta. *Systematic Approach to Income Tax*. Bharat Law House, Delhi
4. Narang , Gaur &Puri(2021), *Income Tax Law*, Kalyani Publishers

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMDC201
Course Title	FUNDAMENTALS OF MARKETING
Credits	03
Total Hours	45
Hours per Week	3
Course Type	Multidisciplinary
Semester	III
Intended Level	Diploma
Issue(s) Addressed	Marketing, Product, Branding, pricing, Distribution channels and Services.
Course Offered to	All courses (excluding BBA, BBA in Tourism & Hospitality & Commerce).
Regulation	2023
Course Overview	This Course: - Covers the nature, evolution, and various orientations of marketing, along with the marketing environment in the Indian context. - Explores segmentation, targeting, and positioning strategies in consumer markets. - Focuses on product life cycle, branding, pricing methods, and new product development. - Discusses the promotion mix, marketing channels, and the unique characteristics and strategies for marketing services using the 7Ps framework. - Through these modules, students gain a comprehensive understanding of marketing principles and their practical applications in diverse contexts.
Prerequisite	Awareness of contemporary marketing trends and technologies.
Course Objectives	The students will be able to: - Comprehend the nature, scope, and significance of marketing, including the evolution of marketing principles and core concepts that underpin modern marketing strategies. - Identify and differentiate between needs, wants, and demands, and understand how these concepts influence consumer behavior and market dynamics. - Apply segmentation, targeting, and positioning techniques to effectively reach and engage target market segments. - Develop strategies for product development, branding, pricing, and managing the product life cycle to meet consumer needs and achieve business objectives. - Design integrated promotion mix strategies utilizing advertising, sales promotion, public relations, personal selling, and understand the role of marketing channels in distributing goods and services. - Demonstrate an understanding of the unique characteristics of marketing services and implement appropriate marketing strategies utilizing the 7Ps

	framework.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe the intangible nature of services, list the innovative marketing approaches to address challenges such as inseparability, perishability, and variability, and formulate strategic plans tailored to service-oriented industries.	R		
CO2	Differentiate between segmentation, targeting, and positioning strategies to devise comprehensive marketing approaches.	U		
CO3	Apply critical thinking skills to assess consumer behavior, market trends, and organizational objectives in order to formulate effective promotional strategies.	A1		
CO4	Categorize the various stages of the Product Life Cycle (PLC) and formulate appropriate marketing strategies for each stage, employing critical thinking and evaluation skills at the application level. Examine the unique characteristics of services and develop comprehensive marketing strategies incorporating the 7Ps.	A2		
CO5	Estimate the methods of pricing, discerning factors that influence pricing decisions, and formulating pricing objectives and policies with proficiency, demonstrating comprehension and analysis skills at the evaluation level.	E		
CO6	Develop comprehensive marketing plans that integrate elements of the marketing environment, company orientations, and core marketing concepts, demonstrating proficiency in holistic marketing strategies tailored to specific target markets.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Marketing: a. Nature, Scope, and Importance of Marketing. b. Needs, Wants & Demands. c. Evolution of Marketing, Core Marketing Concepts. d. Company Orientations: Production, Product, Selling, Marketing, Holistic Marketing. e. Marketing Environment: Demographic, Economic, Political, Legal, Socio-cultural, Technological (Indian context).	12	CO1	R
Unit II	Segmentation, Targeting and Positioning: a. Levels of Market Segmentation, b. Basis for Segmenting Consumer Markets,	12	CO2	U

	c. Difference between Segmentation, Targeting and Positioning.			
Unit III	Product & Pricing Decisions: a. Product Life Cycle (PLC), Product Classification, Product Line and Product Mix Decisions. b. Branding, Packaging, and Labelling, New Product Development. c. Methods of Pricing-the factors influencing the pricing decisions, pricing objectives, pricing policies.	11	CO3	A1
Unit IV	Promotion Mix and Marketing Channels: a. Factors determining Promotion Mix. b. Promotional Tools: Advertising, Sales Promotion, Public Relations, Personal Selling c. Marketing of Services: Unique Characteristics, Marketing Strategies (7Ps).	10	CO4	A2 & E

Learning Resources:

1. Kotler, P. & Keller, K. L. Marketing Management, Pearson.
2. Kotler, P., Armstrong, G., Agnihotri, P. Y., & UIHaq, E. Principles of Marketing. A South Asian Perspective, Pearson.
3. Ramaswamy, V.S. & Namakumari, S. Marketing Management. Global Perspective-Indian Context, Macmillan Publishers India Limited.
4. Zikmund, W.G. & D' Amico, M. Marketing, Ohio. South-Western College Publishing.

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks

Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBASEC201
Course Title	E-COMMERCE
Credits	03
Total Hours	45
Hours per Week	3
Course Type	Skill Enhancement
Semester	III
Intended Level	Diploma
Issue(s) Addressed	Bricks and Mortar in E-commerce, Threats, Security and encryption, IT Act 2000, E-payments transaction.
Course Offered to	BBA and BBA (Tourism & Hospitality Management)
Regulation	2023
Course Overview	This Course: - Emphasizes the critical need for security in e-commerce environments, discussing vulnerabilities, encryption techniques, and measures to protect communication channels, networks, and servers. - The course delves into various models and methods of e-payments, including debit cards, credit cards, and online banking, while addressing associated risks and the significance of digital signatures. - Students explore the diverse applications of e-commerce across industries such as banking, insurance, marketing, e-tailing, online services, auctions, publishing, and entertainment, highlighting the benefits, challenges, and features of conducting transactions online. - Integrated throughout the course, practical labs offer hands-on experience in website development, encryption techniques, e-payment methods, and online business transactions, reinforcing theoretical concepts with real-world applications.
Prerequisite	Students should possess the ability to comprehend technical terms and concepts related to e-commerce, security, and online transactions.
Course Objectives	The students will be able to: - Comprehend the forces driving E-commerce and the technological infrastructure underpinning it, including the dynamics of the World Wide Web and internet evolution. - Understand the importance of security and encryption in E-commerce environments, including identifying vulnerabilities and implementing solutions to protect channels of communication, networks, and servers. - Familiarize with the Information Technology Act 2000 and its recent amendments, including definitions, electronic governance, digital signatures, regulations of certifying authorities, and penalties for cybercrimes. - Gain knowledge of various e-payment systems, including models, methods,

	and risks associated with e-payments, as well as the legal positions of digital signatures and online banking.			
	e. Explore the various facets of online business transactions across industries, including banking, insurance, utilities, marketing, e-tailing, online services, auctions, online learning, publishing, and entertainment.			
	f. Apply theoretical knowledge through practical lab sessions, developing skills in implementing E-commerce solutions and conducting online business transactions securely and efficiently.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define the fundamental concepts of electronic commerce (e-commerce) and recall the importance of security and encryption in e-commerce.	R		
CO2	Discuss the IT Act 2000 and its recent amendments in relation to cyber-crimes and demonstrate the legal framework governing electronic transactions and cyber security.	U		
CO3	Apply theoretical knowledge to practical scenarios, demonstrating proficiency in navigating and utilizing various e-payment platforms securely and efficiently.	A1		
CO4	Analyze the concepts of Electronic Fund Transfer (EFT), Automated Clearing House (ACH), and Automated Ledger Posting, discerning their roles and applications in e-payment ecosystems.	A2		
CO5	Evaluate the diverse applications of e-commerce across various industries recognizing their popularity, benefits, challenges, and distinctive features.	E		
CO6	Formulate strategies for designing, building, and launching an e-commerce website, considering factors such as hardware and software selection, outsourcing vs. in-house development.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction	10	CO1	R
	a. Meaning, nature, concepts, advantages, disadvantages and reasons for transacting online.			
	b. Classification of E-Commerce, e-commerce business models (introduction, key elements of a business model and categorizing major E-commerce business models).			
	c. Forces behind ecommerce. Technology used in E-commerce:.			
	d. The dynamics of World Wide Web and internet (meaning, evolution and features).			

	e. Designing, building and launching e-commerce website (A systematic approach involving decisions regarding selection of hardware, software, and outsourcing vs. in-house development of a website).			
Unit II	Security and Encryption: a. Need and concepts, the e-commerce security environment: (dimension, definition and scope of security), vulnerabilities in the E-commerce environment, solutions. b. Encryption, securing channels of communication, protecting networks and protecting servers and clients.	9	CO2	U
Unit III	IT Act 2000 with recent amendments and Cyber Crimes: a. IT Act 2000: Definitions, Electronic governance, Attribution, acknowledgement and dispatch of electronic records. b. Regulation of certifying authorities, Digital signature, and Digital signatures certificates. c. Duties of subscribers, Penalties and adjudication, Appellate Tribunal, Offences and Cyber-crimes.	9	CO3	A1
Unit IV	E-payment System: a. Models and methods of e-payments (Debit Card, Credit Card, Smart Cards, e-money). b. Digital signatures (procedure, working and legal position), payment gateways; online banking: meaning, concepts, and importance. c. Electronic fund transfer, automated clearing house, automated ledger posting), Risks involved in e-payments.	9	CO4	A2 & E
Unit V	Online Business Transactions a. Meaning, purpose, advantages and disadvantages of transacting online. b. E-commerce applications in various industries like banking, insurance, payment of utility bills, marketing, e-tailing (popularity, benefits, problems and features). c. Online services (financial, travel and career), auctions, online portal, online learning, publishing and entertainment, online shopping from e-tailers.	8	CO5	C
Learning Resources: 1. Laudon, K.C., and GuercioTraver, C. <i>E-Commerce</i> , Pearson Education. 2. Whiteley, D. <i>E-commerce: Strategy, Technology and Applications</i> . McGraw Hill Education 3. Bhaskar, B. <i>Electronic Commerce: Framework, Technology and Application</i> . 4th Ed., McGraw Hill Education 4. Joseph, P.T. <i>E-Commerce: An Indian Perspective</i> . PHI Learning 5. Bajaj, K.K., & Nag, D. <i>E-commerce</i> . McGraw Hill Education				

6. Madan, S. *E-Commerce*. Taxmann
7. Chhabra, T.N., Jain, H.C., and Jain, A. *An Introduction to HTML*. Dhanpat Rai & Co.
8. Elias, A.M., *Electronic Commerce from Vision to Fulfilment*. Pearson Prentice Hall

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
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Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAVAC201	
Course Title	TIME MANAGEMENT	
Credits	1	
Total Hours	15 sessions of 2 hours each	
Hours per Week	2	
Course Type	Value Added Course	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Value based learning	
Course Offered to	BBA and BBA (Tourism & Hospitality Management)	
Regulation	2023	
Course Overview	This Course: a. Helps students Prioritize, plan and arrange daily activities in a productive way b. Assists students in learning techniques to overcome procrastination	
Prerequisite	Basic understanding of time management and ethics.	
Course Objectives	The students will be able to: a. Organize work station and workflow to make better use of time. b. Efficiently delegate tasks. c. Co-ordinate business meetings more effectively. d. Identify the ‘time stealers’ and handle them appropriately. e. Learn scheduling, planning and prioritizing skills.	
Course Outcomes At the end of this course, the students will be able to: a. Learn tips and ways to become better organized. b. Recognize the difference between urgent items and important items. c. Handling workload efficiently. d. Escape the trap of over-committing yourself. e. Utilize Technology Effectively to save time. f. Learn effective ways of handling Paperwork.		
Course Content		
Units	Content	Lecture Hours
Session 1	How Long Is One Minute? Instructions	2

	1. Ask participants to stand up and close their eyes. 2. Then ask them to sit down quietly (so that the other participants cannot hear them) when they think that one minute has gone. 3. Once everybody has sat down, you start the discussion. What will happen is that participants will sit down at different times. So, you can point out to them that time depends heavily on perception. By asking participants when time goes faster for them and when, instead, time never seems to pass, you can introduce to them the idea that passion, time, and productivity are connected.	
Session II	The Jigsaw Puzzle 1. Divide your participants into groups of 3 to 5 people per group. 2. Give each group a puzzle but NOT the image with the big picture, so that they cannot see what the image looks like when the puzzle is finished. 3. After about three minutes, stop the process and ask: ‘What is missing?’ ‘What is making solving the puzzle difficult?’ It is likely they will say that it is because they cannot see the big picture that they are working towards. 4. Now, give them the big pictures and they should complete the puzzles much faster. The point of this time management training game is that it is very hard to work efficiently and in a timely manner, without knowing the ultimate goal we are aiming towards.	2
Session III	Coloured Items – Time Management Training Activity Activity Instructions 1. Divide participants into groups. 2. Provide each group with a set of items of different colors. So, give each group, for example, 6 green items, 6 blue, 6 red, and 6 yellow. 3. Ask each group to collect, in 1 minute, as many blocks as they can. Each person can only use their non-dominant hand. Each item is worth 1 point. 4. Ask the groups to play again but, this time, assign a different point value to each color. 5. After one minute has passed, stop the game. 6. Add up the points and nominate the winning group. You can start the discussion after the game, by asking groups: ‘What was your strategy for playing the game the second time around?’ The discussion should highlight that good organizational skills, planning, and coordination are essential to achieve more in the shortest amount of time.	2
Session IV	Time Management Prioritisation Exercise Prioritization Exercise Instructions 1. Separate participants into groups of 4 to 5 people. 2. Give each group a sheet of A1 paper from a flipchart pad and some colored marker pens. 3. Give them 10 minutes to make a list of tasks that are likely to come up as part of their job or at home (you may want to focus on different areas of life depending on who you are training, or	2

	let the participants choose). 4. Ask them to prioritize these tasks based on the importance of each task. 5. At the end of the 10 minutes, ask the groups to feedback to the rest of the class and ask them: ‘Which tasks did you consider the most important and why?’ The discussion that will follow will revolve around what important tasks are and how we know that they are important.	
Session V	Arrange the Cards Instructions 1. Divide the class into groups of 3 to 5 people. 2. Give each group a deck of playing cards (which you had previously shuffled, so they are not in order). 3. Explain that each team has to lay out the cards in the specific order that you will have previously shown. (You can use a PowerPoint slide for this, with a photo of the cards, or you can have a deck of cards already set up on a table). 4. Explain that cards must be placed in neat rows without touching each other. 5. Tell participants that the team that completes the task in the shortest amount of time wins. 6. Give teams 5 minutes to strategize and carry out any practice runs. Explain that teams can use any resources in the room to help them, as needed. 7. After the first 5 minutes, start the first proper round. 8. There will be three rounds. The idea is that each team should improve with each round. The winning team is the one that accomplishes the task in the shortest amount of time. At the end of the game, start a discussion by asking participants: ‘What strategy did you use to complete the task?’ Strategizing, planning, and delegating should come out, from the discussion, as key elements to managing time successfully.	2
Session VI	How to Overcome Time-wasters This activity, not only introduces the idea of time-wasters, but it also gives your participants the opportunity to start thinking about how to overcome them. Time-wasters Exercise Instructions 1. Write a time-waster on the back of each envelope (a different time-waster on each envelope). Use common time-wasters, which can be things such as meetings, social media, unexpected visitors, etc. 2. Divide the participants into groups of 3 to 5 people. 3. Give each group an envelope and give them 3 minutes to write down a list of ways to overcome the time-waster written on the envelope they were given on one of the index cards (each team has to use only one of the index cards in the envelope). 4. After three minutes are up, ask the groups to pass their envelope to the group next to them, so that envelopes rotate and each group has a different envelope every time. 5. Continue with up to as many rounds as there are groups or as many rounds as time allows.	2

	6. After the last round, start the discussion.	
Session VII	What Did You Do Yesterday? 1. Ask participants to work individually for this task at first. 2. Ask each participant to jot down, on a piece of paper, 5 things they accomplished yesterday. It does not matter how big or small. It can be anything from taking the dog for a walk to closing an important sale for their company. 3. Ask each participant to write down one wasteful thing they did. Wasteful means unproductive, something that did not contribute towards achieving their goals, did not improve the quality of their life or distracted them from more important tasks. 4. Give participants 5 minutes to write down the 5 accomplishments and the wasteful thing. 5. Ask participants to discuss and compare their lists with the person sitting next to them (or they can discuss in groups of three if there is an odd number of participants).	2
Session VIII	Practice your delegation skills Imagine you have a new employee and an observer. Assign some of your tasks to the new employee. The delegator practices delegation and the observer have a sheet that helps them provide feedback on how well they did and what needs to be improved. This kind of scenario improves team coordination and management.	2
Session IX	Overcoming Distractions In this activity, identify your distractions. Keep track of your time over a few days. Put all your distractions on paper, then develop a plan to overcome them. Doing this activity in the group, create a list of your distractions, then talk about solutions.	2
Session X	Time Squared Take three pages containing 24 squares, each indicating the 24 hours of the day. Participants fill the first page with the routine tasks they complete each day. The second page is for the time they spend working that is unproductive. They combine the contents of the first two pages into the third page. The remaining time can be used productively.	2
Session XI	Pomodoro The Pomodoro is a widely known and used time management activity for students, employees, and perfectionists. Millions of people swear by its life-changing power. The <u>Pomodoro</u> technique involves four cycles, each of 30 minutes. Each cycle is divided into 25 minutes of work and a 5-minute break. After completing the four cycles, take a long break of 20 minutes. Repeat the process until the end of the tasks. This is one of the effective time management skills for planning, avoiding distraction, stress management, and setting priorities.	2

Session XII	Kanban Divide your task into four sections as follows: 1. Backlog: This is where you brainstorm and list all of your tasks. Then you choose which tasks to move to the To Do column and which ones can wait their turn. 2. To-Do List: You'll work on the items in the To-Do section. 3. In-progress: These are the projects you currently have in progress. 4. Completed — Tasks you've completed.	2
Session XIII	Circadian Rhythms Each participant in this time management activity has a paper with hourly blocks. They list the energy state they are in at that moment. Are they, for instance, "on fire," "at 70%," "slowing down," and so on? The idea is to make people more aware of their highs and lows to make better use of their time.	2
Session XIV	Schedule Your Priorities A list of tasks, each worth a different number of points, is presented to you in this activity. The group is divided into teams, and each team has 10 minutes to complete its assigned tasks. You then add up the points. After that, you talk with them about their prioritization process.	2
Session XV	Time-boxing 1. Make a list of all your tasks. 2. Establish your goals and decide what you want to achieve with these tasks. 3. Give a task more time if it's important (for example, 1 or 2 hours). 4. To make a difficult task easier to manage, divide it into smaller parts and give each a shorter period (for instance, 20 to 30 minutes). 5. Stop working on a task when the allotted time is up. 6. Go on a break. 7. Review the task.	2

Source:

1. <https://chrismathunit.weebly.com/activity-1-how-long-is-a-minute.html#:~:text=Point%20to%20the%20numbers%20moving,the%20same%20as%20sixty%20seconds>.
2. <https://www.bell-foundation.org.uk/eal-programme/guidance/classroom-guidance/great-ideas/jigsaw-activities/#:~:text=What%20are%20jigsaw%20activities%3F,then%20become%20the%20experts%20in>
3. <https://symondsresearch.com/time-management-activities/>
4. <https://trainingcoursematerial.com/free-games-activities/time-management-activities/arrange-the-cards>
5. <https://quixy.com/blog/time-management-activities/>

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

Semester IV

1. Course Description

Course Code	23BBAMAJ203	
Course Title	MARKETING MANAGEMENT	
Credits	4	
Lecture Hours	60	
Hours per week	4-5	
Category	Major	
Semester	IV	
Regulation	2023	
Course Overview	This course: a. Understand the concepts and functions of marketing. b. Analyse marketing environment impacting the business. c. Segment the market and understand the consumer behaviour. d. Describe the 4 P’s of marketing and also strategize marketing mix. e. Understand the different pricing strategies.	
Pre-requisites	Basic knowledge about marketing concept and functions	
Course Objectives	The students will be able to: a. Identify the basic marketing management. b. Understand the basics of marketing concepts and its evolution. c. Understand and explain STP. d. Discuss about the 4 Ps of marketing. e. Understand the pricing objectives and factors influencing pricing decisions. f. Describe different advertising and sales promotional tools. g. Explain the Principles and Marketing Ethics.	
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to:		
COs	Statement	Revised Bloom’s Taxonomy
CO1	Describe marketing contribution to creating and delivering customer value, and what is the significance of understanding the evolution of marketing concepts?	Remembering
CO2	Explain the concept of product levels and how product characteristics influence consumer preferences.	Understanding
CO3	Compare and contrast different pricing methods and strategies, highlighting their advantages and limitations.	Applying
CO4	Analyse the functions and types of intermediaries in distribution channels, and discuss their significance in marketing.	Analyzing
CO5	Evaluate the principles of sustainable marketing and discuss the ethical considerations in marketing practices.	Evaluation
CO6	Prepare a comprehensive marketing campaign targeting a	Creating

	niche segment identified through creative market segmentation. Consider the factors influencing consumer behaviour and the buying decision process.	

Course Content				
Units	Content	Hours	COs	CLs
UNIT-I	A. Introduction: - Meaning, nature and objectives of Marketing. - Scope and importance of Marketing. - Evolution of Marketing. - Company orientation: Product concept, selling concept, Marketing concept, Holistic marketing concept. - Delivering and Creating Customer Value. B. Recent trends in Marketing & Environment: - E- Business, Tele-marketing, Green Marketing, Relationship Marketing, Digital Marketing, Social media and E-tailing. - Demographic, economic, political, legal, socio cultural, technological environment.	8	CO1	R U A 2A E C
UNIT-2	Market Segmentation & Consumer Behaviour - Meaning and Definition, Bases of Market Segmentation, Measurement Market Segmentation; - Consumer Behaviour-Factors influencing Consumer Behaviour; Buying Decision Process.	10	CO6	R U A 2A E C
UNIT-3	Product Decisions: - Product Levels - Product Characteristics and Classifications - Product Mix - Product Life Cycle - Reasons for launching new products and its failure. - BCG & Ansoff's Matrix. - Meaning of services, unique characteristics of services, 7 Ps of service marketing.	12	CO2	R U A 2A E C
UNIT-4	Price Decision - Pricing Method, - Factor influencing pricing - Types of pricing - Pricing strategies: new product pricing strategies, Product mix pricing strategies, Price adjustment strategies.	10	CO3	R U A 2A E C

UNIT-5	Promotion: - Promotion Mix: Factors determining promotion mix, - Promotional Tools –basics of Advertisement, Sales Promotion, Public Relations & Publicity - Others promotional strategies (Buzz Marketing, Stealth Marketing, Guerrilla Marketing) Distribution Channels: - Channel functions, - Channel Levels, - Types of Intermediaries: Types of Retailers, Types of Wholesalers.	10	CO4	R U A 2A E C
UNIT-6	Socially Responsible Marketing - Sustainable Marketing - Social Criticisms of Marketing - Marketing's Impact on Individual - Principles and Marketing Ethics	6	CO5	R U A 2A E C

Text Books:

1. Kotler, P. & Keller, K. L.: *Marketing Management*, Pearson.
2. Arun Kumar: *Marketing Management*, Vikas Publishing House.
3. Saxena, Rajan: *Marketing Management*, TMH.
4. Gandhi, J.C.: *Marketing*, TMH.
5. Ramaswamy, V.S. and S. Namakumari : *Marketing Management*, Macmillian.

Note: Latest edition of text books may be used.

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	FA2 - Mid-Semester Exams (25 weightage)	FA3 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory long question (Case Study) of 15 marks. Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks

Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (Case Study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rajeev Dutraj Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMAJ204	
Course Title	FIANANCIAL MANAGEMENT	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Financial decisions in a business.	
Course Offered to	BBA	
Regulation	2023	
Course Overview	This course: a. Covers theories of financial management and their application in investment, financing and dividend decisions. b. Covers concepts of cost of capital, leverage analysis, capital structure and dividend theories	
Prerequisite	Basic knowledge about finance and importance of financial management in business	
Course Objectives	The students will be able to: a. Understand basic concepts of financial management and their application in investment, financing and dividend decisions. b. Understand concepts of cost of capital, leverage analysis, capital structure and dividend theories c. Identify courses of action in financial environment that would result in maximization of wealth of an organization. d. Understand management of working capital and estimate the same for an organization	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Recognize the importance of financial management from a strategic perspective	R
CO2	Take both long-term and short-term investment decisions	U
CO3	Apply the capital structure decisions through relevant models	A1
CO4	Compute cost of capital and develop innovative financial strategies	A2
CO5	Analyse the dividend policy of a firm	E
CO6	Comprehend the functions of short term financial	C

	management			
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a. Nature, scope and objective of Financial Management b. Time value of money c. Risk and return concept d. Valuation of securities – Bonds and Equities	12	CO1	R
Unit II	Investment Decisions a. The Capital Budgeting Process, b. Cash flow Estimation c. Payback Period Method, Accounting Rate of Return, Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index d. Capital budgeting under Risk – Certainty Equivalent Approach and Risk- Adjusted Discount Rate.	12	CO2	U
Unit III	Financing Decisions a. Cost of Capital and Financing Decision: Sources of long-term financing, Estimation of components of cost of capital b. Methods for Calculating cost of equity capital, Cost of Retained Earnings, Cost of Debt and Cost of Preference Capital, Weighted Average cost of capital (WACC) c. Capital structure –Theories of Capital Structure (Net Income, Net Operating Income, MM Hypothesis, Traditional Approach) d. Operating and financial leverage; Determinants of capital structure	12	CO3 & CO4	A1 A2
Unit IV	Dividend Decisions a. Theories for relevance and irrelevance of dividend decision for corporate valuation b. Cash and stock dividends c. Dividend policies in practice	12	CO5	E
Unit V	Working Capital Decisions a. Concepts of working capital and the risk-return trade off b. Sources of short-term finance c. Working capital estimation d. Cash management, receivables management, inventory management and payables management.	12	CO6	C
Learning Resources: 1. James C. Van Horne and Sanjay Dhamija, Financial Management and Policy, Pearson				

Education
2. Khan and Jain. Basic Financial Management, McGraw Hill Education
3. Chandra, Prasanna. Fundamentals of Financial Management. McGraw Hill Education
4. Rustagi, R.P. Fundamentals of Financial Management. Taxmann Publication Pvt. Ltd.
5. Pandey, I.M. Financial Management. Vikas Publications. Accounting, Kalyani Publishers

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	FA2 - Mid-Semester Exams (25 weightage)	FA3 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory long question (Case Study) of 15 marks. Total marks: 50	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (Case Study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMAJ205	
Course Title	HUMAN RESOURCE MANAGEMENT	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Human Resource	
Course Offered to	BBA	
Regulation	2023	
Course Overview	This Course: Is designed to provide students the basic understanding of key HRM functions, which include HR planning, recruitment & selection, compensation, performance evaluation, and training & development.	
Prerequisite	Basic knowledge about importance of human resource management in business decision making.	
Course Objectives	The students will be able to: a. Understand the functions, systems, policies and applications of Human Resource Management in organizations. b. Develop an overview of theoretical foundations of key areas associated with HR development in the organizations. c. Enhance HR skills and their ability to assess the constraints and opportunities associated with managing employees in different socio-economic and political context. d. Develop an insight into the effective management of employees that will guide the budding managers through the principles and practices of HRM and the core models of best practices.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Understand and recognize Human Resource Management Perspective	R
CO2	Ability to Draft HR planning, job description and job specification	U
CO3	Ability to train using various methods of Training	A1
CO4	Ability to implement Employee benefits and Welfare measures	A2
CO5	Ability to implement the practices related to employee integration	E
CO6	Ability to implement methods of Industrial	C

	Democracy			
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Human Resource Management: a. Concept, Functions, roles, skills & competencies, HRD-definition, goals and challenges b. The changing environment of HRM – globalization, cultural environment, technological advances, workforce diversity, corporate downsizing, changing skill requirement c. HRM support for improvement programs Work life balance d. HR role in strategy formulation & gaining competitive advantage. HRM issues in Indian Organization	12	CO1	R
Unit II	Human Resource Planning: a. HR Planning Process, Forecasting demand & supply, Skill inventories b. Human Resource Information System (HRIS) succession planning c. Job analysis – Uses, methods, Job description & Job specifications d. HR accounting and Human Resource Development (HRD) audit concept e. Recruitment, Selection & Orientation: internal & external sources, e- recruitment, selection process, orientation process.	12	CO2	U
Unit III	Training: a. Concept, Needs, Systematic approach to training, Methods of training b. Management development: Concept & Methods. c. Performance management system: concept, uses of performance appraisal, performance management methods, factors that distort appraisal, appraisal interview d. Career planning: career anchors, career life stages.	12	CO3	A1
Unit IV	Compensation a. Steps of determining compensation, job evaluation, components of pay structure b. Factors influencing compensation levels, wage differentials & incentives c. Profit sharing, gain sharing, employees’ stock option plans.	12	CO4	A2

	d. Brief introduction of social security, health, retirement & other benefits.			
Unit V	Industrial Relations: a. Introduction to Industrial Relations b. Trade unions- role, types, functions, problems c. Industrial dispute- concept, causes & machinery for settlement of disputes d. Grievance, concepts, causes & grievance redressal machinery e. Discipline-concept, aspect of discipline & disciplinary procedure f. Collective bargaining- concept, types, process, problems, essentials of effective collective bargaining.	12	CO5	E & C
Learning Resources: 1. De Cenzo, D.A. & Robbins: Fundamentals of Human Resource Management, New York: John Wiley & Sons 2. Dessler, G: Human Resource Management, Pearson. 3. Monappa & Saiyaddin: Personnel Management, Tata McGraw Hill. 4. Rao, V.S.P.: Human Resource Management- Text and Cases, Excel Books.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	FA2 - Mid-Semester Exams (25 weightage)	FA3 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory long question (Case Study) of 15 marks. Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10	Higher-order level

		marks	
GROUP D	1 compulsory long question (Case Study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMIN202	
Course Title	QUANTITATIVE TECHNIQUES IN MANAGEMENT	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Quantitative Managerial Decision Making	
Course Offered to	BBA	
Regulation	2023	
Course Overview	This Course: a. Deals with the use of mathematical models for planning of corporate and governmental activities b. Deals with both deterministic and stochastic problems, and they will be analyzed based on the following models and methods: Linear and nonlinear programming, integer programming, network models, simple queuing theory and simulation.	
Prerequisite	Basic knowledge about importance of managerial decision making and optimum utilization of resources	
Course Objectives	The students will be able to: a. Use quantitative methods and techniques for effective decisions–making b. Become proficient in model formulation and applications that are used in solving business decision problems c. Understand different application areas of operations research like transportation problem, assignment model, sequencing models, dynamic programming and game theory d. Formulate different types of mathematical models to tackle optimization problems with business applications.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Solve linear programming problems using appropriate techniques and optimization solvers, interpret the results obtained.	R
CO2	Determine optimal strategy for Minimization of Cost of shipping of products from source to Destination/ Maximization of profits of shipping products using various methods	U
CO3	Optimize the allocation of resources to Demand points in the best possible way using various techniques and minimize the cost or time of completion of number of	A1

	jobs by number of persons.			
CO4	Formulate Network models for service and manufacturing systems, and apply operations research techniques and algorithms to solve these Network problems	A2		
CO5	Model competitive real-world phenomena using concepts from game theory. Analyze pure and mixed strategy games	E		
CO6	Comprehend decision theory under the conditions of risk, certainty and uncertainty	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Linear Programming: a. Formulation of L.P. Problems b. Graphical Solutions (Special cases: Multiple optimal solution, infeasibility, unbounded solution) c. Simplex Methods (Special cases: Multiple optimal solution, infeasibility, degeneracy, unbounded solution) d. Big-M method and Two-phase method e. Duality and Sensitivity (emphasis on formulation & economic interpretation)	10	CO1	R
Unit II	Elementary Transformation a. Formulation of Transport Problem, Solution by N.W. Corner Rule, Least Cost method, Vogel's Approximation Method (VAM) b. Modified Distribution Method. c. Special cases: Multiple Solutions, Maximization case, Unbalanced case, prohibited routes	10	CO2	U
Unit III	Elementary Assignment a. Hungarian Method b. Special cases: Multiple Solutions, Maximization case, Unbalanced case, Restrictions on assignment	10	CO3	A1
Unit IV	Network Analysis a. Construction of the Network diagram b. Critical Path- float and slack analysis c. Total float, free float, independent float d. PERT e. Project Time Crashing	10	CO4	A2

Unit V	Introduction to Game Theory a. Pay off Matrix- Two person Zero-Sum game, Pure strategy b. Saddle point c. Dominance Rule, Mixed strategy, Reduction of $m \times n$ game and solution of 2×2 , $2 \times s$, and $r \times 2$ cases by Graphical and Algebraic methods d. Introduction to Simulation: Monte Carlo Simulation	10	CO5	E
Unit VI	Decision Theory a. Pay off Table, Opportunity Loss Table b. Expected Monetary Value c. Expected Opportunity Loss d. Expected Value of Perfect Information	10	CO6	C

Learning Resources:

1. Vohra, N. D. Quantitative Management. Tata McGraw Hill.
2. Gupta, P. K. Operations Research. Sultan Chand.
3. Kapoor, V. K. Operations Research. Sultan Chand & Sons.
4. Sharma, J. K. Operations Research Theory & Applications. Macmillan India Limited.
5. Kalavathy, S. Operations Research. Vikas Publishing.

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)

GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAVAC202		
Course Title	STRESS MANAGEMENT		
Credits	1		
Total Hours	15 sessions of 2 hours each		
Hours per Week	4		
Course Type	Value Added Course		
Semester	IV		
Intended Level	Diploma		
Issue(s) Addressed	Value based learning		
Course Offered to	BBA and BBA (Tourism & Hospitality Management)		
Regulation	2023		
Course Overview	This Course: a. Aims to equip people with practical skills to cope with stress b. Helps to use one’s time efficiently and feel more in control.		
Prerequisite	Basics of time management		
Course Objectives	The students will be able to: a. Identify the costs and benefits of dealing with stress. b. Define what stress is and started to recognize the signs of stress. c. Engage students in personal stress management strategies and techniques. d. Review the main work areas that can lead to stress and identified ways to address work-related stress throughout the organization. e. Develop the critical role and skills of an effective manager of stress and draw up their own action plan to address the most prominent issues in managing stress in the workplace.		
Course Outcomes At the end of this course, a student will be able to: a. Understand the basic principles of stress management. b. Recognize your stress triggers and how to manage them. c. Develop proactive responses to stressful situations. d. Use coping tips for managing stress both on and off the job. e. Learn to manage stress through diet, sleep and other lifestyle factors. f. Develop a long-term action plan to minimize and better manage stress.			
Course Content			
Units	Content		Lecture Hours
Session 1	Yoga		2

	Here is a sequence of yoga poses for stress relief. Complete each move slowly, one after the other to create a yoga "flow." • Swan dive – Stand with your legs hip-width apart. Reach both arms out to your sides and up to the sky, holding for a breath. At the same time, slowly lower your arms and bend at the waist, keeping your back straight. Reach for the ground. • Downward dog – From the swan dive, place your hands on the ground and walk your feet back until your body is in an 'A' shape. Look between your hands. • Cobra – From downward dog, lower your body down until you're flat on your stomach. Place your palms shoulder-width apart and push your chest up until you're arching your back and you feel a stretch in your stomach muscles. • Child's pose – From cobra, lower yourself back down to your stomach. Push yourself up to your hands and knees with your knees hip-width apart. Touch your big toes together and lower your bottom down to your heels. Lower your stomach between your knees, place your forehead on the ground or your hand and reach your hands forward as far as you can. Rest in this position as long as you'd like and repeat the sequence if desired.	
Session II	Guided Imagery A person may follow the steps below to try guided imagery: 1. Sit or lie down in a comfortable place. 2. Close the eyes. 3. Take a few deep breaths so the body can start relaxing. 4. Visualize a peaceful, calm setting, such as, a garden, lake, or somewhere by the sea. 5. Picture the scene and add more details. Explore the scene with all other senses; for example, imagine birds chirping, the scent of flowers, and the warmth of the sun. 6. Linger in the scene for a few minutes while trying to savor the calmness and sense of relaxation. A person can choose to stay in the scene for as long as they need to rejuvenate. 7. Open the eyes and stretch gently to re-enter the present. People should remember that they can return to the scene whenever they want.	2
Session III	Progressive Muscle Relaxation (PMR) exercise To try PMR: 1. Find a peaceful and quiet place to do the exercise. Sit in a chair or lie down on the floor or a bed. If it feels comfortable, close the eyes. 2. Keeping the mouth closed, inhale deeply and slowly through the nose. Exhale slowly through the mouth and imagine tension leaving the body. 3. Repeat these deep breaths three or four more times. If it causes dizziness, breathe normally instead. 4. On the fifth inhale, squeeze the muscles in the toes and feet and count to four. Then exhale slowly through the mouth, gradually releasing tension from the feet.	2

	5. Repeat step four, this time for the calf muscles. Tense the calf muscles while breathing in, then release when breathing out. Continue to repeat a pattern of tensing muscles while inhaling and then relaxing them while exhaling for muscles all the way up the body. This includes the: • knees • thighs • buttocks • abdomen • hands, by making fists • arms • shoulders, by shrugging them toward the ears • jaw, by clenching the teeth and releasing • face, by scrunching the facial muscles and releasing	
Session IV	Listening to Music Music is one of the amazing stress-busting techniques. Not only listening to music helps in improving your concentration skills and promoting relaxation, but it can also help in stimulating your mind and relieve stress. If you're a stressed student then you can reap the benefits of music. If you're studying, you can play classical or calm music.	2
Session V	Simple Meditation Instructions: 1. Warm up (Optional: take heart rate and note it) 2. Begin by sitting comfortably, balanced, and relaxed (if seated in a chair, feet on the ground). Breathe easy and from the abdomen/"belly breathing" (not chest breathing). 3. Practice a few deep breaths with the group. 4. Rotate the head in easy, slow circles; change direction and rotate in slow, easy circles. 5. Look up; tilt your head way back. Look down; put your chin on your chest. 6. Drop your arms and hands to the side and shake them gently and easily. 7. Raise your feet off the floor and gently and easily shake the knees. 8. Straighten your spine while meditating. 9. Practice (repeat two times) 10. This is done SILENTLY. 11. When teacher says, "Close your eyes", close your eyes. [Once your eyes are closed, simply relax your mind and do not make an effort to think about anything; slowly your mind will clear and relax] When teacher says, "Open your eyes", open your eyes. 12. Now, sit straight up, relaxed, and balanced. 13. "Close your eyes" (two minutes elapse) 14. "Open your eyes" 15. Check in with students: how was that? (Students may give thumbs up or thumbs down.) Now everyone practice it again. 16. Repeat exercise: "Close your eyes" ... two minutes elapse... "Open your eyes" (Optional: take heart rate and compare to heart rate before meditation).	2

Session VI	Peer-Sharing (Co-Listening) Instructions: 1. Students should be in pairs; have students find a partner (e.g. you can number off students 1, 2, 1, 2...). 2. Student #1 talks while student #2 simply listens (e.g. ask Student 1 to share how they are feeling today and why? Or how they are feeling at the moment Or about any concerns or worries they are experiencing). 3. After 1-3 minutes the students switch roles and student #2 talks while student #1 listens for another 1-3 minutes (Student #2 now talks about the same question, e.g. how they are feeling today and why?). 4. Part Two 4. After the pairs are done sharing, group students in triads (groups of three; again you may number off students 1, 2, 3, 1, 2, 3 ...). 5. Student #1 talks while students #2 and #3 listen (e.g. ask Student 1 to talk about opportunities and solutions related to current issue or stressors he/she is experiencing or concerned about). 6. Every 1-3 minutes switch until each student in the group has a turn to talk.	2
Session VII	Animal Charades Instructions: 1. Depending on class size, break class into groups of 2, 3 or 4 students. 2. Write several different names of animals on paper; one name per folded up piece of paper (students may help with this as part of the activity). 3. Put names in the hat. 4. Each group picks a name and figures out how to present their charade to the class. 5. Each group takes a turn presenting their charade, while the "audience" guesses the animals presented. 6. Depending on time, number of groups and number of folded papers, teacher determines how many rounds of charades each group presents. 7. OPTIONAL: At the end of the activity, distribute paper, pencils, and crayons/markers for students to draw and color their favorite animal	2
Session VIII	Silent Ball Instructions: 1. No one can talk or make a sound; that is the object of the game 2. Students may stand by their desks or position students in any arrangement to facilitate tossing the ball to each other around the classroom 3. Make a good throw to a classmate; explain that students cannot throw back to the person who threw to them 4. If student misses the ball or makes a bad pass, student is out and must sit at his/her desk until the next round 5. Play until all students are seated; last two are the champs!	2

Session IX	Movement to Music Freeze Dance Instructions: 1. If necessary, arrange classroom to provide ample space for the activity. 2. Students take a place in the designated “movement/dance” area with sufficient personal space so as not to run into other students OR students may be positioned in a circle and move in the same direction around the circle. 3. Review activity rules with students: * Move to match the music * FREEZE when the music stops * When the music starts again, move to match the music *Activity involves only movement, no voices 4. Start the music. 5. Stop music at timely intervals. 6. Note suggested sequence of music; always end with slow, calming music.	2
Session X	Paper Mosaics Instructions: 1. Students clear their desks of books, folders, etc. 2. Using a pencil, students draw the outline of an object, shape or scene on a 8.5”x11” or 9”x12” piece of paper (see examples attached of Butterfly, Elephant. Flowers, Cat’s Face). 3. Students then cut small colored square paper “tiles” from the scrap construction paper or the magazines (tear out pages you would like to use and then cut the pictures up into little square “tiles”). Modification: for K-1 prepare mosaic patterns and pre-cut paper tiles. 4. Explain to students that each outline should be filled with tiles of the same color. 5. Working with one shape/area/figure at a time, students apply glue to the inside of their outlined shapes, and then place the paper “tiles” in the shape/outline, leaving a small space between each paper “tile” (for some shapes, students may have to cut “customized tiles” to effectively fill in the shape). 6. Students repeat the glue and placement of “tiles” in each shape/outline of their drawings until the mosaic is complete.	2
Session XI	Deep Breathing Exercise Provide students with the following directions: 1. Stand straight up with feet shoulder-width apart 2. Arms and hands are relaxed downward 3. Body is relaxed 4. Eyes closed 5. Focus on lower abdomen (belly) and imagine a small balloon in that space 6. Breath in slowly and deeply through nostrils, imagining the balloon inflating (getting bigger/larger/growing) slowly, hold a few seconds 7. Slowly exhale through the mouth, imagining the balloon gently deflating (getting smaller, shrinking); blow out of the mouth as if blowing out a candle 8. Tip: Place a hand over the lower abdomen to feel it go up and	2

	down, and make sure you're not breathing with the chest 9. Repeat at least 10 times.	
Session XII	The Five Senses Worksheet Mindfulness can be cultivated by paying attention to what we observe and feel while using our different senses one at a time. During mindfulness practice, distractions are observed, and attention is gently returned to the body part receiving focus. Templates can be downloaded online and use for the activity	2
Session XIII	Nature Effect Students are to be taken to a nature park by the teacher and they should be asked to simply enjoy sounds and sights of nature. Merely being in the garden, often performing mindfulness activities, could improve the symptoms of their post-traumatic stress disorder.	2
Session XIV	Anxiety Record Using worksheet, students can record their anxieties, triggers, and their effects. Afterward, they are guided through a breathing exercise and asked to revisit their answers to the questions. A few prompts from this exercise are listed below: • When do you feel anxious? • What thoughts are you having before or during feeling anxious? • Do you think these thoughts are realistic? • What thoughts could you replace them with?	2
Session XV	Mindfulness Meditation Practicing mindfulness meditation 1. Sit on a straight-backed chair or cross-legged on the floor. 2. Focus on an aspect of your breathing, such as the sensations of air flowing into your nostrils and out of your mouth, or your belly rising and falling as you inhale and exhale. 3. Once you've narrowed your concentration in this way, begin to widen your focus. Become aware of sounds, sensations, and your ideas. 4. Embrace and consider each thought or sensation without judging it good or bad. If your mind starts to race, return your focus to your breathing. Then expand your awareness again.	2

Source:

1. <https://www.medicalnewstoday.com/articles/guided-imagery#step-by-step-guide>
2. <https://www.childrens.com/health-wellness/stress-relief-activities-for-kids>
3. <https://www.edutopia.org/sites/default/files/resources/stw-glenview-stress-reduction-activities.pdf>
4. <https://www.wright.edu/sites/www.wright.edu/files/page/attachments/Stress%20Management%20Workshop.pdf>

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:



SALESIAN COLLEGE
(AUTONOMOUS) | SONADA
SILIGURI

Salesian College

(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Business Administration

Department of Management Studies

Curriculum Document
2024 – 2025

VISION

Excel towards an esteemed centre for pursuing holistic education and grooming of prospective management professionals to become part of the corporate houses at the domestic and international levels.

MISSION

Emphasise and create academic excellence, social intelligence and globally competitive skills to comply with the corporate requirement.

1. Programme Overview

Bachelor of Business Administration is a four-year honour degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Acquaint themselves with the essentials of Management theories and its application in problem solving activities.
	PO02: Develop comprehensive knowledge of the tactical process and inculcate inspiration and revolution among students.
	PO03: Provide knowledge and requisite skills in different areas of management like human resource, finance, operations and marketing to give a holistic understanding of a business system.
	PO04: Gain awareness about the various contemporary issues in business management.
Skills	PO05: Build problem-solving capacities through experiential learning and advanced pedagogy to ensure application of knowledge in proficient careers.
	PO06: Develop IT skills in the areas of information search, word processing, office management software, and presentation software needed to excel in business.
	PO07: Develop business and entrepreneurial aptitude among the students.
	PO08: Aid students in choosing and applying suitable tools for decision making required for solving multifaceted managerial problems.
Competence	PO09: Produce industry-ready graduates who have the highest concerns for Personal & Institutional Honour, Social Concerns, Teamwork and Constant Learning.
	PO10: Develop positive attitudes to develop a multi-faceted personality with a sense of environmental awareness and moral values.
	PO11: Inculcate global view of the industrial and organizational establishments and their functions for taking viable decisions in international business setting.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student understands concepts and principles of management; recognize opportunities in the corporate environment and tackle challenges
	PSO2: A student Acquire practical learning through summer internship programme, industrial visit, industrial trips, educational trips, exchange programmes, business development plan etc.
	PSO3: A student understands and develops new dimensions of knowledge through open electives to cater to the need of the industry.
	PSO3: A student acquires the ability to analyse various functional issues affecting the organization
	PSO4: A student demonstrates the ability to frame strategies for organizational benefits
	PSO5: A student develops the ability to analysis and interpretation of data which is used in decision making
	PSO6: A student understand the way to analyse global environment and its Impact on business
	PSO7: A student understands the ecosystem of start-ups in the country
Skills	PSO1: A student will Demonstrate analytical and problem-solving skills through specialization in Finance, Human Resource and Marketing to solve the business issues.
	PSO2: A student will demonstrate the ability to create business plans
	PSO3: A student will acquire the ability to work in groups and achieve common objectives during every organizational crisis situation
	PSO4: A student will demonstrate managerial knowledge to achieve corporate objectives using limited resources
	PSO5: A student will demonstrate managerial competencies by identifying business opportunities, plans and implement revolutions in the workplace.
	PSO6: A student will exhibit managerial skills in the areas of creativity, operations, business process and overall risk-taking activities
	PSO7: A learner will operate effectively as a leader and as an individual member in diverse teams, and in multidisciplinary settings in the areas of marketing, finance and HR
Competence	PSO1: A learner demonstrates competencies required to analyze various functional issues affecting the organization
	PSO2: A student will demonstrate the ability to develop models / frameworks to reflect critically on specific business contexts
	PSO3: A student will demonstrate Effective Oral and Written Communication
	PSO4: A student will correlate various qualitative and quantitative data for management research.
	PSO5: A student will demonstrate extensive ability to work in Groups
	PSO6: A student will develop ethical practices and imbibe values for better Corporate Governance.
	PSO7: A student will understand ethical challenges and choices in a business setting

PROGRAMME MATRIX

BBA 1ST YEAR

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	24BBAMAJ101	Major	Principles of Management	4	3+1+0	60	100
	24BBAMIN101	Minor	Business Mathematics	4	3+1+0	60	100
	24BBASEC101	SEC	Business Communication	3	2+0+1	45	100
	24BBAMDC101	MDC	Fundamentals of Management	3	2+1+0	45	100
	24ENGAEC101	AEC	Compulsory English	2	2+0+0	30	50
	24GEOAEC101	AEC	Environmental Science	2	2+0+0	30	50
	24BBAVAC101	VAC	Indian Constitution	2	2+0+0	30	50
	Total			20	16+3+1	300	550
II	24BBAMAJ102	Major	Business Regulatory Framework	4	3+1+0	60	100
	24BBAMAJ103	Major	Financial Accounting for Managers	4	3+1+0	60	100
	24BBAMIN102	Minor	Managerial Economics	4	3+1+0	60	100
	24BBAMIN103	Minor	Business Environment	4	3+1+0	60	100
	24BBASEC102	SEC	Entrepreneurship Development	3	2+0+1	45	100
	24BBAMDC102	MDC	Introduction to Human Resource Management	3	2+1+0	45	100
	24SCSVED101	VAC	Value Education/NSS/NCC	2	2+0+0	30	50
	Total			24	18+5+1	360	650

Total credits = 20 + 24 = 44 Credits

Note: Students exiting the programme after securing 44 credits will be awarded UG Certificate in Bachelor of Business Administration provided they secure 4 credits in Internship/Industrial Training in addition to 6 credits from skill-based courses earned during first and second semester.

BBA 2ND YEAR

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	24BBAMAJ201	Major	Human Resource Management	4	3+1+0	60	100
	24BBAMIN201	Minor	Income Tax Laws & Practices	4	3+1+0	60	100
	24BBASEC201	SEC	E-Commerce	3	2+0+1	45	100
	24BBAMDC201	MDC	Fundamentals of Marketing	3	2+1+0	45	100
	24ENGAEC201	AEC	Alternative English/MIL/FL	2	2+0+0	30	50
	24GEOAEC201	AEC	Environmental Science	2	2+0+0	30	50
	24BBAAEC201	VAC	Tourism Products	2	2+0+0	30	50
	Total			20	16+3+1	300	550
IV	24BBAMAJ202	Major	Marketing Management	4	3+1+0	60	100
	24BBAMAJ203	Major	Financial Management	4	3+1+0	60	100
	24BBAMIN202	Minor	Goods & Services Tax	4	3+1+0	60	100
	24BBAMIN203	Minor	Quantitative Techniques in Management	4	3+1+0	60	100
	24BBASEC202	SEC	Computer Applications in Business	3	2+0+1	45	100
	24SCSVED201	VAC	Value Education/NSS/NCC	2	2+0+0	30	50
	Total			21	16+4+1	315	550

Total credits = 20 + 21 = 41 Credits

Note: Students exiting the programme after securing 41 credits will be awarded UG Certificate in Bachelor of Business Administration provided they secure 4 credits in Internship/Industrial Training in addition to 6 credits from skill-based courses earned during first and second semester.

BBA 3RD YEAR

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
V	24BBAMAJ301	Major	Organizational Behaviour	4	3+1+0	60	100
	24BBAMAJ302	Major	Strategic Management	4	3+1+0	60	100
	24BBAMAJ303	Major	Business Statistics	4	3+1+0	60	100
	24BBAMAJ304	Major	Cost Accounting	4	3+1+0	60	100
	24BBAMAJ305M/ 24BBAMAJ305F/ 24BBAMAJ305H	Major	Marketing of Services/ Corporate Accounting/ Labour Laws	4	3+1+0	60	100
	Internship			2			
	Total			22	15+5+0	300	500
VI	24BBAMAJ306	Major	Management Accounting	4	3+1+0	60	100
	24BBAMAJ307	Major	Production Management	4	3+1+0	60	100
	24BBAMAJ308	Major	Indian Financial System	4	3+1+0	60	100
	24BBAMAJ309M/ 24BBAMAJ309F/ 24BBAMAJ309H	Major	Consumer Behaviour/ Financial Markets & Institutions/ Organization Development	4	3+1+0	60	100
	24BBAMAJ310M/ 24BBAMAJ310F/ 24BBAMAJ310H	Major	Product & Brand Management/ Microfinance and Financial Inclusion/ Human Resource Development	4	3+1+0	60	100
	Total			20	15+5+0	300	500

Total credits = 22 + 20 = 42 Credits

Note: Students exiting the programme after securing 42 credits will be awarded UG Certificate in Bachelor of Business Administration provided they secure 4 credits in Internship/Industrial Training in addition to 6 credits from skill-based courses earned during first and second semester.

Semester I

1. Course Description

Course Code	24BBAMAJ101	
Course Title	PRINCIPLES OF MANAGEMENT	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Managerial planning, decision making, organizing, staffing, directing, controlling, and coordinating.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Covers the basic concepts of management along with traditional and modern theories b) Explains the process of planning and decision making. c) Describes the importance of organizing and staffing. d) Covers the significance of directing and communication. e) Explains the concepts and essentials of co-ordinating and controlling	
Prerequisite	Basic knowledge about management concepts and functions.	
Course Objectives	A student will be able to: a) To explain the evolution of Management and its principles. b) Acquaint with the fundamentals of managing business. c) Understand individual and group behaviour at the workplace so as to improve the effectiveness of an organisation. d) Create and evaluate different leadership styles. e) Understand the concept of controlling and coordination as an essence of management.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the primary contributors and their contributions to the development of management thought.	R

CO2	Explain the concept of MBO and MBE. Discuss the planning process	U		
CO3	Classify the different organizational structures.	A1		
CO4	Outline the different motivational theories.	A2		
CO5	Recommend the best styles of leadership.	E		
CO6	Develop the steps in controlling and techniques of control.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Management a) Introduction –Meaning, Evolution of management thought Management Theory b) Approaches to management; Fayol’s Process Management theory; Neo-Classical theories - human relations era -Hawthorne studies c) Nature and Characteristics of Management - Scope and Functional areas of Management d) Management as a Science, Art or Profession; Management and Administration	12	CO1	R U A1 A2 E C
Unit II	Planning and Decision Making a) Nature, Importance, Objectives and Purpose of Planning b) Planning Process; Types of plans (Meaning only) c) Decision making- Importance and steps d) MBO and MBE (Meaning only)	12	CO2	R U A1 A2 E C
Unit III	Organizing and Staffing: a) Nature, purpose and principles of Organizing b) Delegation of Authority c) Types of Organization - Departmentation, Committees d) Centralization vs. Decentralization of Authority and Responsibility e) Nature and importance of Staffing	12	CO3	R U A1 A2 E C
Unit IV	Directing & Communicating: a) Meaning and Nature of Direction, Principles of Direction b) Motivation theories – Maslow’s Need Hierarchy Theory, Herzberg’s Two Factor Theory, Mc.Gregor’s X and Y theory c) Leadership – Meaning, Formal and Informal Leadership, Characteristics of Leadership; Leadership Styles – Autocratic Style,	12	CO4 CO5	R U A1 A2 E C

	Democratic Style, Participative Style, Laissez Faire Leadership Styles, Transition Leadership, Charismatic Leadership Style.			
Unit V	Co-ordinating and Controlling: a) Coordination–Meaning, Importance and Principles b) Controlling–Meaning and steps in controlling c) Essentials of Effective Control system, Techniques of Control (in brief).	12	CO6	R U A1 A2 E C
Learning Resources: - Sharma, R.K. and Gupta, S.K. (2009). <i>Principles of Management</i>. Kalyani Publication. - Rudani, R. B. (2020). <i>Principles of management</i>. McGraw-Hill Education. - Gupta, C.B. and Mathur, S. (2020). <i>Management Principles & Applications</i>. MKM Publishers Pvt. Ltd. - Agarwal, N.K. (2010). <i>Principles of Management</i>. DND Publication, Jaipur, 2010. - Prasad, L.M. (2009). <i>Principle & Practice of Management</i>. Sultan Chand & Sons Publication.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10	Higher-order level

		marks	
GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rajeev Dutraj Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMIN101	
Course Title	BUSINESS MATHEMATICS	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Minor	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Mathematics tools & techniques	
Course Offered to	BBA	
Regulation	2024	
Course Overview	This course: a) The ability to explain the concepts and use of equations, formulae, and mathematical expressions and relationships in a variety of contexts b) The ability to analyze and demonstrate skills required in mathematically intensive areas in economics and business c) The ability to integrate mathematical concept in international business scenario.	
Prerequisite	Basic knowledge about mathematics and its application in business and economics.	
Course Objectives	A student will be able to: a) Define basic terms in the areas of business calculus and financial mathematics, b) Explain basic methods of business calculus, types and methods of interest account and their basic applications in practice, c) Solve problems in the areas of business calculus, simple and Compound interest account, use of compound interest account, d) Apply knowledge of mathematics with emphasis on management applications, and e) Connect acquired knowledge and skills with practical problems in business and economic practice.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	State the meaning of matrix, limit, continuity, derivatives, compound interest, integration and	R

	indices	
CO2	Summarize 2 nd ordered derivatives, properties of indices, logarithm	U
CO3	Classify different types of matrices, various techniques of integration for definite and indefinite series	A1
CO4	Analyze maximum and minimum of a function & point of inflexion using derivatives, partial derivatives of functions of several variables using Euler's theorem from their formulas and use them to approximate function values, linear systems with matrices - Matrix inverses - Matrix determinants and Cramer's Rule up to (3x3) matrix.	A2
CO5	Estimate the second derivative function using the derivative rules, consumers' surplus and producers' surplus and interest rates and discount factors. Application of these concepts to the pricing of simple, fixed-income financial instruments and the assessment of investment projects	E
CO6	Construct quadratic equation when the values of the roots are given and to calculate the value of new roots from the existing value of the roots.	C

Course Content

Units	Content	Lecture Hours	COs	RBT
Unit I	Matrices a) Definition of a matrix. b) Types of matrices; Algebra of matrices. c) Calculation of values of determinants up to third order; Adjoint of a matrix; Finding inverse of a matrix through adjoint; d) Applications of matrices to solution of simple business and economic problems	12	CO1 CO3 CO4	R U A1 A2 E C
Unit II	Differential Calculus a) Concepts of limit and continuity of a function; b) Concept of differentiation; Rules of differentiation – simple standard forms.	24	CO1 CO2 CO4 CO5	R U A1 A2 E C

	Applications of differentiation – elasticity of demand and supply; c) Maxima and Minima of functions (involving second order derivatives) relating to cost, revenue and profit, d) Partial Derivatives: Euler’s theorem and its application			
Unit III	Integration a) Integration as a reverse process of Differentiation, b) Integration by Substitution and by parts c) Integration by partial fraction d) Differential equations, Definite integrals, applications of Integrals	12	CO1 CO3	R U A1 A2 E C
Unit IV	Basic Mathematics of Finance a) Simple and compound interest Rates of interest – nominal, effective and continuous – their inter-relationships; b) Annuities c) Quadratic Equation d) Logarithm e) Theory of Indices	12	CO1 CO2 CO6	R U A1 A2 E C
Learning Resources: 1. Nag, N.K. (2019). <i>Business Mathematics and Statistics</i> . Kalyani Publishers. 2. Padmalochan, H. (2017). <i>Business Mathematics</i> . Springer. 3. Gupta, S.P. & Gupta, P.K. (2022). <i>Business Mathematics and Statistics</i> . Sultan Chand & Sons.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks

	question of 15 marks. Total marks: 50		
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 20 marks	Higher-order level
GROUP D	1 compulsory question	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rupam Majumdar Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBASEC101	
Course Title	BUSINESS COMMUNICATION	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Skill Enhancement Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Clarity, conciseness, tone, professionalism, relevance, audience, format, feedback, context, accuracy.	
Course Offered to	BBA & BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Recognizes the need to enhance written as well as oral communication skills. b) States the importance of effective communication in a globalized economy. c) Describes the importance of effectively drafting business reports and letters.	
Prerequisite	Verbal and non-verbal communication, drafting letters and short presentations.	
Course Objectives (total 5)	A Student will be able to: a) Define and explain the nature and significance of communication. They will grasp the process and principles of communication, b) Recognize various communication models, and identify different communication channels. c) Learn about effective communication, including recognizing barriers and employing strategies to overcome them. d) Understand the importance of listening, types of listening, and methods to enhance listening skills. e) Develop skills in report writing, business correspondence, and oral presentations, including PowerPoint presentations, to effectively communicate in various professional scenarios.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the meaning, nature, and objectives of communication	R
CO2	Explain the principles and process of communication, and identify different models.	U

CO3	Differentiate and analyse various channels of communication, including formal, informal, verbal, and non-verbal.	A1		
CO4	Recognize barriers to effective communication and propose strategies to overcome them.	A2		
CO5	Evaluate the significance of listening, identify barriers, and implement techniques for effective listening.	E		
CO6	Compose business reports, letters, and emails, adhering to appropriate formats and etiquettes. Also develop effective oral presentations with well-structured content, applying presentation essentials.	C		
Course Content				
Units	Content	Lecture Hours	COs	RB T
Unit I	Introduction a) Meaning, definition, nature, objectives, and importance of communication. b) Principles of communication and process of communication. c) Models of Communication.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit II	Communication Channels a) Channels of communication. b) Types of communication: Formal, Informal, Verbal, Non- Verbal, Written, Visual communication. c) Levels of communication and direction of communication	12	CO1 CO2	R U A1 A2 E C
Unit III	Effective Communication a) Meaning and barriers to effective communication. b) Ways to overcome barriers to effective communication. c) Meaning, importance, process and types of Listening. d) Barriers to effective Listening and steps to overcome such barriers	12	CO1 CO2 CO4	R U A1 A2 E C
Unit IV	Report Writing and Business Correspondence a) Types, formats, importance, and process of preparing Business reports. b) Drafting minutes, agenda, inquiry letter, complaint letter, persuasive letter, and proposal. c) Writing Resume, letters, office memorandum, office circulars, notices, and orders. d) Technology for communication. Electronic mail: advantages, safety, and smartness in email. E-mail etiquettes.	12	CO1 CO2 CO4 CO5	R U A1 A2 E C
Unit V	Oral and PowerPoint Presentation a) Importance, features, and essentials of effective oral presentation. b) Making presentations: content and organizing.	12	CO1 CO2 CO5 CO6	R U A1 A2 E

	Delivering a presentation			C
Learning Resources: 1. Kaul, A. (2016). <i>Effective Business Communication</i>, 2nd ed. PHI learning. 2. C.B. Gupta (2019). <i>Essentials of Business Communication</i>. Sultan Chand & Sons. 3. Kumar, V., Raj, B., Kapurthala, & Jalandhar. (2017). <i>Comprehension and Communication Skills in English</i>. Kalyani Publishers. 4. Kumar, V., Raj, B., Kapurthala, & Jalandhar. (2017). <i>Comprehension and Communication Skills in English</i>. Kalyani Publishers. 5. Rizvi, M. A. (2005). <i>Effective technical communication</i>. Tata McGraw-Hill. 6. Chanda, S. M. (2010). <i>An Introduction to Critical Thinking</i>. Pearson, Delhi.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMDC101	
Course Title	FUNDAMENTALS OF MANAGEMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	MDC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Managerial planning, organizing, staffing, directing and controlling.	
Course Offered to	All courses (excluding BBA, BBA in Tourism & Hospitality & Commerce)	
Regulation	2024	
Course Overview	This course: a) Covers understanding of management concepts and administration process b) Depicts importance of organizing in business and different theories c) Covers objectives, process and techniques of control mechanism in organization.	
Prerequisite	Basic knowledge of business management.	
Course Objectives	A student will be able to: a) Understand fundamental management concepts, including its definition, scope, functions and the roles managers play in organizations. b) Explore the organizational structure, span of control, and functions of line and staff roles, authority, responsibility, centralization, decentralization, and delegation in organizational settings. c) Examine staffing and its role in organizations, including selection and career planning. d) Delve into the nature of directing, leadership styles, motivation, morale, and discipline. e) Learn the objectives and process of control, the role of information, and methods for measuring performance.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Recall management concepts, evolution, and the roles of managers.	R
CO2	Comprehend the importance of management,	U

	differences between management and administration, and the nature of planning.			
CO3	Apply planning techniques, understand organizational structures, and discuss centralization vs. decentralization	A1		
CO4	Analyse the features and types of planning, assess line & staff functions, and evaluate the impact of delegation of authority.	A2		
CO5	Evaluate leadership qualities and styles, and critically assess the role of information in control.	E		
CO6	Create integrated control systems, formulate effective career plans, and design strategies for motivating employees.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a) Management concepts & Evolution: Definition - nature - scope and functions of management. b) Importance of management, role of manager c) Management and administration.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit II	Planning a) Meaning, features, nature and importance of planning b) Procedure, types of planning c) Planning Techniques d) Planning and control e) MBO.	12	CO1 CO2	R U A1 A2 E C
Unit III	Organizing a) Nature - purpose - organizational structure b) Span of control c) Line & staff functions d) Authority & Responsibility e) Centralization and decentralization f) Delegation of authority.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit IV	Staffing and Directing a) Staffing- nature and purpose, b) Selection, c) Career planning. d) Nature of directing, e) Leadership qualities and styles, f) Motivation - morale and discipline	12	CO1 CO2 CO4 CO5	R U A1 A2 E C

Unit V	Controlling a) The objectives and process of control b) Role of information in control c) Performance standard – Measurement of performance. d) Integrated control system in an organisation.	12	CO1 CO2 CO5 CO6	R U A1 A2 E C
Learning Resources: 1. Robbins, S. P., Coulter, M., Sidani, Y., Jamali, D., & Robbins, S. P. (2011). <i>Management (Arab World Editions)</i> . Pearson Education UK. 2. Koontz, H., O'Donnell, C., & Weihrich, H. (1980). <i>Management</i> . McGraw-Hill Book Company. New York, 514-15. 3. Prasad, L. M. (2020). <i>Principles and practice of management</i> . Sultan Chand & Sons. 4. Rao, V. S. P., & Krishna, V. H. (2009). <i>Management: Text and cases</i> . Excel Books India.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAVAC101	
Course Title	INTRODUCTION TO TOURISM	
Credits	1	
Total Session Hours	30	
Number of Sessions	15	
Course Type	VAC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Growth, development, and recent trends in tourism.	
Course Offered to	BBA	
Regulation	2024	
Course Overview	This course: a) Introduces tourism business, its forms and typologies. b) Enhance the knowledge of students in various areas of tourism industry. c) Equips with the understanding of impact of various factors in tourism	
Prerequisite	Basic knowledge of tourism and tourists.	
Course Objectives	A student will be able to: a) Understand the concept, importance, and types of tourism. b) Identify the composition and typology of tourism. c) Describe the recent trends in domestic and international tourism. d) Explain the growth and development of Tourism in India. e) Identify the economic, social, physical, and environmental impact in tourism	
Course Content		
Session	Session Details	Session Hours
Session I	Introduction to Tourism	2
Session II	Introduction to Tourism: Definitions, Nature and Scope of Tourism	2
Session III	Importance and Components of Tourism.	2
Session IV	Typology of Tourism: Domestic Tourism	2
Session V	International Tourism	2
Session VI	Tourism as an industry.	2
Session VII	Concepts of Tourist, visitor and excursionist	2
Session VIII	Concepts of recent tourism trends.	2
Session IX	Growth and development of tourism business in India	2

Session X	Impacts of Tourism (Social, Economic, Physical and Environmental)	2
Session XI	Field Trip (Eco-Village/Tourism)	2
Session XII	Field Trip	2
Session XIII	Field Report and Discussion	2
Session XIV	Project Submission & Presentation	2
Session XV	Evaluation (Viva-Voce)	2
Learning Resources: 1. Seth, P. N., Seth, P. N., & Bhat, S. S. (2003). <i>An Introduction to Travel and Tourism</i>. Sterling Publishers Pvt. Ltd. 2. Sinha, R. K. (1999). <i>Travel and Tourism Management</i>. Dominant Publishers & Distributors. 3. Chawla, R. (2004). <i>Tourism Management</i>, Sonali Publishers, Delhi. 4. Sharma, S. P. (2004). <i>Tourism Education: Principles, Theories and Practices</i>. Kanishka Publishers. 5. Kamra, K. K., & Chand, M. (2004). <i>Basics of Tourism: Theory, Operation and Practice</i>. 6. Negi, J. (1990). <i>Tourism and Travel: Concepts & Principles</i>. 7. Jayapalan, N. (2001). <i>Introduction to Tourism</i>. Atlantic Publishers & Dist. 8. Nigam, S. C. (2008). <i>Eco-Tourism and Sustainable Development</i>, Rajat Publications.		

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sradha Pradhan Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

Semester II

1. Course Description

Course Code	24BBAMAJ102	
Course Title	BUSINESS REGULATORY FRAMEWORK	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Business and Company Laws	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Covers the basics of Indian Contract Act,1872 b) Covers the basics of Sale of Goods Act, 1930 c) Covers the fundamental elements of Companies Act, 2013 and Consumer Protection Act, 1986 d) Covers the elements of Right to Information Act, 2005	
Prerequisite	Elementary knowledge and understanding of business and company laws	
Course Objectives	A student will be able to: a) Understand the Indian Contract Act 1872: the meaning, essentials and kinds of contract. b) Develop basic understanding of Sale of Goods Act 1930 and Negotiable Instruments Act 1881. c) Understand various aspects of the Companies Act 2013 and the Limited Liability Partnership Act 2008. d) To build concept regarding the Consumer Protection Act 1986	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Define and recall the meaning, essentials, and kinds of contract.	R
CO2	State the meanings and types of negotiable instruments; define ‘Goods’ as per the Sale of Goods Act 1930 and explain the concept of sale and agreement to sell.	U
CO3	Illustrate the meanings and types of companies.	A1

	shares and documents required for the incorporation of a company under the Companies Act 2013; explain the meaning, nature, types and formation of partnership.			
CO4	State the objectives and machinery for consumer protection and illustrate the rights of consumers.	A2		
CO5	Explain the features and define various terms under the Right to Information Act 2005.	E		
CO6	Construct a Memorandum of Association & Article of Association.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	The Indian Contract Act, 1872 a) Meaning and Essentials of contract; b) Kinds of contract Based on: validity, formation & performance, law relating to offer and acceptance, consideration, competency to contract, free consent, Void agreements, performance of contracts. c) Discharge of contracts, breach of contracts and quasi contract, Special contracts: contract of indemnity and guarantee, bailment and pledge, and agency	10	CO1	R
Unit II	Sale of Goods Act 1930 a) Meaning of Sale and agreement to sell, b) Implied conditions and warranties, sale by non-owners, rights of unpaid seller. c) Negotiable Instruments Act 1881: Meaning of negotiable instruments, type of negotiable instruments, promissory note, bill of exchange, cheque	14	CO2	U
Unit III	The Companies Act 2013 a) Meaning and types, Incorporation, b) Memorandum & Articles of Association, Prospectus, c) Issue of shares and bonus shares, rights issue, sweat equity, role of directors, share qualification, company meetings. d) The Limited Liability Partnership Act 2008: Meaning and nature of limited partnership, formation, partners & their relations, extent and limitation of liability.	12	CO3 CO6	C
Unit IV	Consumer Protection Act, 1986 a) Objectives and machinery for consumer protection, defects and deficiency removal, rights of consumers. b) Amendments in Consumer Protection Act	12	CO4	A2

	2019.			
Unit V	The Right to Information Act 2005: Salient features and coverage of the act, definition of terms information, right, record, public authority; obligations of public authorities, requesting information and functions of PIO.	12	CO5	A1 E
Learning Resources: 1. Kuchhal, M. C., & Kuchhal, V. (2013). <i>Business law</i>. Vikas Publishing House. 2. Kuchhal, M. C., & Kuchhal, V. (2010). <i>Business Legislation for Management</i>. Vikas Publishing House. 3. Anand, K., & Suremya, S. L. (2021). <i>External and Internal Rules of Corporate Governance</i>. Issue 4 Int'l JL Mgmt. & Human., 4, 2887. 4. Singh, A. (n.d). <i>Principles of Mercantile Law</i>. Eastern Book Company. 5. Kapoor, G. K. & Gulshan. S.S. (2008). <i>Business Law Including Company Law</i>. New Age International.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMAJ103	
Course Title	FINANCIAL ACCOUNTING FOR MANAGERS	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Book-keeping and Accounting	
Course Offered to	BBA	
Regulation	2024	
Course Overview	This course: a) Recognizes the need to understand the framework of accounting as well accounting standards for passing journal entries and preparing financial statements. b) Equips with the ability of demonstrating various treatments for dependent branches. c) Introduces the concept of hire purchase payment system and describes the various methods of accounting for recording such transactions.	
Prerequisite	Basic knowledge of accounting.	
Course Objectives (total 5)	A student will be able to: a) Explain the theoretical framework as well as different accounting terms and the concept of GAAP. b) Explain the different methods of charging depreciation. c) Construct ledger accounts from journal entries, produce a trial balance and prepare the final accounts of a sole proprietorship firm. d) Describe different types of branches and demonstrate various accounting treatments for dependent branches. e) Construct the books of accounts using different systems under Hire Purchase and demonstrate accounting treatments in case of partial and full repossession.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the theoretical framework as well as different accounting terms and the concept of GAAP.	R
CO2	Explain the different methods of charging	U

	depreciation.	
CO3	Demonstrate various accounting treatments for dependent branches.	A1
CO4	Differentiate between Hire Purchase and Instalment Purchase System.	A2
CO5	Recommend accounting treatments in case of partial and full repossession and maintain the books of accounts using different systems under Hire Purchase.	E
CO6	Construct ledger accounts from journal entries, produce a trial balance and prepare the final accounts of a sole proprietorship firm.	C

Course Content

Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Financial Accounting a) Introduction, scope, importance, objectives and limitations of accounting. b) Users of Accounting Information, Accounting terms and Generally Accepted Accounting Principles. c) Basic Accounting Concepts and Accounting Conventions; Accounting Standards.	12	CO1	R U A1 A2 E C
Unit II	Accounting Process and Business Income a) Process of Accounting; Meaning of Double entry system; Accounting Rules; Accounting Equation. Posting entries in Journal, Ledger and preparation of Trial Balance. b) Recording of transactions in Cash Book and in Subsidiary Books – Purchase Book, Purchase Returns Book, Sales Book, and Sales Returns Book; Opening and Closing Entries. c) (i) Capital and revenue expenditures and receipts (ii) Reserves and provisions: meaning, objective and types (iii) Depreciation: concept of depreciation; factors in the measurement of depreciation; methods of computing depreciation: straight line method and diminishing balance method; change of methods.	12	CO2 CO6	R U A1 A2 E C
Unit III	Final Accounts of a Sole Proprietor Preparing Trading Account, Profit & Loss	12	CO6	R U A1

	Account and Balance Sheet for a Sole Proprietor with important adjustments.			A2 E C
Unit IV	Branch Accounting a) Meaning, Objectives and Types of Branches- Dependent Branches, Independent Branches and Foreign Branches. b) Methods of maintaining books of accounts of Dependent Branches by Head Office under Debtor System, Stock & Debtors System, Wholesale Branch System and Final Account System.	12	CO3	R U A1 A2 E C
Unit V	Accounting for Hire Purchase a) Meaning and features of Hire Purchase. Important Definitions – Hire Purchase Agreement, Hire Purchase Price Cash Price, Hire Purchase Charges and Down Payment. Differences between Hire Purchase and Instalment Purchase System. b) Problems on calculation of interest and ascertainment of Cash Price under Reverse Calculation Method. c) Preparation of accounts under Hire purchase trading and stock and debtors system; Accounting treatments in case of Partial and full repossession.	12	CO4 CO5	R U A1 A2 E C
Learning Resources: 1. Hanif, M., & Mukherjee, A. (2018). <i>Financial Accounting-II, 4e</i> . McGraw-Hill Education. 2. Amitabha Basu. (2021), <i>Financial Accounting</i> . Tee Dee Publications. 3. Basu and Das (2021), <i>Selected Problems on Financial Accounting (volume I)</i> (19th Edition) <i>Rabindra Library</i> . 4. Maheshwari, S.N and Maheshwari, S.K. (2018). <i>Financial Accounting</i> (6th Edition). Vikas Publishing House, New Delhi.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study/ financial interpretation	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMIN102	
Course Title	MANAGERIAL ECONOMICS	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Economic tools and techniques used to address managerial issues.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Provides introduction to Managerial Economics enabling the students to become better decision-makers in market economies. b) Equips with the ability of demonstrating demand and supply theory with an analytical approach. c) Introduces the production, cost, and revenue analysis to make better economic decisions.	
Prerequisite	Basic knowledge of Introductory Economics.	
Course Objectives	A student will be able to: a) Identify the basic principles of Managerial Economics and demonstrate the theory of consumer behaviour. b) Understand the concepts of demand and supply, its laws, and classify the different degrees of price elasticity of demand. c) Describe production function and demonstrate the three stages of production. d) Explain the behaviour of long-run and short-run cost curves and total, average, and marginal revenue curves. e) Identify the different forms of market economies and determine the market equilibrium.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define utility and describe the cardinal and ordinal utility approach.	R
CO2	Summarise the theory of demand and supply and explain the different degrees of elasticity.	U

CO3	Classify the different forms of market structure	A1		
CO4	Analyse the short-run and long-run cost curves as well as the total, average and marginal revenue curves	A2		
CO5	Estimate the short-run and long-run equilibrium of firms under different market structures.	E		
CO6	Construct diagrams to explain the Law of Variable Proportions and Law of Returns to Scale	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	A. Introduction to Managerial Economics a) Definition of economics and branch of economics b) Managerial Economics – Meaning, nature and scope; basic economic tools in Managerial Economics. B. Theory of Consumer Behaviour a) Meaning, approaches, and measures of Utility b) Relationship between Total and Marginal Utility c) Law of Diminishing Marginal Utility and Law of Equi-Marginal Utility d) Indifference curves and budget constraints e) Marginal Rate of Substitution f) Consumer Equilibrium and Consumer Surplus (concept only)	10	CO1	R
Unit II	A. Introduction to Demand and Supply a) Introduction to Demand and Supply b) Law of Demand- assumptions, reasons for downward slope and exceptions c) Demand schedule and Demand Curve d) Supply curve; determinants of supply; and Law of Supply- assumptions, reasons for upward slope and exceptions e) Movement along the Demand & Supply Curve and Shift in Demand & Supply Curve B. Elasticity of Demand and Supply a) Meaning and Types of Elasticity of demand- Price, Income and Cross Elasticity. b) Factors affecting Price Elasticity and degrees of price elasticity of demand. c) Income Elasticity of Demand & Cross Elasticity of Demand d) Price elasticity of Supply e) Equilibrium price and its concept	14	CO2	U
Unit III	Theory of Production	12	CO6	C

	a) Meaning of Production and factors of production b) Production Function: short-run and long-run c) Law of Variable Proportions d) Three stages of Production e) Concept of Isoquant and Iso-cost Line f) Law of Returns to Scale			
Unit IV	Cost and Revenue Analysis a) Cost concepts b) Variable, fixed and total cost curves c) Long-run Cost and Short-run Cost Curves d) Economies of scales and economies of scope e) Revenue Concepts: Total, Average and Marginal Revenue curves	12	CO4	A2
Unit V	Theory of Market Structure a) Meaning and forms of market b) Perfect Competition: meaning, features, Short-run and Long-run Equilibrium c) Monopoly: meaning, features, Short-run and Long-run Equilibrium, price discrimination (types and degrees) d) Monopolistic competition: meaning, features, Short-run and Long-run Equilibrium e) Oligopoly: meaning, features, Non-collusive (Cournot's model, and Sweezy's model (kinked demand curve) and Collusive Oligopoly (cartels and price leadership theory)	12	CO3 CO5	A1 E

Learning Resources:

- Salvatore, D. (2009). *Principles of Microeconomics* (5th ed.). Oxford University Press
- Roy, D. (2021). *Managerial Microeconomics* (1st ed.). Abhijeet Publications
- Lipsey, R., & Chrystal, A. (2008). *Economics* (11th ed.). Oxford University Press
- Koutosyannis, A. (1979). *Modern Micro Economics* (2nd ed.). Palgrave Macmillan.
- Pindyck, R. Rubinfeld, D. & Mehta, P. (2009). *MicroEconomics* (7th ed.). Pearson

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short	Group activity, Subjective-type questions, or viva-voce carrying 20	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5

(10 questions of 2 marks each).	questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	marks.	marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMIN103	
Course Title	BUSINESS ENVIRONMENT	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Political, Socio-cultural, legal, economic, and technological environmental issues.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Covers different elements of Business environment and the effects of internal and external factors of business environment. b) Describes the current economic condition and its impact on business. c) Explains the positive and negative impact of technology in modern business.	
Prerequisite	Basic knowledge of business, its nature and objectives.	
Course Objectives (total 5)	A student will be able to: a) Explain the concept, nature, and importance of business environment. b) Analyse the relationships between government and business and evaluate the political, economic, legal, and social policies of the country. c) Enumerate the concept and features of Intellectual Property Rights. d) Analyse how business is affected by different macro-economic variables. e) Give observation as to how technology has helped modern business	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Describe the concept, nature and importance of business environment.	R
CO2	Explain the concept and features of Intellectual Property Rights.	U
CO3	Give observation as to how technology has helped modern business.	A1
CO4	Analyse how business is affected by different	A2

	macro-economic variable.			
CO5	Evaluate the political, economic, legal and social policies of the country.		E	
CO6	Propose different modes of entering into International Business		C	
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Business Environment a) Concept, nature, and importance of business environment. b) Types of environments: general, task environment, internal and external environment, c) Basic elements of environment: socio-cultural, political, legal, economic, and technological elements	12	CO1	R U A1 A2 E C
Unit II	Socio-cultural Environment a) Social environment - Cultural heritage - social attitudes b) Impact of foreign culture, castes, and communities – joint family systems - linguistic and religious groups c) Types of social organization -Corporate Social Responsibilities of business	12	CO5	R U A1 A2 E C
Unit III	Political and Legal Environment a) Fundamental Rights and Directive Principles of State Policy b) State intervention in economic affairs: role of the government in creating a proper business environment. c) The changing legal environment of business, IPR- key concepts and features.	12	CO2 CO5	R U A1 A2 E C
Unit IV	Economic and Technological Environment a) Economic systems and their impact on business b) Macro-economic parameters like GDP, growth rate, population - Urbanisation - Fiscal deficit - Plan investment - Per capita income and their impact on business decisions c) Technological Environment – choice of Technology - Problems in Selecting Appropriate Technology. Importance of technology to Business.	12	CO3 CO4 CO5	R U A1 A2 E C
Unit V	International Environment of Business	12	CO6	R

	a) Globalization: concept and nature, merits and demerits of globalisation. b) Strategies for entering foreign markets: exporting, licensing and c) Franchising, contract manufacturing, management contracting, joint venture, merger and acquisition, strategic alliance and counter trade. d) Multinational corporations: concept, features, merits and demerits.			U A1 A2 E C
Learning Resources: 1. Aswathappa, K. (2009). <i>Essentials of business environment</i> . Karnataka: Himalaya Publishing House. 2. Cherunllam, F. (2019). <i>Business Environment</i> (27th Revised Edition). Himalaya Publishing House. 3. Pustin, P. (2009). <i>Business Environment-Text and Cases</i> . New Delhi-110008. 4. Gupta, C. B. (2022). <i>Business Environment</i> . Sultan Chand & Sons.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBASEC102	
Course Title	ENTREPRENEURSHIP DEVELOPMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Skill Enhancement Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Issues of start-ups, family businesses, mobilisation of resources, and feasibility of plans.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Discusses the concept, role and functions of business incubators, angel investors, venture capital and private equity funds. c) c. Recognises the significance of writing the business plan/ project proposal.	
Prerequisite	Basic knowledge about the concept of entrepreneur.	
Course Objectives	A student will be able to: a) Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Discuss the concept of business groups and role of business houses and family business in India; c) Describe the concept, role and functions of business incubators, angel investors, venture capital and private equity fund. d) Prepare the contents of a business plan/ project proposal. e) Evaluate the basic problems faced by start-ups.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Describe the concept, role and functions of business incubators, angel investors, venture capital and private equity fund.	R
CO2	Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour.	U
CO3	Demonstrate Public and private system of stimulation.	A1

CO4	Examine the concept of business groups and role of business houses and family business in India.	A2		
CO5	Evaluate the basic problems faced by start-ups.	E		
CO6	Prepare the contents of a business plan/ project proposal.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a) Meaning, elements, determinants and importance of entrepreneurship and creative behaviour; b) Entrepreneurship and creative response to the society problems and at work. c) Dimensions of entrepreneurship: intrapreneurship, technopreneurship, cultural entrepreneurship, international entrepreneurship, netpreneurship, ecopreneurship, and social entrepreneurship	12	CO2	R U A1 A2 E C
Unit II	Entrepreneurship and Micro, Small and Medium Enterprises a) Concept of business groups and role of business houses and family business in India; b) The contemporary role models in Indian business: their values, business philosophy and behavioural orientations; c) Conflict in family business and its resolution	12	CO4	R U A1 A2 E C
Unit III	Entrepreneurial Finance a) Public and private system of stimulation, support and sustainability of entrepreneurship. b) Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur's associations and self-help groups. c) The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.	12	CO1 CO3	R U A1 A2 E C
Unit IV	Sources of business ideas and tests of feasibility. a) Significance of writing the business plan/ project proposal; Contents of business plan/ project proposal; b) Designing business processes, location,	12	CO6	R U A1 A2 E C

	layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered); c) Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions.			
Unit V	Mobilising Resources a) Mobilising resources for start-up b) Accommodation and utilities; Preliminary contracts with the vendors, suppliers, bankers, principal customers; c) Contract management: Basic start-up problems.	12	CO5	R U A1 A2 E C
Learning Resources: 1. Kuratko, D. F., & Rao, T. V. (2012). <i>Entrepreneurship: A South-Asian Perspective</i>. Cengage Learning. 2. Desai, V. (2009). <i>Dynamics of Entrepreneurial Development and Management</i>. Himalaya Publishing House. 3. Holt, D. H. (1992). <i>Entrepreneurship: New venture creation</i>. Prentice Hall of India. 4. Plsek, Paul E. (1997). <i>Creativity, Innovation and Quality. (Eastern Economic Edition)</i>. New Delhi: Prentice-Hall of India. 5. Singh, N. P. (1985). <i>Emerging Trends in Entrepreneurship Development</i>. New Delhi: ASEED. 6. Khanka, S. S. (2006). <i>Entrepreneurial development</i>. S. Chand Publishing. 7. Ramachandran, K. (2009). <i>Entrepreneurship Development: Indian Cases on Change Agents</i>. Tata McGraw-Hill Pub.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)

GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMDC102	
Course Title	INTRODUCTION TO HUMAN RESOURCE MANAGEMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Addresses the issues related to human resources in an organisation.	
Course Offered to	All courses (excluding BBA & BBA in Tourism & Hospitality)	
Regulation	2024	
Course Overview	This course: a) Examines HRM's role in effective people management and goal achievement and HR managers' responsibilities including strategic planning, policy formulation, and employee relations. b) Performs job analysis and emphasizes the importance of a fair, objective, and legal recruitment and selection process. c) Highlights the significance of improving skills and performance and explores the objectives and benefits of appraisal systems.	
Prerequisite	Basic knowledge about Human Resource Management.	
Course Objectives	A student will be able to: a) Recognize the essential qualities and characteristics required for effective HR management. b) Identify the premises of effective HR planning and discuss the process involved in HR planning. c) Acquire knowledge of job analysis, description, and specification to effectively define job roles and requirements. d) Discover various training and development methods and their application in different contexts. e) Identify and evaluate different methods of performance appraisal, including conventional and non-conventional approaches.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the importance, objectives, and functions of HRM and state the role and qualities of an HR Manager.	R
CO2	Explain the objectives, importance, and process	U

	of HR Planning.			
CO3	Classify the different sources of recruitment and demonstrate the process of selection.	A1		
CO4	Distinguish between job description and job specification and outline the concept of job design, job rotation, job enlargement, job enrichment, promotion, and demotion.	A2		
CO5	Evaluate the performance of employees using different conventional and non-conventional methods of performance appraisal.	E		
CO6	Propose the best training methods to be applied in different managerial context.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to HRM a) HRM – Meaning, Scope and Importance b) Nature of HRM – Objectives and Functions of HRM c) Role of HR Manager d) Qualities and characteristics necessary for a good HR Manager	8	CO1	R U A1 A2 E C
Unit II	Human Resource Planning a) Human Resource Planning – meaning, Objectives and importance b) Premises of planning – Process of Planning c) Control and review mechanisms	8	CO2	R U A1 A2 E C
Unit III	Recruitment and Selection a) Recruitment and Selection – Concept and meaning; sources of recruitment; Selection procedure b) Job design, Job rotation, job enlargement, job enrichment, c) Job Analysis – job description and job specification d) Promotion – demotion – separation.	10	CO3 CO4	R U A1 A2 E C
Unit IV	Training and Development a) Training and Development – meaning, difference and significance b) Training Methods – On-the-job and Off-the-job. c) Executive development – Methods of executive development.	9	CO6	R U A1 A2 E C
Unit V	Performance Appraisal	10	CO5	R U

	a) Performance Appraisal – meaning, purpose of performance appraisal – Methods of appraisal b) Conventional and non-conventional methods c) Morale – meaning and significance – measurement of morale – measures to tone up morale			A1 A2 E C
Learning Resources: 1. Gary, D. (2011). <i>Human Resource Management</i>. Pearson Education India. 2. Jeffrey, A. M. (2015). <i>Strategic Human Resource Management</i>. South-Western College Publishing. 3. Khanka, S. S. (2007). <i>Human Resource Management</i>. S. Chand Publishing. 4. Bratton, J., & Gold, J. (2001). <i>Human Resource Management Theory and Practice</i>. Hound Mills. 5. Aswathappa, K., & Dash, S. (2021). <i>Human Resource Management</i>. McGraw-Hill Education. 6. Noe, R., Hollenbeck, J., Gerhart, B., & Wright, P. (2006). <i>Human Resources Management: Gaining a Competitive Advantage</i>. New York, MA: McGraw-Hill Education.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)

Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:



Salesian College

(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Business Administration
Tourism & Hospitality Management

Department of Management Studies

Curriculum Document
2023 – 2024

Vision

Accomplishing excellence in educational, training, and professional services under the sectors of travel, tourism, and hospitality.

Mission

Provide quality tourism and hospitality education by a judicious blend of well-structured training needs-based classroom teaching, workshops, online teaching sessions, case study cohorts and mentoring by academic and industry experts.

1. Programme Overview

Bachelor of Business Administration in Tourism and Hospitality Management is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Provide students with a comprehensive understanding of the theoretical and applied aspects of the Tourism & Hospitality Industry.
	PO02: Inculcate all the desired skills of standard operating procedures & service provisions to meet the needs of today's customer by providing desired services required in the Tourism & Hospitality Industry.
	PO03: Equip with hospitality skills required to provide customer satisfaction into the hotel & tourism sector
	PO04: Gain efficiency to fulfil guest requirements for food & beverage service, meetings, conferences, events, travel moments & caterings.
Skills	PO05: Apply knowledge of tourism concepts along with the management theories and practices to solve business related problems in tourism domain
	PO06: Contextualize tourism within broader cultural, environmental, political, and economic dimensions of society
	PO07: Foster analytical and critical thinking abilities for data-based decision making
	PO08: understand, analyze, and communicate global, economic, legal, and ethical aspects of tourism business
Competence	PO09: Identify and understand how new ideas, concepts or products emerge within relevant fields
	PO10: Communicate key ideas in written texts and oral presentations
	PO11: Critique tourism practices for their implications locally and globally

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops the ability to apply the knowledge of Hotel Operations and Training skills in the domain of Tourism and Hospitality Management.
	PSO2: A student gathers excellence in solving the complex problems in the field of Hospitality Management with an understanding of the societal, legal and cultural impacts of the solution.
	PSO3: A student develops knowledge on exposure of practical skills, enhanced with continuous outdoor exposure and industrial training.
	PSO3: A student develops knowledge about the talent of becoming member in a

	team with right attitudes
	PSO4: A student gathers basic and essential knowledge regarding various activities undertaken by tourism industry and necessary knowledge and skill to work in the industry
	PSO5: A student develops the personality so as to become a responsible citizen with greater awareness about Indian society and its culture.
	PSO6: A student develops knowledge, skill and attitude to set up tourism related establishments.
	PSO7: A student develops the ability to contextualize tourism within broader cultural, environmental, political and economic dimensions of society.
Skills	PSO1: A student will develop as socially, ethically responsible business leaders.
	PSO2: A student will execute the educational implications of the theories of psychology.
	PSO3: A student will be able to bridge the gap between theoretical and practical knowledge by adopting innovative practices.
	PSO4: A student will be able to sharpen soft and hard skills for being better professionals.
	PSO5: A student will accumulate entrepreneurial skills for promoting a better ecosystem of business.
	PSO6: A student will demonstrate the knowledge of tourism managerial science to solve complex travel and hospitality problems using limited resources
	PSO7: A learner will function effectively as an individual, and as a member or leader in diverse sectors, and in multidisciplinary settings.
Competence	PSO1: A learner demonstrates entrepreneurial competencies in the tourism industry.
	PSO2: A student will exhibit managerial skills in the areas of tourism marketing, hospitality, airline, HR, etc.
	PSO3: A student will identify tourism business opportunities, destination design and implement innovations in the workspace.
	PSO4: A student will possess a sturdy foundation for higher education and research in tourism and hospitality.
	PSO5: A student will demonstrate analytical and problem-solving skills through an internship in Air Ticketing, Hospitality Management, Cargo and Logistics, Human Recourse, and Tourism Marketing etc. to solve the issues.
	PSO6: A student will comprehend the core concepts and core products, methods and practices in tourism management.
	PSO7: A student will venture into his/her own travel business or excel in executive roles in the private /government sector.

Programme Matrix

BBATHM 1st Year

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23BBAMAJ101	Major	Principles of Management	4	3+1+0	60	100
	23THMMAJ101	Major	Fundamentals of Tourism	4	3+1+0	60	100
	23BBAMIN101	Minor	Managerial Economics	4	3+1+0	60	100
	23BBAMDC101	MDC	Fundamentals of Management	3	3+0+0	45	100
	23ENGAEC101	AEC	Compulsory English	2	2+0+0	30	50
	23BBASEC101	SEC	Business Communication	3	2+0+1	45	100
	23SCSVED101	VAC	Value Education	1	1+0+0	15	50
	23THMVAC101	VAC	Leadership & Management Skills	1	1+0+0	15	50
	Total			22	18+3+1	330	650
II	23BBAMAJ103	Major	Business Regulatory Framework	4	3+1+0	60	100
	23THMMAJ102	Major	Tourism Resources & Products	4	3+1+0	60	100
	23BBAMIN102	Minor	Business Environment	4	3+1+0	60	100
	23BBAMDC102	MDC	Human Resource Management	3	3+0+0	45	100
	23ENGAEC102	AEC	Alternative English	2	2+0+0	30	50
	23BBASEC102	SEC	Entrepreneurship Development	3	2+0+1	45	100
	23SCSVED102	VAC	Value Education	1	1+0+0	15	50
	23THMVAC102	VAC	Career and Team Skills	1	1+0+0	15	50
	Total			22	18+3+1	330	650

Total credits = 22+22 = 44 Credits

Note: Students exiting the programme after securing 44 credits will be awarded UG Certificate in Bachelor of Business Administration in Tourism & Hospitality Management provided they secure 4 credits in Internship/Industrial Training in addition to 6 credits from skill-based courses earned during first and second semester.

BBATHM 2nd Year

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	23THMMAJ201	Major	Hospitality Management	4	3+1+0	60	100
	23BBAMAJ202	Major	Organisational Behaviour	4	3+1+0	60	100
	23THMMIN201	Minor	Financial Accounting in Tourism	4	3+1+0	60	100
	23BBAMDC201	MDC	Fundamentals of Marketing	3	3+0+0	45	100
	23GEOAEC201	AEC	Environmental Science	2	2+0+0	30	50
	23BBASEC201	SEC	E-Commerce	3	2+0+1	45	100
	23SCSVED201	VAC	Value Education	1	1+0+0	15	50
	23BBAVAC201	VAC	Time Management	1	1+0+0	15	50
	Total			22	18+3+1	330	650
IV	23THMMAJ202	Major	Tourism Marketing	4	3+1+0	60	100
	23THMMAJ203	Major	Financial Management in Tourism Business	4	3+1+0	60	100
	23THMMAJ204	Major	Human Resource Management in Tourism	4	3+1+0	60	100
	23THMMIN202	Minor	Fundamentals of Cost Accounting	4	3+1+0	60	100
	23GEOAEC202	AEC	Environmental Science	2	2+0+0	30	50
	23SCSVED202	VAC	Value Education	1	1+0+0	15	50
	23BBAVAC202	VAC	Stress Management	1	1+0+0	15	50
	Total			20	16+4+0	300	550

Total credits = 42

Note: Students exiting the programme after securing 86 credits (44 + 42) will be awarded UG Diploma in Bachelor of Business Administration in Tourism & Hospitality Management provided they secure additional 4 credits in Internship/Industrial Training.

BBATHM 3rd Year

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
V	23THMMAJ301	Major	Concept and Impacts of Tourism	4	3+1+0	60	100
	23THMMAJ302	Major	Profile of Modern Tourism	4	3+1+0	60	100
	23THMMAJ303	Major	Customer Relationship Management in Tourism	4	3+1+0	60	100
	23THMMAJ304	Major	(To be decided by BoS)	4	3+1+0	60	100
	23THMMIN301	Minor	(To be decided by BoS)	4	3+1+0	60	100
	23SCSVED301	VAC	Value Education	1	1+0+0	15	50
	23THMVAC301	VAC	(To be decided by BoS)	1	1+0+0	15	50
	Total			22	17+5+0	330	600
VI	23THMMAJ305	Major	Transport in Travel and Tourism	4	3+1+0	60	100
	23THMMAJ306	Major	Airport Handling	4	3+1+0	60	100
	23THMMAJ307	Major	Culture in Indian Subcontinent	4	3+1+0	60	100
	23THMMIN302	Minor	(To be decided by BoS)	4	3+1+0	60	100
	Internship			4	0+0+4	60	100
	Total			20	12+4+4	300	500

Total credits = 42

Note: Students exiting the programme after securing 128 credits (86 + 42) will be awarded UG Degree in Bachelor of Business Administration in Tourism & Hospitality Management.

BBATHM 4th Year (Honours) without Research

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
VII	23THMMAJ401	Major	Indian Financial System	4	3+1+0	60	100
	23THMMAJ402	Major	Conservation And Preservation Of Nature and Culture	4	3+1+0	60	100
	23THMMAJ403	Major	Procedure and Operations in The Tourism Business	4	3+1+0	60	100
	23BBAMAJ404	Major	Corporate Governance & Business Ethics	4	3+1+0	60	100
	23BBAMIN401	Minor	International Business	4	3+1+0	60	100
	Total			20	15+5+0	300	500
VIII	23BBAMAJ405	Major	Strategic Management	4	3+1+0	60	100
	23THMMAJ404	Major	Emerging Trends and Dimensions of Tourism	4	3+1+0	60	100
	23THMMAJ405	Major	(To be decided by BoS)	4	3+1+0	60	100
	23THMMAJ406	Major	(To be decided by BoS)	4	3+1+0	60	100
	23BBAMIN402	Minor	Management Information System	4	3+1+0	60	100
	Total			20	15+5+0	300	500

Total credits = 40

Note: Students securing 168 credits (128 + 40) will be awarded UG Degree (Honours) in Bachelor of Business Administration in Tourism & Hospitality Management.

BBATHM 4th Year (Honours) with Research

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
VII	23THMMAJ401	Major	Indian Financial System	4	3+1+0	60	100
	23THMMAJ402	Major	Conservation And Preservation of Nature and Culture	4	3+1+0	60	100
	23THMMAJ403	Major	Procedure and Operations in The Tourism Business	4	3+1+0	60	100
	23BBAMIN401	Minor	International Business	4	3+1+0	60	100
	Research			4	4+0+0	60	100
	Total			20	16+4+0	300	500
VIII	23BBAMAJ404	Major	Strategic Management	4	3+1+0	60	100
	23THMMAJ404	Major	Emerging Trends and Dimensions of Tourism	4	3+1+0	60	100
	23BBAMIN402	Minor	Management Information System	4	3+1+0	60	100
	Research Project/ Dissertation			8	8+0+0	120	100
	Total			20	17+3+0	300	400

Total credits = 40

Note: Students securing 168 credits (128 + 40) will be awarded UG Degree (Honours) with Research in Bachelor of Business Administration in Tourism & Hospitality Management.

Semester I

1. Course Description

Course Code	23BBAMAJ101	
Course Title	PRINCIPLES OF MANAGEMENT	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Managerial planning, decision making, organising, staffing, directing, controlling and coordinating.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Covers the basic concepts of management along with traditional and modern theories b) Explains the process of planning and decision making. c) Describes the importance of organising and staffing. d) Covers the significance of directing and communication. e) Explains the concepts and essentials of co-ordinating and controlling	
Prerequisite	Basic knowledge about management concepts and functions.	
Course Objectives	A student will be able to: a) To explain the evolution of Management and its principles. b) Acquaint with the fundamentals of managing business. c) Understand individual and group behaviour at the workplace so as to improve the effectiveness of an organisation. d) Create and evaluate different leadership styles. e) Understand the concept of controlling and coordination as an essence of management.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the primary contributors and their contributions to the development of management thought.	R
CO2	Explain the concept of MBO and MBE. Discuss the planning process	U

CO3	Classify the different organizational structures.	A1		
CO4	Outline the different motivational theories.	A2		
CO5	Recommend the best styles of leadership.	E		
CO6	Develop the steps in controlling and techniques of control.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Management a) Introduction –Meaning, Evolution of management thought Management Theory b) Approaches to management; Fayol’s Process Management theory; Neo-Classical theories - human relations era -Hawthorne studies c) Nature and Characteristics of Management - Scope and Functional areas of Management d) Management as a Science, Art or Profession; Management and Administration	12	CO1	R U A1 A2 E C
Unit II	Planning and Decision Making a) Nature, Importance, Objectives and Purpose of Planning b) Planning Process; Types of plans (Meaning only) c) Decision making- Importance and steps d) MBO and MBE (Meaning only)	12	CO2	R U A1 A2 E C
Unit III	Organising and Staffing: a) Nature, purpose, and principles of Organizing b) Delegation of Authority c) Types of Organization - Departmentation, Committees d) Centralization vs. Decentralization of Authority and Responsibility e) Nature and importance of Staffing	12	CO3	R U A1 A2 E C
Unit IV	Directing & Communicating: a) Meaning and Nature of Direction, Principles of Direction b) Motivation theories – Maslow’s Need Hierarchy Theory, Herzberg’s Two Factor Theory, Mc.Gregor’s X and Y theory c) Leadership – Meaning, Formal and Informal Leadership, Characteristics of Leadership; Leadership Styles – Autocratic Style, Democratic Style, Participative Style, Laissez Faire Leadership Styles, Transition Leadership, Charismatic Leadership Style.	12	CO4 CO5	R U A1 A2 E C

Unit V	Co-ordinating and Controlling: a) Coordination–Meaning, Importance and Principles b) Controlling–Meaning and steps in controlling c) Essentials of Effective Control system, Techniques of Control (in brief).	12	CO6	R U A1 A2 E C
Learning Resources: 1. Sharma, R.K. and Gupta, S.K. (2009). <i>Principles of Management</i> . Kalyani Publication. 2. Rudani, R. B. (2020). <i>Principles of management</i> . McGraw-Hill Education. 3. Gupta, C.B. and Mathur, S. (2020). <i>Management Principles & Applications</i> . MKM Publishers Pvt. Ltd. 4. Agarwal, N.K. (2010). <i>Principles of Management</i> . DND Publication, Jaipur, 2010. 5. Prasad, L.M. (2009). <i>Principle & Practice of Management</i> . Sultan Chand & Sons Publication.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rajeev Dutraj Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMMAJ101	
Course Title	FUNDAMENTALS OF TOURISM	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Issues in Tourism Industry, travel behaviours and motivations.	
Course Offered to	BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Familiarizes the students with the basic concepts of travel and tourism and discusses the terminologies used. b) Provides an insight into the different systems of tourism and how travel and tourism evolved over a period of time and reached the modern stage. c) Enhances the knowledge of students in various areas related to tourism, travel behaviors and motivations and how it affects the destination.	
Prerequisite	Basic knowledge of tourism.	
Course Objectives (total 5)	A student will be able to: a) Define tourism. State the characteristics, scope, and factors influencing the growth and development of tourism. b) Explain the different kind of Theories of Tourism c) Present the different theories of travel motivations and state the relevance of motivation studies and different travel motives. d) List the positive and negative impacts of tourism. e) Discuss the objectives, roles, and functions of different tourism organizations	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define Tourism and its basic components and can also state the characteristics, scope, and factors influencing the growth and development of tourism.	R
CO2	Explain the Forms of Tourism and its different Theories.	U
CO3	Explain the concept of Travel Motivation	A1
CO4	Outline the basic components about the tourism industry.	A2

CO5	Discuss the objectives, roles, and functions of different tourism organizations.	E		
CO6	List the positive and negative impacts of Tourism.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Tourism a) Tourism- Meaning, Definition, Characteristics and Scope; Factors Influencing the Growth and Development of Tourism. b) Tourist, Visitor, Traveler, Excursionist and Transient - Definition and Differentiation. c) Concept of Resource, Attraction, Product, Demand, Market and Destination in Tourism. d) Components and Elements of Tourism; Interrelationship between Leisure, Recreation and Tourism; Tourism Infrastructure.	12	CO1	R U A1 A2 E C
Unit II	Tourism and Its Theories a) Tourism and Its Theories: Need for Measurement of Tourism, Interdisciplinary Approaches, Types & Forms of Tourism. b) Different Tourism Systems- Leiper's Geo-spatial Model, Mill-Morrison, Mathieson & Wall, c) Butler's Tourism Area Life Cycle (TALC), Demonstration Effect, Crompton's Push and Pull Theory, and d) Stanley Plog's Allo-centric and Psycocentric Model of Destination Preferences.	12	CO2	R U A1 A2 E C
Unit III	Travel Behaviors and Motivations a) Meaning of Travel Motivation & Behavior; Theory of Travel Motivations; Travel demotivators; Relevance of Motivation Studies; 'Push' and 'Pull' Forces; Typology of Tourism. b) Different Travel Motives, Tourist Centric Approach, and Leisure Travel Motivations. c) Tourist Decision-making Process, Lifestyle Pattern, Tourism & Cultural Relationships, Cultural Exchanges, GIT, FIT & Affinity Group Travel, Bilateral & Multilateral Tourism, d) Relationship between Human Life and Travel, Growth of Social Tourism.	12	CO3	R U A1 A2 E C

Unit IV	Tourism Industry & Its Linkages a) Meaning and Nature of Tourism Industry; Input and Output of Tourism Industry. b) Tourism Industry Network- Direct, Indirect and Support Services. c) Basic Components of Tourism -Transport-Accommodation- Facilities & Amenities, Horizontal and Vertical Integration in Tourism Business. d) Tourism Business during Liberalization & Globalizations, Positive & Negative Impacts of Tourism	12	CO4 CO6	R U A1 A2 E C
Unit V	UNIT-5: Tourism Organizations Tourism Organizations: Objectives, Roles, and Functions of United Nations World Tourism Organization (WTO), Pacific Asia Travel Association (PATA), World Tourism & Travel Council (WTTC), International Hotel Association (IHA), Ministry of Tourism, Govt. of India, India Tourism Development Corporation (ITDC), Federation of Hotel, and Restaurants Associations of India (FHRAI).	12	CO5	R U A1 A2 E C

Learning Resources:

Text Books

1. Mill and Morrison, (1992), The Tourism System: An Introductory Text, Prentice Hall
2. Cooper, Fletcher et al, (1993), Tourism Principles and Practices, Pitman
3. Mill, R.C., (1990), Tourism: The International Business, Prentice Hall, New Jersey
4. Bhatia, A.K., - International Tourism.

Note: Latest edition of textbooks may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each.	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks

	GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory question (case study) of 15 marks. Total marks: 50 marks.		
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMIN101	
Course Title	MANAGERIAL ECONOMICS	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Economic tools and techniques used to address managerial issues.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Provides introduction to Managerial Economics enabling the students to become better decision-makers in market economies. b) Equips with the ability of demonstrating demand and supply theory with an analytical approach. c) Introduces the production, cost, and revenue analysis to make better economic decisions.	
Prerequisite	Basic knowledge of Introductory Economics.	
Course Objectives	A student will be able to: a) Identify the basic principles of Managerial Economics and demonstrate the theory of consumer behaviour. b) Understand the concepts of demand and supply, its laws, and classify the different degrees of price elasticity of demand. c) Describe production function and demonstrate the three stages of production. d) Explain the behaviour of long-run and short-run cost curves and total, average, and marginal revenue curves. e) Identify the different forms of market economies and determine the market equilibrium.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define utility and describe the cardinal and ordinal utility approach.	R
CO2	Summarise the theory of demand and supply and explain the different degrees of elasticity.	U
CO3	Classify the different forms of market structure	A1

CO4	Analyse the short-run and long-run cost curves as well as the total, average and marginal revenue curves	A2		
CO5	Estimate the short-run and long-run equilibrium of firms under different market structures.	E		
CO6	Construct diagrams to explain the Law of Variable Proportions and Law of Returns to Scale	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	A. Introduction to Managerial Economics a) Definition of economics and branch of economics b) Managerial Economics – Meaning, nature and scope; basic economic tools in Managerial Economics. B. Theory of Consumer Behaviour a) Meaning, approaches, and measures of Utility b) Relationship between Total and Marginal Utility c) Law of Diminishing Marginal Utility and Law of Equi-Marginal Utility d) Indifference curves and budget constraints e) Marginal Rate of Substitution f) Consumer Equilibrium and Consumer Surplus (concept only)	10	CO1	R
Unit II	A. Introduction to Demand and Supply a) Introduction to Demand and Supply b) Law of Demand- assumptions, reasons for downward slope and exceptions c) Demand schedule and Demand Curve d) Supply curve; determinants of supply; and Law of Supply- assumptions, reasons for upward slope and exceptions e) Movement along the Demand & Supply Curve and Shift in Demand & Supply Curve B. Elasticity of Demand and Supply a) Meaning and Types of Elasticity of demand- Price, Income and Cross Elasticity. b) Factors affecting Price Elasticity and degrees of price elasticity of demand. c) Income Elasticity of Demand & Cross Elasticity of Demand d) Price elasticity of Supply e) Equilibrium price and its concept	14	CO2	U
Unit III	Production Theory a) Meaning of Production and factors of	12	CO6	C

	production b) Production Function: short-run and long-run c) Law of Variable Proportions d) Three stages of Production e) Concept of Isoquant and Iso-cost Line f) Law of Returns to Scale			
Unit IV	Cost and Revenue Analysis a. Cost concepts b. Variable, fixed and total cost curves c. Long-run Cost and Short-run Cost Curves d. Economies of scales and economies of scope e. Revenue Concepts: Total, Average and Marginal Revenue curves	12	CO4	A2
Unit V	Market Structure a) Meaning and forms of market b) Perfect Competition: meaning, features, Short-run and Long-run Equilibrium c) Monopoly: meaning, features, Short-run and Long-run Equilibrium, price discrimination (types and degrees) d) Monopolistic competition: meaning, features, Short-run and Long-run Equilibrium e) Oligopoly: meaning, features, Non-collusive (Cournot's model, and Sweezy's model (kinked demand curve) and Collusive Oligopoly (cartels and price leadership theory)	12	CO3 CO5	A1 E
Learning Resources: 1. Salvatore, D. (2009). <i>Principles of Microeconomics</i> (5th ed.). Oxford University Press 2. Roy, D. (2021). <i>Managerial Microeconomics</i> (1st ed.). Abhijeet Publications 3. Lipsey, R., & Chrystal, A. (2008). <i>Economics</i> (11th ed.). Oxford University Press 4. Koutosyannis, A. (1979). <i>Modern Micro Economics</i> (2nd ed.). Palgrave Macmillan. 5. Pindyck, R. Rubinfeld, D. & Mehta, P. (2009). <i>MicroEconomics</i> (7th ed.). Pearson R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks.	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks

	GROUP D: 1 case study of 15 marks. Total marks: 50		
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMDC101	
Course Title	FUNDAMENTALS OF MANAGEMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	MDC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Managerial planning, organising, staffing, directing and controlling.	
Course Offered to	All courses (excluding BBA & BBA in Tourism & Hospitality)	
Regulation	2023	
Course Overview	This course: a) Covers understanding of management concepts and administration process b) Depicts importance of organizing in business and different theories c) Covers objectives, process and techniques of control mechanism in organization.	
Prerequisite	Basic knowledge of business management.	
Course Objectives	A student will be able to: a) Understand fundamental management concepts, including its definition, scope, functions and the roles managers play in organizations. b) Explore the organizational structure, span of control, and functions of line and staff roles, authority, responsibility, centralization, decentralization, and delegation in organizational settings. c) Examine staffing and its role in organizations, including selection and career planning. d) Delve into the nature of directing, leadership styles, motivation, morale, and discipline. e) Learn the objectives and process of control, the role of information, and methods for measuring performance.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Recall management concepts, evolution, and the roles of managers.	R
CO2	Comprehend the importance of management, differences between management and administration, and the nature of planning.	U
CO3	Apply planning techniques, understand	A1

	organizational structures, and discuss centralization vs. decentralization			
CO4	Analyze the features and types of planning, assess line & staff functions, and evaluate the impact of delegation of authority.	A2		
CO5	Evaluate leadership qualities and styles, and critically assess the role of information in control.	E		
CO6	Create integrated control systems, formulate effective career plans, and design strategies for motivating employees.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a) Management concepts & Evolution: Definition - nature - scope and functions of management. b) Importance of management, role of manager c) Management and administration.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit II	Planning a) Meaning, features, nature, and importance of planning b) Procedure, types of planning c) Planning Techniques d) Planning and control e) MBO.	12	CO1 CO2	R U A1 A2 E C
Unit III	Organizing a) Nature - purpose - organizational structure b) Span of control c) Line & staff functions d) Authority & Responsibility e) Centralization and decentralization f) Delegation of authority.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit IV	Staffing and Directing a) Staffing- nature and purpose, b) Selection, c) Career planning. d) Nature of directing, e) Leadership qualities and styles, f) Motivation - morale and discipline	12	CO1 CO2 CO4 CO5	R U A1 A2 E C
Unit V	Controlling a) The objectives and process of control b) Role of information in control c) Performance standard – Measurement of	12	CO1 CO2 CO5 CO6	R U A1 A2 E C

	performance. d) Integrated control system in an organisation.			
Learning Resources: 1. Robbins, S. P., Coulter, M., Sidani, Y., Jamali, D., & Robbins, S. P. (2011). <i>Management (Arab World Editions)</i>. Pearson Education UK. 2. Koontz, H., O'Donnell, C., & Weihrich, H. (1980). <i>Management</i>. McGraw-Hill Book Company. New York, 514-15. 3. Prasad, L. M. (2020). <i>Principles and practice of management</i>. Sultan Chand & Sons. 4. Rao, V. S. P., & Krishna, V. H. (2009). <i>Management: Text and cases</i>. Excel Books India.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBASEC101	
Course Title	BUSINESS COMMUNICATION	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	SEC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Clarity, conciseness, tone, professionalism, relevance, audience, format, feedback, context, accuracy.	
Course Offered to	BBA & BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Recognizes the need to enhance written as well as oral communication skills. b) States the importance of effective communication in a globalized economy. c) Describes the importance of effectively drafting business reports and letters.	
Prerequisite	Verbal and non-verbal communication, drafting letters and short presentations.	
Course Objectives (total 5)	A Student will be able to: a) Define and explain the nature and significance of communication. They will grasp the process and principles of communication, b) Recognize various communication models, and identify different communication channels. c) Learn about effective communication, including recognizing barriers and employing strategies to overcome them. d) Understand the importance of listening, types of listening, and methods to enhance listening skills. e) Develop skills in report writing, business correspondence, and oral presentations, including PowerPoint presentations, to effectively communicate in various professional scenarios.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the meaning, nature, and objectives of communication	R
CO2	Explain the principles and process of communication, and identify different models.	U
CO3	Differentiate and analyse various channels of communication, including formal, informal, verbal, and non-verbal.	A1

CO4	Recognize barriers to effective communication and propose strategies to overcome them.	A2		
CO5	Evaluate the significance of listening, identify barriers, and implement techniques for effective listening.	E		
CO6	Compose business reports, letters, and emails, adhering to appropriate formats and etiquettes. Also develop effective oral presentations with well-structured content, applying presentation essentials.	C		
Course Content				
Units	Content	Lecture Hours	COs	RB T
Unit I	Introduction a) Meaning, definition, nature, objectives, and importance of communication. b) Principles of communication and process of communication. c) Models of Communication.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit II	Communication Channels a) Channels of communication. b) Types of communication: Formal, Informal, Verbal, Non- Verbal, Written, Visual communication. c) Levels of communication and direction of communication	12	CO1 CO2	R U A1 A2 E C
Unit III	Effective Communication a) Meaning and barriers to effective communication. b) Ways to overcome barriers to effective communication. c) Meaning, importance, process, and types of Listening. d) Barriers to effective Listening and steps to overcome such barriers	12	CO1 CO2 CO4	R U A1 A2 E C
Unit IV	Report Writing and Business Correspondence a) Types, formats, importance, and process of preparing Business reports. b) Drafting minutes, agenda, inquiry letter, complaint letter, persuasive letter, and proposal. c) Writing Resume, letters, office memorandum, office circulars, notices, and orders. d) Technology for communication. Electronic mail: advantages, safety, and smartness in email. E-mail etiquettes.	12	CO1 CO2 CO4 CO5	R U A1 A2 E C
Unit V	Oral and PowerPoint Presentation a) Importance, features, and essentials of effective oral presentation. b) Making presentations: content and organising.	12	CO1 CO2 CO5 CO6	R U A1 A2 E C

	Delivering a presentation			
Learning Resources: 1. Kaul, A. (2016). <i>Effective Business Communication, 2nd ed.</i> PHI learning. 2. C.B. Gupta (2019). <i>Essentials of Business Communication.</i> Sultan Chand & Sons. 3. Kumar, V., Raj, B., Kapurthala, & Jalandhar. (2017). <i>Comprehension and Communication Skills in English.</i> Kalyani Publishers. 4. Kumar, V., Raj, B., Kapurthala, & Jalandhar. (2017). <i>Comprehension and Communication Skills in English.</i> Kalyani Publishers. 5. Rizvi, M. A. (2005). <i>Effective technical communication.</i> Tata McGraw-Hill. 6. Chanda, S. M. (2010). <i>An Introduction to Critical Thinking.</i> Pearson, Delhi.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 7	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMVAC101	
Course Title	LEADERSHIP & MANAGEMENT SKILLS	
Credits	1	
Total Session Hours	30	
Number of Sessions	15	
Course Type	VAC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Time management, conflict management, stress management, and self-development.	
Course Offered to	BBA & BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Recognizes the need to enhance Time, Conflict, and Stress Management Skills. b) States the importance of developing self-discipline and control. c) Describes the importance of developing business ideas, product pitching and Innovative leadership.	
Prerequisite	Basic knowledge of leadership and its qualities.	
Course Objectives	A student will be able to: a) Develop essential skills to influence and motivate others. b) Inculcate emotional and social intelligence and integrative thinking for effective leadership. c) Create and maintain an effective and motivated team to work for society. d) Make learners understand personal values and apply ethical principles in professional and social contexts. e) Familiarize the learners with the budgeting process and make them conscious of the significance of budgeting, savings, and investment.	
Course Content		
Session	Session Details	Session Hours
Session I	Present a report/video prepared by group of students. Each group is asked to answer the following questions: a) Did someone emerge as the leader of the group activities? b) Was the group leader effective in motivating the members to work as a team and complete the task? Yes/No and why? c) What kind of leadership style did the leader adopt?	2

Session II	Role Play Select three volunteers from among the learners. Explain a leadership situation. Ask them to act.	2
Session III	The learners are asked to sit in groups of 4-8, depending on class size. Each group must consider that it is responsible for managing the class event and is told to prepare a summary of the following items in 20 minutes. a) Fix a suitable date for the event b) Work out a budget for the event. c) Complete a list of tasks to be performed for organizing the event. d) Combine tasks to form roles. e) Identify the reporting relationship among the different roles. f) Assign roles to different individuals in the group so that the event can be successfully managed. g) Each member to prioritize and schedule the tasks included in each role so that all the deadlines are met.	2
Session IV	Activity of Time Management Situation for discussion: Two individuals are asked to paint the walls of two different rooms of identical dimensions. They are given an equal quantity of paint and told to finish the work by the end of the day. One person finishes the work two hours before the end of the day but the painting is patchy and uneven. The other person does not complete the painting of the entire room, he consumes all the paint as well, but whatever work he has done is even and beautiful. Discuss the efficiency and effectiveness of the two painters. They may be asked to answer the question: Are any of the two painters successful in managing their tasks?	2
Session V	Activity on Conflict Management The learners must be asked a) Can you recall the last conflict you had with an individual or a group? b) Did you resolve it? How was it resolved? What was the outcome of the Conflict? Draw focus on empathy and communication for resolving interpersonal conflicts	2

Session VI	Activity on Stress Management Ask the learners to look at each obstacle they encounter as a learning experience. For example. “You may not have done well in your mid-term exam, but that has motivated you to study harder and ace your final exam”. - Make the choice not to over-react to stressors and deal with them one at a time For example, take a few deep breaths and carry on. - Take an objective view of your stressor For example, is preparing dinner for 12 people really that horrible? - Communicate! Ask the learners not to ruminate or bottle up their emotions, as this will lead to an explosion later on.	2
Session VII	Develop self-discipline and control Tell the learners - “Either train yourself to study harder in preparation for your final examination, or train yourself to work out four times a week to lose those extra kilos that you gained since the last dinner party!” Maintenance! Practice, practice, practice for a long life of resilient living! Learners should be encouraged to inculcate the reading habit, which helps in busting stress. Some suggested readings for learners could be: - Swami Vivekananda. 1958. Powers of the Mind. Kolkata: Advaita Ashrama. - Abdul Kalam, APJ. 1999. Wings of Fire- An Autobiography. Universities Press.	2
Session VIII	Activity on Self-Management Skills The learners may be asked to watch this 5.5-minute video on Goleman’s explanation of EI https://www.youtube.com/watch?v=Y7m9eNoB3NU Ask the learners to answer the following question: - Is IQ or EQ more important for success in Life? - Establish the significance of EI and self-awareness as a component of EI. This 4.5-minute video on “Can EI be Learnt” can be watched by learners.	2
Session IX	Developing Self-Awareness with JOHARI window Learners may be asked to carry out the JOHARI window exercise in groups of 4. Learners who are willing may be asked to share the findings of the JOHARI window exercise.	2

Session X	Activity on Developing Business Idea Ask learners to identify the market to test their potential ideas. → Share the “DOs” and “DO NOTs”. Do – (example can be) a) The learners must identify a real market and gain insights and honest feedback from potential customers. b) Keep your eyes and ears open and pay close attention to customers’ cues, inputs, etc. DO NOT- (example can be) c) Don’t consider your parents, or friends as a potential market d) • Don’t be adamant to defend your idea or convey an offensive response to criticism.	2
Session XI	Activity on Product Pitching Role Play: Let learners form three groups, each of the group having at least four to five learners. The groups will act as: a) Potential venture capitalists/investors; b) Potential customers; and c) Members of regulatory agencies. Ask each learner to pitch his/her product in front of the three groups. Let each group play a serious role, full of critical inputs. Keep a separate group of observers who provide a careful analysis of each of the pitching event(s). Record the pitching process and ask each of the learners to review his/her pitching. Final suggestion: Ask them to keep rehearsing their pitching process. Through multiple rehearsals and analysis each learner should be able to make a razor sharp and pertinent pitch within one minute.	2
Session XII	Activity on Innovative Leadership Ask learners to write a brief note on their views or any incidents from their past when they realized the importance of any or many of the following: a) Self-Awareness and Control b) Empathy c) Social Expertness d) Personal Influence e) Mastery of Vision Let them interpret these with a free mind without prejudice or external hint or guidance. Once they have written give a brief input to explain the terms.	2
Session XIII	Activity on Designing Skit Role Play: Make multiple groups of learners. Allocate one title each from the following list of ten topics, to each group. a) Words can hurt, pay attention to them	2

	b) Share when you have failures c) Be kind d) Listen e) Disagree with respect f) Show empathy g) Share your own feelings h) Encourage the relationship i) Recognize your feeling j) Explain what feelings do k) Be savvy with discipline l) Apologize with dignity m) Model responsibility n) Make yourself available Ask each group to keep their topic secret from other groups. Now ask each group to come up with a small skit highlighting their topic. Other groups will try to decipher the message which must be the moral embedded in the skit. Let the other groups interpret the topic.	
Session XIV	Activity on Creative Confidence Ask learners to watch the following video for the methodology of developing human-centric solutions for creating social good (this can be a home assignment). The video entitled India's Hidden Hot Beds of Invention Ted Talk by Anil Gupta – https://www.ted.com/talks/anil_gupta_india_s_hidden_hotbeds_of_invention Show them the following Ted talk entitled “How to Build Your Creative Confidence” by David Kelly https://www.ted.com/talks/david_kelley_how_to_build_your_creative_confidence Based on the video, encourage them to build and take forward their idea. Ask any three learners to volunteer for presenting their idea in the five stages of design thinking. Time can be given for them to prepare. Ask other learners to also frame their ideas using the five-point framework of design thinking	2
Session XV	Self-reflection exercise on ethics and integrity: Make the learners do self-analysis and reflection. Ask them to follow the following steps: a) Write a short autobiography (say 100 words). b) Write 100 words about their present situation. c) Write 100 words about their future. Now ask them to identify what	2

	would be the top 5 things/characteristics/personality traits that will help them achieve their future goals and visions.	
Learning Resources: 1. Ashokan, M. S. (2015). <i>Karmayogi: A Biography of E. Sreedharan</i>. Penguin Random House, London, UK. 2. Sinek, S. (2009). <i>Start with Why: How Great Leaders Inspire Everyone to Take Action</i>. Portfolio London: Penguin. 3. Akhilesh, K. B. (n.d). Lecture no 9 Leadership in the NPTEL Course on Evolution of Management. https://nptel.ac.in/courses/122/108/122108038 4. Carnegie, D. (2018). <i>Overcoming Worry and Stress</i>. New Delhi: Manjul Publishing House. 5. Dawkins, E. R. (2016). <i>52 Weeks of Self Reflection—Your Guided Journal of Self Reflection</i>. A B Johnson Publishing, United States.		

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

Semester II

1. Course Description

Course Code	23BBAMAJ103	
Course Title	BUSINESS REGULATORY FRAMEWORK	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Business and Company Laws	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Covers the basics of Indian Contract Act,1872 b) Covers the basics of Sale of Goods Act, 1930 c) Covers the fundamental elements of Companies Act, 2013 and Consumer Protection Act, 1986 d) Covers the elements of Right to Information Act, 2005	
Prerequisite	Elementary knowledge and understanding of business and company laws	
Course Objectives	A student will be able to: a) Understand the Indian Contract Act 1872: the meaning, essentials and kinds of contract. b) Develop basic understanding of Sale of Goods Act 1930 and Negotiable Instruments Act 1881. c) Understand various aspects of the Companies Act 2013 and the Limited Liability Partnership Act 2008. d) To build concept regarding the Consumer Protection Act 1986	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define and recall the meaning, essentials, and kinds of contract.	R
CO2	State the meanings and types of negotiable instruments; define ‘Goods’ as per the Sale of Goods Act 1930 and explain the concept of sale and agreement to sell.	U
CO3	Illustrate the meanings and types of companies,	A1

	shares and documents required for the incorporation of a company under the Companies Act 2013; explain the meaning, nature, types, and formation of partnership.			
CO4	State the objectives and machinery for consumer protection and illustrate the rights of consumers.	A2		
CO5	Explain the features and define various terms under the Right to Information Act 2005.	E		
CO6	Construct a Memorandum of Association & Article of Association.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	The Indian Contract Act, 1872 a) Meaning and Essentials of contract; b) Kinds of contract Based on: validity, formation & performance, law relating to offer and acceptance, consideration, competency to contract, free consent, Void agreements, performance of contracts. c) Discharge of contracts, breach of contracts and quasi contract, Special contracts: contract of indemnity and guarantee, bailment and pledge, and agency	10	CO1	R
Unit II	Sale of Goods Act 1930 a) Meaning of Sale and agreement to sell, b) Implied conditions and warranties, sale by non-owners, rights of unpaid seller. c) Negotiable Instruments Act 1881: Meaning of negotiable instruments, type of negotiable instruments, promissory note, bill of exchange, cheque	14	CO2	U
Unit III	The Companies Act 2013 a) Meaning and types, Incorporation, b) Memorandum & Articles of Association, Prospectus, c) Issue of shares and bonus shares, rights issue, sweat equity, role of directors, share qualification, company meetings. d) The Limited Liability Partnership Act 2008: Meaning and nature of limited partnership, formation, partners & their relations, extent, and limitation of liability.	12	CO3 CO6	C
Unit IV	Consumer Protection Act, 1986 a) Objectives and machinery for consumer protection, defects and deficiency removal, rights of consumers.	12	CO4	A2

	b) Amendments in Consumer Protection Act 2019.			
Unit V	The Right to Information Act 2005: Salient features and coverage of the act, definition of terms information, right, record, public authority; obligations of public authorities, requesting information and functions of PIO.	12	CO5	A1 E

Learning Resources:

1. Kuchhal, M. C., & Kuchhal, V. (2013). *Business law*. Vikas Publishing House.
2. Kuchhal, M. C., & Kuchhal, V. (2010). *Business Legislation for Management*. Vikas Publishing House.
3. Anand, K., & Suremya, S. L. (2021). *External and Internal Rules of Corporate Governance*. Issue 4 Int'l JL Mgmt. & Human., 4, 2887.
4. Singh, A. (n.d). *Principles of Mercantile Law*. Eastern Book Company.
5. Kapoor, G. K. & Gulshan. S.S. (2008). *Business Law Including Company Law*. New Age International.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level

GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMMAJ102	
Course Title	TOURISM RESOURCES & PRODUCTS	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Mathematics tools & techniques	
Course Offered to	BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Covers the concept and classification of tourism products, emphasizing India's unique socio-cultural aspects, diverse landscapes, and geographical features that influence tourism. b) Explores man-made, cultural, and heritage tourism products, including Indian traditions, architectural heritage, music, and cultural festivals. Case studies highlight popular man-made attractions like amusement parks, museums, and various festivals. c) Focuses specifically on the tourism products of West Bengal, showcasing its natural attractions, man-made sites, cultural aspects, and unique cuisine.	
Prerequisite	Basic knowledge about the Tourism Products and Resources	
Course Objectives	A student will be able to: a) Define and classify tourism products b) Explore the diversities in landform and landscape including outstanding geographical features like climate, flora, and fauna. c) Explain the richness of Indian culture, traditions, customs, and handicrafts, emphasizing their significance in attracting tourists. d) Explore the diversities in landform and landscape including outstanding geographical features like climate, flora, and fauna. e) Describe the emerging trends in tourism product.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Explain Tourism Products.	R
CO2	Define different types of Tourism Product.	U
CO3	Differentiate between Natural Tourism Product and	A1

	Man-made Tourism Product.			
CO4	State the emerging trends in tourism	A2		
CO5	Define Tourism Resources.	E		
CO6	Enumerate the Tourism product of West Bengal	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Tourism product: a) Tourism Product; Definition, Concept & Classifications, b) Nature & Characteristic of India's Tourism Products c) Typology & Nature of Tourism resources – Natural & Man made, Socio cultural, d) Diversities in Landform & Landscape – Outstanding, Geographical features - Climate, Flora & Fauna. e) Nature & Scope to tourist places in India.	12	CO2	R U A1 A2 E C
Unit II	Unit- II Man-made, Cultural and Heritage Tourism Product. a) Man-made Tourism Products: Indian culture tradition, customs and handicrafts, b) Architectural Heritage of India, different styles of architect in India, c) Music: Classical and folklore, fairs and festivals. d) Cultural and Heritage Products of India. e) Case study of Man-made Tourism Products- Amusement Parks, Museum, Agri-tourism, Kite Festival, Boat Festival, Dance Festival.	24	CO4	R U A1 A2 E C
Unit III	Natural Tourism Product a) Natural Tourism resources in India-Existing use patterns vis-a-vis potential with relation to varied landforms (mountains, deserts, beaches, coastal areas & islands), b) Tourism & nature conservation-Conflicts. c) Natural and Symbiotic Tourism Products. d) Locations, Accessibility, Facilities, Amenities, Unique Selling Propositions (USP), National Parks & Wildlife Sanctuaries, Hill Stations, Beach Resorts of India.	12	CO1 CO3	R U A1 A2 E C
Unit IV	Emerging Trends in Tourism Product	12	CO6	R U

	a) Emerging Trends: Adventure Tourism – Classification of Adventure Tourism b) Land Based –Water Based –Aero Based With suitable examples. c) Medical Tourism, Village Tourism, Community Based Tourism, Agri-tourism, Homestay/BnB d) Sustainable Tourism, Eco-Tourism, Dark Tourism, Blue Tourism, LGBT, MICE and other tourism related areas.			A1 A2 E C
Unit V	West Bengal Tourism Product a) Natural –National Park, Wildlife Sanctuary, Bird Sanctuary, b) Hill station, Beach, Waterfalls, c) Man Made-Heritage Sites, Historical Monuments, Pilgrimage sites, d) Culture, Art, Dance, Music, Handicrafts, Painting., e) Cuisines and specialty dishes.	12	CO6	R U A1 A2 E C

Learning Resources:

Text Books:

1. Jacob, Robinet et al, Indian Tourism Products, Abijeet Publications, New Delhi
2. Acharya Ram, Tourism and Cultural Heritage of India: ROSA Publication,
3. Basham. A.L, The Wonder that was India: Rupa and Company, Delhi.
4. Manoj Dixit, Charu Sheela, Tourism Products, New Royal Books.
5. Hussain. A.K, The National Culture of India, national Book Trust, New Delhi
6. Sarina Singh, India, Lonely Planet Publication.
7. Kaul H.K, 'Travelers India' Oxford University Press.
8. Negi, Jagmohan, Adventure Tourism and sports, Kanishka Publisher
9. Basham, A.L., A Cultural History of India. Oxford University Press, USA Stephen Ball, Encyclopedia of Tourism Resources in India, Butterworth –Heinemann

Note: Latest edition of textbooks may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMIN102	
Course Title	BUSINESS ENVIRONMENT	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Political, Socio-cultural, legal, economic, and technological environmental issues.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Covers different elements of Business environment and the effects of internal and external factors of business environment. b) Describes the current economic condition and its impact on business. c) Explains the positive and negative impact of technology in modern business.	
Prerequisite	Basic knowledge of Business, its nature, and objectives.	
Course Objectives (total 5)	A student will be able to: a) Explain the concept, nature, and importance of business environment. b) Analyse the relationships between government and business and evaluate the political, economic, legal, and social policies of the country. c) Enumerate the concept and features of Intellectual Property Rights. d) Analyse how business is affected by different macro-economic variables. e) Give observation as to how technology has helped modern business	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the concept, nature, and importance of business environment.	R
CO2	Explain the concept and features of Intellectual Property Rights.	U
CO3	Give observation as to how technology has helped modern business.	A1
CO4	Analyse how business is affected by different macro-economic variable.	A2
CO5	Evaluate the political, economic, legal, and social policies of the country.	E

CO6	Propose different modes of entering International Business	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Business Environment a) Concept, nature, and importance of business environment. b) Types of environments: general, task environment, internal and external environment, c) Basic elements of environment: socio-cultural, political, legal, economic, and technological elements	12	CO1	R U A1 A2 E C
Unit II	Socio-cultural Environment a) Social environment - Cultural heritage - social attitudes b) Impact of foreign culture, castes, and communities – joint family systems - linguistic and religious groups c) Types of social organization -Corporate Social Responsibilities of business	12	CO5	R U A1 A2 E C
Unit III	Political and Legal Environment a) Fundamental Rights and Directive Principles of State Policy b) State intervention in economic affairs: role of the government in creating a proper business environment. c) The changing legal environment of business, IPR- key concepts and features.	12	CO2 CO5	R U A1 A2 E C
Unit IV	Economic and Technological Environment a) Economic systems and their impact on business b) Macro-economic parameters like GDP, growth rate, population - Urbanisation - Fiscal deficit - Plan investment - Per capita income and their impact on business decisions c) Technological Environment – choice of Technology - Problems in Selecting Appropriate Technology. Importance of technology to Business.	12	CO3 CO4 CO5	R U A1 A2 E C
Unit V	International Environment of Business a) Globalization: concept and nature, merits and demerits of globalisation. b) Strategies for entering foreign markets: exporting, licensing and c) Franchising, contract manufacturing,	12	CO6	R U A1 A2 E C

	management contracting, joint venture, merger and acquisition, strategic alliance and counter trade. d) Multinational corporations: concept, features, merits and demerits.			

Learning Resources:

1. Aswathappa, K. (2009). *Essentials of business environment*. Karnataka: Himalaya Publishing House.
2. Cherunllam, F. (2019). *Business Environment* (27th Revised Edition). Himalaya Publishing House.
3. Pustin, P. (2009). *Business Environment-Text and Cases*. New Delhi-110008.
4. Gupta, C. B. (2022). *Business Environment*. Sultan Chand & Sons.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMDC102	
Course Title	HUMAN RESOURCE MANAGEMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Addresses the issues related to human resources in an organisation.	
Course Offered to	All courses (excluding BBA & BBA in Tourism & Hospitality)	
Regulation	2023	
Course Overview	This course: a) Examines HRM's role in effective people management and goal achievement and HR managers' responsibilities including strategic planning, policy formulation, and employee relations. b) Performs job analysis and emphasizes the importance of a fair, objective, and legal recruitment and selection process. c) Highlights the significance of improving skills and performance and explores the objectives and benefits of appraisal systems.	
Prerequisite	Basic knowledge about Human Resource Management.	
Course Objectives	A student will be able to: a) Recognize the essential qualities and characteristics required for effective HR management. b) Identify the premises of effective HR planning and discuss the process involved in HR planning. c) Acquire knowledge of job analysis, description, and specification to effectively define job roles and requirements. d) Discover various training and development methods and their application in different contexts. e) Identify and evaluate different methods of performance appraisal, including conventional and non-conventional approaches.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the importance, objectives, and functions of HRM and state the role and qualities of an HR Manager.	R

CO2	Explain the objectives, importance and process of HR Planning.	U		
CO3	Classify the different sources of recruitment and demonstrate the process of selection.	A1		
CO4	Distinguish between job description and job specification and outline the concept of job design, job rotation, job enlargement, job enrichment, promotion and demotion.	A2		
CO5	Evaluate the performance of employees using different conventional and non-conventional methods of performance appraisal.	E		
CO6	Propose the best training methods to be applied in different managerial context.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to HRM a) HRM – Meaning, Scope and Importance b) Nature of HRM – Objectives and Functions of HRM c) Role of HR Manager d) Qualities and characteristics necessary for a good HR Manager	8	CO1	R U A1 A2 E C
Unit II	Human Resource Planning a) Human Resource Planning – meaning, Objectives and importance b) Premises of planning – Process of Planning c) Control and review mechanisms	8	CO2	R U A1 A2 E C
Unit III	Recruitment and Selection a) Recruitment and Selection – Concept and meaning; sources of recruitment; Selection procedure b) Job design, Job rotation, job enlargement, job enrichment, c) Job Analysis – job description and job specification d) Promotion – demotion – separation.	10	CO3 CO4	R U A1 A2 E C
Unit IV	Training and Development a) Training and Development – meaning, difference and significance b) Training Methods – On-the-job and Off-the-job. c) Executive development – Methods of executive development.	9	CO6	R U A1 A2 E C
Unit V	Performance Appraisal a) Performance Appraisal – meaning, purpose of performance appraisal – Methods of appraisal	10	CO5	R U A1 A2

	b) Conventional and non-conventional methods c) Morale – meaning and significance – measurement of morale – measures to tone up morale			E C

Learning Resources:

1. Gary, D. (2011). *Human Resource Management*. Pearson Education India.
2. Jeffrey, A. M. (2015). *Strategic Human Resource Management*. South-Western College Publishing.
3. Khanka, S. S. (2007). *Human Resource Management*. S. Chand Publishing.
4. Bratton, J., & Gold, J. (2001). *Human Resource Management Theory and Practice*. Hound Mills.
5. Aswathappa, K., & Dash, S. (2021). *Human Resource Management*. McGraw-Hill Education.
6. Noe, R., Hollenbeck, J., Gerhart, B., & Wright, P. (2006). *Human Resources Management: Gaining a Competitive Advantage*. New York, MA: McGraw-Hill Education.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBASEC102	
Course Title	ENTREPRENEURSHIP DEVELOPMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Skill Enhancement Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Issues of start-ups, family businesses, mobilisation of resources, and feasibility of plans.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Discusses the concept, role and functions of business incubators, angel investors, venture capital and private equity funds. c) c. Recognises the significance of writing the business plan/ project proposal.	
Prerequisite	Basic knowledge about the concept of entrepreneur.	
Course Objectives	A student will be able to: a) Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Discuss the concept of business groups and role of business houses and family business in India; c) Describe the concept, role and functions of business incubators, angel investors, venture capital and private equity fund. d) Prepare the contents of a business plan/ project proposal. e) Evaluate the basic problems faced by start-ups.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the concept, role and functions of business incubators, angel investors, venture capital and private equity fund.	R
CO2	Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour.	U
CO3	Demonstrate Public and private system of stimulation.	A1
CO4	Examine the concept of business groups and role of business houses and family business in India.	A2
CO5	Evaluate the basic problems faced by start-ups.	E

CO6	Prepare the contents of a business plan/ project proposal.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a) Meaning, elements, determinants and importance of entrepreneurship and creative behaviour; b) Entrepreneurship and creative response to the society problems and at work. c) Dimensions of entrepreneurship: intrapreneurship, technopreneurship, cultural entrepreneurship, international entrepreneurship, netpreneurship, ecopreneurship, and social entrepreneurship	12	CO2	R U A1 A2 E C
Unit II	Entrepreneurship and Micro, Small and Medium Enterprises a) Concept of business groups and role of business houses and family business in India; b) The contemporary role models in Indian business: their values, business philosophy and behavioural orientations; c) Conflict in family business and its resolution	12	CO4	R U A1 A2 E C
Unit III	Entrepreneurial Finance a) Public and private system of stimulation, support, and sustainability of entrepreneurship. b) Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur’s associations and self-help groups. c) The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.	12	CO1 CO3	R U A1 A2 E C
Unit IV	Sources of business ideas and tests of feasibility. a) Significance of writing the business plan/ project proposal; Contents of business plan/ project proposal; b) Designing business processes, location, layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered); c) Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions.	12	CO6	R U A1 A2 E C

Unit V	Mobilising Resources a) Mobilising resources for start-up b) Accommodation and utilities; Preliminary contracts with the vendors, suppliers, bankers, principal customers; c) Contract management: Basic start-up problems.	12	CO5	R U A1 A2 E C

Learning Resources:

1. Kuratko, D. F., & Rao, T. V. (2012). *Entrepreneurship: A South-Asian Perspective*. Cengage Learning.
2. Desai, V. (2009). *Dynamics of Entrepreneurial Development and Management*. Himalaya Publishing House.
3. Holt, D. H. (1992). *Entrepreneurship: New venture creation*. Prentice Hall of India.
4. Plsek, Paul E. (1997). *Creativity, Innovation and Quality. (Eastern Economic Edition)*. New Delhi: Prentice-Hall of India.
5. Singh, N. P. (1985). *Emerging Trends in Entrepreneurship Development*. New Delhi: ASEED.
6. Khanka, S. S. (2006). *Entrepreneurial development*. S. Chand Publishing.
7. Ramachandran, K. (2009). *Entrepreneurship Development: Indian Cases on Change Agents*. Tata McGraw-Hill Pub.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMVAC102		
Course Title	CAREER & TEAM SKILLS		
Credits	1		
Total Session Hours	30		
Number of Sessions	15		
Course Type	VAC		
Semester	II		
Intended Level	Certificate		
Issue(s) Addressed	Time management, conflict management, stress management, and self-development.		
Course Offered to	BBA in Tourism & Hospitality Management		
Regulation	2023		
Course Overview	This course: a) Acquire career skills and fully pursue to partake in a successful career path. b) Prepare a good résumé and prepare for interviews and group discussions. c) Understand the significance of team skills and design, develop, and adapt to situations as an individual and as a team member.		
Prerequisite	Basic knowledge of leadership, career and team skills		
Course Objectives	A student will be able to: a) Demonstrate a set of cognitive skills such as critical thinking, problem-solving and the ability to learn for smooth and efficient functioning at a workplace. b) Demonstrate a set of non-cognitive skills such as empathy, creativity, teamwork, and collaboration, for smooth and efficient functioning at a workplace. c) Use common technology messaging tools that are used in an organization for the flow of information and transition from command and control to informal communication during an online or offline team session. d) Actively use and operate online team communication tools such as Webinar, Skype, Zoom, Google, and Hangout. e) Appreciate and demonstrate team skills.		
Course Content			
Session	Session Details		Session Hours
Session I	Resume skills- (Briefing on introducing resume and related terms,		2

	importance, difference between VC, resume and bio-data) Provide some exemplary résumés for learners to evaluate, as a small group assignment based on essential components. Hold discussion on résumés with essential components and without essential components. Ask the learners to identify the errors made in the résumé.	
Session II	Interview skills- (Introduction to the meaning and types of interviews) Role Play: Make small groups of learners. One learner plays the role of interviewee and three or four others can be the interviewers. The role may be reversed after each interviewee answers one question. Other learners can observe and give their comments.	2
Session III	Group discussion skills- (Brief discussion on meaning, importance and types of group discussion) Simulation • Eight to ten learners as participants in a GD sitting in a semi-circle or a U-shaped arrangement. • The panelists may observe the group from a distance. • Duration of the GD maybe 45 minutes to an hour. • Roles that a candidate can play in a GD such as initiator, data giver, criticizer, supporter, listener, questioner, traffic policeman, spectator and leader (coordinator).	2
Session IV	Exploring career opportunities- (Short discussion on process of career exploration. Personal characteristics, requirements of jobs and sources of career information) Project Preparation of Career Case Study in an identified occupation: • Ask the learners to identify professionals in the career of their choice and interview them using an interview schedule or questionnaire. • The learners may analyse the responses in the case study and finalize their career plans. • Learners can also share the case studies with peers to think about a particular career.	2
Session V	Presentation skills (Discussion on meaning, types and strategies of presentation) An assignment can be given to the learners to select a particular type of presentation and suggest the opening and closing of the presentation. After the submission of the assignment, the faculty member can ask a few learners to describe the opening and closing of the presentation. Other learners can note down the strong and weak	2

	points. The same may be shared with the presenters.	
Session VI	Trust and collaboration (Short discussion on Importance of Trust in Creating a Collaborative Team and different types of trust) Learners may be asked to prepare a brief write up on each type of trust and present it in the classroom for sharing. It can be small group work.	2
Session VII	Listening as a team skill (Discussion on listening as a team skill and advantages of effective listening skills) Activity A group discussion can be organized and learners can observe the following advantages of listening skills: • Effective listening implies concentration and the use of other senses as it is more than just hearing the spoken words. • We learn more when we talk less and listen more. • The better we listen, the more will we be listened to. • Listening makes us more knowledgeable and thoughtful. • Without listening, messages are misunderstood and communication breaks down. • Good listeners always come across as wise people. • Good listening and skillful questioning give out a powerful message to those with whom we interact. • Good listening encourages open, honest and full communication. • Always seek clarification while listening, to ensure that your understanding is correct.	2
Session VIII	Brainstorming (Brief discussion on nature, importance and process of brainstorming) Demonstrate a brainstorming session using the following steps: a) Define the problem clearly and lay out any criteria to be met. b) Keep the session focused on the problem. c) Ensure that no one criticizes or evaluates ideas during the session. Criticism introduces an element of risk for group members when putting forward an idea. This stifles creativity and cripples the free-running nature of a good brainstorming session. d) Encourage an enthusiastic, uncritical attitude among members of the group. Try to get everyone to contribute and develop ideas, including the quietest members of the group. Let the students have fun brainstorming. Encourage them to come up with as many ideas as possible, from solidly practical ones to wildly impractical ones. Welcome creativity. e) Ensure that no train of thought is followed for too long. f) Encourage people to develop other people's ideas, or to use other ideas to create new ones. g) Appoint one person to note down ideas that come out of the session. A good way of doing this is to use a flip chart. This should be studied and evaluated after the session.	2

Session IX	Social and cultural etiquette (Brief discussion on importance of social and cultural etiquette in improving interpersonal relationships and the role of social and cultural etiquette in an organization) Organize a brainstorming session on social etiquette. Ask learners to prepare a list of social etiquette people practice in social settings. After the brainstorming session, cross-check whether learners have identified all etiquette listed below. If they have left any, describe them. • Always be on time for get-togethers to show respect for other people's time. • Make eye contact during a conversation. Avoid looking over the other person's shoulder unless you see potential danger. • Never interrupt the other person unless it is very essential • Give and receive compliments graciously. • Don't gossip with and about friends. After all, if you share gossip with someone, that person will wonder what you are saying behind his or her back. • Hold doors for anyone who seems to be struggling, including physically challenged people and parents with young children. • Always carry a gift for the host or hostess, if invited formally. • Do not visit friends or others during illness to avoid their exposure to illness. • Cover your mouth and nose when you sneeze. • Pay your share when you are with a friend or group. If you stiff your friends, they may not invite you again. This includes tipping.	2
Session X	Internal Communication (Brief discussion on the need for effective internal communication and different tools for effective internal communication) The learners may be asked to visit any organization/institution and: - Find out the tools used for internal communication within the organization/institution. - Learn the strengths and weaknesses of each tool (may take feedback from employees and employer/ seniors) - Prepare the write up and present it for discussion in the classroom. This will help to understand the effectiveness of the types of communication tools in making communication more functional and productive within an organization.	2
Session XI	Active listening strategies (Discussion on importance of active listening skills in workplace) Role play: Learners can play the role of a leader and team members and practice listening skills. The faculty member can observe the performance of learners (as a leader and team member) and assess them. Self-evaluation of listening skills: Learners may be asked to visit a few following websites given in the references to know about their listening skills. They may develop their own listening profile and address the	2

	challenges of listening effectively.	
Session XII	Peer behaviour and participation (Discussion on importance of group coherence in an organisation) Organizing a discussion session: • Peer observation reports of the behaviour and participation of each learner during a brainstorming session. • The faculty member may develop some criteria with the help of learners to assess the knowledge and learning of skills. • Self-learning report of each learner about their experience and reflection during a brainstorming session.	2
Session XIII	Peer pressure (Discussion on positive and negative effects of peer pressure) Organise a simulation model on the impact of positive and negative peer pressure and the strategies to overcome negative peer pressure.	2
Session XIV	Developing interpersonal skills (Discussion on the importance of interpersonal skills in management) Students may be asked to see the following video and identify areas of improvement, focus on basic communication skills and improve more advanced communication skills. https://www.skillsyouneed.com/interpersonal-skills.html	2
Session XV	Self-control (Discussion on defining self-control and impacts of self-control in organizational behaviour) The learners can watch the following video to learn about Self Control: Teaching Learners About Their Greatest Inner Strength with Nathan DeWall	2

Learning Resources:

1. Kuratko, D. F., & Rao, T. V. (2012). *Entrepreneurship: A South-Asian Perspective*. Cengage Learning.
2. Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2014). *Empreendedorismo-9*. Amgh Editora.
3. Desai, V. (2009). *Dynamics of Entrepreneurial Development and Management* (pp. 119-134). Himalaya Publishing House.
4. Dollinger, M. J. (1985). *Environmental contacts and financial performance of the small firm*. Journal of Small Business Management (pre-1986), 23(000001), 24.
5. Holt, D. H. (1992). *Entrepreneurship*. New Venture Creation.
6. Plsek, Paul E. (n.d). *Creativity, Innovation and Quality. (Eastern Economic Edition)*, New Delhi: Prentice-Hall of India. ISBN-81-203-1690-8.
7. Singh, N. P. (n.d). *Emerging Trends in Entrepreneurship Development*. New Delhi: ASEED.
8. Khanka, S. S. (2006). *Entrepreneurial Development*. S. Chand Publishing.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

Semester III

1. Course Description

Course Code	23THMMAJ201		
Course Title	HOSPITALITY MANAGEMENT		
Credits	04		
Total Hours	60		
Hours per Week	4-5		
Course Type	Major		
Semester	III		
Intended Level	Diploma		
Issue(s) Addressed	Functionality of hospitality industry		
Course Offered to	BBA (Tourism & Hospitality Management)		
Regulation	2023		
Course Overview	This course: a. Introduces students to the fundamental concepts of hospitality management. b. Explain the functioning of hospitality industry. c. Explain the need and functioning of Human Resource in hospitality industry. d. Serves as a foundation for students to be ready for the hospitality.		
Prerequisite	Basic knowledge of tourism and hospitality.		
Course Objectives	A student will be able to: a. Explain basic idea about hospitality industry. b. Understand the structure, components, and functions of the hospitality industry, including hotels, restaurants, travel and tourism. c. Acquire practical knowledge of day-to-day operations in hospitality establishments, including front office, housekeeping, food and beverage. d. Discuss the importance of human resource management principles relevant to the hospitality industry, including recruitment, training, and employee relations. e. Prepare students for diverse roles within the hospitality industry, fostering a combination of practical skills, industry knowledge, and a customer-centric mind-set.		
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:			
COs	Statements		Cognitive Level Mapping
CO1	Describe basic idea about hospitality management.		R

CO2	Explain the structure, components, and trends of the Hospitality industry.	U		
CO3	Apply the concept of Human Resource with special emphasis on Hospitality Industry.	A1		
CO4	Analyze HR process of recruitment, training process and employee relations within the Hospitality industry.	A2		
CO5	Analyze leadership and management skills to oversee and lead hospitality teams.	A2		
CO6	Evaluate the specific aspects related to accommodations, room layout, food and beverage options and guest satisfaction.	E		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Hospitality Industry in Tourism a. Growth of Hotel Industry - Introduction - Future of Hospitality Industry - Role of accommodation in the Growth of Tourism. b. Definition of Hotel - Types of Hotel Secondary Hospitality Establishment -Traditional and Supplementary accommodation. c. Hotel Grading System - Changing Profile of Hotel Industry. d. d) Hotel Chains in India: Ashoka, Welcome Group, Oberoi and Taj Group of Hotels	15	CO1 CO2 CO3 CO5	R U A1 A2
Unit II	Management Function in Hospitality (Hotel) Industry a. Front Office Desk- Front Office Staff - Qualities of Front Office Staff. b. Hotel Reservation - Status of Rooms - Function of Information Department - Specimen Bill Form - Lobby Manager - Public Relation officer - Reception. c. Department - House Keeping -Organisation - Communication in Hotels	15	CO1 CO2 CO3 CO5 CO6	R U A1 A2 E
Unit III	Human Resource Management in Hotels a. Personnel Management - Sources of Manpower for Hotel - Catering Industry - Employee Facilities and Benefits. b. Induction Training and Development - Leadership - Communication - Tools of Management - Financial Management.	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E
Unit IV	Room Plans a. Types of Rooms - Check in and Check-out Procedures. b. Food and Beverage Services Outlets - Various Types of Food Services. c. Restaurant Organization - Equipment - Room Service.	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E

Learning Resources:

1. Yogendra K. Sharma (2003). *Hotel Management*, Kanishka Publishers, New Delhi.
2. S. Kannan (2003). *Hotel Industry in India*, Deep and Deep Publications, Pvt. Ltd., New Delhi.
3. R.K. Malhotra (2002). *Food Service and Catering Management*, Anmol Publication Pvt. Ltd., New Delhi.
4. Amrik Singh Sudan (2002). *House Keeping Management*, Anmol Publication Pvt. Ltd., New Delhi.
5. Sudhir Andrew (1994). *Food Beverage Service Training Manual*, Tata McGraw Hill Publishing Co. Ltd., New Delhi
6. Y.P. Singh (2001) *Effective Hotel Management*, Anmol Publication Pvt. Ltd., New Delhi.

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Aparna Moktan Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMAJ202
Course Title	ORGANIZATIONAL BEHAVIOUR
Credits	4
Total Hours	60
Hours per Week	4-5
Course Type	Major
Semester	III
Intended Level	Diploma
Issue(s) Addressed	Individual and group behaviour, attitude, job satisfaction and workplace dynamics.
Course Offered to	BBA and BBA (Tourism & Hospitality Management)
Regulation	2023
Course Overview	This course: - Recognizes the importance of Organizational Behaviour in the context of various contributing disciplines and emphasizes its role in understanding individual and group behaviour within the organization. - Equips with the concepts of learning, attitude, and job satisfaction, and their impact on workplace dynamics, emphasizing the causation of job satisfaction and its organizational implications. - Analyses the concept of groups and teams, various leadership theories and compare Indian leadership styles with global counterparts, understanding the impact of culture on leadership dynamics. - Explores various conflict types, both interpersonal and inter-group, and different methods of conflict resolution. - Explores the nature and process of organizational change and addresses the causes and remedies of resistance.
Prerequisite	Basic knowledge of the concept of Management and its functions.
Course Objectives	A student will be able to: - Define Organizational Behaviour and articulate its significance in the context of various contributing disciplines. - Examine and analyse the foundations of individual behaviour in an organization. - Analyse the concepts of personality and values and explore their relevance in the workplace, focusing on person-job fit and person-organization fit. - Evaluate the concepts of learning, attitude, and job satisfaction, and their impact on workplace dynamics, emphasizing the causation of job satisfaction and its organizational implications. - Explain the nature and process of organizational change, utilizing force field analysis and addressing resistance causes and remedies.
Course Outcomes based on RBT and Cognitive Level Mapping	

At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define Organizational Behaviour and articulate its significance in the context of various contributing disciplines, emphasizing its role in understanding individual and group behaviour within organizations.	R		
CO2	Examine and analyse the foundations of individual behaviour, including biographical characteristics, to comprehend the factors influencing behaviour in organizational settings.	U		
CO3	Investigate conflict management strategies within organizations, covering causes of conflict, communication, negotiation, and various methods of conflict resolution, while also exploring organizational change and stress management concepts and their practical applications.	A1		
CO4	Analyse the concepts of personality and values, including the Myers-Briggs Type Indicator (MBTI) and Big Five model, and explore their relevance in the workplace, focusing on person-job fit and person-organization fit.	A2		
CO5	Evaluate the concepts of learning, attitude, and job satisfaction, and their impact on workplace dynamics, emphasizing the causation of job satisfaction and its organizational implications.	E		
CO6	Construct specific strategies, tools, and communication methods that can be employed, considering the nuances of the technology industry and the need for a smooth transition to the new project management framework.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Organizational Behaviour: a. Definition of Organizational Behaviour, its significance, and contributing disciplines to OB. b. Opportunities for OB (Globalization, Indian workforce diversity, customer service, innovation and change, networked organizations, work-life balance, people skills, positive work environment, ethics). c. Foundations of Individual Behaviour – biographical characteristics.	12	CO1	R U A1 A2 E C
Unit II	Individual Behaviour: a. Learning, attitude and Job satisfaction: Concept of learning, conditioning, shaping and reinforcement. Concept of attitude, components, behaviour and attitude. Job satisfaction: causation; impact of satisfied employees on the workplace. b. Motivation: Concept; Theories (Hierarchy of	12	CO2 CO4	R U A1 A2 E C

	needs, X and Y, Two factor, McClelland, Goal setting, Self-efficacy, Equity theory); Job characteristics model; Redesigning job and work arrangements; Employee involvement; Flexible benefits, c. Personality and Values: Concept of personality; Myers-Briggs Type Indicator (MBTI); Big Five model. Relevance of values; Indian values; Linking personality and values to the workplace (person-job fit, person organization fit) d. Perception, Decision Making and Emotions: Perception and Judgements; Factors; Linking perception to individual decision making: Decision making in organizations, Ethics in decision making. Emotional labour; Emotional Intelligence.			
Unit III	Group Behaviour: a. Groups and Work Teams: Concept of Groups and Teams; Five Stage model of group development; Group think and shift; Indian perspective on group norms. Group and teams; Types of teams; Creating team players from individuals building and team-based work (TBW) b. Leadership: Concept; Trait theories; Behavioural theories (Ohio and Michigan studies); Contingency theories (Fiedler, Hersey and Blanchard, Path-Goal); Authentic leadership; Mentoring, self-leadership, online leadership: Inspirational Approaches (transformational, charismatic). Comparison of Indian leadership styles with other countries.	12	CO1	
Unit IV	Conflict Management in Organization: a. Causes of Conflict— Communication and Conflict Resolution—Negotiating to solve Conflict; Programme on Negotiation. b. Organizing Conflicts—Types of Conflicts, Interpersonal and Inter-group Conflicts. c. Methods of Conflict Resolution—Regulating Conflicts in Organization.	12	CO3	R U A1 A2 E C
Unit V	Organizational Change and Stress Management: a. Organizational Change: Concept and Nature; Need and Process; Force field Analysis; Resistance to change -Causes and Remedies, Management of Planned change. b. Stress Management: Meaning and Causes of Stress; Physical and Psychological impacts of Stress, Measures to overcome stress, Drive towards effective stress management.	12	CO6	

Learning Resources:

1. Fred Luthans, *Organizational Behaviour* (12th Edition) McGraw Hill
2. Khanka S.S, *Organizational Behaviour* (Standard Edition) S. Chand
3. Stephen Robbins, *Organizational Behaviour* (18th Edition) Pearson
4. Steven L McShane, Mary, Himanshu Rai, *Organizational Behaviour* (9th Edition) McGraw Hill

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMMIN201	
Course Title	FINANCIAL ACCOUNTING IN TOURISM	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Book-keeping and Accounting	
Course Offered to	BBA (Tourism & Hospitality Management)	
Regulation	2023	
Course Overview	This course: a. Recognizes the need to understand the framework of accounting as well accounting standards in tourism business. b. Equips with the ability for passing journal entries and preparing financial statements of a Sole Proprietor in the tourism industry. c. Equips with the ability of demonstrating various treatments for depreciation. d. Introduces the concept of various methods of accounting for recording transactions with different adjustments.	
Prerequisite	Basic knowledge of business and accounting.	
Course Objectives	A student will be able to: a. Explain the theoretical framework as well as different accounting terms and the concept of GAAP. b. Extend the knowledge of systematic maintenance of books of accounts to real life tourism business. c. Explain the different methods of charging depreciation. d. Demonstrate the knowledge on the process of accounting cycle and basic steps involved in Accounting of a tourism business. e. Construct ledger accounts from journal entries, produce a trial balance and prepare the final accounts of a sole proprietorship firm in the tourism industry.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the theoretical framework as well as different accounting terms and the concept of GAAP.	R
CO2	Explain the different methods of charging depreciation.	U
CO3	Apply the accounting rules to show the journal entries,	A1

	ledger, and trial balance of the business transactions.	
CO4	Analyse the different types of receipts and expenditures.	A2
CO5	Recommend accounting treatments & adjustments for some important items while preparing Final Accounts of a Sole Proprietor in the Tourism Industry.	E
CO6	Construct ledger accounts from journal entries, produce a trial balance and prepare the final accounts of a sole proprietorship firm.	C

Course Content

Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Financial Accounting a. Introduction, scope, importance, objectives and limitations of accounting. b. Users of Accounting Information, Accounting terms and Generally Accepted Accounting Principles. c. Basic Accounting Concepts and Accounting Conventions; Accounting Standards.	15	CO1	R U A1 A2 E C
Unit II	Accounting Process in the Tourism Sector a. Process of Accounting; Meaning of Double entry system; Accounting Rules; Accounting Equation; Transaction Analysis; Posting entries in Journal, Ledger and preparation of Trial Balance. b. Recording of transactions in Cash Book and in Subsidiary Books – Purchase Book, Purchase Returns Book, Sales Book, and Sales Returns Book; Opening and Closing Entries.	15	CO3 CO6	R U A1 A2 E C
Unit III	Expenditures and Receipts, Depreciation, Provision and Reserves a. Capital, revenue, deferred revenue expenditures and receipts. b. Reserves and provisions: meaning, objective and types. c. Depreciation: concept of depreciation; factors in the measurement of depreciation; methods of computing depreciation: straight line method and diminishing balance method; change of methods (by both current and retrospective effect).	15	CO2 CO4	
Unit IV	Final Accounts of a Sole Proprietor in Tourism Business Preparing Trading Account, Profit & Loss Account and Balance Sheet for a Sole Proprietor with important adjustments.	15	CO5 CO6	R U A1 A2 E C

Learning Resources:

1. Hanif, M., & Mukherjee, A. (2018). *Financial Accounting-II, 4e*. McGraw-Hill Education.

2. Amitabha Basu. (2021), *Financial Accounting*. Tee Dee Publications.
3. Basu and Das (2021), *Selected Problems on Financial Accounting (volume I)* (19th Edition) *Rabindra Library*.
4. Maheshwari, S.N and Maheshwari, S.K. (2018). *Financial Accounting* (6th Edition). Vikas Publishing House, New Delhi.

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (financial interpretation). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks .	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (financial interpretation)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAMDC201
Course Title	FUNDAMENTALS OF MARKETING
Credits	03
Total Hours	45
Hours per Week	3
Course Type	Multidisciplinary
Semester	III
Intended Level	Diploma
Issue(s) Addressed	Marketing, Product, Branding, pricing, Distribution channels and Services.
Course Offered to	Other courses besides BBA and BBA (Tourism & Hospitality Management)
Regulation	2023
Course Overview	This Course: - Covers the nature, evolution, and various orientations of marketing, along with the marketing environment in the Indian context. - Explores segmentation, targeting, and positioning strategies in consumer markets. - Focuses on product life cycle, branding, pricing methods, and new product development. - Discusses the promotion mix, marketing channels, and the unique characteristics and strategies for marketing services using the 7Ps framework. - Through these modules, students gain a comprehensive understanding of marketing principles and their practical applications in diverse contexts.
Prerequisite	Awareness of contemporary marketing trends and technologies.
Course Objectives	The students will be able to: - Comprehend the nature, scope, and significance of marketing, including the evolution of marketing principles and core concepts that underpin modern marketing strategies. - Identify and differentiate between needs, wants, and demands, and understand how these concepts influence consumer behavior and market dynamics. - Apply segmentation, targeting, and positioning techniques to effectively reach and engage target market segments. - Develop strategies for product development, branding, pricing, and managing the product life cycle to meet consumer needs and achieve business objectives. - Design integrated promotion mix strategies utilizing advertising, sales promotion, public relations, personal selling, and understand the role of marketing channels in distributing goods and services. - Demonstrate an understanding of the unique characteristics of marketing

	services and implement appropriate marketing strategies utilizing the 7Ps framework.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe the intangible nature of services, list the innovative marketing approaches to address challenges such as inseparability, perishability, and variability, and formulate strategic plans tailored to service-oriented industries.	R		
CO2	Differentiate between segmentation, targeting, and positioning strategies to devise comprehensive marketing approaches.	U		
CO3	Apply critical thinking skills to assess consumer behavior, market trends, and organizational objectives in order to formulate effective promotional strategies.	A1		
CO4	Categorize the various stages of the Product Life Cycle (PLC) and formulate appropriate marketing strategies for each stage, employing critical thinking and evaluation skills at the application level. Examine the unique characteristics of services and develop comprehensive marketing strategies incorporating the 7Ps.	A2		
CO5	Estimate the methods of pricing, discerning factors that influence pricing decisions, and formulating pricing objectives and policies with proficiency, demonstrating comprehension and analysis skills at the evaluation level.	E		
CO6	Develop comprehensive marketing plans that integrate elements of the marketing environment, company orientations, and core marketing concepts, demonstrating proficiency in holistic marketing strategies tailored to specific target markets.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Marketing: a. Nature, Scope, and Importance of Marketing. b. Needs, Wants & Demands. c. Evolution of Marketing, Core Marketing Concepts. d. Company Orientations: Production, Product, Selling, Marketing, Holistic Marketing. e. Marketing Environment: Demographic, Economic, Political, Legal, Socio-cultural, Technological (Indian context).	12	CO1	R
Unit II	Segmentation, Targeting and Positioning: a. Levels of Market Segmentation,	12	CO2	U

	b. Basis for Segmenting Consumer Markets, c. Difference between Segmentation, Targeting and Positioning.			
Unit III	Product & Pricing Decisions: a. Product Life Cycle (PLC), Product Classification, Product Line and Product Mix Decisions. b. Branding, Packaging, and Labelling, New Product Development. c. Methods of Pricing-the factors influencing the pricing decisions, pricing objectives, pricing policies.	11	CO3	A1
Unit IV	Promotion Mix and Marketing Channels: a. Factors determining Promotion Mix. b. Promotional Tools: Advertising, Sales Promotion, Public Relations, Personal Selling c. Marketing of Services: Unique Characteristics, Marketing Strategies (7Ps).	10	CO4	A2 & E

Learning Resources:

1. Kotler, P. & Keller, K. L. Marketing Management, Pearson.
2. Kotler, P., Armstrong, G., Agnihotri, P. Y., & UIHaq, E. Principles of Marketing. A South Asian Perspective, Pearson.
3. Ramaswamy, V.S. & Namakumari, S. Marketing Management. Global Perspective-Indian Context, Macmillan Publishers India Limited.
4. Zikmund, W.G. & D'Amico, M. Marketing, Ohio. South-Western College Publishing.

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks

Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBASEC201
Course Title	E-COMMERCE
Credits	03
Total Hours	45
Hours per Week	3
Course Type	Skill Enhancement
Semester	III
Intended Level	Diploma
Issue(s) Addressed	Bricks and Mortar in E-commerce, Threats, Security and encryption, IT Act 2000, E-payments transaction.
Course Offered to	BBA and BBA (Tourism & Hospitality Management)
Regulation	2023
Course Overview	Course Overview: This Course: - Emphasizes the critical need for security in e-commerce environments, discussing vulnerabilities, encryption techniques, and measures to protect communication channels, networks, and servers. - The course delves into various models and methods of e-payments, including debit cards, credit cards, and online banking, while addressing associated risks and the significance of digital signatures. - Students explore the diverse applications of e-commerce across industries such as banking, insurance, marketing, e-tailing, online services, auctions, publishing, and entertainment, highlighting the benefits, challenges, and features of conducting transactions online. - Integrated throughout the course, practical labs offer hands-on experience in website development, encryption techniques, e-payment methods, and online business transactions, reinforcing theoretical concepts with real-world applications.
Prerequisite	Students should possess the ability to comprehend technical terms and concepts related to e-commerce, security, and online transactions.
Course Objectives	- Comprehend the forces driving E-commerce and the technological infrastructure underpinning it, including the dynamics of the World Wide Web and internet evolution. - Understand the importance of security and encryption in E-commerce environments, including identifying vulnerabilities and implementing solutions to protect channels of communication, networks, and servers. - Familiarize with the Information Technology Act 2000 and its recent amendments, including definitions, electronic governance, digital signatures, regulations of certifying authorities, and penalties for cybercrimes. - Gain knowledge of various e-payment systems, including models, methods, and risks associated with e-payments, as well as the legal positions of digital signatures and online banking.

	e. Explore the various facets of online business transactions across industries, including banking, insurance, utilities, marketing, e-tailing, online services, auctions, online learning, publishing, and entertainment. f. Apply theoretical knowledge through practical lab sessions, developing skills in implementing E-commerce solutions and conducting online business transactions securely and efficiently.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define the fundamental concepts of electronic commerce (e-commerce), including its meaning, nature, and key components. Recall the importance of security and encryption in e-commerce.	R		
CO2	Discuss the IT Act 2000 and its recent amendments in relation to cyber-crimes, demonstrating comprehension and understanding of the legal framework governing electronic transactions and cyber security.	U		
CO3	Implement encryption techniques to secure communication channels, networks, servers, and clients involved in e-commerce transactions. Apply theoretical knowledge to practical scenarios, demonstrating proficiency in navigating and utilizing various e-payment platforms securely and efficiently.	A1		
CO4	Analyse the concepts of Electronic Fund Transfer (EFT), Automated Clearing House (ACH), and Automated Ledger Posting, discerning their roles and applications in e-payment ecosystems.	A2		
CO5	Evaluate the diverse applications of e-commerce across various industries such as banking, insurance, utility bill payments, marketing, and e-tailing, recognizing their popularity, benefits, challenges, and distinctive features.	E		
CO6	Formulate strategies for designing, building, and launching an e-commerce website, considering factors such as hardware and software selection, outsourcing vs. in-house development.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a. Meaning, nature, concepts, advantages, disadvantages and reasons for transacting online. b. Classification of E-Commerce, e-commerce business models (introduction, key elements of a business model and categorizing major E-commerce business models). c. Forces behind ecommerce. Technology used in E-commerce:.	10	CO1	R

	d. The dynamics of World Wide Web and internet (meaning, evolution and features). e. Designing, building and launching e-commerce website (A systematic approach involving decisions regarding selection of hardware, software, and outsourcing vs. in-house development of a website).			
Unit II	Security and Encryption: a. Need and concepts, the e-commerce security environment: (dimension, definition and scope of security), vulnerabilities in the E-commerce environment, solutions. b. Encryption, securing channels of communication, protecting networks and protecting servers and clients.	9	CO2	U
Unit III	IT Act 2000 with recent amendments and Cyber Crimes: a. IT Act 2000: Definitions, Electronic governance, Attribution, acknowledgement and dispatch of electronic records. b. Regulation of certifying authorities, Digital signature, and Digital signatures certificates. c. Duties of subscribers, Penalties and adjudication, Appellate Tribunal, Offences and Cyber-crimes.	9	CO3	A1
Unit IV	E-payment System: a. Models and methods of e-payments (Debit Card, Credit Card, Smart Cards, e-money). b. Digital signatures (procedure, working and legal position), payment gateways; online banking: meaning, concepts, and importance. c. Electronic fund transfer, automated clearing house, automated ledger posting), Risks involved in e-payments.	9	CO4	A2 & E
Unit V	Online Business Transactions a. Meaning, purpose, advantages and disadvantages of transacting online. b. E-commerce applications in various industries like banking, insurance, payment of utility bills, marketing, e-tailing (popularity, benefits, problems and features). c. Online services (financial, travel and career), auctions, online portal, online learning, publishing and entertainment, online shopping from e-tailers.	8	CO5	C
Learning Resources: 1. Laudon, K.C., and GuercioTraver, C. <i>E-Commerce</i>, Pearson Education. 2. Whiteley, D. <i>E-commerce: Strategy, Technology and Applications</i>. McGraw Hill Education 3. Bhaskar, B. <i>Electronic Commerce: Framework, Technology and Application</i>. 4th Ed., McGraw Hill Education				

4. Joseph, P.T. *E-Commerce: An Indian Perspective*. PHI Learning
5. Bajaj, K.K., & Nag, D. *E-commerce*. McGraw Hill Education
6. Madan, S. *E-Commerce*. Taxmann
7. Chhabra, T.N., Jain, H.C., and Jain, A. *An Introduction to HTML*. Dhanpat Rai & Co.
8. Elias, A.M., *Electronic Commerce from Vision to Fulfilment*. Pearson Prentice Hall

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAVAC201	
Course Title	TIME MANAGEMENT	
Credits	1	
Total Hours	15 sessions of 2 hours each	
Hours per Week	2	
Course Type	Value Added Course	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Value based learning	
Course Offered to	BBA and BBA (Tourism & Hospitality Management)	
Regulation	2023	
Course Overview	This Course: a. Helps students Prioritize, plan and arrange daily activities in a productive way b. Assists students in learning techniques to overcome procrastination	
Prerequisite	Basic understanding of time management and ethics.	
Course Objectives	The students will be able to: a. Organize work station and workflow to make better use of time. b. Efficiently delegate tasks. c. Co-ordinate business meetings more effectively. d. Identify the ‘time stealers’ and handle them appropriately. e. Learn scheduling, planning and prioritizing skills.	
Course Outcomes At the end of this course, a student will be able to: a. Learn tips and ways to become better organized. b. Recognize the difference between urgent items and important items. c. Handling workload efficiently. d. Escape the trap of over-committing yourself. e. Utilize Technology Effectively to save time. f. Learn effective ways of handling Paperwork.		
Course Content		
Units	Content	Lecture Hours
Session 1	How Long Is One Minute? Instructions 1. Ask participants to stand up and close their eyes.	2

	2. Then ask them to sit down quietly (so that the other participants cannot hear them) when they think that one minute has gone. 3. Once everybody has sat down, you start the discussion. What will happen is that participants will sit down at different times. So, you can point out to them that time depends heavily on perception. By asking participants when time goes faster for them and when, instead, time never seems to pass, you can introduce to them the idea that passion, time, and productivity are connected.	
Session II	The Jigsaw Puzzle 1. Divide your participants into groups of 3 to 5 people per group. 2. Give each group a puzzle but NOT the image with the big picture, so that they cannot see what the image looks like when the puzzle is finished. 3. After about three minutes, stop the process and ask: ‘What is missing?’ ‘What is making solving the puzzle difficult?’ It is likely they will say that it is because they cannot see the big picture that they are working towards. 4. Now, give them the big pictures and they should complete the puzzles much faster. The point of this time management training game is that it is very hard to work efficiently and in a timely manner, without knowing the ultimate goal we are aiming towards.	2
Session III	Coloured Items – Time Management Training Activity Activity Instructions 1. Divide participants into groups. 2. Provide each group with a set of items of different colors. So, give each group, for example, 6 green items, 6 blue, 6 red, and 6 yellow. 3. Ask each group to collect, in 1 minute, as many blocks as they can. Each person can only use their non-dominant hand. Each item is worth 1 point. 4. Ask the groups to play again but, this time, assign a different point value to each color. 5. After one minute has passed, stop the game. 6. Add up the points and nominate the winning group. You can start the discussion after the game, by asking groups: ‘What was your strategy for playing the game the second time around?’ The discussion should highlight that good organizational skills, planning, and coordination are essential to achieve more in the shortest amount of time.	2
Session IV	Time Management Prioritisation Exercise Prioritization Exercise Instructions 1. Separate participants into groups of 4 to 5 people. 2. Give each group a sheet of A1 paper from a flipchart pad and some colored marker pens. 3. Give them 10 minutes to make a list of tasks that are likely to come up as part of their job or at home (you may want to focus on different areas of life depending on who you are training, or let the participants choose).	2

	4. Ask them to prioritize these tasks based on the importance of each task. 5. At the end of the 10 minutes, ask the groups to feedback to the rest of the class and ask them: ‘Which tasks did you consider the most important and why?’ The discussion that will follow will revolve around what important tasks are and how we know that they are important.	
Session V	Arrange the Cards Instructions 1. Divide the class into groups of 3 to 5 people. 2. Give each group a deck of playing cards (which you had previously shuffled, so they are not in order). 3. Explain that each team has to lay out the cards in the specific order that you will have previously shown. (You can use a PowerPoint slide for this, with a photo of the cards, or you can have a deck of cards already set up on a table). 4. Explain that cards must be placed in neat rows without touching each other. 5. Tell participants that the team that completes the task in the shortest amount of time wins. 6. Give teams 5 minutes to strategize and carry out any practice runs. Explain that teams can use any resources in the room to help them, as needed. 7. After the first 5 minutes, start the first proper round. 8. There will be three rounds. The idea is that each team should improve with each round. The winning team is the one that accomplishes the task in the shortest amount of time. At the end of the game, start a discussion by asking participants: ‘What strategy did you use to complete the task?’ Strategizing, planning, and delegating should come out, from the discussion, as key elements to managing time successfully.	2
Session VI	How to Overcome Time-wasters This activity, not only introduces the idea of time-wasters, but it also gives your participants the opportunity to start thinking about how to overcome them. Time-wasters Exercise Instructions 1. Write a time-waster on the back of each envelope (a different time-waster on each envelope). Use common time-wasters, which can be things such as meetings, social media, unexpected visitors, etc. 2. Divide the participants into groups of 3 to 5 people. 3. Give each group an envelope and give them 3 minutes to write down a list of ways to overcome the time-waster written on the envelope they were given on one of the index cards (each team has to use only one of the index cards in the envelope). 4. After three minutes are up, ask the groups to pass their envelope to the group next to them, so that envelopes rotate and each group has a different envelope every time. 5. Continue with up to as many rounds as there are groups or as many rounds as time allows. 6. After the last round, start the discussion.	2

Session VII	What Did You Do Yesterday? 1. Ask participants to work individually for this task at first. 2. Ask each participant to jot down, on a piece of paper, 5 things they accomplished yesterday. It does not matter how big or small. It can be anything from taking the dog for a walk to closing an important sale for their company. 3. Ask each participant to write down one wasteful thing they did. Wasteful means unproductive, something that did not contribute towards achieving their goals, did not improve the quality of their life or distracted them from more important tasks. 4. Give participants 5 minutes to write down the 5 accomplishments and the wasteful thing. 5. Ask participants to discuss and compare their lists with the person sitting next to them (or they can discuss in groups of three if there is an odd number of participants).	2
Session VIII	Practice your delegation skills Imagine you have a new employee and an observer. Assign some of your tasks to the new employee. The delegator practices delegation and the observer have a sheet that helps them provide feedback on how well they did and what needs to be improved. This kind of scenario improves team coordination and management.	2
Session IX	Overcoming Distractions In this activity, identify your distractions. Keep track of your time over a few days. Put all your distractions on paper, then develop a plan to overcome them. Doing this activity in the group, create a list of your distractions, then talk about solutions.	2
Session X	Time Squared Take three pages containing 24 squares, each indicating the 24 hours of the day. Participants fill the first page with the routine tasks they complete each day. The second page is for the time they spend working that is unproductive. They combine the contents of the first two pages into the third page. The remaining time can be used productively.	2
Session XI	Pomodoro The Pomodoro is a widely known and used time management activity for students, employees, and perfectionists. Millions of people swear by its life-changing power. The <u>Pomodoro</u> technique involves four cycles, each of 30 minutes. Each cycle is divided into 25 minutes of work and a 5-minute break. After completing the four cycles, take a long break of 20 minutes. Repeat the process until the end of the tasks. This is one of the effective time management skills for planning, avoiding distraction, stress management, and setting priorities.	2

Session XII	Kanban Divide your task into four sections as follows: 1. Backlog: This is where you brainstorm and list all of your tasks. Then you choose which tasks to move to the To Do column and which ones can wait their turn. 2. To-Do List: You'll work on the items in the To-Do section. 3. In-progress: These are the projects you currently have in progress. 4. Completed — Tasks you've completed.	2
Session XIII	Circadian Rhythms Each participant in this time management activity has a paper with hourly blocks. They list the energy state they are in at that moment. Are they, for instance, "on fire," "at 70%," "slowing down," and so on? The idea is to make people more aware of their highs and lows to make better use of their time.	2
Session XIV	Schedule Your Priorities A list of tasks, each worth a different number of points, is presented to you in this activity. The group is divided into teams, and each team has 10 minutes to complete its assigned tasks. You then add up the points. After that, you talk with them about their prioritization process.	2
Session XV	Time-boxing 1. Make a list of all your tasks. 2. Establish your goals and decide what you want to achieve with these tasks. 3. Give a task more time if it's important (for example, 1 or 2 hours). 4. To make a difficult task easier to manage, divide it into smaller parts and give each a shorter period (for instance, 20 to 30 minutes). 5. Stop working on a task when the allotted time is up. 6. Go on a break. 7. Review the task.	2

Source:

1. <https://chrismathunit.weebly.com/activity-1-how-long-is-a-minute.html#:~:text=Point%20to%20the%20numbers%20moving,the%20same%20as%20sixty%20seconds>.
2. <https://www.bell-foundation.org.uk/eal-programme/guidance/classroom-guidance/great-ideas/jigsaw-activities/#:~:text=What%20are%20jigsaw%20activities%3F,then%20become%20the%20experts%20in>
3. <https://symondsresearch.com/time-management-activities/>
4. <https://trainingcoursematerial.com/free-games-activities/time-management-activities/arrange-the-cards>
5. <https://quixy.com/blog/time-management-activities/>

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

Semester IV

1. Course Description

Course Code	23THMMAJ203	
Course Title	TOURISM MARKETING	
Credits	04	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Marketing and Advertising in Tourism Industry	
Course Offered to	BBA (Tourism & Hospitality Management)	
Regulation	2023	
Course Overview	This course: a. Introduces students to the basic concept of tourism marketing b. Develops an understanding the need marketing in tourism	
Prerequisite	Basic knowledge of tourism industry	
Course Objectives	The students will be able to: a. Interpret basic concepts of tourism marketing, its functions and strategy b. Explain developing tourism products and experiences that meet the needs and desires of target markets. c. Analyse the role of marketing in tourism. d. Evaluate the role of media in tourism marketing.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define tourism and marketing relation.	R
CO2	Discuss the elements of tourism marketing.	U
CO3	Classify various tourism marketing strategies.	A1
CO4	Analyse the need of tourism marketing.	A2
CO5	Examine the use different media platforms for tourism marketing.	A2
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit I	Basic Concept - Core concepts in Marketing, Needs, Wants & Demands, Products, Customer value & satisfaction, quality, exchange & transactions, markets and marketing. - Segmentation of Tourism, Market-concept, justification, importance and bases. - Market Research-methods, research problem areas, marketing research in the tourism industry. - Tourism life cycle	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
Unit II	Tourism Marketing Mix 8 Ps. Methods of Pricing-the factors influencing the pricing decisions, pricing objectives, pricing policies. - Service Characteristics of Tourism. Unique features of tourist demand and tourism product. - Branding and packaging-conditions that support branding	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
Unit III	Tourism Marketing Strategy - Destination Planning and Product Diversification. Destination Marketing. - Marketing strategy in the new digital age-E-Business, E-Commerce and E-Marketing. - Complementary Marketing	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
Unit IV	Importance of Media - Role of Media in promotion of Tourism TV/ Radio, Newspaper, Travel Magazines, Documentaries, Guide Books, Travel writers. - Electronic Tourism promotion: Advertising, Public relations, sales promotion and personal selling.	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
Learning Resources: - Kotler Philip (1993), <i>Marketing Management: Analysis, Planning Implementation, and Control</i>, Prentice Hall of India, New Delhi. - Brigs, Susan (1997), <i>Successful Tourism Marketing: A Practical Handbook</i>, Kogan Page, London. - Middleton (1994), <i>Victor T.C Marketing in Travel and Tourism</i>, Oxford. - Brunt, Paul (1997), <i>Market Research in Travel and Tourism</i>, Butterworth Heinemaun. - Hollway, (Harlow: Longman, 1995) Nama Kumari and Rama Swami <i>J.C. Marketing for Tourism Marketing Management</i> Note: Latest edition of text books may be used.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Aparna Moktan Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMMAJ204	
Course Title	FINANCIAL MANAGEMENT IN TOURISM BUSINESS	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Finance in Tourism Business	
Course Offered to	BBA (Tourism & Hospitality Management)	
Regulation	2023	
Course Overview	This Course: a. Covers theories of financial management and their application in investment, financing and dividend decisions in the tourism industry. b. Covers concepts of cost of capital, leverage analysis and capital structure.	
Prerequisite	Basic knowledge about finance and importance of financial management in business	
Course Objectives	The students will be able to: a. Understand basic concepts of financial management and their application in investment, financing and dividend decisions. b. Understand concepts of cost of capital, leverage analysis, capital structure and dividend theories c. Identify courses of action in financial environment that would result in maximization of wealth of an organization. d. Understand management of working capital and estimate the same for an organization	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Recognize the importance of financial management from a strategic perspective	R
CO2	Take both long-term and short-term investment decisions	U
CO3	Apply the capital structure decisions through relevant models	A1
CO4	Compute cost of capital and develop innovative financial strategies	A2
CO5	Analyse the dividend policy of a firm	E
CO6	Comprehend the functions of short term financial	C

	management			
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a. Nature, scope and objective of Financial Management b. Time value of money c. Risk and return concept d. Valuation of securities – Bonds and Equities	12	CO1	R
Unit II	Investment Decisions a. The Capital Budgeting Process, b. Cash flow Estimation c. Payback Period Method, Accounting Rate of Return, Net Present Value (NPV), Internal Rate of Return (IRR), Profitability Index	12	CO2	U
Unit III	Financing Decisions a. Cost of Capital and Financing Decision: Sources of long-term financing, Estimation of components of cost of capital b. Methods for Calculating cost of equity capital, Cost of Retained Earnings, Cost of Debt and Cost of Preference Capital, Weighted Average cost of capital (WACC) c. Capital structure –Theories of Capital Structure (Net Income, Net Operating Income, MM Hypothesis, Traditional Approach) d. Operating and financial leverage.	12	CO3 & CO4	A1 A2
Unit IV	Dividend Decisions a. Theories for relevance and irrelevance of dividend decision for corporate valuation b. Cash and stock dividends c. Dividend policies in practice	12	CO5	E
Unit V	Working Capital Decisions a. Concepts of working capital and the risk-return trade off b. Sources of short-term finance c. Working capital estimation	12	CO6	C
Learning Resources: 1. James C. Van Horne and Sanjay Dhamija, Financial Management and Policy, Pearson Education 2. Khan and Jain. Basic Financial Management, McGraw Hill Education 3. Chandra, Prasanna. Fundamentals of Financial Management. McGraw Hill Education 4. Rustagi, R.P. Fundamentals of Financial Management. Taxmann Publication Pvt. Ltd. 5. Pandey, I.M. Financial Management. Vikas Publications. Accounting, Kalyani Publishers				

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks. (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMMAJ205	
Course Title	Human Resource Management in Tourism	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Human Resource issues in tourism industry	
Course Offered to	BBA (Tourism & Hospitality Management)	
Regulation	2023	
Course Overview	This Course: Is designed to provide students the basic understanding of key HRM functions, which include HR planning, recruitment & selection, compensation, performance evaluation, and training & development in tourism industry.	
Prerequisite	Basic knowledge about importance of human resource management in tourism business decision making	
Course Objectives	The students will be able to: a. Understand the functions, systems, policies and applications of Human Resource Management in tourism organizations. b. Develop an overview of theoretical foundations of key areas associated with HR development in the tourism businesses. c. Enhance HR skills and their ability to assess the constraints and opportunities associated with managing employees in different socio-economic and political context. d. Develop an insight into the effective management of employees that will guide the budding managers through the principles and practices of HRM and the core models of best practices.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Understand and recognize Human Resource Management Perspective	R
CO2	Ability to Draft HR planning, job description and job specification	U
CO3	Ability to recruit, select and interview job candidates	A1
CO4	Ability to train using various methods of Training.	A2

CO5	Ability to appraise the Performance of the employees	E		
CO6	Ability to implement methods of Industrial Democracy	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Human Resource Management a. Definition, Concept of HRM & its Evolution. Components of HRM. Importance of Human Resource Practices in Tourism Industry. b. Difference between HRM & Personnel Management. c. Role of HR Manager in retail outlet. d. New trends in HRM due to globalization, deregulation and Technological advancements, with special focus on Tourism industry.	12	CO1	R
Unit II	Human Resource Planning a. Human Resource Planning: Process, Forecasting demand & supply, Skill inventories b. Human Resource Information System (HRIS) succession planning c. Factors and Process of Human Resource Planning in different retail outlets. Skill Inventory, Problems in HR Planning d. Job Analysis and Job Description – Concept. Job Specification and Job Evaluation	12	CO2	U
Unit III	Acquisition and Development a. Meaning and Concept of Recruitment. Factors affecting Recruitment process in Tourism sector. b. Methods / Types of Recruitment followed in present scenario. c. Selection – Concept and Process followed. d. Types of interviews and Tests conducted in tourism sector. Placement of selected candidate. e. Concept and Significance of Training in different sectors. f. Identifying training requirements needs. g. Methods and Types of Training programs followed in tourism industry.	14	CO3	A1 A2

	h. Difference between Training and Development. Policy followed in Tourism industry			
Unit IV	Performance Appraisal a. Performance management system: concept, uses of performance appraisal b. Performance management methods, factors that distort appraisal, appraisal interview Career planning: career anchors, career life stages. KPA, Graphic Rating Scale, Checklist Error in Performance Appraisal, PA Forms	12	CO4	E
Unit V	Industrial Relations: a. Introduction to Industrial Relations b. Trade unions- role, types, functions, problems c. Industrial dispute- concept, causes & machinery for settlement of disputes d. Collective bargaining- concept, types, process, problems, essentials of effective collective bargaining.	10	CO5	C

Learning Resources:

1. De Cenzo, D.A. & Robbins: Fundamentals of Human Resource Management, New York: John Wiley & Sons
2. Dessler, G: Human Resource Management, Pearson.
3. Monappa & Saiyaddin: Personnel Management, Tata McGraw Hill.
4. Rao, V.S.P.: Human Resource Management- Text and Cases, Excel Books.

Note: Latest edition of text books may be used.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (Weightage – 10)	FA2 - Mid-Semester Exams (Weightage – 25)	FA3 (Weightage – 10)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each)	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 long question of 15 marks (case study). Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79% – 2 marks 80%-85% – 3 marks 86%-90% – 4 marks Above 90% – 5 marks

Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMMIN202	
Course Title	FUNDAMENTALS OF COST ACCOUNTING	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Costs incurred by tourism company – its classifications, methods, and accounting.	
Course Offered to	BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Primarily helps the students to understand the concept of costing as a decision-making tool in business operations. b) Equips with the ability to classify costs and overheads under different category. c) Provides the understanding of cost centres, profit centres and cost units. d) Analyses emerging concepts of cost accounting and its relevance in the tourism industry.	
Prerequisite	Basic knowledge of accounting, cost, and its types.	
Course Objectives	The students will be able to: a) Evaluate the need and essentials of uniform costing and the pre-requisites of inter firm comparisons. b) Monitor costs of raw materials, labour, transportation cost, overheads etc. in the tourism industry. c) Advise ways to bring economy by analyzing costs and implications of different production methods. d) Monitor performance and efficiency to locate and report various problems in different departments. e) Construct cost statements and accounts under different methods in the tourism and hospitality industry.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the concept of cost accounting, cost centre, profit centre, and classify cost on different basis.	R
CO2	Explain the different inventory analysis methods.	U
CO3	Apply the payroll procedures; calculate remuneration and incentive plans for preparing the labour cost	A1

	statement.			
CO4	Analyse the different classes of overheads; allocation, absorption and apportionment of overheads.	A2		
CO5	Evaluate the inventory control techniques, incentive plans in preparation of labour cost statement.	E		
CO6	Construct cost statements under transport and hotels and lodges services.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Cost Accounting in Tourism: (a) Meaning, objectives, nature, scope and importance of Cost Accounting. (b) Difference between Cost Accounting and Financial Accounting. (c) Cost concepts and classifications; cost centre and profit centre. (d) Installation of a costing system; Role of a cost accountant in an organization.	12	CO1	R U A1 A2 E C
Unit II	Material Costing: (a) Inventory control techniques; (b) Purchase of materials – procedure; (c) Stock levels of Materials and EOQ; (d) Storage of materials (bin card and stores ledger); (e) Issue of materials and Methods of pricing of materials issues — FIFO, LIFO, Simple Average, and Weighted Average.	12	CO5 CO2	R U A1 A2 E C
Unit III	Labour Costing: (a) Accounting and Control of labour cost; (b) Time keeping and time booking; (c) Concept and treatment of idle time, over time, labour turnover and fringe benefits; (d) Methods of wage payment and the Incentive schemes – Halsey plan, Rowan plan, and Taylor’s Differential piece wage system.	12	CO3	R U A1 A2 E C
Unit IV	Overheads Costing: (a) Classification of Overheads; (b) Allocation, Apportionment and Absorption of overheads; (c) Preparation of Overheads Distribution Statements; (d) Computation of Machine Hour Rate.	12	CO4	R U A1 A2 E C

	(e) Activity Based Costing: meaning, objectives, stages, cost driver and cost pool, importance, weaknesses and Activity Based Costing vs. Traditional Costing.			
Unit V	Service Costing: (a) Meaning, characteristics and cost classifications. (b) Computation of Transport Costing (c) Costing of Hotels and Lodges	12	CO6	R U A1 A2 E C

Learning Resources:

1. Horngren, C. T., Datar, S. M. & Rajan, M. V., *Cost Accounting: A Managerial Emphasis*. Pearson Education.
2. Jawahar Lal, *Cost Accounting*. McGraw Hill Education.
3. Nigam, B.M. Lal and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning.
4. M. Haniff, *Modern Cost & Management Accounting*
5. Goel, R. *Cost Accounting*. International Book House
6. Singh, S. *Cost Accounting*. Scholar Tech Press, New Delhi.
7. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
8. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi.
9. Maheshwari, S.N. and Mittal S.N. *Cost Accounting: Theory and Problems*. ShriMahavir Book Depot, New Delhi.
10. Jain & Narang, *Cost & Management Accounting*. Kalyani Publishers

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	FA2 - Mid-Semester Exams (25 weightage)	FA3 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks. (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory long question (financial interpretation) of 15 marks. Total marks: 50 marks.	Presentation/ Assignment/ Project/ Group Presentation/ Group Discussion/ Case Study carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions	2 marks × 5 = 10	Lower-order level

	out of 8	marks	
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory long question (financial interpretation)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23BBAVAC202	
Course Title	Stress Management	
Credits	1	
Total Hours	15 sessions of 2 hours each	
Hours per Week	2	
Course Type	Value Added Course	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Value based learning	
Course Offered to	Management Studies	
Regulation	2023	
Course Overview	This Course: a. Aims to equip people with practical skills to cope with stress b. Helps to use one’s time efficiently and feel more in control.	
Prerequisite	Basics of time management	
Course Objectives	The students will be able to: a. Identify the costs and benefits of dealing with stress. b. Define what stress is and started to recognize the signs of stress. c. Engage students in personal stress management strategies and techniques. d. Review the main work areas that can lead to stress and identified ways to address work-related stress throughout the organization. e. Develop the critical role and skills of an effective manager of stress and draw up their own action plan to address the most prominent issues in managing stress in the workplace.	
Course Outcomes At the end of this course, a student will be able to: a. Understand the basic principles of stress management. b. Recognize your stress triggers and how to manage them. c. Develop proactive responses to stressful situations. d. Use coping tips for managing stress both on and off the job. e. Learn to manage stress through diet, sleep and other lifestyle factors. f. Develop a long-term action plan to minimize and better manage stress.		
Course Content		
Units	Content	Lecture Hours
Session 1	Yoga Here is a sequence of yoga poses for stress relief.	2

	Complete each move slowly, one after the other to create a yoga "flow." • Swan dive – Stand with your legs hip-width apart. Reach both arms out to your sides and up to the sky, holding for a breath. At the same time, slowly lower your arms and bend at the waist, keeping your back straight. Reach for the ground. • Downward dog – From the swan dive, place your hands on the ground and walk your feet back until your body is in an 'A' shape. Look between your hands. • Cobra – From downward dog, lower your body down until you're flat on your stomach. Place your palms shoulder-width apart and push your chest up until you're arching your back and you feel a stretch in your stomach muscles. • Child's pose – From cobra, lower yourself back down to your stomach. Push yourself up to your hands and knees with your knees hip-width apart. Touch your big toes together and lower your bottom down to your heels. Lower your stomach between your knees, place your forehead on the ground or your hand and reach your hands forward as far as you can. Rest in this position as long as you'd like and repeat the sequence if desired.	
Session II	Guided Imagery A person may follow the steps below to try guided imagery: 1. Sit or lie down in a comfortable place. 2. Close the eyes. 3. Take a few deep breaths so the body can start relaxing. 4. Visualize a peaceful, calm setting, such as, a garden, lake, or somewhere by the sea. 5. Picture the scene and add more details. Explore the scene with all other senses; for example, imagine birds chirping, the scent of flowers, and the warmth of the sun. 6. Linger in the scene for a few minutes while trying to savor the calmness and sense of relaxation. A person can choose to stay in the scene for as long as they need to rejuvenate. 7. Open the eyes and stretch gently to re-enter the present. People should remember that they can return to the scene whenever they want.	2
Session III	Progressive Muscle Relaxation (PMR) exercise To try PMR:	2

	1. Find a peaceful and quiet place to do the exercise. Sit in a chair or lie down on the floor or a bed. If it feels comfortable, close the eyes. 2. Keeping the mouth closed, inhale deeply and slowly through the nose. Exhale slowly through the mouth and imagine tension leaving the body. 3. Repeat these deep breaths three or four more times. If it causes dizziness, breathe normally instead. 4. On the fifth inhale, squeeze the muscles in the toes and feet and count to four. Then exhale slowly through the mouth, gradually releasing tension from the feet. 5. Repeat step four, this time for the calf muscles. Tense the calf muscles while breathing in, then release when breathing out. Continue to repeat a pattern of tensing muscles while inhaling and then relaxing them while exhaling for muscles all the way up the body. This includes the: • knees • thighs • buttocks • abdomen • hands, by making fists • arms • shoulders, by shrugging them toward the ears • jaw, by clenching the teeth and releasing • face, by scrunching the facial muscles and releasing	
Session IV	Listening to Music Music is one of the amazing stress-busting techniques. Not only listening to music helps in improving your concentration skills and promoting relaxation, but it can also help in stimulating your mind and relieve stress. If you're a stressed student then you can reap the benefits of music. If you're studying, you can play classical or calm music.	2
Session V	Simple Meditation Instructions: 1. Warm up (Optional: take heart rate and note it) 2. Begin by sitting comfortably, balanced, and relaxed (if seated in a chair, feet on the ground). Breathe easy and from the abdomen/"belly breathing" (not chest breathing). 3. Practice a few deep breaths with the group. 4. Rotate the head in easy, slow circles; change direction and rotate in slow, easy circles.	2

	5. Look up; tilt your head way back. Look down; put your chin on your chest. 6. Drop your arms and hands to the side and shake them gently and easily. 7. Raise your feet off the floor and gently and easily shake the knees. 8. Straighten your spine while meditating. 9. Practice (repeat two times) 10. This is done SILENTLY. 11. When teacher says, "Close your eyes", close your eyes. [Once your eyes are closed, simply relax your mind and do not make an effort to think about anything; slowly your mind will clear and relax] When teacher says, "Open your eyes", open your eyes. 12. Now, sit straight up, relaxed, and balanced. 13. "Close your eyes" (two minutes elapse) 14. "Open your eyes" 15. Check in with students: how was that? (Students may give thumbs up or thumbs down.) Now everyone practice it again. 16. Repeat exercise: "Close your eyes" ... two minutes elapse... "Open your eyes" (Optional: take heart rate and compare to heart rate before meditation)	
Session VI	Peer-Sharing (Co-Listening) Instructions: 1. Students should be in pairs; have students find a partner (e.g. you can number off students 1, 2, 1, 2...). 2. Student #1 talks while student #2 simply listens (e.g. ask Student 1 to share how they are feeling today and why? Or how they are feeling at the moment Or about any concerns or worries they are experiencing). 3. After 1-3 minutes the students switch roles and student #2 talks while student #1 listens for another 1-3 minutes (Student #2 now talks about the same question, e.g. how they are feeling today and why?). 4. Part Two 4. After the pairs are done sharing, group students in triads (groups of three; again you may number off students 1, 2, 3, 1, 2, 3 ...). 5. Student #1 talks while students #2 and #3 listen (e.g. ask Student 1 to talk about opportunities and solutions related to current issue or stressors he/she is experiencing or concerned about). 6. Every 1-3 minutes switch until each student in the group has a turn to talk.	2

Session VII	Animal Charades Instructions: 1. Depending on class size, break class into groups of 2, 3 or 4 students. 2. Write several different names of animals on paper; one name per folded up piece of paper (students may help with this as part of the activity). 3. Put names in the hat. 4. Each group picks a name and figures out how to present their charade to the class. 5. Each group takes a turn presenting their charade, while the “audience” guesses the animals presented. 6. Depending on time, number of groups and number of folded papers, teacher determines how many rounds of charades each group presents. 7. OPTIONAL: At the end of the activity, distribute paper, pencils, and crayons/markers for students to draw and color their favorite animal	2
Session VIII	Silent Ball Instructions: 1. No one can talk or make a sound; that is the object of the game 2. Students may stand by their desks or position students in any arrangement to facilitate tossing the ball to each other around the classroom 3. Make a good throw to a classmate; explain that students cannot throw back to the person who threw to them 4. If student misses the ball or makes a bad pass, student is out and must sit at his/her desk until the next round 5. Play until all students are seated; last two are the champs!	2
Session IX	Movement to Music Freeze Dance Instructions: 1. If necessary, arrange classroom to provide ample space for the activity. 2. Students take a place in the designated “movement/dance” area with sufficient personal space so as not to run into other students OR students may be positioned in a circle and move in the same direction around the circle. 3. Review activity rules with students: * Move to match the music * FREEZE when the music stops * When the music starts again, move to match the music *Activity involves only movement, no voices 4. Start the music. 5. Stop music at timely intervals. 6. Note suggested	2

	sequence of music; always end with slow, calming music.	
Session X	Paper Mosaics Instructions: 1. Students clear their desks of books, folders, etc. 2. Using a pencil, students draw the outline of an object, shape or scene on a 8.5"x11" or 9"x12" piece of paper (see examples attached of Butterfly, Elephant, Flowers, Cat's Face). 3. Students then cut small colored square paper "tiles" from the scrap construction paper or the magazines (tear out pages you would like to use and then cut the pictures up into little square "tiles"). Modification: for K-1 prepare mosaic patterns and pre-cut paper tiles. 4. Explain to students that each outline should be filled with tiles of the same color. 5. Working with one shape/area/figure at a time, students apply glue to the inside of their outlined shapes, and then place the paper "tiles" in the shape/outline, leaving a small space between each paper "tile" (for some shapes, students may have to cut "customized tiles" to effectively fill in the shape). 6. Students repeat the glue and placement of "tiles" in each shape/outline of their drawings until the mosaic is complete.	2
Session XI	Deep Breathing Exercise Provide students with the following directions: 1. Stand straight up with feet shoulder-width apart 2. Arms and hands are relaxed downward 3. Body is relaxed 4. Eyes closed 5. Focus on lower abdomen (belly) and imagine a small balloon in that space 6. Breath in slowly and deeply through nostrils, imagining the balloon inflating (getting bigger/larger/growing) slowly, hold a few seconds 7. Slowly exhale through the mouth, imagining the balloon gently deflating (getting smaller, shrinking); blow out of the mouth as if blowing out a candle 8. Tip: Place a hand over the lower abdomen to feel it go up and down, and make sure you're not breathing with the chest 9. Repeat at least 10 times	2

Session XII	The Five Senses Worksheet Mindfulness can be cultivated by paying attention to what we observe and feel while using our different senses one at a time. During mindfulness practice, distractions are observed, and attention is gently returned to the body part receiving focus. Templates can be downloaded online and use for the activity	2
Session XIII	Nature Effect Students are to be taken to a nature park by the teacher and they should be asked to simply enjoy sounds and sights of nature. Merely being in the garden, often performing mindfulness activities, could improve the symptoms of their post-traumatic stress disorder.	2
Session XIV	Anxiety Record Using worksheet, students can record their anxieties, triggers, and their effects. Afterward, they are guided through a breathing exercise and asked to revisit their answers to the questions. A few prompts from this exercise are listed below: • When do you feel anxious? • What thoughts are you having before or during feeling anxious? • Do you think these thoughts are realistic? • What thoughts could you replace them with?	2
Session XV	Mindfulness Meditation Practicing mindfulness meditation 1. Sit on a straight-backed chair or cross-legged on the floor. 2. Focus on an aspect of your breathing, such as the sensations of air flowing into your nostrils and out of your mouth, or your belly rising and falling as you inhale and exhale. 3. Once you've narrowed your concentration in this way, begin to widen your focus. Become aware of sounds, sensations, and your ideas. 4. Embrace and consider each thought or sensation without judging it good or bad. If your mind starts to race, return your focus to your breathing. Then expand your awareness again.	2
Source: 1. https://www.medicalnewstoday.com/articles/guided-imagery#step-by-step-guide 2. https://www.childrens.com/health-wellness/stress-relief-activities-for-kids 3. https://www.edutopia.org/sites/default/files/resources/stw-glenview-stress-reduction-activities.pdf 4. https://www.wright.edu/sites/www.wright.edu/files/page/attachments/Stress%20Management%20Workshop.pdf		

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:



SALESIAN COLLEGE
(AUTONOMOUS) | SONADA
SILIGURI

Salesian College

(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Business Administration
Tourism & Hospitality Management

Department of Management Studies

Curriculum Document
2024 – 2025

Vision

Accomplishing excellence in educational, training, and professional services under the sectors of travel, tourism, and hospitality.

Mission

Provide quality tourism and hospitality education by a judicious blend of well-structured training needs-based classroom teaching, workshops, online teaching sessions, case study cohorts and mentoring by academic and industry experts.

1. Programme Overview

Bachelor of Business Administration in Tourism and Hospitality Management is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Provide students with a comprehensive understanding of the theoretical and applied aspects of the Tourism & Hospitality Industry.
	PO02: Inculcate all the desired skills of standard operating procedures & service provisions to meet the needs of today's customer by providing desired services required in the Tourism & Hospitality Industry.
	PO03: Equip with hospitality skills required to provide customer satisfaction into the hotel & tourism sector
	PO04: Gain efficiency to fulfil guest requirements for food & beverage service, meetings, conferences, events, travel moments & caterings.
Skills	PO05: Apply knowledge of tourism concepts along with the management theories and practices to solve business related problems in tourism domain
	PO06: Contextualize tourism within broader cultural, environmental, political, and economic dimensions of society
	PO07: Foster analytical and critical thinking abilities for data-based decision making
	PO08: understand, analyze, and communicate global, economic, legal, and ethical aspects of tourism business
Competence	PO09: Identify and understand how new ideas, concepts or products emerge within relevant fields
	PO10: Communicate key ideas in written texts and oral presentations
	PO11: Critique tourism practices for their implications locally and globally

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops the ability to apply the knowledge of Hotel Operations and Training skills in the domain of Tourism and Hospitality Management.
	PSO2: A student gathers excellence in solving the complex problems in the field of Hospitality Management with an understanding of the societal, legal and cultural impacts of the solution.
	PSO3: A student develops knowledge on exposure of practical skills, enhanced with continuous outdoor exposure and industrial training.

	PSO3: A student develops knowledge about the talent of becoming member in a team with right attitudes
	PSO4: A student gathers basic and essential knowledge regarding various activities undertaken by tourism industry and necessary knowledge and skill to work in the industry
	PSO5: A student develops the personality so as to become a responsible citizen with greater awareness about Indian society and its culture.
	PSO6: A student develops knowledge, skill and attitude to set up tourism related establishments.
	PSO7: A student develops the ability to contextualize tourism within broader cultural, environmental, political and economic dimensions of society.
Skills	PSO1: A student will develop as socially, ethically responsible business leaders.
	PSO2: A student will execute the educational implications of the theories of psychology.
	PSO3: A student will be able to bridge the gap between theoretical and practical knowledge by adopting innovative practices.
	PSO4: A student will be able to sharpen soft and hard skills for being better professionals.
	PSO5: A student will accumulate entrepreneurial skills for promoting a better ecosystem of business.
	PSO6: A student will demonstrate the knowledge of tourism managerial science to solve complex travel and hospitality problems using limited resources
	PSO7: A learner will function effectively as an individual, and as a member or leader in diverse sectors, and in multidisciplinary settings.
Competence	PSO1: A learner demonstrates entrepreneurial competencies in the tourism industry.
	PSO2: A student will exhibit managerial skills in the areas of tourism marketing, hospitality, airline, HR, etc.
	PSO3: A student will identify tourism business opportunities, destination design and implement innovations in the workspace.
	PSO4: A student will possess a sturdy foundation for higher education and research in tourism and hospitality.
	PSO5: A student will demonstrate analytical and problem-solving skills through an internship in Air Ticketing, Hospitality Management, Cargo and Logistics, Human Recourse, and Tourism Marketing etc. to solve the issues.
	PSO6: A student will comprehend the core concepts and core products, methods and practices in tourism management.
	PSO7: A student will venture into his/her own travel business or excel in executive roles in the private /government sector.

PROGRAMME MATRIX

BBATHM 1ST YEAR

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	24BBAMAJ101	Major	Principles of Management	4	3+1+0	60	100
	24THMMIN101	Minor	Cultural Heritage of India	4	3+1+0	60	100
	24BBASEC101	SEC	Business Communication	3	2+0+1	45	100
	24BBAMDC101	MDC	Fundamentals of Management	3	2+1+0	45	100
	24ENGAEC101	AEC	Compulsory English	2	2+0+0	30	50
	24GEOAEC101	AEC	Environmental Science	2	2+0+0	30	50
	24THMVAC101	VAC	Leadership Skills	2	2+0+0	30	50
	Total			20	16+3+1	300	550
II	24THMMAJ101	Major	Fundamentals of Tourism	4	3+1+0	60	100
	24THMMAJ102	Major	Hospitality Management	4	3+1+0	60	100
	24BBAMIN102	Minor	Managerial Economics	4	3+1+0	60	100
	24BBAMIN103	Minor	Business Environment	4	3+1+0	60	100
	24BBASEC102	SEC	Entrepreneurship Development	3	2+0+1	45	100
	24BBAMDC102	MDC	Introduction to Human Resource Management	3	2+1+0	45	100
	24SCSVED101	VAC	Value Education/NSS/NCC	2	2+0+0	30	50
	Total			24	18+5+1	360	650

Total credits = 20 + 24 = 44 Credits

Note: Students exiting the programme after securing 44 credits will be awarded UG Certificate in Bachelor of Business Administration provided they secure 4 credits in Internship/Industrial Training in addition to 6 credits from skill-based courses earned during first and second semester.

BBA 2ND YEAR

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	24THMMAJ201	Major	Human Resource Management in Tourism	4	3+1+0	60	100
	24THMMIN201	Minor	Financial Accounting in Tourism	4	3+1+0	60	100
	24BBASEC201	SEC	E-Commerce	3	2+0+1	45	100
	24BBAMDC201	MDC	Fundamentals of Marketing	3	2+1+0	45	100
	24ENGAEC201	AEC	Alternative English/MIL/FL	2	2+0+0	30	50
	24GEOAEC201	AEC	Environmental Science	2	2+0+0	30	50
	24THMVAC201	VAC	Career and Team Skills	2	2+0+0	30	50
	Total			20	16+3+1	300	550
IV	24THMMAJ202	Major	Tourism Marketing	4	3+1+0	60	100
	24THMMAJ203	Major	Travel Agency and Tour Operations Management	4	3+1+0	60	100
	24THMMIN202	Minor	Fundamentals of Cost Accounting	4	3+1+0	60	100
	24BBAMIN203	Minor	(To be decided in BoS)	4	3+1+0	60	100
	24BBASEC202	SEC	Computer Applications in Business	3	2+0+1	45	100
	24SCSVED201	VAC	Value Education/NSS/NCC	2	2+0+0	30	50
	Total			21	16+4+1	315	550

Total credits = 20 + 21 = 41 Credits

Note: Students exiting the programme after securing 41 credits will be awarded UG Certificate in Bachelor of Business Administration provided they secure 4 credits in Internship/Industrial Training in addition to 6 credits from skill-based courses earned during first and second semester.

BBA 3RD YEAR

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
V	24BBAMAJ301	Major	Organizational Behaviour	4	3+1+0	60	100
	24BBAMAJ302	Major	Strategic Management	4	3+1+0	60	100
	24BBAMAJ303	Major	Tourism	4	3+1+0	60	100
	24BBAMAJ304	Major	Cost Accounting	4	3+1+0	60	100
	24BBAMAJ305M/ 24BBAMAJ305F/ 24BBAMAJ305H	Major	Marketing of Services/ Corporate Accounting/ Labour Laws	4	3+1+0	60	100
	Internship			2			
	Total			22	15+5+0	300	500
VI	24BBAMAJ306	Major	Management Accounting	4	3+1+0	60	100
	24BBAMAJ307	Major	Production Management	4	3+1+0	60	100
	24BBAMAJ308	Major	Indian Financial System	4	3+1+0	60	100
	24BBAMAJ309M/ 24BBAMAJ309F/ 24BBAMAJ309H	Major	Consumer Behaviour/ Financial Markets & Institutions/ Organization Development	4	3+1+0	60	100
	24BBAMAJ310M/ 24BBAMAJ310F/ 24BBAMAJ310H	Major	Product & Brand Management/ Microfinance and Financial Inclusion/ Human Resource Development	4	3+1+0	60	100
	Total			20	15+5+0	300	500

Total credits = 22 + 20 = 42 Credits

Note: Students exiting the programme after securing 42 credits will be awarded UG Certificate in Bachelor of Business Administration provided they secure 4 credits in Internship/Industrial Training in addition to 6 credits from skill-based courses earned during first and second semester.

Semester I

1. Course Description

Course Code	24BBAMAJ101	
Course Title	PRINCIPLES OF MANAGEMENT	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Managerial planning, decision making, organizing, staffing, directing, controlling, and coordinating.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Covers the basic concepts of management along with traditional and modern theories b) Explains the process of planning and decision making. c) Describes the importance of organizing and staffing. d) Covers the significance of directing and communication. e) Explains the concepts and essentials of co-ordinating and controlling	
Prerequisite	Basic knowledge about management concepts and functions.	
Course Objectives	A student will be able to: a) To explain the evolution of Management and its principles. b) Acquaint with the fundamentals of managing business. c) Understand individual and group behaviour at the workplace so as to improve the effectiveness of an organisation. d) Create and evaluate different leadership styles. e) Understand the concept of controlling and coordination as an essence of management.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the primary contributors and their contributions to the development of management thought.	R
CO2	Explain the concept of MBO and MBE. Discuss the planning process	U

CO3	Classify the different organizational structures.	A1		
CO4	Outline the different motivational theories.	A2		
CO5	Recommend the best styles of leadership.	E		
CO6	Develop the steps in controlling and techniques of control.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Management a) Introduction –Meaning, Evolution of management thought Management Theory b) Approaches to management; Fayol’s Process Management theory; Neo-Classical theories - human relations era -Hawthorne studies c) Nature and Characteristics of Management - Scope and Functional areas of Management d) Management as a Science, Art or Profession; Management and Administration	12	CO1	R U A1 A2 E C
Unit II	Planning and Decision Making a) Nature, Importance, Objectives and Purpose of Planning b) Planning Process; Types of plans (Meaning only) c) Decision making- Importance and steps d) MBO and MBE (Meaning only)	12	CO2	R U A1 A2 E C
Unit III	Organizing and Staffing: a) Nature, purpose and principles of Organizing b) Delegation of Authority c) Types of Organization - Departmentation, Committees d) Centralization vs. Decentralization of Authority and Responsibility e) Nature and importance of Staffing	12	CO3	R U A1 A2 E C
Unit IV	Directing & Communicating: a) Meaning and Nature of Direction, Principles of Direction b) Motivation theories – Maslow’s Need Hierarchy Theory, Herzberg’s Two Factor Theory, Mc.Gregor’s X and Y theory c) Leadership – Meaning, Formal and Informal Leadership, Characteristics of Leadership; Leadership Styles – Autocratic Style, Democratic Style, Participative Style, Laissez Faire Leadership Styles, Transition Leadership,	12	CO4 CO5	R U A1 A2 E C

	Charismatic Leadership Style.			
Unit V	Co-ordinating and Controlling: a) Coordination–Meaning, Importance and Principles b) Controlling-Meaning and steps in controlling c) Essentials of Effective Control system, Techniques of Control (in brief).	12	CO6	R U A1 A2 E C
Learning Resources: 1. Sharma, R.K. and Gupta, S.K. (2009). <i>Principles of Management</i> . Kalyani Publication. 2. Rudani, R. B. (2020). <i>Principles of management</i> . McGraw-Hill Education. 3. Gupta, C.B. and Mathur, S. (2020). <i>Management Principles & Applications</i> . MKM Publishers Pvt. Ltd. 4. Agarwal, N.K. (2010). <i>Principles of Management</i> . DND Publication, Jaipur, 2010. 5. Prasad, L.M. (2009). <i>Principle & Practice of Management</i> . Sultan Chand & Sons Publication.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15	Creating level

		marks	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rajeev Dutraj Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24THMMIN101	
Course Title	Cultural Heritage of India	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Minor	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Cultural and Heritage of India	
Course Offered to	BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Covers the concept and classification of tourism products, emphasizing India's unique socio-cultural aspects, diverse landscapes, and geographical features that influence tourism. b) Explores man-made, cultural, and heritage tourism products, including Indian traditions, architectural heritage, music, and cultural festivals. Case studies highlight popular man-made attractions like amusement parks, museums, and various festivals. c) Focuses specifically on the tourism products of West Bengal, showcasing its natural attractions, man-made sites, cultural aspects, and unique cuisine.	
Prerequisite	Basic knowledge of Cultural and Heritage of India	
Course Objectives	A student will be able to: a) Define and classify tourism products b) Explore the diversities in landform and landscape including outstanding geographical features like climate, flora, and fauna. c) Explain and emphasize the richness of Indian culture, traditions, customs, and handicrafts in tourism. d) Geographical features like climate, flora, and fauna. e) Describe the emerging trends in tourism product.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define Tourism Resources of India	R
CO2	Understand Art and Architecture	U
CO3	Discuss the Cultural Development during	A1

	Ancient India			
CO4	Discuss the Cultural Development during Medieval India		A2	
CO5	Understand the Cultural Development during Modern India		E	
CO6	Understand Unity in Diversity		C	
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Indian Culture Heterogeneous Population a) Spirit of Toleration - Unity in Diversity - Caste system - Religious sites b) Customs and Traditions - Monuments - Handicrafts c) Fairs and Festivals - Performing arts - Music and Musical instruments. d) Sikkim and the Darjeeling Hills: Socio - cultural aspects	12	CO1 CO2 CO5	R U A1 A2 E C
Unit II	Cultural Development during Ancient India a) Art and architecture during Indus Valley Civilization b) Vedic culture - Literature - Social structure – Religion c) Mauryan art and architecture-Gandhara school of art-Fine arts and literature during Gupta period-Ancient universities	12	CO3	R U A1 A2 E C
Unit III	Cultural Development during Medieval India a) Sultanate art and architecture-Literature b) Cultural and artistic achievements of the Pallavas, Cholas and Vijaynagar Empire c) Mughal art and architecture-Literature	10	CO3	R U A1 A2 E C
Unit IV	Unit IV: Cultural Development during Modern India a) Art and architecture of the early Europeans-Portuguese-Dutch-French	12	CO3 CO4	R U

	b) Art and architecture of the British India			A1 A2 E C R
Unit V	West Bengal Tourism Product a) Natural –National Park, Wildlife Sanctuary, Bird Sanctuary, b) Hill station, Beach, Waterfalls, c) Man Made-Heritage Sites, Historical Monuments, Pilgrimage sites, d) Culture, Art, Dance, Music, Handicrafts, Painting., e) Cuisines and specialty dishes.	12	CO6	U A1 A2 E C

Learning Resources:

Reading List:

1. A.K Mittal (1990). Political and Cultural History of India, Sahitya Bhawan, Agra.
2. Edith Tomory (1982). History of Fine arts in India and the West, Orient Longman.
3. Percy Brown (2003). Indian Architecture, D.B. Taraporevala Sons & Co. Pvt. Ltd.
4. Rajkumar (2003). Essays in Indian Art and Architecture, Discovery Publishing House, Pvt. Ltd., New Delhi.
5. A.L. Basham (2002). Cultural History of India, Oxford University Press.
6. Satish Grover (1981). The Architecture of India: Islam, Vikas Publishing House, Pvt. Ltd, New Delhi.
7. Ram Acharya (1980). Tourism and Cultural Heritage of India, RBSA Publication, Jaipur.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each.	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks

	GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory question of 15 marks. Total marks: 50		
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 20 marks	Higher-order level
GROUP D	1 compulsory question	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Aparna Moktan Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBASEC101	
Course Title	BUSINESS COMMUNICATION	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Skill Enhancement Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Clarity, conciseness, tone, professionalism, relevance, audience, format, feedback, context, accuracy.	
Course Offered to	BBA & BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Recognizes the need to enhance written as well as oral communication skills. b) States the importance of effective communication in a globalized economy. c) Describes the importance of effectively drafting business reports and letters.	
Prerequisite	Verbal and non-verbal communication, drafting letters and short presentations.	
Course Objectives (total 5)	A Student will be able to: a) Define and explain the nature and significance of communication. They will grasp the process and principles of communication, b) Recognize various communication models, and identify different communication channels. c) Learn about effective communication, including recognizing barriers and employing strategies to overcome them. d) Understand the importance of listening, types of listening, and methods to enhance listening skills. e) Develop skills in report writing, business correspondence, and oral presentations, including PowerPoint presentations, to effectively communicate in various professional scenarios.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the meaning, nature, and objectives of communication	R
CO2	Explain the principles and process of communication, and identify different models.	U

CO3	Differentiate and analyse various channels of communication, including formal, informal, verbal, and non-verbal.	A1		
CO4	Recognize barriers to effective communication and propose strategies to overcome them.	A2		
CO5	Evaluate the significance of listening, identify barriers, and implement techniques for effective listening.	E		
CO6	Compose business reports, letters, and emails, adhering to appropriate formats and etiquettes. Also develop effective oral presentations with well-structured content, applying presentation essentials.	C		
Course Content				
Units	Content	Lecture Hours	COs	RB T
Unit I	Introduction a) Meaning, definition, nature, objectives, and importance of communication. b) Principles of communication and process of communication. c) Models of Communication.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit II	Communication Channels a) Channels of communication. b) Types of communication: Formal, Informal, Verbal, Non- Verbal, Written, Visual communication. c) Levels of communication and direction of communication	12	CO1 CO2	R U A1 A2 E C
Unit III	Effective Communication a) Meaning and barriers to effective communication. b) Ways to overcome barriers to effective communication. c) Meaning, importance, process and types of Listening. d) Barriers to effective Listening and steps to overcome such barriers	12	CO1 CO2 CO4	R U A1 A2 E C
Unit IV	Report Writing and Business Correspondence a) Types, formats, importance, and process of preparing Business reports. b) Drafting minutes, agenda, inquiry letter, complaint letter, persuasive letter, and proposal. c) Writing Resume, letters, office memorandum, office circulars, notices, and orders. d) Technology for communication. Electronic mail: advantages, safety, and smartness in email. E-mail etiquettes.	12	CO1 CO2 CO4 CO5	R U A1 A2 E C
Unit V	Oral and PowerPoint Presentation a) Importance, features, and essentials of effective oral presentation. b) Making presentations: content and organizing.	12	CO1 CO2 CO5 CO6	R U A1 A2 E

	Delivering a presentation			C
Learning Resources: 1. Kaul, A. (2016). <i>Effective Business Communication</i>, 2nd ed. PHI learning. 2. C.B. Gupta (2019). <i>Essentials of Business Communication</i>. Sultan Chand & Sons. 3. Kumar, V., Raj, B., Kapurthala, & Jalandhar. (2017). <i>Comprehension and Communication Skills in English</i>. Kalyani Publishers. 4. Kumar, V., Raj, B., Kapurthala, & Jalandhar. (2017). <i>Comprehension and Communication Skills in English</i>. Kalyani Publishers. 5. Rizvi, M. A. (2005). <i>Effective technical communication</i>. Tata McGraw-Hill. 6. Chanda, S. M. (2010). <i>An Introduction to Critical Thinking</i>. Pearson, Delhi.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMDC101	
Course Title	FUNDAMENTALS OF MANAGEMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	MDC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Managerial planning, organizing, staffing, directing and controlling.	
Course Offered to	All courses (excluding BBA, BBA in Tourism & Hospitality & Commerce)	
Regulation	2024	
Course Overview	This course: a) Covers understanding of management concepts and administration process b) Depicts importance of organizing in business and different theories c) Covers objectives, process and techniques of control mechanism in organization.	
Prerequisite	Basic knowledge of business management.	
Course Objectives	A student will be able to: a) Understand fundamental management concepts, including its definition, scope, functions and the roles managers play in organizations. b) Explore the organizational structure, span of control, and functions of line and staff roles, authority, responsibility, centralization, decentralization, and delegation in organizational settings. c) Examine staffing and its role in organizations, including selection and career planning. d) Delve into the nature of directing, leadership styles, motivation, morale, and discipline. e) Learn the objectives and process of control, the role of information, and methods for measuring performance.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Recall management concepts, evolution, and the roles of managers.	R
CO2	Comprehend the importance of management,	U

	differences between management and administration, and the nature of planning.			
CO3	Apply planning techniques, understand organizational structures, and discuss centralization vs. decentralization	A1		
CO4	Analyse the features and types of planning, assess line & staff functions, and evaluate the impact of delegation of authority.	A2		
CO5	Evaluate leadership qualities and styles, and critically assess the role of information in control.	E		
CO6	Create integrated control systems, formulate effective career plans, and design strategies for motivating employees.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a) Management concepts & Evolution: Definition - nature - scope and functions of management. b) Importance of management, role of manager c) Management and administration.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit II	Planning a) Meaning, features, nature and importance of planning b) Procedure, types of planning c) Planning Techniques d) Planning and control e) MBO.	12	CO1 CO2	R U A1 A2 E C
Unit III	Organizing a) Nature - purpose - organizational structure b) Span of control c) Line & staff functions d) Authority & Responsibility e) Centralization and decentralization f) Delegation of authority.	12	CO1 CO2 CO4	R U A1 A2 E C
Unit IV	Staffing and Directing a) Staffing- nature and purpose, b) Selection, c) Career planning. d) Nature of directing, e) Leadership qualities and styles, f) Motivation - morale and discipline	12	CO1 CO2 CO4 CO5	R U A1 A2 E C

Unit V	Controlling a) The objectives and process of control b) Role of information in control c) Performance standard – Measurement of performance. d) Integrated control system in an organisation.	12	CO1 CO2 CO5 CO6	R U A1 A2 E C
Learning Resources: 1. Robbins, S. P., Coulter, M., Sidani, Y., Jamali, D., & Robbins, S. P. (2011). <i>Management (Arab World Editions)</i> . Pearson Education UK. 2. Koontz, H., O'Donnell, C., & Weihrich, H. (1980). <i>Management</i> . McGraw-Hill Book Company. New York, 514-15. 3. Prasad, L. M. (2020). <i>Principles and practice of management</i> . Sultan Chand & Sons. 4. Rao, V. S. P., & Krishna, V. H. (2009). <i>Management: Text and cases</i> . Excel Books India.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Sunita Sherpa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	23THMVAC101	
Course Title	LEADERSHIP & MANAGEMENT SKILLS	
Credits	1	
Total Session Hours	30	
Number of Sessions	15	
Course Type	VAC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Time management, conflict management, stress management, and self-development.	
Course Offered to	BBA in Tourism & Hospitality Management	
Regulation	2023	
Course Overview	This course: a) Recognizes the need to enhance Time, Conflict, and Stress Management Skills. b) States the importance of developing self-discipline and control. c) Describes the importance of developing business ideas, product pitching and Innovative leadership.	
Prerequisite	Basic knowledge of leadership and its qualities.	
Course Objectives	A student will be able to: a) Develop essential skills to influence and motivate others. b) Inculcate emotional and social intelligence and integrative thinking for effective leadership. c) Create and maintain an effective and motivated team to work for society. d) Make learners understand personal values and apply ethical principles in professional and social contexts. e) Familiarize the learners with the budgeting process and make them conscious of the significance of budgeting, savings, and investment.	
Course Content		
Session	Session Details	Session Hours
Session I	Present a report/video prepared by group of students. Each group is asked to answer the following questions: a) Did someone emerge as the leader of the group activities? b) Was the group leader effective in motivating the members to work as a team and complete the task? Yes/No and why? c) What kind of leadership style did the leader adopt?	2

Session II	Role Play Select three volunteers from among the learners. Explain a leadership situation. Ask them to act.	2
Session III	The learners are asked to sit in groups of 4-8, depending on class size. Each group must consider that it is responsible for managing the class event and is told to prepare a summary of the following items in 20 minutes. - Fix a suitable date for the event - Work out a budget for the event. - Complete a list of tasks to be performed for organizing the event. - Combine tasks to form roles. - Identify the reporting relationship among the different roles. - Assign roles to different individuals in the group so that the event can be successfully managed. - Each member to prioritize and schedule the tasks included in each role so that all the deadlines are met.	2
Session IV	Activity of Time Management Situation for discussion: Two individuals are asked to paint the walls of two different rooms of identical dimensions. They are given an equal quantity of paint and told to finish the work by the end of the day. One person finishes the work two hours before the end of the day but the painting is patchy and uneven. The other person does not complete the painting of the entire room, he consumes all the paint as well, but whatever work he has done is even and beautiful. Discuss the efficiency and effectiveness of the two painters. They may be asked to answer the question: Are any of the two painters successful in managing their tasks?	2
Session V	Activity on Conflict Management The learners must be asked - Can you recall the last conflict you had with an individual or a group? - Did you resolve it? How was it resolved? What was the outcome of the Conflict? Draw focus on empathy and communication for resolving interpersonal conflicts	2

Session VI	Activity on Stress Management Ask the learners to look at each obstacle they encounter as a learning experience. For example. “You may not have done well in your mid-term exam, but that has motivated you to study harder and ace your final exam”. - Make the choice not to over-react to stressors and deal with them one at a time For example, take a few deep breaths and carry on. - Take an objective view of your stressor For example, is preparing dinner for 12 people really that horrible? - Communicate! Ask the learners not to ruminate or bottle up their emotions, as this will lead to an explosion later on.	2
Session VII	Develop self-discipline and control Tell the learners - “Either train yourself to study harder in preparation for your final examination, or train yourself to work out four times a week to lose those extra kilos that you gained since the last dinner party!” Maintenance! Practice, practice, practice for a long life of resilient living! Learners should be encouraged to inculcate the reading habit, which helps in busting stress. Some suggested readings for learners could be: - Swami Vivekananda. 1958. Powers of the Mind. Kolkata: Advaita Ashrama. - Abdul Kalam, APJ. 1999. Wings of Fire- An Autobiography. Universities Press.	2
Session VIII	Activity on Self-Management Skills The learners may be asked to watch this 5.5-minute video on Goleman’s explanation of EI https://www.youtube.com/watch?v=Y7m9eNoB3NU Ask the learners to answer the following question: - Is IQ or EQ more important for success in Life? - Establish the significance of EI and self-awareness as a component of EI. This 4.5-minute video on “Can EI be Learnt” can be watched by learners.	2
Session IX	Developing Self-Awareness with JOHARI window Learners may be asked to carry out the JOHARI window exercise in groups of 4. Learners who are willing may be asked to share the findings of the JOHARI window exercise.	2

Session X	Activity on Developing Business Idea Ask learners to identify the market to test their potential ideas. → Share the “DOs” and “DO NOTs”. Do – (example can be) a) The learners must identify a real market and gain insights and honest feedback from potential customers. b) Keep your eyes and ears open and pay close attention to customers’ cues, inputs, etc. DO NOT- (example can be) c) Don’t consider your parents, or friends as a potential market d) • Don’t be adamant to defend your idea or convey an offensive response to criticism.	2
Session XI	Activity on Product Pitching Role Play: Let learners form three groups, each of the group having at least four to five learners. The groups will act as: a) Potential venture capitalists/investors; b) Potential customers; and c) Members of regulatory agencies. Ask each learner to pitch his/her product in front of the three groups. Let each group play a serious role, full of critical inputs. Keep a separate group of observers who provide a careful analysis of each of the pitching event(s). Record the pitching process and ask each of the learners to review his/her pitching. Final suggestion: Ask them to keep rehearsing their pitching process. Through multiple rehearsals and analysis each learner should be able to make a razor sharp and pertinent pitch within one minute.	2
Session XII	Activity on Innovative Leadership Ask learners to write a brief note on their views or any incidents from their past when they realized the importance of any or many of the following: a) Self-Awareness and Control b) Empathy c) Social Expertness d) Personal Influence e) Mastery of Vision Let them interpret these with a free mind without prejudice or external hint or guidance. Once they have written give a brief input to explain the terms.	2
Session XIII	Activity on Designing Skit Role Play: Make multiple groups of learners. Allocate one title each from the following list of ten topics, to each group.	2

	a) Words can hurt, pay attention to them b) Share when you have failures c) Be kind d) Listen e) Disagree with respect f) Show empathy g) Share your own feelings h) Encourage the relationship i) Recognize your feeling j) Explain what feelings do k) Be savvy with discipline l) Apologize with dignity m) Model responsibility n) Make yourself available Ask each group to keep their topic secret from other groups. Now ask each group to come up with a small skit highlighting their topic. Other groups will try to decipher the message which must be the moral embedded in the skit. Let the other groups interpret the topic.	
Session XIV	Activity on Creative Confidence Ask learners to watch the following video for the methodology of developing human-centric solutions for creating social good (this can be a home assignment). The video entitled India's Hidden Hot Beds of Invention Ted Talk by Anil Gupta – https://www.ted.com/talks/anil_gupta_india_s_hidden_hotbeds_of_invention Show them the following Ted talk entitled “How to Build Your Creative Confidence” by David Kelly https://www.ted.com/talks/david_kelley_how_to_build_your_creative_confidence Based on the video, encourage them to build and take forward their idea. Ask any three learners to volunteer for presenting their idea in the five stages of design thinking. Time can be given for them to prepare. Ask other learners to also frame their ideas using the five-point framework of design thinking	2
Session XV	Self-reflection exercise on ethics and integrity: Make the learners do self-analysis and reflection. Ask them to follow the following steps: a) Write a short autobiography (say 100 words).	2

	b) Write 100 words about their present situation. c) Write 100 words about their future. Now ask them to identify what would be the top 5 things/characteristics/personality traits that will help them achieve their future goals and visions.	
Learning Resources: 1. Ashokan, M. S. (2015). <i>Karmayogi: A Biography of E. Sreedharan</i>. Penguin Random House, London, UK. 2. Sinek, S. (2009). <i>Start with Why: How Great Leaders Inspire Everyone to Take Action</i>. Portfolio London: Penguin. 3. Akhilesh, K. B. (n.d). Lecture no 9 Leadership in the NPTEL Course on Evolution of Management. https://nptel.ac.in/courses/122/108/122108038 4. Carnegie, D. (2018). <i>Overcoming Worry and Stress</i>. New Delhi: Manjul Publishing House. 5. Dawkins, E. R. (2016). <i>52 Weeks of Self Reflection—Your Guided Journal of Self Reflection</i>. A B Johnson Publishing, United States.		

2. Assessment

FA (20 marks)	Attendance (5 marks)
Activity-based Assessment.	75%-79%– 2 marks
	80%-85%– 3 marks
	86%-90%– 4 marks
	Above 90%– 5 marks
Summative Assessment (SA – 25 marks)	
Project Submission and Viva voce of 25 marks.	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Debarati Deb Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

Semester II

1. Course Description

Course Code	23THMMAJ101	
Course Title	FUNDAMENTALS OF TOURISM	
Credits	4	
Total Hours	60	
Hours per Week	4-5	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Issues in Tourism Industry, travel behaviours and motivations.	
Course Offered to	BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Familiarizes the students with the basic concepts of travel and tourism and discusses the terminologies used. b) Provides an insight into the different systems of tourism and how travel and tourism evolved over a period of time and reached the modern stage. c) Enhances the knowledge of students in various areas related to tourism, travel behaviors and motivations and how it affects the destination.	
Prerequisite	Basic knowledge of tourism.	
Course Objectives (total 5)	A student will be able to: a) Define tourism. State the characteristics, scope, and factors influencing the growth and development of tourism. b) Explain the different kind of Theories of Tourism c) Present the different theories of travel motivations and state the relevance of motivation studies and different travel motives. d) List the positive and negative impacts of tourism. e) Discuss the objectives, roles, and functions of different tourism organizations	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define Tourism and its basic components and can also state the characteristics, scope, and factors influencing the growth and development of	R

	tourism.			
CO2	Explain the Forms of Tourism and its different Theories.	U		
CO3	Explain the concept of Travel Motivation	A1		
CO4	Outline the basic components about the tourism industry.	A2		
CO5	Discuss the objectives, roles, and functions of different tourism organizations.	E		
CO6	List the positive and negative impacts of Tourism.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Tourism a) Tourism- Meaning, Definition, Characteristics and Scope; Factors Influencing the Growth and Development of Tourism. b) Tourist, Visitor, Traveler, Excursionist and Transient - Definition and Differentiation. c) Concept of Resource, Attraction, Product, Demand, Market and Destination in Tourism. d) Components and Elements of Tourism; Interrelationship between Leisure, Recreation and Tourism; Tourism Infrastructure.	12	CO1	R U A1 A2 E C
Unit II	Tourism and Its Theories a) Tourism and Its Theories: Need for Measurement of Tourism, Interdisciplinary Approaches, Types & Forms of Tourism. b) Different Tourism Systems- Leiper’s Geo-spatial Model, Mill-Morrison, Mathieson & Wall, c) Butler’s Tourism Area Life Cycle (TALC), Demonstration Effect, Crompton’s Push and Pull Theory, and d) Stanley Plog’s Allo-centric and Psycocentric Model of Destination Preferences.	12	CO2	R U A1 A2 E C
Unit III	Travel Behaviors and Motivations a) Meaning of Travel Motivation & Behavior; Theory of Travel Motivations; Travel demotivators; Relevance of Motivation Studies; 'Push' and 'Pull' Forces; Typology of Tourism.	12	CO3	R U A1 A2 E C

	b) Different Travel Motives, Tourist Centric Approach, and Leisure Travel Motivations. c) Tourist Decision-making Process, Lifestyle Pattern, Tourism & Cultural Relationships, Cultural Exchanges, GIT, FIT & Affinity Group Travel, Bilateral & Multilateral Tourism, d) Relationship between Human Life and Travel, Growth of Social Tourism.			
Unit IV	Tourism Industry & Its Linkages a) Meaning and Nature of Tourism Industry; Input and Output of Tourism Industry. b) Tourism Industry Network- Direct, Indirect and Support Services. c) Basic Components of Tourism -Transport-Accommodation- Facilities & Amenities, Horizontal and Vertical Integration in Tourism Business. d) Tourism Business during Liberalization & Globalizations, Positive & Negative Impacts of Tourism	12	CO4 CO6	R U A1 A2 E C
Unit V	UNIT-5: Tourism Organizations Tourism Organizations: Objectives, Roles, and Functions of United Nations World Tourism Organization (WTO), Pacific Asia Travel Association (PATA), World Tourism & Travel Council (WTTC), International Hotel Association (IHA), Ministry of Tourism, Govt. of India, India Tourism Development Corporation (ITDC), Federation of Hotel, and Restaurants Associations of India (FHRAI).	12	CO5	R U A1 A2 E C
Learning Resources: Text Books 1. Mill and Morrison, (1992), The Tourism System: An Introductory Text, Prentice Hall 2. Cooper, Fletcher et al, (1993), Tourism Principles and Practices, Pitman 3. Mill, R.C., (1990), Tourism: The International Business, Prentice Hall, New Jersey 4. Bhatia, A.K., - International Tourism. Note: Latest edition of textbooks may be used.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory question (case study) of 15 marks. Total marks: 50 marks.	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Aparna Moktan Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24THMMAJ102
Course Title	HOSPITALITY MANAGEMENT
Credits	4
Total Hours	60
Hours per Week	4
Course Type	Minor
Semester	II
Intended Level	Certificate
Issue(s) Addressed	Economic tools and techniques used to address managerial issues.
Course Offered to	BBA and BBA in Tourism & Hospitality Management
Regulation	2024
Course Overview	This course: a) Provides introduction to Managerial Economics enabling the students to become better decision-makers in market economies. b) Equips with the ability of demonstrating demand and supply theory with an analytical approach. c) Introduces the production, cost, and revenue analysis to make better economic decisions.
Prerequisite	Basic knowledge of Introductory Economics.
Course Objectives	A student will be able to: a) Identify the basic principles of Managerial Economics and demonstrate the theory of consumer behaviour. b) Understand the concepts of demand and supply, its laws, and classify the different degrees of price elasticity of demand. c) Describe production function and demonstrate the three stages of production. d) Explain the behaviour of long-run and short-run cost curves and total, average, and marginal revenue curves. e) Identify the different forms of market economies and determine the market equilibrium.
Course Outcomes based on RBT and Cognitive Level Mapping	

At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define utility and describe the cardinal and ordinal utility approach.	R		
CO2	Summarise the theory of demand and supply and explain the different degrees of elasticity.	U		
CO3	Classify the different forms of market structure	A1		
CO4	Analyse the short-run and long-run cost curves as well as the total, average and marginal revenue curves	A2		
CO5	Estimate the short-run and long-run equilibrium of firms under different market structures.	E		
CO6	Construct diagrams to explain the Law of Variable Proportions and Law of Returns to Scale	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Hospitality Industry in Tourism: Growth of Hotel Industry - Introduction - Future of Hospitality Industry - Role of accommodation in the Growth of Tourism Definition of Hotel - Types of Hotel Secondary Hospitality Establishment -Traditional and Supplementary accommodation. Hotel Grading System - Changing Profile of Hotel Industry Hotel Chains in India: Ashoka, Welcome Group, Oberoi and Taj Group of Hotels	10	CO1	R
Unit II	Management Function in Hospitality (Hotel) Industry: Front Office Desk- Front Office Staff - Qualities of Front Office Staff Hotel Reservation - Status of Rooms - Function of Information Department - Specimen Bill Form - Lobby Manager - Public Relation officer - Reception	14	CO2	U

	Department - House Keeping -Organisation - Communication in Hotels.			
Unit III	Human Resource Management in Hotels: Personnel Management - Sources of Manpower for Hotel - Catering Industry - Employee Facilities and Benefits Induction Training and Development - Leadership - Communication - Tools of Management - Financial Management.	12	CO6	C
Unit IV	Room Plans : Types of Rooms - Check in and Check-out Procedures - accommodation operations - Guest relations -Property management systems	12	CO4	A2
Unit V	Food and Beverage Management Food and Beverage Services Outlets - Various Types of Food Services- Restaurant Organization - Equipments - Room Service.	12	CO3 CO5	A1 E
Learning Resources: 1. Yogendra K. Sharma (2003). Hotel Management, Kanishka Publishers, New Delhi 2. Vijay Dhawan (2004) Food Beverage Service, Frank Bros and Co. 3. S. Kannan (2003). Hotel Industry in India, Deep and Deep Publications, Pvt. Ltd., New Delhi 4. R.K. Malhotra (2002). Food Service and Catering Management, Anmol Publication Pvt. Ltd., New Delhi. 5. Sudhir Andrew (1994).Food Beverage Service Training Manual, Tata McGraw Hill Publishing Co. Ltd., New Delhi. 6. D.R. Lillicrap (1983). Food Beverage Service, Edward Arnold Publishers Ltd., London. 7. References: 8. Amrik Singh Sudan (2002). House Keeping Management, Anmol Publication Ltd. 9. Praveen Sethi (2004). Hand Book of Hospitality and Tourism, Anmol Publication, Delhi. 10. Rajendran Singh (2001). Hotel and Hospitality Management, Kalpaz Publication, Delhi. 11. Y.P. Singh (2001) Effective Hotel Management, Anmol Publication Pvt. Ltd., New Delhi. 12. Pushpinder S. Gill (1997). Tourism and Hotel Management, Anmol Publications, New Delhi.				

13. Manish Ratti (2001) Hotel, Tourism and Hospitality Management, Rajat Publications, Delhi

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2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 marks . (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 compulsory question (case study) of 15 marks. Total marks: 50 marks.	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 compulsory question (case study)	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Aparna Moktan Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMIN102	
Course Title	MANAGERIAL ECONOMICS	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Economic tools and techniques used to address managerial issues.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Provides introduction to Managerial Economics enabling the students to become better decision-makers in market economies. b) Equips with the ability of demonstrating demand and supply theory with an analytical approach. c) Introduces the production, cost, and revenue analysis to make better economic decisions.	
Prerequisite	Basic knowledge of Introductory Economics.	
Course Objectives	A student will be able to: a) Identify the basic principles of Managerial Economics and demonstrate the theory of consumer behaviour. b) Understand the concepts of demand and supply, its laws, and classify the different degrees of price elasticity of demand. c) Describe production function and demonstrate the three stages of production. d) Explain the behaviour of long-run and short-run cost curves and total, average, and marginal revenue curves. e) Identify the different forms of market economies and determine the market equilibrium.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define utility and describe the cardinal and ordinal utility approach.	R
CO2	Summarise the theory of demand and supply and explain the different degrees of elasticity.	U

CO3	Classify the different forms of market structure	A1		
CO4	Analyse the short-run and long-run cost curves as well as the total, average and marginal revenue curves	A2		
CO5	Estimate the short-run and long-run equilibrium of firms under different market structures.	E		
CO6	Construct diagrams to explain the Law of Variable Proportions and Law of Returns to Scale	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	A. Introduction to Managerial Economics a) Definition of economics and branch of economics b) Managerial Economics – Meaning, nature and scope; basic economic tools in Managerial Economics. B. Theory of Consumer Behaviour a) Meaning, approaches, and measures of Utility b) Relationship between Total and Marginal Utility c) Law of Diminishing Marginal Utility and Law of Equi-Marginal Utility d) Indifference curves and budget constraints e) Marginal Rate of Substitution f) Consumer Equilibrium and Consumer Surplus (concept only)	10	CO1	R
Unit II	A. Introduction to Demand and Supply a) Introduction to Demand and Supply b) Law of Demand- assumptions, reasons for downward slope and exceptions c) Demand schedule and Demand Curve d) Supply curve; determinants of supply; and Law of Supply- assumptions, reasons for upward slope and exceptions e) Movement along the Demand & Supply Curve and Shift in Demand & Supply Curve B. Elasticity of Demand and Supply a) Meaning and Types of Elasticity of demand- Price, Income and Cross Elasticity. b) Factors affecting Price Elasticity and degrees of price elasticity of demand. c) Income Elasticity of Demand & Cross Elasticity of Demand d) Price elasticity of Supply e) Equilibrium price and its concept	14	CO2	U
Unit III	Production Theory	12	CO6	C

	a) Meaning of Production and factors of production b) Production Function: short-run and long-run c) Law of Variable Proportions d) Three stages of Production e) Concept of Isoquant and Iso-cost Line f) Law of Returns to Scale			
Unit IV	Cost and Revenue Analysis a) Cost concepts b) Variable, fixed and total cost curves c) Long-run Cost and Short-run Cost Curves d) Economies of scales and economies of scope e) Revenue Concepts: Total, Average and Marginal Revenue curves	12	CO4	A2
Unit V	Market Structure a) Meaning and forms of market b) Perfect Competition: meaning, features, Short-run and Long-run Equilibrium c) Monopoly: meaning, features, Short-run and Long-run Equilibrium, price discrimination (types and degrees) d) Monopolistic competition: meaning, features, Short-run and Long-run Equilibrium e) Oligopoly: meaning, features, Non-collusive (Cournot's model, and Sweezy's model (kinked demand curve) and Collusive Oligopoly (cartels and price leadership theory)	12	CO3 CO5	A1 E
Learning Resources: - Salvatore, D. (2009). <i>Principles of Microeconomics</i> (5th ed.). Oxford University Press - Roy, D. (2021). <i>Managerial Microeconomics</i> (1st ed.). Abhijeet Publications - Lipsey, R., & Chrystal, A. (2008). <i>Economics</i> (11th ed.). Oxford University Press - Koutosyannis, A. (1979). <i>Modern Micro Economics</i> (2nd ed.). Palgrave Macmillan. - Pindyck, R. Rubinfeld, D. & Mehta, P. (2009). <i>MicroEconomics</i> (7th ed.). Pearson				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short	Group activity, Subjective-type questions, or viva-voce carrying 20	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5

(10 questions of 2 marks each).	questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	marks.	marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Shradha Sharma Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMIN103	
Course Title	BUSINESS ENVIRONMENT	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Political, Socio-cultural, legal, economic, and technological environmental issues.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Covers different elements of Business environment and the effects of internal and external factors of business environment. b) Describes the current economic condition and its impact on business. c) Explains the positive and negative impact of technology in modern business.	
Prerequisite	Basic knowledge of business, its nature and objectives.	
Course Objectives (total 5)	A student will be able to: a) Explain the concept, nature, and importance of business environment. b) Analyse the relationships between government and business and evaluate the political, economic, legal, and social policies of the country. c) Enumerate the concept and features of Intellectual Property Rights. d) Analyse how business is affected by different macro-economic variables. e) Give observation as to how technology has helped modern business	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Describe the concept, nature and importance of business environment.	R
CO2	Explain the concept and features of Intellectual Property Rights.	U
CO3	Give observation as to how technology has helped modern business.	A1
CO4	Analyse how business is affected by different	A2

	macro-economic variable.			
CO5	Evaluate the political, economic, legal and social policies of the country.		E	
CO6	Propose different modes of entering into International Business		C	
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Business Environment a) Concept, nature, and importance of business environment. b) Types of environments: general, task environment, internal and external environment, c) Basic elements of environment: socio-cultural, political, legal, economic, and technological elements	12	CO1	R U A1 A2 E C
Unit II	Socio-cultural Environment a) Social environment - Cultural heritage - social attitudes b) Impact of foreign culture, castes, and communities – joint family systems - linguistic and religious groups c) Types of social organization -Corporate Social Responsibilities of business	12	CO5	R U A1 A2 E C
Unit III	Political and Legal Environment a) Fundamental Rights and Directive Principles of State Policy b) State intervention in economic affairs: role of the government in creating a proper business environment. c) The changing legal environment of business, IPR- key concepts and features.	12	CO2 CO5	R U A1 A2 E C
Unit IV	Economic and Technological Environment a) Economic systems and their impact on business b) Macro-economic parameters like GDP, growth rate, population - Urbanisation - Fiscal deficit - Plan investment - Per capita income and their impact on business decisions c) Technological Environment – choice of Technology - Problems in Selecting Appropriate Technology. Importance of technology to Business.	12	CO3 CO4 CO5	R U A1 A2 E C
Unit V	International Environment of Business	12	CO6	R

	a) Globalization: concept and nature, merits and demerits of globalisation. b) Strategies for entering foreign markets: exporting, licensing and c) Franchising, contract manufacturing, management contracting, joint venture, merger and acquisition, strategic alliance and counter trade. d) Multinational corporations: concept, features, merits and demerits.			U A1 A2 E C
Learning Resources: 1. Aswathappa, K. (2009). <i>Essentials of business environment</i> . Karnataka: Himalaya Publishing House. 2. Cherunllam, F. (2019). <i>Business Environment</i> (27th Revised Edition). Himalaya Publishing House. 3. Pustin, P. (2009). <i>Business Environment-Text and Cases</i> . New Delhi-110008. 4. Gupta, C. B. (2022). <i>Business Environment</i> . Sultan Chand & Sons.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBASEC102	
Course Title	ENTREPRENEURSHIP DEVELOPMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Skill Enhancement Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Issues of start-ups, family businesses, mobilisation of resources, and feasibility of plans.	
Course Offered to	BBA and BBA in Tourism & Hospitality Management	
Regulation	2024	
Course Overview	This course: a) Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Discusses the concept, role and functions of business incubators, angel investors, venture capital and private equity funds. c) c. Recognises the significance of writing the business plan/ project proposal.	
Prerequisite	Basic knowledge about the concept of entrepreneur.	
Course Objectives	A student will be able to: a) Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Discuss the concept of business groups and role of business houses and family business in India; c) Describe the concept, role and functions of business incubators, angel investors, venture capital and private equity fund. d) Prepare the contents of a business plan/ project proposal. e) Evaluate the basic problems faced by start-ups.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Describe the concept, role and functions of business incubators, angel investors, venture capital and private equity fund.	R
CO2	Explain the meaning, elements, determinants and importance of entrepreneurship and creative behaviour.	U
CO3	Demonstrate Public and private system of stimulation.	A1

CO4	Examine the concept of business groups and role of business houses and family business in India.	A2		
CO5	Evaluate the basic problems faced by start-ups.	E		
CO6	Prepare the contents of a business plan/ project proposal.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction a) Meaning, elements, determinants and importance of entrepreneurship and creative behaviour; b) Entrepreneurship and creative response to the society problems and at work. c) Dimensions of entrepreneurship: intrapreneurship, technopreneurship, cultural entrepreneurship, international entrepreneurship, netpreneurship, ecopreneurship, and social entrepreneurship	12	CO2	R U A1 A2 E C
Unit II	Entrepreneurship and Micro, Small and Medium Enterprises a) Concept of business groups and role of business houses and family business in India; b) The contemporary role models in Indian business: their values, business philosophy and behavioural orientations; c) Conflict in family business and its resolution	12	CO4	R U A1 A2 E C
Unit III	Entrepreneurial Finance a) Public and private system of stimulation, support and sustainability of entrepreneurship. b) Requirement, availability and access to finance, marketing assistance, technology, and industrial accommodation, Role of industries/entrepreneur’s associations and self-help groups. c) The concept, role and functions of business incubators, angel investors, venture capital and private equity fund.	12	CO1 CO3	R U A1 A2 E C
Unit IV	Sources of business ideas and tests of feasibility. a) Significance of writing the business plan/ project proposal; Contents of business plan/ project proposal; b) Designing business processes, location,	12	CO6	R U A1 A2 E C

	layout, operation, planning & control; preparation of project report (various aspects of the project report such as size of investment, nature of product, market potential may be covered); c) Project submission/ presentation and appraisal thereof by external agencies, such as financial/non-financial institutions.			
Unit V	Mobilising Resources a) Mobilising resources for start-up b) Accommodation and utilities; Preliminary contracts with the vendors, suppliers, bankers, principal customers; c) Contract management: Basic start-up problems.	12	CO5	R U A1 A2 E C
Learning Resources: 1. Kuratko, D. F., & Rao, T. V. (2012). <i>Entrepreneurship: A South-Asian Perspective</i>. Cengage Learning. 2. Desai, V. (2009). <i>Dynamics of Entrepreneurial Development and Management</i>. Himalaya Publishing House. 3. Holt, D. H. (1992). <i>Entrepreneurship: New venture creation</i>. Prentice Hall of India. 4. Plsek, Paul E. (1997). <i>Creativity, Innovation and Quality. (Eastern Economic Edition)</i>. New Delhi: Prentice-Hall of India. 5. Singh, N. P. (1985). <i>Emerging Trends in Entrepreneurship Development</i>. New Delhi: ASEED. 6. Khanka, S. S. (2006). <i>Entrepreneurial development</i>. S. Chand Publishing. 7. Ramachandran, K. (2009). <i>Entrepreneurship Development: Indian Cases on Change Agents</i>. Tata McGraw-Hill Pub.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks .	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)

GROUP A	5 very short questions out of 8	2 marks $\times$ 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks $\times$ 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks $\times$ 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks $\times$ 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Nihel Thapa Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:

1. Course Description

Course Code	24BBAMDC102	
Course Title	INTRODUCTION TO HUMAN RESOURCE MANAGEMENT	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Addresses the issues related to human resources in an organisation.	
Course Offered to	All courses (excluding BBA & BBA in Tourism & Hospitality)	
Regulation	2024	
Course Overview	This course: a) Examines HRM's role in effective people management and goal achievement and HR managers' responsibilities including strategic planning, policy formulation, and employee relations. b) Performs job analysis and emphasizes the importance of a fair, objective, and legal recruitment and selection process. c) Highlights the significance of improving skills and performance and explores the objectives and benefits of appraisal systems.	
Prerequisite	Basic knowledge about Human Resource Management.	
Course Objectives	A student will be able to: a) Recognize the essential qualities and characteristics required for effective HR management. b) Identify the premises of effective HR planning and discuss the process involved in HR planning. c) Acquire knowledge of job analysis, description, and specification to effectively define job roles and requirements. d) Discover various training and development methods and their application in different contexts. e) Identify and evaluate different methods of performance appraisal, including conventional and non-conventional approaches.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the importance, objectives, and functions of HRM and state the role and qualities of an HR Manager.	R
CO2	Explain the objectives, importance, and process	U

	of HR Planning.			
CO3	Classify the different sources of recruitment and demonstrate the process of selection.	A1		
CO4	Distinguish between job description and job specification and outline the concept of job design, job rotation, job enlargement, job enrichment, promotion, and demotion.	A2		
CO5	Evaluate the performance of employees using different conventional and non-conventional methods of performance appraisal.	E		
CO6	Propose the best training methods to be applied in different managerial context.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to HRM a) HRM – Meaning, Scope and Importance b) Nature of HRM – Objectives and Functions of HRM c) Role of HR Manager d) Qualities and characteristics necessary for a good HR Manager	8	CO1	R U A1 A2 E C
Unit II	Human Resource Planning a) Human Resource Planning – meaning, Objectives and importance b) Premises of planning – Process of Planning c) Control and review mechanisms	8	CO2	R U A1 A2 E C
Unit III	Recruitment and Selection a) Recruitment and Selection – Concept and meaning; sources of recruitment; Selection procedure b) Job design, Job rotation, job enlargement, job enrichment, c) Job Analysis – job description and job specification d) Promotion – demotion – separation.	10	CO3 CO4	R U A1 A2 E C
Unit IV	Training and Development a) Training and Development – meaning, difference and significance b) Training Methods – On-the-job and Off-the-job. c) Executive development – Methods of executive development.	9	CO6	R U A1 A2 E C
Unit V	Performance Appraisal	10	CO5	R U

	a) Performance Appraisal – meaning, purpose of performance appraisal – Methods of appraisal b) Conventional and non-conventional methods c) Morale – meaning and significance – measurement of morale – measures to tone up morale			A1 A2 E C
Learning Resources: 1. Gary, D. (2011). <i>Human Resource Management</i>. Pearson Education India. 2. Jeffrey, A. M. (2015). <i>Strategic Human Resource Management</i>. South-Western College Publishing. 3. Khanka, S. S. (2007). <i>Human Resource Management</i>. S. Chand Publishing. 4. Bratton, J., & Gold, J. (2001). <i>Human Resource Management Theory and Practice</i>. Hound Mills. 5. Aswathappa, K., & Dash, S. (2021). <i>Human Resource Management</i>. McGraw-Hill Education. 6. Noe, R., Hollenbeck, J., Gerhart, B., & Wright, P. (2006). <i>Human Resources Management: Gaining a Competitive Advantage</i>. New York, MA: McGraw-Hill Education.				

2. Assessment

Formative Assessment (FA – 50 marks)			
FA1 (10 weightage)	Mid-Semester Exams (25 weightage)	FA2 (10 weightage)	Attendance (5 marks)
Multiple-Choice Question and/or Objective-type questions of 20 mark (10 questions of 2 marks each).	GROUP A: 5 very short questions out of 8 carrying 2 marks each. GROUP B: 3 short questions out of 5 carrying 5 marks each. GROUP C: 1 long question out of 2 carrying 10 marks. GROUP D: 1 case study of 15 marks. Total marks: 50	Group activity, Subjective-type questions, or viva-voce carrying 20 marks.	75%-79%– 2 marks 80%-85%– 3 marks 86%-90%– 4 marks Above 90%– 5 marks
Summative Assessment (SA – 50 marks)			
GROUP	NO. OF QUESTIONS TO ATTEMPT	MARKS	RBT (level)
GROUP A	5 very short questions out of 8	2 marks × 5 = 10 marks	Lower-order level
GROUP B	3 short questions out of 5	5 marks × 3 = 15 marks	Higher-order level
GROUP C	1 long question out of 2	10 marks × 1 = 10 marks	Higher-order level
GROUP D	1 case study	15 marks × 1 = 15 marks	Creating level

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)

Name: Dr. Dipankar Rudra Signature:	Name: Dr. Dipankar Rudra Signature:	Name: Mr. Anirban Ghosh Signature:



Salesian College (Autonomous)
Sonada- Siliguri

Curriculum Framework
For
Master of Science in Psychology

Department of Psychology

Curriculum Document
2023-2024

Vision

To build professional psychologists who would excel in knowledge, competency, orientation and practice of psychology, with high ethical standards and social relevance.

Mission

To function as professional and socially conscious psychologists who can achieve excellence in knowledge generation, and serve society by making innovative contributions in the field of mental health and in the process of social change.

1. Program Overview

Master of Science (M Sc) in Psychology is a two-year professional degree programme with specialization in Clinical Psychology and Organizational Psychology

2. Program Objectives and Outcome (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Grasp the advanced theories in behavioural sciences.
	PO02: Acquaint him/herself with the nature and process of research and testing in Psychology.
	PO03: Relate his/her understanding of guidance and counselling, practice of various psychoanalytic, behavioural and humanistic theories in counselling and psychotherapies and apply them in the real life setting.
	PO04: Gain awareness about the various contemporary innovations in psychology practice.
Skills	PO05: Demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes
	PO06: Construct abilities in assessment, diagnostic and intervention practices in psychology.
	PO07: Integrate and apply various behaviour analysis methods and practices in individual and group application of psychological theories.
	PO08: Acquaint him/herself with the diverse current evidence-based practices in Psychology including development in quantitative and qualitative research domains and design independent researches.
Competency	PO09: Explore new ideas and thoughts through the application of theoretical knowledge of psychology in service of individuals, groups and the society in general.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as psychology professionals to practice in clinical and non-clinical settings to provide methods, tools, strategies and approaches in practicing psychology for the welfare of all.
	PO11: Enable the students in functioning diversity of psychology within and outside the nation and to promote interest in research and development of multifaced subjects and domains of psychology at pan national level.
Value	PO12: Observe and maintain professional ethics, gender equality and other human values

3. Program Specific Objectives and Outcomes (PSOs)

After the completion of the programme, a student will be able to:	
Knowledge	PSO01: Develop an idea about Cognitive Psychology and the role of perception, memory, learning, language, and thinking in behavior functioning.
	PSO02: Develop knowledge about biological basis of behavior and different methods of bio psychology, and neuropsychology.
	PSO03: Develop the concept of psychological research, quantitative and qualitative and statistics, descriptive and inferential in conducting psychological data analysis and theoretical formulations.
	PSO04: Develop knowledge about the psychological testing and its application.
	PSO05: Develop knowledge about different theories of personality and emotion and motivational processes and health psychology and stress management.
	PSO06: Develop Knowledge about Clinical Psychology And its Application.
	PSO07: Develop Knowledge about Industrial Psychology And its Application.
Skills	PSO01: Develop a clear idea about the role of perception, memory, learning, language, and thinking in Behavior.
	PSO02: Execute the educational implications of different theories of psychology.
	PSO03: Construct assessment and diagnostic skills using laboratory experiments for diagnostic, clinical and non-clinical services.
	PSO04: Develop the skills for research and data analysis.
	PSO05: Advocate the importance of counseling and psychotherapy in behaviour modification and psychological treatment services.
	PSO06: Develop the skills for diagnosing different neuropsychological disorders and its treatment.
	PSO07: Develop the skill for diagnosis, prognosis of different disorders.
	PSO08: Develop the skills for organizational stress management and employee wellbeing.
Competency	PSO01: Demonstrate competencies required for counselling, psychotherapy and other behavior modification techniques and treatments.
	PSO02: Analyze the data by using descriptive and inferential statistics.
	PSO03: Systematize the concepts of adjustment, maladjustment and the various interpretations of the psychological tests.
	PSO04: Correlate various qualitative and quantitative data for psychological research.
	PSO05: Envision a society where people from all walks of life enjoy equal and equitable rights and opportunities in the workplace.
	PSO06: Diagnose different psychological and neuropsychological disorders.
	PSO07: Analyze the contemporary trends in psychology.
	PSO08: Analyzing data by using SPSS.
Values	PSO01: Understand the professional ethics and human values
	PSO02: Develop a sense of gender equality and environment friendly attitude and behaviour in professional practice.

Program Matrix

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23PSYMAJ501	Core	Advanced Biological Basis of Behaviour	4	4+0+0	60	100
	23PSYMAJ502	Core	Advanced Research Methodology and Statistics	4	4+0+0	60	100
	23PSYMAJ503	Core	Advanced Cognitive Psychology	4	3+0+1	45+30	100
	23PSYMAJ504	Core	Indian Contribution to Psychology	4	3+0+1	45+30	100
	23PSYMAJ505	INT-I	Internship-1	4	0+0+4	60+60	50+50
	Total			20	20	390	500
II	23PSYMAJ 506	Core	Advanced Social Psychology	4	3+0+1	45+30	100
	23PSYMAJ507	Core	Neuropsychology	4	3+0+1	45+30	100
	23PSYMAJ508	Core	Advanced Psychological Testing	4	3+0+1	45+30	100
	23PSYMAJ509	Core	Personality, Motivation and Emotion	4	3+0+1	45+30	100
	23PSYMAJ510	INT-II	Internship-2	4	0+0+4	60+60	50+50
	Total			20	20	420	500

Clinical Psychology (Elective-A)

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	23PSYMAJ601-A	Major	Advanced Clinical Psychology I	4	3+1+0	45+30	100
	23PSYMAJ602-A	Major	Psychotherapy-I	4	3+0+1	45+30	100
	23PSYMAJ603-A	Major	Clinical Psychology Practicum	4	0+0+4	120	100
	23PSYMAJ604	Major	Positive Psychology	4	3+1+0	45+30	100
	23PSYMAJ605-A	INT-III	Internship-3	4	0+0+4	120	50+50
	Total			20	20	465	500
IV	23PSYMAJ606-A	Major	Advanced Clinical Psychology II	4	3+0+1	45+30	100
	23PSYMAJ607-A	Major	Psychotherapy-II	4	3+0+1	45+30	100
	23PSYMAJ608-A	Major	Health Psychology	4	3+0+1	45+30	100
	23PSYMAJ 609	Major	Dissertation	8	0+0+8	240	200
	Total			20	20	465	500

Organisational Psychology (Elective-B)

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	23PSYMAJ 601-B	Major	Introduction to Industrial and Organizational Psychology	4	3+1+0	60	100
	23PSYMAJ602-B	Major	Personnel Psychology	4	3+1+0	60	100
	23PSYMAJ603-B	Major	Organizational psychology Practicum	4	0+0+4	120	100
	23PSYMAJ604	Major	Positive Psychology	4	3+1+0	45+30	100
	23PSYMAJ605-B	INT-III	Internship-3	4	0+0+4	60+60	50+50
	Total			20	20	465	500
IV	23PSYMAJ606-B	Major	Organizational Stress, Management of Stress and Employee Wellbeing	4	3+0+1	45+30	100
	23PSYMAJ607-B	Major	Work Environment and Strategic Management	4	3+0+1	45+30	100
	23PSYMAJ608-B	Major	Organizational Development and Human Resource Management	4	3+0+1	45+30	100
	23PSYMAJ609	Major	Dissertation	8	0+0+8	240	200
	Total			20	20	465	500

Total Credit in PG-80

Course Description

23PSYMAJ501: Advanced Biological Basis of Behaviour

Course Code	23PSYMAJ501			
Course Title	Advanced Biological Basis of Behaviour			
Credits	04 (4+0+0)			
Lecture/Practical Hours	60			
Hours/Week	4			
Category	Core			
Semester	1			
Issue(s) Addressed	Biological basis of behavior, glands and its functions, methods of biopsychology, gender, human values and ethics			
Regulation	2023			
Course Overview:	This course– a. To understand the biological basis for psychology and neurophysiology. b. To develop an understanding of the methods in biopsychology. c. To identify different glands and its functions. d. To understand the effects of sleep and drugs on behavior.			
Course Objectives:	The students will be able to – a. Describe different parts of brain and spinal cord, its location and functions. b. Understand the different methods of biopsychology. c. Identify different glands and its effect on human behaviour. d. Understand the effects of sleep and drug on human behaviour.			
Prerequisites:	Basic knowledge of Brain and physiology of behavior.			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS			BLOOM's LEVEL
CO1	Explain the biological basis for psychology and neurophysiology			R
CO2	Differentiate between different physiological methods			U
CO3	Analyze the function of different glands.			A1 A2
CO4	Analyze the role of sleep and drugs on behavior.			C
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Biological foundation of psychology: a. Organization and functions of the brain and spinal cord b. Genetic bases of behaviour –chromosomes and genes. c. Neurophysiology: Generation and conduction of	15	CO1 CO2 CO3 CO4	R U A1 A2 E

	action potential d. Synaptic transmission and neuromuscular transmission.			C
Unit II	Methods in biopsychology- a. Anatomical methods, b. Degeneration techniques, c. Lesion techniques, d. Chemical methods, e. Stereotaxic surgery	15	CO1 CO2 CO3 CO4	R A1 A2 E C
Unit III	Endocrine Glands and Hormone Products: a. Functions of different hormones. b. Hormonal imbalance and behaviour	15	CO1 CO2	R U
Unit IV	Sleep and Circadian Rhythm: a. Biological rhythms, states of sleep b. Disorders of sleep. c. Drug and behaviour: Determinants of Drug effects; d. Drug abuse and addiction	15	CO1 CO2 CO3 CO4	R U A1 A2 E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Reference Books:

1. Grossman, S. P. : *A Text Book of Physiological Psychology*, John Willey and Sons Inc. New York, 1967
2. Kalat, J.W. (2004). *Biological Psychology*, 8th Edition, Thompson – Wadsworth.
3. Kolb, B. and Whishaw, I.Q. (2013). *An Introduction to Brain and Behaviour*. New York: Worth Publishers.
4. Morgan, C.T. (1965). *Physiological Psychology*, McGraw Hill, New York.

Suggested Readings:

1. Barrett, K.E., Barman, S.M., Boitano, S., and Brooks, H.L.(2012). *Ganong's review of medical physiology*. Tata McGraw-Hill.
2. Carlson, N. (2013). *Physiology of Behaviour*. NJ: Pearson Education Inc.
3. Hall, J.E. (2011). *Guyton and Hall Textbook of medical physiology*. Elsevier.
4. Pinel, J.P.J: *Biopsychology*. Allyn and Bacon (2000).

Assessment

Formative Assessment: 50marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50marks

One Short Questions to be answered out of two given from lower order of RBT – (10Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40Marks).

SummativeAssessmentTime:2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ502: Advanced Research Methodology and Statistics

Course Code	23PSYMAJ502	
Course Title	Advanced Research Methodology and Statistics	
Credits	04 (4+0+0)	
Lecture/Practical Hours	60	
Hours/Week	4	
Category	Core	
Semester	1	
Issue(s) Addressed	Research process, design, Statistical Issues	
Regulation	2023	
Course Overview:	This course– a. Identify the basic concepts of research methodology. b. Explain different research designs. c. Differentiate between groups by using statistical procedure and analyse the relationship between variables. d. Create the objective knowledge in the context of subjective reality experiences	
Course Objectives:	The students will be able to – i. Describe the nature and types of research ii. Classify different types of research design. iii. Compare different groups statistically and describe the relationship between variables iv. Create knowledge based on subjective reality in an objective paradigm	
Prerequisites:	Basic knowledge of research methodology.	
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to		
CLOs	STATEMENTS	BLOOM's LEVEL
CO1	Describe the nature and types of research	R
CO2	Understand the process of psychological research.	U
CO3	Classify and analyze different types of experimental and non-experimental designs	A1
CO4	Computing group differences and Formulate relation between variables	A2
CO5	Create new research paradigm in the context of qualitative research	C

Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Introduction to Research Methodology a. Definition, Nature, Purpose of Research b. Types- Experimental and Non-Experimental c. Ethics in research d. Steps of psychological research	15	CO1 CO2 CO3 CO4 CO5	R U A 1 A2 E C
Unit II	Experimental and non-experimental Designs a. Between Group Designs- Matched Group, Randomized and Factorial; b. Within Group Designs c. Quasi Experimental Research Design d. Ex-post Facto Research Design e. Single Subject Research Design	15	CO1 CO2 CO3 CO4 CO5	R A 1 A2 E C
Unit III	A. Introduction to statistics and Analysis of Group differences a. Descriptive, Inferential, Parametric and Non Parametric statistics b. One-way Anova, c. Two-way Anova, d. ANCOVA, e. MANOVA, f. Wilcoxin sign rank test, g. Mann Whitney U test B. Correlation a. Multiple Correlation b. Partial correlation. c. Exploring relationship- Regression Analysis- Simple linear, Multiple. d. Factor Analysis-types	15	CO1 CO2 CO3 CO4 CO5	R A 1 A2 E C
	History, Paradigms and Methods of Qualitative		CO1	R

Unit IV	Research	15	CO2	A
	a. History of Qualitative Research		CO3	1
	b. Paradigms: Positivism, Post-Positivism, Critical Theory, Constructivism, Feminist approach		CO4	A2
	c. Methods: Ethnography, Historical Research, Action Research, Grounded Approach, Narrative Approach, Case Study, Focus Group, Mixed Methods		CO5	E
	d. Analysis and Interpretation, Evaluation, and Representation of Qualitative Data			C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Reference Books

1. Anastasi, A. and Urbina S.: *Psychological Testing*, Pearson, First Edition Harman, H. H. (1962). Harman H. H.(1962) *Modern Factor analysis*, Chicago University Press.
2. Denzin Norman K, and Lincoln Yvonna S. (2011) *The Sage Handbook of Qualitative Research*, Sage Publications, New Delhi
3. Glesne, C. (2016). *Becoming qualitative researchers: An introduction*. Pearson. One Lake Street, Upper Saddle River, New Jersey 07458.
4. Harman H. H.(1962) *Modern Factor analysis*, Chicago University Press.
5. McGuigan,F.J.: *Experimental Psychology: A Methodological Approach*, Prentice Hall,1990.
6. Mohsin, S.M.: *Research methods in Behavioural Sciences*, Orient longman, Calcutta. (Latest edition).
7. Patton Quinn Michael, (2002), *Qualitative Research and Evaluation Methods*, Sage Publications, New Delhi
8. Silverman David (2005), *Doing Qualitative Research*, Sage Publications, New Delhi

Suggested books

1. Creswell J. W.: (2014), *Research Design: Quantitative, Qualitative and Mixed Method Approaches*, Sage Publishing, Fourth Edition
2. Das, D. and Das, A. (2008). *Statistics in Biology and Psychology*. Academic Publishers, Calcutta (Latest edition)
3. Garrett, H.E. (1981). *Statistics in Psychology and education*. VakilsFeffer and Simons Ltd.
4. Kerlinger F.N.: *Foundations of Behavioral Research*, Surjeet Publications
5. Kerlinger F.N.: *Foundations of Behavioural Research*, Surjeet Publications
6. Singh, A.K.: *Tests, Measurements and Research Methods in Behavioural Sciences*. Tata McGraw Hill.
7. Singh, A.K.: *Tests, Measurements and Research Methods in Behavioural Sciences*. Tata McGraw Hill.
8. Taylor Stephanie (Ed)(2002), *Ethnographic Research A Reader*, Sage New Delhi

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50marks

One Short Questions to be answered out of two given from lower order of RBT – (10Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40Marks).

Summative Assessment Time:2Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signat ure:	Name: Signat ure:	Name: Signat ure:

(seal)

(seal)

23PSYMAJ503: Advanced Cognitive Psychology

Course Code	23PSYMAJ503

Course Title	Advanced Cognitive Psychology			
Credits	04 (03 Theory+ 0 Tutorial+01 Practical)			
Lecture/Practical Hours	45-L (1 credit theory is 15 hours) 30-P (1 credit practical is 30 hours)			
Hours/Week	4			
Category	Core			
Semester	1			
Issue(s) Addressed	Gender, Human values, professional ethics			
Regulation	2023			
Course Overview:	This course – a. Identifies the advance concept of Cognitive Psychology. b. Explains the theories in perception, memory, intelligence, and thinking c. Analyse the dynamics of human Cognition and Behaviour.			
Course Objectives:	The students will be able to – i. Describe the concepts of Cognitive Psychology ii. Explain the theories in Cognitive Psychology. iii. Analyse and apply the concepts of Cognitive Psychology in various domains of life. iv. Design critical and analytical skills regarding the application of Cognitive Psychology in human life and Psychological services.			
Prerequisites:	Basic interest to learn Cognitive Psychology			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS			BLOOM's LEVEL
CO1	Define the concepts of advanced Cognitive Psychology			R
CO2	Explain the core Cognitive Psychological concepts, models, theories, varied perspectives in the study of human behaviour			U
CO3	Analyse the concept of Cognitive Psychology and apply in various domains of life.			A1 A2
CO4	Design critical and analytical skills regarding application of Cognitive Psychology in Psychological services			C
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	a. Cognitive approach to psychology: Origin and current status of cognitive psychology, assumptions and methods of cognitive psychology b. Attention and Perception: Concept and mechanism; Types and theories; Applications; Pattern recognition	15	CO1 CO2 CO3 CO4	R U A 1 A2 E C

Unit II	A.Memory and Learning Processes: Current models and directions. Types of memory; Encoding and retrieval process in long term memory; Memory distortions; remembering the personal past; Learning process- knowledge representation and retrieval; Approaches to memory- information processing and connectionist. B.Language processes: Language acquisition, Models of reading and language comprehension; Meaning and beyond; Language production; Language and thought.	15	CO1 CO2 CO3 CO4	R U A 1 A2 E C
Unit III	a. Decision Making and problem solving: Models and theories; Complex and uncertain decision making; Human problem solving strategies- heuristics and algorithmic; expert and novice problem solvers b. Artificial Intelligence Artificial Intelligence latest applications in Cognitive Psychology; Technology Assisted Psychological services Research and Innovation in AI and Cognitive Psychology development	15	CO1 CO2 CO3 CO4	R U A 1 A2 E C
Unit IV	Practical based on the course theory Any two from the following a. Perception-SPAT b. Attention-Stroop Effect c. Memory-Priming Effect d. Learning-Transfer of learning d. Problem Solving-Tower	30	CO1 CO2 CO3 CO4	R U A 1 A2

	of Hanoi Test e. AI-project			E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Reference Books

1. Dirk Geeraerts and Hubert Cuyckens (2007), The Oxford Handbook of Cognitive Linguistics, Oxford University Press.
2. E. Bruce Goldstein (2008), Cognitive Psychology: Connecting Mind, Research, and Everyday Experience, Third Edition, Wadsworth, Cengage Learning.
3. Nick Braisby and Angus Gellatly (2005), Cognitive Psychology, Oxford University Press.
4. Margaret W. Malin (2013), Cognition, John Wiley and Sons

Suggested Books:

1. Matlin, M.W. (2008). Cognition (7th Ed.). CA: John Wiley and Sons.
2. Baddley, A. (1997). Human memory: Theory and practice. New York: Psychology Press.
3. Best, J.B. (1992). Cognitive Psychology .3rd Edition. West Publishing Company
4. Galotti, K.M. (2001). Cognitive Psychology In and Out of the Laboratory. 2nd Edition, Wadsworth.
5. Goldstein B E (2007). Sensation and Perception (7th Edition) Wadsworth
6. Harley, Treror, A. (2002). The psychology of language: From data to theory. Taylor Francis.
7. Smith, E.E. and Kosslyn, (2007). Cognitive psychology: Mind and brain. Prentice Hall.
8. Tripathi, A.N. and Babu, Nandita (2008). Cognitive processes. In Misra, G. (Ed.). Psychology in India: Advances in Research, Vol. 1. New Delhi: Pearson Education

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50 marks

One Short Questions to be answered out of two given from lower order of RBT – (10 Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40 Marks).

SummativeAssessmentTime:2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature :	Name: Signature :	Name: Signature :

(seal)

(seal)

(College Seal)

23PSYMAJ504: Indian Contribution to Psychology

Course Code	23PSYMAJ504

Course Title	Indian Contribution to Psychology			
Credits	04 (3+0+1)			
Lecture/Practical Hours	60			
Hours/Week	4			
Category	Core			
Semester	1			
Issue(s) Addressed	Gender, Human values, professional ethics			
Regulation	2023			
Course Overview:	This course is– a. to acquire knowledge about Indian contribution to Psychology. b. to examine the various development stages of Psychology in India c. to understand the skills and process of various religious schools of thought. d. to analyse the contrast between eastern and western Psychology. e. to apply various indigenous concepts of Psychology in practice			
Course Objectives:	The students will be able to – i. understand the development of Psychology in Indian Context ii. discuss the psychology of various indigenous practices developed in India iii. apply the dimensions of western and eastern Psychology iv. analyse and evaluate the use of Psychology concepts developed in Indian context			
Prerequisites:	Basic knowledge of cultural practices in India.			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS		BLOOM's LEVEL	
CO1	Describe the various concepts developed in Indian Philosophy and culture		R	
CO2	Appreciate the similarities and difference between western and eastern Psychology		U	
CO3	Analyse various religious schools of thought like Buddhism, Jainism and Sufism that contributed to psychology concepts.		A1 A2	
CO4	Apply the indigenous concepts of Psychology in human services.		C	
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Indian Psychology and Applications. a. Nature of India Psychology, fundamental assumptions of Indian Psychology, b. comparing eastern	15	CO 1	R

	and western approaches c. application of counselling and therapy: Vipasana, Mindfulness, Hathayoga based therapies. d. Gandhi's Nai Talim, Satyagraha, psycho spiritual tool for conflict resolution e. Tagore's system of education, Sri Aurobindo's integral education f. Gandhi's Chakra and work culture in relation to Organisational Psychology		CO 2 CO 3 CO4	U A 1 A2 E C
Unit II	Psychology in Ancient Indian Philosophy a. Upanishad's status of consciousness, factors of personality, mental functions, highermental f2023-244n Yoga, b. Nyaya concept of personality, psychology of perception, stages of consciousness, Vaiseshika theory of consciousness, c. factors of personality, theory of perception, Mimamsa factors of personality, psychophysical system, cognition,	15	CO1 CO2 CO3 CO4	R A 1 A2 E C

	d. Advaita vedantam, human personality, psychophysical apparatus, states of consciousness, functions of mind, e. Vishista Advaita, Nature of consciousness, factors of personality, factors of mind.			
Unit III	Psychology in Buddhism, Jainism and Sufism a. Buddhism factors of personality, levels of consciousness, functioning of mind, b. Jainism-Nature of consciousness, cognition, sense organs, verbal comprehension, extra sensory perception, affection, conation, mental activity c. Sufism- historical background, basic concepts, spirit, views of the self and soul, d. Mindfulness practical workshop	30	CO1 CO2 CO3 CO4	R A 1 A2 E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Suggested Books

1. Cacarelli S. K, White N J, Misra G (2017), Psychology (5th South Asian edition), Pearson Education
2. Cornelissen M, Misra G, Varma S (2013), Foundations and Applications of Indian Psychology, Pearson Education India

Reference Books

1. Misra G (Edited)(2019), Personality in Indigenous tradition, In ICSSR Research Surveys and explorations Psychology, (Vol 2), Individual and the social processes and Issues. Oxford University Press
2. Rao K R and Paranjpe A C,(2016), Psychology in Indian tradition, Springer
3. Sinha D. (2015), Psychology for India, Sage.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian

College

Summative Assessment: 50 marks

One Short Questions to be answered out of two given from lower order of RBT – (10 Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40 Marks).

summativeAssessmentTime:2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature :	Name: Signature :	Name: Signature :

(Seal)

(Seal)

Semester II

23PSYMAJ506: Advanced Social Psychology

Course Code	23PSYMAJ506

Course Title	Advanced Social Psychology			
Credits	4 (3+0+1)			
Lecture/Practical Hours	45+30			
Hours/Week	4			
Category	Core			
Semester	II			
Issue(s) Addressed	Approaches to study of social behaviour, social categorization and grouping and theoretical approaches to leadership			
Regulation	2023			
Course Overview:	This course is– a. to describe the current trends in social psychology, social cognition and its types. b. to develop an understanding of the effect of grouping on human behaviour and social identity. c. to contrast different social influence processes. d. to design the concept of inter group relation.			
Course Objectives:	The students will be able to – i. Describe current trends in the study of Social Psychology such as role of cognition, social neuroscience, social diversity, etc ii. Understand the concept of grouping and it’s effect on decision making process. iii. Compare the effect of social norms and their perception on behaviour. iv. Create the concept of inter group relations and conflict resolution			
Prerequisites:	Basic knowledge of social psychology.			
Course Learning Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS	BLOOM’s LEVEL		
CO1	explain the current trends in the study of Social Psychology such as role of cognition, social neuroscience, social diversity, etc	R		
CO2	understand the concept of grouping and its effect on the decision making process.	U		
CO3	analyse effect of social norms and their perception on behaviour.	A1 A2		
CO4	construct the role inter group relations on behaviour and conflict resolution	C		
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT

Unit I	Introduction: a. Current trends in social psychology, b. Approaches to the study of social behaviour, c. Methodological and ethical issues. Social Cognition a. Heuristics and other short-cut strategies; b. Effects of framing and anchoring; counterfactual thinking and mental simulation, affect and social cognition, action identification, c. self-reference effects	15	CO1 CO2 CO3 CO4	R U A 1 A2 E C
Unit II	Social Categorization, Groups and Leadership: a. Social identity and social comparison models, b. Categorical differentiation and groups, c. Group cohesiveness, group decision making; d. Emergence of leader, theoretical approaches to leadership,	15	CO1 CO2 CO3 CO4	R A 1 A2 E C

	e. Leader characteristics and effectiveness.			
Unit III	Social Influence Processes: a. Social norms and their perception, b. Conformity, factors influencing conformity; c. Compliance and it's factors and types d. Obedience.	15	CO1 CO2 CO3 CO4	R A1 A2 E C
Unit IV	Intergroup Relations: a. Relative deprivation, realistic group conflict b. Social identity approaches, dynamics of intergroup behaviour c. Type of social conflicts, conflict resolution strategies d. Practical on Leadership and aggression	30	CO1 CO2 CO3 CO4	R U A1 A2 E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Suggested Books:

1. Aronson, E., Wilson, T.D., and Akert, R.M. (1999). Social Psychology (3rd ed.). New York: Longman.
2. Baron, R. A., Branscombe, N. R. and Byrne, D. (2009). Social psychology (12thed.). New York: Pearson Education.
3. Burke, Peter J. (2006). Contemporary social psychological theories. Stanford: Stanford social sciences.

4. Taylor, S.E., Peplau, L.A., and Sears, D.O. (2006). Social psychology (12thed.). New Jersey: Pearson Education.

Reference Books

1. Delamater, J. (2003). Handbook of social psychology. New York: Kluswer Academic.
2. Hogg, M.A. and Cooper, Joel (2003). Sage handbook of social psychology. Los Angeles: SAGE.
3. Kakar, S. (2007). The Indians, Portrait of a People. New Delhi: Viking Penguin
4. Myer, D.G. (2012). Social psychology (11thed.). New York: McGraw Hill.

Assessment

Formative Assessment: 50marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50 marks

One Short Questions to be answered out of two given from lower order of RBT – (10 Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40 Marks).

SummativeAssessmentTime:2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ507: Neuropsychology

Course Code	23PSYMAJ507			
Course Title	Neuropsychology			
Credits	04 (3+0+1)			
Lecture/Practical Hours	45+30			
Hours/Week	4			
Category	Core			
Semester	II			
Issue(s) Addressed	Neuropsychology and its scope, neuropathology, neuropsychological rehabilitation.			
Regulation	2023			
Course Overview:	This course– To understand the concept of neuropsychology and it’s application. b. To develop an understanding of the methods in neuropsychology. c. To identify the causes of neuropathology and neuropsychological rehabilitation. d. To understand behavioural, cognitive, emotional, personality changes associated with lobe function.			
Course Objectives:	The students will be able to – i. Understand the concept of neuropsychology. ii. Understand different methods of neuropsychology. iii. Identify different causes of neuropathology, and neuropsychological rehabilitation iv. Understand behavioural, cognitive, emotional, personality changes associated with lobe function.			
Prerequisites:	Basic knowledge of Brain and physiology of behavior.			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS			BLOOM’s LEVEL
CO1	explain the concept of neuropsychology and it’s scope and application.			R
CO2	differentiate between causes of neuropathology and its effect on behaviour			U
CO3	analyse different methods used in neuropsychology and neuropsychological rehabilitation.			A1 A2
CO4	to Assess neuropathology by using neuropsychological tests.			C
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Introduction	15	CO1	R
	a. Introducing Neuropsychology,		CO2	U
	b. History, and Emergence		CO3	A1
				A2
				E

	c. Scope of Neuropsychology.		CO4	C
Unit II	Causes of neuropathology a. Head Trauma, b. Vascular Disorder, c. Degenerative Disorder, d. Toxic Conditions, e. Oxygen Deprivation Deficits of different brain lobes Behavioural, Emotional, Personality, Cognitive changes associated with lobe functions. 1. FRONTAL, 2. PARIETAL, 3. TEMPORAL, 4. OCCIPITAL.	15	CO1 CO2 CO3 CO4	R A1 A2 E C
Unit III	Methods - a. Invasive Techniques, b. Electrical Processing, c. Structural and d. Functional Imaging techniques. Neuropsychological Rehabilitation- e. Planning, process and outcome of cognitive retraining, f. Role of Family/ larger community	15	CO1 CO2 CO3 CO4	R A1 A2 E C
Unit IV	Neuropsychological Assessment: a. BGT b. Halstead Reitan Neuropsychology test battery. c. PGI Battery	30	CO1 CO2 CO3 CO4	R U A1 A2 E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Suggested Books:

1. Kalat, J. W. (2019). *Biological psychology*. Cengage.
2. Kandel, E., Schwartz, J., Jessell, T., Jessell, D. B. M. B. T., Siegelbaum, S., and Hudspeth, A. J. (2012). *Principles of Neural Science*, Fifth Edition. McGraw-Hill Publishing.
3. Kolb, B., Whishaw, I. Q., and Teskey, G. C. (2016). *An introduction to brain and behaviour*. Worth

Reference Books:

1. Crossman, A. R., Neary, D., and Crossman, B. (2015). *Neuroanatomy: An illustrated colour text*. Elsevier
2. Carlson, N. R., and Birkett, M. A. (2017). *Physiology of behaviour* (12th edition). Pearson.

Assessment

Formative Assessment: 50marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

*SummativeAssessment:*50marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20Marks)
- b) ThreeLongQuestionstobeansweredoutofsixsetfromhigherorderofRBT–(30Marks).

SummativeAssessmentTime:2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
(seal)	(seal)	

23PSYMAJ508: Advanced Psychological Testing

Course Code	23PSYMAJ508			
Course Title	Advanced Psychological Testing			
Credits	4 (3+0+1)			
Lecture/Practical Hours	45+30			
Hours/Week	4			
Category	Core			
Semester	II			
Issue(s) Addressed	Psychological testing and Test standardization			
Regulation	2023			
Course Overview:	This course– a. Discuss the basics of psychological testing. b. Explain the process of test standardization. c. Differentiate among different areas of testing. d. Analyze attitude and personality profiles.			
Course Objectives:	The students will be able to – i. Describe the nature and types of psychological testing and measurement. ii. Understand the process of test standardization. iii. Explain and classify different types of psychological tests iv. Examine attitude and personality of individuals.			
Prerequisites:	Basic knowledge of Psychological testing.			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS			BLOOM's LEVEL
CO1	describe the nature and types of psychological testing and measurement.			R
CO2	understand the process of test standardization.			U
CO3	classify and analyse different type of psychological tests.			A1 A2
CO4	implement different psychological tests.			C
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Introduction to Psychological Testing a. Definition, Nature, Purpose of psychological tests b. Types of tests c. Scales of measurement	15	CO1 CO2 CO3 CO4	R U A1 A2 E C

Unit II	Test Standardization a. Reliability: Definition, Nature, Types b. Validity: Definition, Nature, Types c. Norms: Definition, Nature, Types	15	CO1 CO2 CO3 CO4	R A1 A2 E C
Unit III	Areas of Testing a. Intelligence test: Concept and types b. Personality assessment: Concept and types c. Creative, Aptitude and Interest Inventories: Concept and Types d. Attitude Scales: Concept and Types	15	CO1 CO2 CO3 CO4	R A1 A2 E C
Unit IV	Practical any two a. Measurement of Attitude b. Measurement of Intelligence c. Measurement of Aptitude d. Assessment of Personality	30	CO1 CO2 CO3 CO4	R U A1 A2 E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Suggested books

1. Anastasi. A. (1976). Psychological testing. Macmillan.
2. Gregory, R.J. (2017). Psychological Testing: History, Principles and Applications. 7th Edition. Noida. Pearson.
3. Kothari, C.R.: Research Methodology Methods and Techniques. WishwaPrakashan Calcutta, Second edition (1990).
4. Singh, A.K.: Tests, Measurements and Research Methods in Behavioural Sciences. Tata McGraw Hill.

Reference Books

1. Anastasi, A. and Urbina S.: Psychological Testing, Pearson, First Edition
2. Freeman, S.F.: Theory and practice of Psychological testing. Oxford and IBH publishing Co. Calcutta. Third Edition.
3. Gullickson, H. and Menick, S. (1960). Psychological scaling , theory and applications , Wiley.
4. Kaplan, R.M. and Saccuzzo D.P.: Psychological Testing Principles, Applications, and Issues, Wadsworth, Fifth Edition.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50 marks

One Short Questions to be answered out of two given from lower order of RBT – (10 Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40 Marks).

SummativeAssessmentTime:2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature :	Name: Signature :	Name: Signature :

(seal)

(seal)

23PSYMAJ509: Personality, Motivation and Emotion

Course Code	23PSYMAJ509			
Course Title	Personality, Motivation and Emotion			
Credits	04 (3+0+1)			
Lecture/Practical Hours	45+30			
Hours/Week	4			
Category	Core			
Semester	II			
Issue(s) Addressed	Nature and theories of personality, motivation, emotion, gender, human values and ethics			
Regulation	2023			
Course Overview:	This course is to– a. Understand the nature of personality. b. Explain the approaches to the study of personality. c. Analyse the nature and theories of motivation. d. Analyse the nature and theories of emotion.			
Prerequisites:	Basic knowledge of Brain and physiology of behavior.			
Course Objectives:	The students will be able to – i. Describe the nature and concept of personality. ii. Understand the theoretical perspective of personality. iii. Analyze the concept and theories of motivation. iv. Analyze the concept and theories of emotion			
Prerequisites:	Basic knowledge on personality, motivation and emotion			
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to				
Cos	STATEMENTS			BLOOM's LEVEL
CO1	Describe the nature and concept of personality.			R
CO2	Contrast the theories of personality.			U
CO3	Analyse the nature and concept of motivation and emotion			A1 A2
CO4	Evaluate the theories of motivation and emotion.			E
CO5	Apply the theories of personality, motivation and emotion.			C
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Introduction to Personality a. Definition and nature of personality b. Determinants of personality c. Eastern and Western Concept of personality	15	CO1 CO2 CO3 CO4	R U A 1 A2 E C
	Approaches to the study of personality		CO1	R U

Unit II	a. Type approach b. Trait approach c. Psychodynamic approach d. Psychosocial approach	15	CO2 CO3 CO4	A 1 A2 E C
Unit III	Introduction and theories of motivation a. Definition and Nature of Motivation, Concept of homeostasis b. Theory of needs and drives c. Maslow's theory of Self Actualization d. McClelland's theory of Needs	15	CO1 CO2 CO3 CO4	R A 1 A2 E C
Unit IV	Introduction and theories of emotion a. Definition, Nature and Physiological correlates of emotion. b. James Lange's theory of emotion c. Cannon and Bard's theory of emotion d. Schachter and Singer's theory of emotion e. Cognitive appraisal theory of emotion f. Practical on Emotional Intelligence	30	CO1 CO2 CO3 CO4	R A 1 A2 E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Suggested Books:

1. Allport, G.W. (1962). Personality: A Psychological Interpretation. Constable and Co.
2. Ciccarelli, S. K., and Meyer, G. E. (2010). Psychology: South Asian Edition. New Delhi: Pearson Education.
3. Cloninger S.C. (2012), Theories of Personality: Understanding Persons (6th Edition). Pearson Education
4. Feist, J., and Feist, G. J. (2012). Theories of Personality (8th ed.). New York: McGraw Hill
5. Passer, M.W. and Smith, R.E. (2010), Psychology: The science of mind and behaviour. New Delhi: Tata McGraw-Hill
6. Hall, G. C., Lindzey, G., and Campbell, J. C. (1998). Theories of personality (4th ed.). New York: Wiley.

Reference Books:

1. Barret, L. F., Niedenthal, P.M., and Winkielman (2005). Emotion and consciousness. New York: The Guilford Press.
2. Carr, A. (2008). Positive Psychology: The science of happiness and human strengths. New Delhi: Routledge
3. Ekman, P. (2003). Emotions revealed. London: Weidenfield and Nicolson.

4. Kitayama, S. and Markus, H.R. (1994). Emotion and culture empirical studies of mutual influence. Washington, DC: American Psychological Association.
5. Mishra G, and Mohanty A. K.(2002).Perspectives on Indigenous psychology(edited) New Delhi: Concept Publishing Company.

Assessment

Formative Assessment: 50marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50 marks

One Short Questions to be answered out of two given from lower order of RBT – (10 Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40 Marks).

SummativeAssessmentTime:2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
	(seal)	(seal)

III semester M Sc Psychology- Clinical Psychology (Elective-A)
23PSYMAJ601-A- Advanced Clinical Psychology I

Course Code	PSYMAJ601A	
Course Title	Advanced Clinical Psychology I	
Credits	3+1+0	
Lecture/Practical Hours	60	
Hours/Week	4	
Category	Major Core	
Semester	3	
Issue(s) Addressed	Introduction to clinical psychology and diagnostic assessment	
Regulation	2023	
Course Overview:	This course– a. Describe the basic concepts of clinical psychology and assessment b. Classify different cognitive and neuropsychological assessments,Classify different personality and other psycho-diagnostic assessments C)understand the etiology and current classificatory systems of mental disorders learn about the different symptoms, course and prognosis of mental disorders	
Course Objectives:	The students will be able to – i. Summarize the basic of clinical psychology and assessments ii. Understand classificatory systems used worldwide along with cultural -phenomenon and differences. iii. identify how individual differences and diversity impact psychological diagnosis and treatment. iv. Identify symptoms and etiologies of various disorders.	
Prerequisites:	Basic knowledge of Clinical Psychology.	
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to		
CLOs	STATEMENTS	BLOOM's LEVEL
CO1	Describe the nature and prerequisites of clinical psychology	R
CO2	Understand the process of assessment in clinical psychology	U
CO3	Contrast and compare the models of etiology of mental disorders	A1 and A2
CO4	Able to identify how individual differences and diversity impact psychological diagnosis and treatment	A1 and A2
CO5	Identify symptoms and aetiologies of various disorders.	A1, A2E and C

Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Introduction to Clinical Psychology - Definition, Scope, Historical Overview - Observation, Clinical Interview, Case History, Mental Status Examination, Psycho-diagnostic assessments - Ethical issues, Cultural issues, Currents scenario and future prospects Introduction to Psychopathology: - Classification systems in psychopathology: ICD-10/11 and DSM-5 - Major Theoretical Models of Psychopathology: The Biological model, Psychoanalytic model, Behaviouristic model, cognitive and socio cultural, social constructionist.	15	CO1 and CO2	R U A1 A2 E C
Unit II	Assessment of cognitive and neuropsychological functions - Vineland Social Maturity Scale - Raven's Progressive Matrices, - Advanced Progressive Matrices - Stanford Binet (5th Ed), Wechsler Adult Intelligence Scale (4th Ed), - Wechsler Memory Scale (3rd Ed.) - Millon's Clinical Multiaxial Inventory-3	15	CO3	R A1 A2 E C

	g. Learning Disability Evaluation Scale			
Unit III	Introduction to disorders 1) Anxiety related Disorders-(Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) Specific Phobia b) Panic Disorder c) Generalized Anxiety Disorder d) Social Anxiety Disorder e) Agoraphobia 2) Stress and Trauma Related Disorder-(Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) Adjustment disorder b) PTSD c) Acute stress disorder. 3) Obsessive Compulsive Related Disorder-(Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) OCD b) Hoarding Disorder c) Excoriation Disorder d) Body Dysmorphic Disorder e) Trichotillomania 4) Eating Disorder-(Aetiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) Anorexia Nervosa b) Bulimia Nervosa Binge Eating Disorder	15	CO4	R A1 A2 E C
Unit IV	Schizophrenia Spectrum Disorder.* 1. Schizoaffective Disorder* 2. Schizophreniform Disorder*			R U

	3. Delusional Disorder* 4. Brief Psychotic Disorder* a. * (Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment)	30	CO5	A1 A2 E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Suggested books

1. Ahuja, N (2011). *A Short Textbook of Psychiatry (7th Ed.)*, Jaypee Brothers Medical Publishers
2. Anastasi, A, and Urbina, S. (1997). *Psychological testing. (7th Ed., Indian Reprint)*, Pearson Education Inc.
3. Kaplan R.M, Saccuzzo D.P (2001) *Psychological Testing, Principles, applications and issues (5th ed.)* New Delhi Asian Books
4. Mangal S.K., Mangal S (2023) *Essentials of Clinical Psychology: An Indian Perspective*, Taylor And Francis
5. Walsh, K (1994). *Neuro-psychology – A Clinical Approach. (3rd Ed.)*, B.I. Churchill Livingstone Pub.

Reference Books

1. Exner, J.E. (1983). *Rorschach Assessment*. Wiley and Sons
2. Lezek M. D., (1995) *Neuropsychological Assessment*, Oxford University Press
3. Rapaport, D., Gill, M. and Schaffer, (1970). *Diagnostic Psychological Testing*. London Univ. of London Press
4. Singh, A.K. (1997). *Tests, Measurements and Research Methods in Behavioral Science*, N. D. Bharati Bhawan.
5. Strub, R.L. and Black, L.W. (2003). *The Mental Status Examination in Neurology, 4th edition*. F.A. Davis Company

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50 marks

Theory (25)

One Short Questions to be answered out of two given from lower order of RBT – (10 Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40 Marks).

SummativeAssessmentTime:2 Hours for pen and paper test

Practical (25)

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ602-A- Psychotherapy I

Course Code	23PSYMAJ602-A	
Course Title	Psychotherapy I (T + P)	
Credits	4	
Total Hours	45 hours Theory + 30 hours Practical	
Hours per Week	4	
Course Type	Major	
Semester	III	
Category	Major Core	
Intended Level	Clinical Psychology Specialization	
Issue(s) Addressed	Gender, Human values, professional ethics, theories and practice of counselling and psychotherapy	
Course Offered to	M Sc Psychology	
Regulation	2023	
Course Overview	This course: a. Provides the student with an opportunity to gain advanced knowledge and skills in psychotherapy b. Aims to provide each student the methods of practising psychotherapy using different approaches	
Prerequisite	i. Students are expected to adhere to American Psychological Association <i>Code of Ethics</i> . ii. Students are required to attend at least 75% of theory classes and all the practical assigned to the course	
Course Objectives	A student will be able to: i. Understand the theories of psychotherapy. ii. Understand the psychotherapy process. iii. Understand therapeutic techniques of major psychotherapies	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the nature and methods of psychotherapy	R
CO2	Gain an understanding of psychotherapy process.	U
CO3	Identify the different theoretical approaches used in psychotherapy.	A1
CO4	Demonstrate an appreciation of application of the theories of psychotherapy in practice.	A2
CO5	Refine and identify their professional and scientific methods of different types of psychotherapies.	E
CO6	Research various constructs and concepts	C

	used in psychotherapy			
Syllabus				
Units	Content	Lecture Hours	COs	RBT
Unit I	Research and training issues: a. Introduction; Research in Psychotherapy; b. Training and Supervision of individual Psychotherapists; c. Other critical issues in psychotherapy	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Psychodynamic therapies: a. Psychoanalysis; b. Adlerian Therapy; c. Brief Analytic; d. Object-Relations; e. Interpersonal Approaches	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Humanistic therapies: a. Client-Centered; b. Existential; c. Advanced current psychotherapies and counselling practices	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Behavioural and Cognitive-behavioural therapies: a. Behavioural therapy, b. Cognitive therapy (Beck), c. Rational Emotive Behaviour Therapy (Ellis). d. Mock counselling sessions	30	CO1 CO2 CO3 CO4 CO5 CO6	A1 A2 E C
Learning Resources: (Latest edition books listed in APA style: Seventh Edition) R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating Reference Books: 1. Sharf, R.S. (2000). Theories of psychotherapy and counselling: Concepts and cases (2nd Ed.). Singapore: Brooks/Cole. 2. Trull, T. J., and Phares, E. J. (2001). Clinical psychology: Concepts, methods, and profession (6thEd.). Belmont, CA: Wadsworth/Thomson Learning 3. Brems, C. (2000). Dealing with challenges in psychotherapy and counselling. Singapore: Brooks/Cole. 4. Brems, C. (2001). Basic skills in psychotherapy and counselling. Singapore: Brooks/Cole. Suggested readings: 1. Dryden, W. (2007). Dryden's handbook of individual therapy. (5th ed). Sage Publications: New Delhi. 2. Feltham, C. (ed.) (1999). Controversies in psychotherapy and counselling. New Delhi: Sage. 3. Hecker, J. E., and Thorpe, G. L. (2005). Introduction to clinical psychology: Science, practice, and ethics (Low Price Edition). Delhi: Pearson Education				

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

a) Theory (25 Marks).

b) Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature: (seal)	Name: Signature: (seal)	Name: Signature:

23PSYMAJ603-A- - Clinical Psychology Practicum

Course Code	23PSYMAJ 603-A

Course Title	Clinical Psychology Practicum			
Credits	(0+0+4)			
Lecture/Practical Hours	120			
Hours/Week	4			
Category	Major Core			
Semester	3			
Issue(s)Addressed	clinical psychopathology, diagnostic assessments using both DSM V and ICD 10.			
Regulation	2023			
Course Overview:	This course– a. understand the etiology and current classificatory systems of mental disorders b. learn about the different symptoms, course and prognosis of mental disorders			
Course Objectives:	1. To Understand the process of assessment in clinical psychology 2. To Classify and analyse different types of cognitive and neuropsychological tests 3. To Classify and analyse different types of personality and other psycho diagnostic tests 4. To Implement various psychological tests			
Prerequisites:	Basic knowledge of cognition, health psychology, abnormal psychology			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS			BLOOM's LEVEL
CO1	Understand the process of assessment in clinical psychology			R
CO2	Classify and analyse different types of cognitive and neuropsychological tests			U
CO3	Classify and analyse different types of personality and other psycho diagnostic tests			A1 A2
CO4	Implement various psychological tests			C
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	a. Assessment of cognitive functions (WAIS IV) b. DST	15	CO1 CO2 CO3	RU A1 A2

Unit II	a. Assessment of personality (NEO-PI-3) a. Assessment of Autism/ Learning Disability (CARS 2/SLD Comprehensive Diagnostic Battery)	15	CO1 CO2 CO3 CO4	RU A1 A2 E C
Unit III	A) STAT/BAI B) Academic Stress C) RIBT D)Y-BOCS E) Life Satisfaction Scale	15	CO1 CO2 CO3 CO4	R U A1 A2 E C
Unit IV	A) JPMR B) REBT C) Psychological Wellbeing Scale	30	CO1 CO2 CO3 CO4	R A1 A2 E
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Reference Books

1. Hamilton, M. (1976). Fish's Clinical Psychopathology. Year Book Medical Publishers, Incorporated.
2. International Statistical Classification of Diseases and Related Health Problems 10th Revision, ICD-10. (1992). World Health Organization.
3. Kaplan, H. and Sadock, B. (1997). Comprehensive Textbook of Psychiatry. Williams and Wilkins.
4. Kendall, P.C., and Butcher, J. N. (Eds). (1982). Handbook of research methods in clinical psychology. Wiley. New York.
5. Lazarus, R. S. and Folkman, S. (1984). Stress, Appraisal and Coping. Springer.
6. Makenna, P. J. (1997). Schizophrenia and related syndromes. Psychology Press.
7. Matson, J. L. and Mulick, J. A. (eds). (1991). Handbook of Mental Retardation. Pergamon Press.
8. Mondal, J. (2009). Mental Health, Mental Disorders and Psychotherapy. Sova Book agency.
9. Newton, T., Finman, S. and Handy, J. (1995). Managing Stress. Sage.
10. Pestonjee, D. M. (1992). Stress and Coping. An Indian Experience. Sage

Suggested Readings:

1. Andrade, C. (2000). Advances in Psychiatry. Oxford Univ Press.
2. Barnhill, J.W. (2013). DSM-5 (@) Clinical Cases, 1st Edition, American Psychiatric Association Publishing.
3. Berman, P. S. (1997). Case conceptualization and treatment planning. Sage.
4. Black, D. W. and Andreasen, N.C. (2017). Introductory Textbook of Psychiatry, DSM-5 Edition, CBS Publishers and Distributors.

5. Butcher, J.N., Hooley, J.M., Mineka, S. and Dwivedi, C.B. (2014). Abnormal Psychology, 16th Edition, Pearson.
6. Cohen, D. J. and Volkman, F. R. (1997). Handbook of autism and Pervasive developmental disorder. Wiley.
7. Comer, R. J. (1998). Abnormal Psychology. WH Freeman and Company.
8. Dagnostic and Statistical Manual (Fifth Edition), DSM-5tm, (2013). American Psychiatric Association.
9. Gelder, M., Gath, D., Mayou, R. and Cowen, P (1996). Oxford Textbook of Psychiatry. Oxford Univ Press.
10. Goldberger, L., and Brezenitz, S. (1982). Handbook of Stress. Theoretical and Clinical Aspect. The Free Press. New York.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50 marks

Theory (25)

One Short Questions to be answered out of two given from lower order of RBT – (10 Marks)

Two Long Questions to be answered out of four set from higher order of RBT–(40 Marks).

SummativeAssessmentTime:2 Hours for pen and paper test.

Practical (25)

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

PSYMAJ604: Positive Psychology

Course Code	PSYMAJ604			
Course Title	Positive Psychology			
Credits	4(4+0+0)			
Lecture/Practical Hours	60			
Hours/Week	4			
Category	Major			
Semester	III			
Issue(s)Addressed	Happiness and life satisfaction, Wellbeing, Character Strength and Virtues Gender, Human values and Ethics			
Regulation	2023			
Course Overview:	This course– a. Understand the nature and theories of positive psychology. b. Explain the major types of positive emotions. c. Analyze the nature of character strength and virtues. d. Analyze the nature of happiness. e. Analyze the nature of wellbeing.			
Course Objectives:	The students will be able to– i. Describe the nature and history of positive psychology. ii. Understand the major positive emotions. iii. Analyze the concept of character strength virtues iv. Analyze the concept of happiness v. Analyze the concept of wellbeing.			
Prerequisites:	Knowledge on the basics of happiness and wellbeing			
Course Outcomes(Cos)and Cognitive Level Mapping At the end of this course, the students will be able to				
Cos	STATEMENTS			BLOOM's LEVEL
CO1	Describe the nature and perspective of positive psychology.			R
CO2	Distinguish different positive emotions.			U
CO3	Explain the nature and concept of character strength and virtues.			A1 A2
CO4	Classify the types and strategies of happiness.			E
CO5	Classify the types and indicators of wellbeing.			C
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Introduction to Positive Psychology	15	CO1	R
	a) Definition and nature of positive psychology		CO2	U A1 A2
	b) Historical development		CO3	E
	c) Theoretical perspective		CO4	C

	d) Dimensions and Scopes of Positive Psychology		CO5	
Unit II	Positive Emotional States and Processes a. Positive Emotional States: Nature and determinants of Hope, Optimism, Gratitude, Forgiveness and Love b. Influence of Positive Emotions on physical and mental health c. The positive psychology of emotional intelligence d. Positive Psychology in the fields of health, education, work and everyday life	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit III	Strength and Virtues a. Definition, Classification, Nurturance and Assessment of virtues b. Barriers and obstacles in the development of strength and virtues c. Empathy and Altruism d. Resilience in the face of challenge and loss	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit IV	Happiness and Wellbeing a. Definition, Nature, Determinants and Types of happiness	15	CO1 CO2	R U A1 A2

	b. Traits associated with happiness and enhancement strategies c. Definition, Nature, Determinants and Types of Wellbeing d. Indicators of life satisfaction and wellbeing		CO3 CO4 CO5	E C
R: Remembering, U: Understanding, A1:Applying, A2:Analysing, E: Evaluating, C:Creating				

Reference Books:

1. Compton, W.C. (2005). *Introduction to positive psychology*. Belmont: Wadsworth.
2. Linley, P.A; and Joseph, S.(2004). *Positive psychology in practice*. New York:Wiley.
3. Peterson, C. (2006), *Positive Psychology*, New York: Oxford University Press Goleman and Daniel, Emotional Intelligence
4. Peterson, C., and Seligman, M. E. (2004). *Character strengths and virtues: A handbook and classification* (Vol. 1). Oxford University Press.
5. Snyder, C. R., and Lopez, S. J. (Eds.). (2001). *Handbook of positive psychology*. Oxford university press.

Suggested Books:

1. Argyle, M. 1987. *The psychology of happiness*. London: Methuen.
2. Baumgardner, S.R. and Crothers, M.K. (2009). *Positive Psychology*. New Delhi: Pearson Education
3. Carr, A. (2004). *Positive Psychology*. The Science of Happiness and Human Strengths. London. Routledge.
4. Lopez, S. J. (Ed.). (2011). *The encyclopedia of positive psychology*. John Wiley and Sons.
5. Snyder, C.R. and Lopez, S. (2007). *Positive Psychology. The scientific and Practical explorations of Human Strengths*. Sage Publications

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks
Theory (50 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:
(seal)	(seal)	

23PSYMAJ605-A- Internship (Clinical Psychology)

Course Code	23PSYMAJ 602-A			
Course Title	Internship Clinical Psychology			
Credits	(0+0+4)			
Lecture/ Practical Hours	120			
Hours/Week	4			
Category	Major Core			
Semester	3			
Issue(s)Add ressed	clinical psychopathology, diagnostic assessments using both DSM V and ICD 10.			
Regulation	2023			
Course Overview:	This course– Offers the internship program designed to develop and enhance the student's knowledge of Clinical psychology			
Course Objectives:	a) To Understand the purpose of the internship requirement to gain practical, on-the-job experience in areas relevant to the practice of I/O psychology. b) To Implement the course material or theoretical knowledge in practice.			
Prerequisit es:	Basic knowledge of Psychological skills			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS			BLOOM's LEVEL
CO1	Implementation the course material or theoretical knowledge in practice.			R
CO2	· Understand the purpose of the internship requirement to gain practical, on-the-job experience in areas relevant to the practice of I/O psychology.			U
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
	Once the student has secured an internship, a daily log of internship hours should be kept and maintained throughout the internship experience.	120	CO1	R U

The daily log should include detailed information regarding activities/achievements, insights, time spent on each activity, as well as feelings or reactions. This log will be used to facilitate writing your Internship Report, which will include the following: a) An executive summary b) Internship log c) Overall evaluation of the internship d) A technical report describing the purpose of internship, projects completed, and general outcomes. e) An Appendix including any materials created during the course of internship. A brief presentation providing an overview of the report will be given at the end of the semester.		CO2	A1
		CO3	A2
			E
			C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating			

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory Internship report (25 Marks).

Practical and Viva (25 Marks).

Evaluation:

a) Internship Report

b) Presentation and Comprehensive Viva Voce

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

(seal)

Semester III-Industrial and Organizational Psychology (Elective-B)

23PSYMAJ601-B- Introduction to Industrial and Organizational Psychology

Course Code	23PSYMAJ601-B	
Course Title	Introduction to Industrial and Organizational Psychology	
Credits	4	
Total Hours	45 hours Theory + 30 hours Practical	
Hours per Week	4	
Course Type	Major	
Semester	III	
Category	Major Core	
Intended Level	Organizational Psychology Specialization	
Issue(s) Addressed	Gender, Human values, professional ethics, theories and practice of organizational psychology	
Course Offered to	M Sc Psychology	
Regulation	2023	
Course Overview	This course: a. Covers the concepts, nature and principles of industrial and organizational psychology. b. Examines the fundamental processes and core psychological concepts, models, classical theories, varied perspectives in the study of behaviour in workplace setting.	
Prerequisite	Baic knowledge in psychology and managerial science	
Course Objectives	A student will be able to: v. Understand the concept, nature and principles and used of research methods in industrial and organizational psychology. vi. Acquaint with the basic psychological processes in organizations and to develop knowledge in handling human issues in organizations. vii. Develop an understanding of workplace behaviour such as motivation, leadership and attitude in	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept, nature and principles and used of research methods in industrial and organizational psychology.	R
CO2	Explain the basic psychological processes in organizations and to develop knowledge in handling human issues in organizations.	U
CO3	Develop an understanding of workplace behaviour such as motivation, leadership and attitude in	A1 and A2

Syllabus				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Industrial and Organizational Psychology a) Definition, and Nature Of I/O Psychology b) Fields of I/O Psychology a. Research Methods: Observation, Correlation and Experimental	15	CO1 CO2 CO3	R U and A1 U and A1
Unit II	Organizational Behavior a) Definition, Nature and Scope of Organizational Behavior b) Factors Affecting Behavior in Organizations (Individual, Group and Organization System Level) c) Theories of Organizations: Classic Organizational Theory, Human Relation Theory, Contingency Theory And System Theory	15	CO1 CO2 CO3	R and U U and A1 U and A1
Unit III	The Motivation to Work and Leadership a) Meaning and Importance of Motivation in the Workplace b) Motivational Theories: Need, Behavior, Job Design And Cognitive Theories c) Approaches to the Study of Leadership: Trait, Behavioral and Contingency	15	CO1 CO2 CO3	R and U U and A1 U and A1
Unit IV	Organizational Attitudes Emotions and Behavior a) Attitude: Definition and Components, Types of Job Attitude- Job Satisfaction, Job Involvement, Organizational Commitment, Psychological Contract b) Emotions at Workplace: Emotional Labor c) Positive Organizational Behavior	15	CO1 CO2 CO3	R and U U and A1 A2 and E
Learning Resources: (Latest edition books listed in APA style: Seventh Edition) Reference Books 1. Muchinsky, Paul M.. (1990). Psychology applied to work : an introduction to industrial and organizational psychology 2. Steve M. Jex, Thomas W. Britt., Organizational psychology : a scientist-practitioner approach ; Third edition				

3. Parameshwaran, E. G., and Beena, C. (2010): An Invitation to Psychology, Neelkamal Pvt. Hyderabad

Suggested books

1. Kinicki, A., and Kreitner, R. (2008). Organizational Behaviour: Key Concepts, Skills and Best Practices (pp. 16-17). The McGraw-Hill Companies
2. Luthans, F., Luthans, K. W., and Luthans, B. C. (2015). Organizational Behaviour: An Evidence-based Approach (13th ed.). Charlotte, North Carolina: Information Age.
3. Robbins, Stephen P., Judge, Timothy A.. Organizational Behaviour. 14th Ed Upper Saddle River, New Jersey: Pearson, 2011.
4. Riggio, Ronald E.. (2013). Introduction to industrial/organizational psychology, 6th ed.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal) (seal)

23PSYMAJ602-B- Personnel Psychology

Course Code	23PSYMAJ602-B				
Course Title	Personnel Psychology				
Credits	4 (3+1+0)				
Total Hours	60				
Hours per Week	4				
Course Type	Major				
Semester	III				
Category	Major Core				
Intended Level	Organizational Psychology Specialization				
Issue(s) Addressed	Gender, Human values, professional ethics, theories and practice of personnel psychology				
Course Offered to	M Sc Psychology				
Regulation	2023				
Course Overview	This course: a. Covers the concept, nature and principles of personnel psychology. b. Examines the fundamental processes and core psychological concepts, models, classical theories in personnel psychology.				
Prerequisite	Baic knowledge in psychology and managerial science				
Course Objectives	A student will be able to: i. Acquaint with the concept and nature of personnel psychology ii. Understand and apply the process of recruitment and selection iii. Develop an understanding of job design and job analysis iv. Understand the concept and methods of performance appraisal				
Course Outcomes based on RBT and Cognitive Level Mapping					
At the end of this course, a student will be able to:					
COs	Statements	Cognitive Level Mapping			
C01	Define the concept and nature of personnel psychology	R			
CO2	Apply the process of recruitment and selection	U			
CO3	Understand the job design and job analysis process and methods	A1 and A2			
CO4	Explain the concept and methods of performance appraisal	C			
Syllabus					
Units	Content	Lecture Hours	COs	RBT	
Unit I	Framework of Personnel Psychology a) Nature and Scope of Personnel Psychology b) Function of Personnel Psychologist	15	CO1 CO2 CO3	R U and A1 A1and	

	c) Importance of Human Resource Management			A2
Unit II	Employee Recruitment selection and Placement a) Human Resource Planning b) Steps in the Employee Selection Process c) A Model for Employee Selection, Methods for Assessing and Selecting Employees	15	CO1 CO2 CO3	R and U U and A1 U and A1
Unit III	Job design and Job Analysis a) Job Design: Definition, Designing Efficient Jobs, Job Enrichment b) Job Analysis: Definition, Methods and Specific Job Analysis Techniques c) Job Evaluation and Comparable worth	15	CO1 CO2 CO3	R and U U and A1 U and A1
Unit IV	Performance Management a) Performance Appraisal: Definition and Methods b) Sources of performance Appraisal Information c) Errors in performance Appraisal	15	CO1 CO2 CO3	R and U U and A1 A2 and E

Reference Books

1. Arnold J., Robinson, Iran, T. and Cooper, Cary L (1996): Work Psychology, Macmillan India Ltd.
2. Jayagopal, R (1990): Human Resource Development: Conceptual Analysis and Strategies, Sterling Publishing, New Delhi.
3. Paranjpe Vivek (1991): Human Resource Management In India : Legal Perspective, Capital Books International, New Delhi.

Suggested books

1. Mamoria, C. B., Gankar, S. V., and Pareek, U. (2011). Personnel Management, Mumbai, Himalaya Publishing House.
2. Muchinsky, Paul M.. (1990). Psychology applied to work : an introduction to industrial and organizational psychology
3. Riggio, Ronald E.. (2013). Introduction to industrial/organizational psychology, 6th ed.
4. Subba Rao, P. (2011). Essentials of Human Resource Management and Industrial Relations. Mumbai, Himalaya Publishing House.
5. Tomas Chamorro-Premuzic and Adrian Furnham (2010), The Psychology of Personnel Selection, First Edition, Cambridge University Press, The Edinburgh Building, Cambridge CB2 8RU, UK

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

(seal)

23PSYMAJ603-B- - Industrial Psychology Practicum

Course Code	23PSYMAJ 603-B			
Course Title	I/O Psychology Practicum			
Credits	(0+0+4)			
Lecture/Practical Hours	120			
Hours/Week	4			
Category	Major Core			
Semester	3			
Issue(s)Address ed	Psychological training tools, techniques and methods in industrial psychology			
Regulation	2023			
Course Overview:	This course– Offers the practical aspects of understanding, applying various psychological tools and equipment’s in the field of industrial and organizational psychology to address and solve individual, groups and organizational problems.			
Course Objectives:	i. Carry out practical in the different areas of Industrial psychology. ii. Familiarize with the psychological tests used for Industrial purposes. iii. Apply the knowledge and skills for administering tests and writing their reports.			
Prerequisites:	Basic knowledge of Psychology			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS			BLOOM’s LEVEL
CO1	Understand the process of assessment in I/O psychology			R
CO2	Analyse the different types of psychological tests			U
CO3	Implement various psychological tests			A1
CO4	Apply the use of psychological tools in the process of organization			A2
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	a) Recruitment and Selection	15	CO1	R
	b) Quality of Life		CO2	U
	c) Work Motivation		CO3	A2

Unit II	a) Occupational Stress b) Organizational Climate/Culture c) Leadership d) Life Satisfaction Scale	15	CO1 CO2 CO3 CO4	R U A2
Unit III	a) Training and Development b) Emotional Labour c) Positive Organizational Behaviour	15	CO1 CO2 CO3	R U A1
Unit IV	a) Job Analysis b) Job Satisfaction c) Performance Appraisal d) Psychological well-being scale	15	CO1 CO2 CO3	R A1 A2 E
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Practical and Viva (50 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

(seal)

23PSYMAJ605-B- Internship (Organizational Psychology)

Course Code	23PSYMAJ 605-B			
Course Title	Internship Organizational Psychology			
Credits	(0+0+4)			
Lecture/ Practical Hours	120			
Hours/Week	4			
Category	Major Core			
Semester	3			
Issue(s)Address sed	Industrial and Organisational psychology, Personnel Psychology and Organisational Behavior			
Regulation	2023			
Course Overview:	This course– Offers the internship program designed to develop and enhance the student's knowledge of Organizational psychology			
Course Objectives:	a) To Understand the purpose of the internship requirement to gain practical, on-the-job experience in areas relevant to the practice of I/O psychology. b) To Implement the course material or theoretical knowledge in practice.			
Prerequisites:	Basic knowledge of Psychological skills			
Course Learning Outcomes (CLOs) and Cognitive Level Mapping At the end of this course, the students will be able to				
CLOs	STATEMENTS			BLOOM's LEVEL
CO1	Implementation the course material or theoretical knowledge in practice.			R
CO2	· Understand the purpose of the internship requirement to gain practical, on-the-job experience in areas relevant to the practice of I/O psychology. ·			U
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
	Once the student has secured an internship, a daily log of internship hours should be kept and maintained throughout the internship experience.		CO1	RUA1

	The daily log should include detailed information regarding activities/achievements, insights, time spent on each activity, as well as feelings or reactions. This log will be used to facilitate writing your Internship Report, which will include the following: a) An executive summary b) Internship log c) Overall evaluation of the internship d) A technical report describing the purpose of internship, projects completed, and general outcomes. e) An Appendix including any materials created during the course of internship. A brief presentation providing an overview of the report will be given at the end of the semester.	120	CO2 CO3	A2 E C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory Internship report (25 Marks).

Practical and Viva (25 Marks).

Evaluation Methods:

a) Internship Report

b) Presentation and Comprehensive Viva Voce

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

(seal)

IV semester M Sc Psychology- Clinical Psychology (Elective-A)

23PSYMAJ 606-A- Advanced Clinical Psychology II

Course Code	23PSYMAJ 651-A				
Course Title	Advanced Clinical Psychology II				
Credits	04 (3+0+1)				
Lecture/Practical Hours	60				
Hours/Week	4				
Category	Major Core				
Semester	3				
Issue(s)Addressed	symptoms and etiologies of various disorders, and treatment procedure.				
Regulation	2024				
Course Overview:	a. understand the etiology and current classificatory systems of mental disorders b. learn about the different symptoms, course and prognosis of mental disorders				
Prerequisites:	Basic knowledge of cognition, health psychology, abnormal psychology				
Course Objectives:	I. To develop an understanding of the most common psychiatric illnesses and the basis of psychopathology formation II. To Identify symptoms and etiologies of various disorders III. To enable students to the study and prediction of adaptive and maladaptive behaviors and its processes across lifespan. IV. To demonstrate understanding of skills required to diagnose various disorders.				
Course Outcomes (Cos)and Cognitive Level Mapping At the end of this course, the students will be able to					
Cos	STATEMENTS			BLOOM's LEVEL	
CO1	Contrast and compare the models of etiology of mental disorders			R	
CO2	Identify symptoms and etiologies of various disorders.			U	
CO3	Demonstrate understanding of skills required to diagnose various disorders.			A1 A2	
CO4	Enable students to the study and prediction of adaptive and maladaptive behaviors and its processes across lifespan.			C	
Syllabus					
UNITS	CONTENT		HOURS	Cos	RBT

Unit I	1) Mood disorder-(Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) Bipolar I b) Bipolar II c) Major Depressive Disorder d) Persistent Depressive Disorder e) Premenstrual Dysphoric Disorder f) Cyclothymic Disorder 2) Somatic Symptom and Dissociative Disorder--(Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) Somatic Symptom Disorder b) Hypochondriasis c) Somatization Disorder d) Conversion Disorder e) Depersonalization/Derealization Disorder f) Dissociative Identity Disorder. 3) Sexual Dysfunctions and Gender Dysphoria	15	CO 1C O2 CO 3	R U U
Unit II	1) Personality Disorder- -(Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) Cluster A b) Cluster B c) Cluster C 2) Substant Related Disorder	15	CO1 CO2 CO3	RUA 1 A2 E C
Unit III	1) Neurocognitive Disorder--(Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) Delirium b) Parkinson c) Huntington d) Alzheimer 2) Neurodevelopmental Disorder--(Etiology, Diagnosis, Clinical Features, Differential Diagnosis, Prognosis, Treatment) a) ADHD	15	CO 1C O2	R U U U

	b) Oppositional Disorder c) ASD d) TIC			
Unit IV	Practical- 1) TAT 2) BDI-2 3) DST 4) MMPI	30	CO1 CO2	U A1
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Reference Books

1. Andrade, C. (2000). Advances in Psychiatry. Oxford Univ Press.
2. Barnhill, J.W. (2013). DSM-5 (@) Clinical Cases, 1st Edition, American Psychiatric Association Publishing.
3. Berman, P. S. (1997). Case conceptualization and treatment planning. Sage.
4. Black, D. W. and Andreasen, N.C. (2017). Introductory Textbook of Psychiatry, DSM-5 Edition, CBS Publishers and Distributors.
5. Butcher, J.N., Hooley, J.M., Mineka, S. and Dwivedi, C.B. (2014). Abnormal Psychology, 16th Edition, Pearson.
6. Cohen, D. J. and Volkman, F. R. (1997). Handbook of autism and Pervasive developmental disorder. Wiley.
7. Comer, R. J. (1998). Abnormal Psychology. WH Freeman and Company.
8. Diagnostic and Statistical Manual (Fifth Edition), DSM-5tm, (2013). American Psychiatric Association.
9. Gelder, M., Gath, D., Mayou, R. and Cowen, P (1996). Oxford Textbook of Psychiatry. Oxford Univ Press.
10. Goldberger, L., and Brezenitz, S. (1982). Handbook of Stress. Theoretical and Clinical Aspect. The Free Press. New York.

Suggested Readings:

1. Hamilton, M. (1976). Fish's Clinical Psychopathology. Year Book Medical Publishers, Incorporated.
2. International Statistical Classification of Diseases and Related Health Problems 10th Revision, ICD-10. (1992). World Health Organization.
3. Kaplan, H. and Sadock, B. (1997). Comprehensive Textbook of Psychiatry. Williams and Wilkins.
4. Kendall, P.C., and Butcher, J. N. (Eds). (1982). Handbook of research methods in clinical psychology. Wiley. New York.
5. Lazarus, R. S. and Folkman, S. (1984). Stress, Appraisal and Coping. Springer.
6. Makenna, P. J. (1997). Schizophrenia and related syndromes. Psychology Press.
7. Matson, J. L. and Mulick, J. A. (eds). (1991). Handbook of Mental Retardation. Pergamon Press.
8. Mondal, J. (2009). Mental Health, Mental Disorders and Psychotherapy. Sova Book agency.
9. Newton, T., Finman, S. and Handy, J. (1995). Managing Stress. Sage.
10. Pestonjee, D. M. (1992). Stress and Coping. An Indian Experience. Sage

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ 607-A

Psychotherapy-II

Course Code	23PSYMAJ652-A	
Course Title	Psychotherapy II (T + P)	
Credits	4	
Total Hours	45 hours Theory + 30 hours Practical	
Hours per Week	4	
Course Type	Major	
Semester	IV	
Intended Level	Clinical Psychology Specialization	
Issue(s) Addressed	Gender, Human values, professional ethics, group and family therapy techniques	
Course Offered to	M Sc Psychology	
Regulation	2023 - 24	
Course Overview	This course: a. Provides the student with an opportunity to gain knowledge and skills in different types of group and family psychotherapies b. Aims to provide each student the methods of practising various methods of group and family psychotherapy using different approaches.	
Prerequisite	i. Students are expected to adhere to American Psychological Association <i>Code of Ethics</i> . ii.Students are required to attend at least 75% of theory classes and all the practical assigned to the course	
Course Objectives	A student will be able to: i. Understand the theories of different types of group and family psychotherapy. ii. Understand the group therapy process. iii. Understand major family therapies	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the nature and methods of different types of group and family psychotherapies	R
CO2	Gain an understanding of group and family therapies	U

CO3	Identify the different theoretical approaches used in group and family therapies.	A1		
CO4	Demonstrate an appreciation of application of the theories of group and family therapy.	A2		
CO5	Refine and identify their professional and scientific methods of different types of group and family psychotherapies.	E		
CO6	Research various constructs and concepts used in group and family therapies.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Historical outlook and developmental structures: a. History of Family Therapy / Group therapy; b. Developmental structure in Family therapy and group therapy	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Approaches in group therapy: a. Group therapy theories; b. Emergence of group therapy based interventions; c. Brief forms of group therapy; d. Group interventions techniques	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Approaches in Family therapy: a. Family Therapy basics, case history taking and diagnosis b. Theories-structural, psychodynamic, strategic, systemic and behavioural c. Treatment of family and couples using Family therapy techniques. d. Hypothesis formulation, circular questions, intervention plan	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Research and Application: a. Research in family therapy; b. Applications of group and family therapy; c. Modern developments in family therapy d. Mock group therapy-practical e. Mock family counselling-practical	30	CO1 CO2 CO3 CO4 CO5 CO6	A1 A2 E C

Learning Resources: (Latest edition books listed in APA style: Seventh Edition)

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Reference Books:

1. Nichols, P.M and Schwartz C.R (2006). *Family Therapy –concepts and methods*, 7th edition, Allyn and Bacon, Boston, Pearson education, Inc.
2. Corey, G (2008) *Theory and Practice of Group Psychotherapy*, 8TH edition, Pacific Grove, C A: Brooks/Cole.
3. Agazarian, Y. M. (1997), *System-Centered Therapy for Groups*, Guilford Press
4. Alonso, A., and Swiller, H.I. (1992) *Group Therapy in Clinical Practice*, American Psychiatric Press, Inc.

Suggested readings:

1. Bernard, H. S. and Mac Kenzie, K.R. (eds.) (1999), *Basics of Group Psychotherapy*, Guilford Press.
2. Bion, W.R. (1959) *Experiences in Groups and other Papers*. N.Y.: Basic Books.
3. Corey, M. and Corey, G. (1997) *Groups: Process and Practice* (5th ed.) Pacific Grove, CA: Brooks/Cole.
4. Dies, R.R. and Mac Kenzie, K.R. (1983) *Advances in Group Psychotherapy: Integrating Research and Practice*. N.Y.: International University Press.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ 608-A**Health Psychology**

Course Code	PSYMAJ653A
Course Title	Health Psychology
Credits	3+0+1
Lecture/Practical Hours	45L+30P
Hours/Week	4
Course Type	Major
Semester	IV
Intended Level	Clinical Psychology Specialization
Issues Addressed	Theories of health, Stress, Health issues
Course Offered to	M Sc Psychology
Regulation	2023-2024

Course Overview:**This course –**

- Identify the basic concepts of health psychology.
- Explain the process of stress, its physiology and models.
- Summarize the nature of stress related disorders.
- Implement various psychological tests.

Course Objectives:**The students will be able to –**

- Describe health psychology and its models.
- Understand the nature of stress and coping.
- Analyze the causes and management of various stress related disorders.
- Conduct psychological assessments.

Prerequisites: Knowledge of the different branches of Psychology.

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to

Cos	STATEMENTS	BLOOM's LEVEL
CO1	Describe Health Psychology and its theoretical concepts	R
CO2	Summarize the nature of stress and coping	U
CO3	Distinguish and Apply Health Promoting and Health Damaging behaviours.	A1 and A2
CO4	Examine the sources and management of different chronic health problems.	A2
CO5	Implement various psychological tests	E and C

Syllabus

UNITS	CONTENT	HOURS	Cos	REVISED BLOOM's TAXONOMY

Unit 1	Introduction to Health Psychology - Key Concepts: Definition, Goals, Assumptions, - Theoretical perspective in Health Psychology: Biomedical model, Biopsychosocial model, Health Belief Model, Theory of Planned Behaviour, Self Regulating model - Health Psychologist: Education, Training, Role, Difference with other Mental Health Professionals - Current status and future trends: Concept of National and District Mental Health Programmes, National Mental Health Policies, Challenges of Healthcare system in India, Future of Health Psychology in India	15	CO1	R and U U U and A2 A2 and E
Unit 2	Stress and Coping - Stress: Definition, Physiology, Sources and Types - Models of Stress: GAS and Cognitive Appraisal - Life situation and perception of stress: Stress in children, adolescents, elderly and trauma victims - Coping: Definition and Types	15	CO2	R and U U and A2 A2 E
Unit 3	Chronic Health Problems and Health Habits - Introduction: Definition and sources of chronic health problems - Nature of major chronic health problems: Hypertension, Heart Disease, Cancer, Type II Diabetes, AIDS, Migraine, Asthma - Emotional response to chronic health problems: Denial, Anxiety, Depression - Health habits: Health Promoting (Diet, Exercise, Sleep, Vaccination, Screening) and Health Damaging behaviours (Smoking, Drinking, Obesity)	15	CO3 and CO4	R U and A2 U and A2 C
Unit 4	Practical (Any 2) - Measurement of stress (Perceived Stress Scale-10) - Measurement of coping styles (Coping Checklist) - Measurement of overall health (Psycho Physiological State Inventory) - Measurement of problems (Problem Checklist)	30	CO5	E and C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Reference Books

1. Brannon, L., Feist, J., and Updegraff, J. A. (2013). *Health psychology: An introduction to behavior and health*. Cengage Learning.
2. Chen, D. D. (2017). *Stress Management and Prevention: Applications to Daily Life*, Taylor and Francis, 3rd Edition.
3. Weiten, W. and Lloyd, M. (2007). *Psychology applied to modern life: Adjustment in the 21st century*, Indian Edition 8th. Thomson
4. Drench, M. E., Noonan, A. C., Sharby, N., and Ventura, S. H. (2007). *Psychosocial aspects of health care*. Upper Saddle River, NJ: Pearson Prentice Hall.
5. Anisman, H. (2021). *Health psychology: a biopsychosocial approach*. Sage.

Suggested books

1. Lovallo, W.R. (2004). *Stress and Health: Biological and Psychological Interactions (Behavioral Medicine and Health Psychology)*, 2nd Edition. Sage Publications.
6. Ogden, J. (2017). *Health psychology: A textbook* (4th ed.). McGraw Hill Education.
7. Sarafino, Edward P and Smith, Timothy W (2012). *Health Psychology – Bio psychosocial Interaction* (7th ed). Wiley India Edition.
8. Taylor, Shelley E. (2018). *Health Psychology* (10th ed). McGraw Hill Higher Education. Indian Edition
9. Straub, R. O. (2011). *Health psychology*. Macmillan.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

(seal)

IV semester M Sc Psychology- Organisational Psychology (Elective-B)

23PSYMAJ 606-B

**Organizational Stress,
Management of Stress and
Employee Wellbeing**

Course Code	PSYMAJ651B
Course Title	Organizational stress, management of stress and employee wellbeing
Credits	3+0+1
Lecture/Practical Hours	45-L 30-P
Hours/Week	4
Semester	4

Course Overview:

This course –

- Describe the basic nature of workplace stress
- Estimate the ways of handling occupational stress
- Examine the nature of Employee Assistant Programme
- Implement various psychological tests related to occupational stress

Course Objectives:

The students will be able to

- Summarize the basic of occupational stress
- Analyze the techniques of workplace stress management
- Analyze the nature of Employee Assistant Programme
- Conduct psychological tests related to occupational stress

Prerequisites: Knowledge of the basics of psychology

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to

Cos	STATEMENTS	BLOOM's LEVEL
CO1	Describe the nature of occupational stress	R
CO2	Understand the theoretical perspective of work stress and its sources	U
CO3	Classify and analyse different types of coping and stress management techniques	A1 and A2
CO4	Classify and analyse different types of Employee Assistant Programme	A1 and A2
CO5	Implement various psychological tests	E and C

Syllabus

UNITS	CONTENT	HOURS	Cos	REVISED BLOOM's TAXONOMY
Unit 1	Stress in Workplace a. Definition, Concept and Sources of occupational stress b. Theoretical framework, Person-		CO1	R and U

	Environment Fit Approach, Job Demands-Control Model, Effort-Reward Imbalance Theory c. Effects of occupational stress on job satisfaction, physical and psychological health d. Job related burnout, Symptoms of workplace stress related diseases, Absenteeism	15	and CO2	U A1 U and A2
Unit 2	Stress and Coping a. Holistic Model of coping, coping styles, stress management techniques Intervention concerning task and work environment, b. Effectiveness of organization-based interventions c. Organizational Role clarity, Role of managers and Social Relationships d. Counseling and Career Planning	15	CO3	U A1 U and A2 A2 and C
Unit 3	Employee Assistance Program a. Nature b. Strength and Challenges c. Evaluation d. Future Roles	15	CO4	U, A1 and C U, A1 and C
Unit 4	Practical (any 2) a. Assessment of burnout (Maslach Burnout Inventory) b. Assessment of organizational role stress (Organizational Role Stress Scale) c. Assessment of absenteeism (Absenteeism Questionnaire by WHO) d. Assessment of EAP effectiveness	30	CO5	E and C
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Reference Books

1. Agarwal, R. (2001). *Stress in Life and at Work*. Response Books
2. Soderback, I. (Eds.). (2015). *International Handbook of Occupational Therapy Interventions*. 2nd Edition. Springer.
3. Stranks, J. (2005). *Stress at Work Management and Prevention*. Routledge.
4. Weinberg, A., Sutherland, V.J., Cooper, C. (2016). *Organizational Stress Management: A Strategic Approach*. United Kingdom. Palgrave Macmillan.
5. Wong, P.T.P, Wong, L.C.J. (2005). *Handbook of Multicultural Perspective on stress and coping (International and Cultural Psychology)*. Canada. Springer Publishers

Suggested books

1. Anisman, H. (2014). *An Introduction to Stress and Health*. Sage.
2. Dewe, P.J., O'Driscoll, M. P. and Cooper, C.L. (2010). *Coping with Work Stress: A Review and Critique*. Wiley- Blackwell
3. Pestonjee, D.M, Pande, S. (2013). *Stress and Work: Perspectives on Understanding and Managing Stress*. India. Sage Publication.

4. Quick, J.C. and Telrik, L.E. (2014). *Handbook of occupational health Psychology. Second Revised Edition*. Washington DC. American Psychological Association.
5. Rice, V. H. (Eds.). (2000). *Handbook of Stress, Coping, and Health*. Sage.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

(seal)

23PSYMAJ 607-B**Organisational Development and Strategic Management**

Course Code	23PSYMAJ 652-B	
Course Title	Work Environment and Strategic Management	
Credits	04(3+0+1)	
Lecture/Practical Hours	30+30	
Hours/Week	4	
Semester	4	
Issue(s)Addressed	Organizational culture, conflict management.	
Regulation	2024	
Course Overview:	a. Understand Nature of Organizational Culture Organizational Socialization , Multiculturalism and Diversity Management. b. Negotiation strategies and process for conflict Management.	
Prerequisites:	Basic Knowledge about Industrial Psychology.	
Course Objectives:	I. To sensitize students to the need of managing differently in diverse cultural environments II. To develop skills for diagnosing and understanding heterogeneity of cultures, and to function effectively in them. III. To develop effective communication skills to resolve organizational conflict. IV. To develop Negotiation strategies and process.	
Course Outcomes(Cos)and Cognitive Level Mapping At the end of this course ,the students will be able to		
Cos	STATEMENTS	BLOOM’s LEVEL
CO1	Explain the techniques for managing different diverse cultural environments	R
CO2	Develop skills for diagnosing and understanding heterogeneity of cultures, and to function effectively in them	U
CO3	Develop effective communication skills to resolve organizational conflict.	A1 A2
CO4	Develop Negotiation strategies and process.	C

Syllabus				
UNITS	CONTENT	HOURS	Cos	RBT
Unit I	Organizational Culture and Organizational Development a) Nature of Organizational Culture b) Creating , Sustaining and Changing Culture c) Organizational Socialization , Multiculturalism and Diversity Management d) Entrepreneurship development e) Innovation f) Knowledge development Communication, conflict and decision making a) Definition and Types of communication b) Barriers to communication c) Conflict-resolution techniques, causes and consequences d) Decision making e) Johari Window, Transactional Analysis	15	CO 1C O2 CO 3 CO4	R U A 1 A2
Unit II	i)Work Motivation and Quality of Work life. a) Concept b) Relationship between work motivation and QWL c) Theories of work motivation ii) Quality of work life a) Concept b) Determinants c) Evaluating and increasing quality of work life	15	CO 1C O2 CO 3	R U A 1 A2 E

Unit III	1. Conflict and negotiation: Intra-individual, interpersonal, and inter-group conflicts; conflict process; Negotiation strategies and process.	15+ 15	CO1 CO2 CO3 CO4	U A1 A2 E
Unit IV	Practicum- Two Practicum Based on Unit I to Unit III	30		R U A1 A2 E C
R: Remembering, U: Understanding, A1:Applying, A2:Analysing, E: Evaluating, C: Creating				

Reference Books:

1. Agarwal, R.D. (1994). Organization and management. New Delhi. Tata McGraw Hill.
2. Ancona, D.G. (2004). Managing for the Future: Organizational Behaviour and Processes. Cengage Learning.
3. Anderson, L. D. (2013). Organizational Development. 2nd edition. Sage.
4. Andrews, P.H. and Herschel, R.T. (1997). Organizational communication.
5. Byrne, Z. (2014). Understanding Employee Engagement: Theory, Research and Practice. Routledge.
6. Chmiel, N. (2008). An Introduction to Work and Organizational Psychology: A European Perspective. John Wiley and Sons.
7. Conyne, K. R. (2014). Group Work Leadership. Sage.
8. Cooper, C.L., Dewe, P. and O'driscoli, MP. (2001). Organizational Stress. Sage.
9. Dahiya, D.S. (1997). Communication process in organization. Rawat Publication.
10. Duck, S. (1998). Human Relationships. 3rd edition. Sage.

Suggested Readings:

1. Hall, R.H. (1997). Organization: Structure. Prentice Hall.
 2. Hollway, W. (1997). Work Psychology and Organizational Behaviour: Managing the Individual at Work. Sage.
- Syllabus- Applied Psychology, C.U., 2018
3. Jaklin, F. and Linda, L.P. (2000). The New Handbook of Organizational Communication. Sage.
 4. Kumar, A. (2000). Organizational behaviour. Anmol Publication.
 5. Landy, J. F. and Conte, M. J. (2010). Work In The 21st Century: An Introduction to the Industrial and Organizational Psychology. 2nd edition. Black Well Publishing Ltd. U.K.
 6. Lencioni, P. (2012). The Advantage: Why Organizational Health Trumps Everything Else in Business. Jossey-Bass.
 7. Leonard, S. H., Lewis, R., Freedman, M. and Passmore, J. (2013). The WileyBlackwell Handbook of the Psychology of Leadership, Change, and Organizational Development. Wiley-Blackwell.
 8. Levy, P. (2016). Industrial/Organizational Psychology. Worth Publisher.
 9. Mauch, J.G. (Ed.) (1997). Handbook of organizations. Vol. 1, 2. Rawat Publication.
 10. Moorhead, G. and Griffin, R. (Eds.) (1999). Organizational behavior. 5th edition. Delhi. AITBS Pub.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ 608B – Human Resource Management

Course Code	23PSYMAJ 653-B			
Course Title	Human Resource Management			
Credits	04(3+0+1)			
Lecture/Practical Hours	45+30			
Hours/Week	4			
Semester	4			
Issue(s)Addressed				
Regulation	2024			
Course Overview:	a. Primary functions of human resource management b. Maintenance and development of human resource management c. Role of psychologist in HR development			
Prerequisites:	Basic Knowledge about Human Resource Management.			
Course Objectives:	I. Explain the HR Management system at various levels in general and in certain specific industries or organizations. II. Develop an HR Plan considering the manpower requirements of an organization. Illustrate the key concepts of performance appraisal III. Select appropriate motivation and reward system and elaborate the compensation system. IV. Plan an ideal work environment embedded with suitable welfare interventions programme. V. Integrate the understanding of various HR concepts along with the domain concept in order to take correct business decisions			
Course Outcomes (Cos)and Cognitive Level Mapping At the end of this course, the students will be able to				
Cos	STATEMENTS		BLOOM’s LEVEL	
CO1	Explain the planning in human resource management		R	
CO2	Develop skills for psychological training of human resources		U	
CO3	Analyse employee issues and remedies		A1 A2	
CO4	Design strategies and process for better employee environment.		C	
Syllabus				
UNITS	CONTENT	HOURS	Cos	RBT
Unit I	Human Resource Management and Planning a. induction - Nature and scope of Human Resource	15	CO1 CO2	R U

	Management objectives, structure, functions and models of human resource management b. role of HRM, HRM at work, handling human relation problems, c. Human Resource Planning – Contemporary perspectives		CO3 CO4	A 1 A2
Unit II	Maintenance of Human Resource a. Maintenance of Human Resource – Motivation and Reward System b. Job evaluation - Compensation – Wage and salary, Incentive patterns c. Collective Bargaining – Types and process – Importance	15	CO1 CO2 CO3	R U A 1 A2 E
Unit III	Employee issues, welfare and Intervention Programmes a. Employee problems – Disciplining, Promotion, Transfer and Separations b. Employee welfare safety health benefits and services c. Industrial Counseling and Intervention Programmes Leadership d. managing careers, decision making. Human Relations and Work Environment a. Human relations b. Participative management c. Quality circles d. Total quality management e. Industrial relations f. Employee communication g. Human Engineering h. Working conditions i. Improvement in work environment j. Work from Home: Implications on individuals and teams in organizations k. International Human Resource Management	15	CO1 CO2 CO3 CO4	U A1 A2 E

Unit IV	Practicum- a. Assessment- any psychology test for selection b. Mock interview process c. Mock employee counselling	30		R U A1 A2 E C
R: Remembering, U: Understanding, A1:Applying, A2:Analysing, E: Evaluating, C: Creating				

Reference Books

1. Aswathappa, K. (2006) Human Resource and Personnel Management. (4thed.). New Delhi: Tata McGraw Hill Publications
2. David, A. D., and Robin, S.P. (2007). Personnel/Human Resource Management. (3rdEd.). New Delhi: Prentice Hall Private Limited.
3. Dressler, G., and Varkkey, B. (2011). Human Resource Management. (12thed.). New Delhi: Prentice Hall Private Limited:

WEB RESOURCES

1. <https://uwaterloo.ca/psychology/human-resources-managementprogram#:~:text=>
2. <https://oxfordre.com/psychology/view/10.1093/acrefore/9780190236557.001.0001/acrefore-9780190236557-e-14>
3. <https://ejop.psychopen.eu/index.php/ejop/article/view/438/438.html>
4. <https://www.economicsdiscussion.net/human-resource-management/human-resource-planning-definition-importance-objectives-process-prerequisites/31575>
5. <https://www.iedunote.com/human-resource-planning>
6. https://psychology.fandom.com/wiki/Performance_appraisal#:~:text=
7. <https://www.oxfordbibliographies.com/view/document/obo-9780199828340/obo-9780199828340-0213.xml>
8. <https://www.managementstudyguide.com/performanceappraisal.htm>
9. <https://www.economicsdiscussion.net/human-resource-management/compensation-and-reward-management/32236>
10. <https://smallbusiness.chron.com/components-comprehensivetotal-rewards-motivation-system-36942.html>
11. <https://www.verywellmind.com/the-incentive-theory-of-motivation2795382>
12. <https://www.businessballs.com/self-management/workplace-wellbeing/>
13. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5580621/>
14. <https://www.sciencedirect.com/science/article/pii/S0001879120301299>
15. <https://www.businessnewsdaily.com/10162-industrialorganizational-psychology.htm> *Formative*

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ609- Dissertation

For all Elective Course

Dissertation Part 1: Introduction, Literature Review, Methodology- (4 credits)

Dissertation Part 2: Results, Interpretation and Discussion- (4 credits)

The topic of dissertation has to be selected from the field relevant to specialization

Assessment:

Total Marks -200

Internal Assessment by respective guide: Marks -50

Dissertation work and record submission: Marks-50

Final Viva by external evaluator: Marks-100

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

SIGNATURE OF EXTERNAL EXPERTS	Prof. Satyananda Panda HOD Department of psychology Central University Sikkim	Dr Johnson Alex HoD,Associate Professor, Department of Psychology, Kannur University, Kerala	Dr Paramita Datta Rej Assistant Professor, Division of Applied Psychology, Faculty of Allied Health Sciences, Sri Ramachandra Institute of Higher Education and Research (Deemed to be University), Porur, Chennai- 600116
SIGNATURE OF UNIVERSITY NOMINEE	Prof Jayanti Basu Department of Applied Psychology Rashbehary Shiksha Prangan University of Calcutta 92 APC Road Kolkata 700009		
SIGNATURE OF ALUMNI MEMBER	Ms. Vasudha Agrawal 2017 batch BA Psychology Alumni, Psychologist at Campion International School, Siliguri		
SIGNATURE OF INDUSTRY EXPERT	Mrs. Aditi Majumdaar, Consultant Clinical Psychologist, Jalpaiguri Govt Medical College and Hospital and 158 BASE Hospital, Army Base, Bendubi		
SIGNATURE OF HOD	Dr Prince C P Associate Professor and Head Department of Psychology		



Salesian College
(Autonomous)
Sonada -
Siliguri

National Education Policy (NEP) 2020 Curriculum
Framework
For
Bachelor of Arts/Science in Psychology

Department of Psychology

Curriculum
Document 2023 – 2024

Vision

To build competent psychologists who would excel in knowledge, orientation, and practice of psychology, with high ethical standards and social relevance.

Mission

To function as professional and socially conscious psychologists who can achieve excellence in knowledge generation, and serve society by making innovative contributions in the field of mental health and in the process of social change.

1. Programme Overview

Bachelor of Arts/Science in Psychology Honours/Research is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures a 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Grasp the theories of basics in behavioural sciences, especially general psychology.
	PO02: Acquaint him/herself with the history and development of psychology in major theoretical approaches in the west and in India
	PO03: Relate his/her understanding of guidance and counselling, practice of various psychoanalytic, behavioural and humanistic theories in counselling and psychotherapies
	PO04: Gain awareness about the various contemporary innovations in psychology.
Skills	PO05: Demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes.
	PO06: Construct abilities in assessment, diagnostic and intervention practices in psychology.
	PO07: Integrate and apply various behaviour analysis methods and practices in individual and group application of psychological theories.
	PO08: Acquaint him/herself with the diverse current evidence based practices in Psychology including development in quantitative and qualitative research domains.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical knowledge of psychology in service of individuals, groups and the society in general.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as psychology professionals to practice in clinical and non-clinical settings to provide methods, tools, strategies and approaches in practicing psychology.
	PO11: Enable the students in functioning diversity of psychology within and outside the nation and to promote interest in research and development of multifaced subjects and domains of psychology at pan national level.

3. Programme Specific Objectives and Outcomes (PSOs)

After the completion of the programme, a student will be able to:	
Knowledge	PSO1: Develop a clear idea about the subject Psychology, its nature, scope and aim of learning Psychology.
	PSO2: Gather knowledge about General Psychology, theories and their implication in the field of behavioural science practice.
	PSO3: Develop knowledge about the detailed history of Psychology Indian and international.
	PSO3: Develop knowledge about the detailed history of Psychoanalytic, behavioural and humanistic schools of Psychology.
	PSO4: Internalise the basics of psychology, the role of perception, memory, learning, language, emotions and thinking in behaviour functioning in normal and abnormal ways.
	PSO5: Develop knowledge about basics of brain, neurology and its role in cognitive functioning and behaviour modification.

	PSO6: Develop the concept of guidance and counselling, and various types of psychotherapy.
	PSO7: Develop the concept of psychological research, quantitative and qualitative and statistics, descriptive and inferential in conducting psychological data analysis and theoretical formulations.
Skills	PSO1: Develop a clear idea about the subject psychology, the physiological and mental functions in behaviour and its changes.
	PSO2: Execute the educational implications of different theories of psychology.
	PSO3: Construct assessment and diagnostic skills using laboratory experiments for diagnostic, clinical and non-clinical services.
	PSO4: Develop an understanding of Artificial Intelligence and role of technology in tele-counselling and tele psychological services.
	PSO5: Advocate the importance of counselling and psychotherapy in behaviour modification and psychological treatment services.
	PSO6: Develop the skill of communication skills both vocal, non-verbal and e-learning related.
	PSO7: Exhibit an excellent communication skill, life skill education, peace and value education.
Competence	PSO1: Demonstrate competencies required for counselling, psychotherapy and other behaviour modification techniques and treatments.
	PSO2: Analyse the detailed history of Psychology in different approaches and schools of philosophy and learn on wellness consultation with positive psychological approach.
	PSO3: Systematise the concepts of adjustment, maladjustment and the various interpretations of the psychological tests.
	PSO4: Correlate various qualitative and quantitative data for psychological research.
	PSO5: Envision a society where people from all walks of life enjoy equal and equitable rights and opportunities.
	PSO6: Compute statistical analysis in the field of psychological research.
	PSO7: Analyse the contemporary trends in psychology.

Programme Matrix

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23PSYMAJ101	Major	Basic Psychological Processes-I	4	3+0+1	45+30	100
	23PSYMAJ102	Major	Brain and Behaviour	4	3+1+0	60	100
	23PSYMIN101	Minor	Psychology and Learning in Human Life	4	3+0+1	45+30	100
	23PSYMDC101	MDC	Team building and stress management	3	2+0+1	30+30	100
	23PSYSEC101	SEC	Life Skill Education and Wellness	3	2+0+1	30+30	100
	23AECE101	AEC	Compulsory English	2	0+0+2	30	50
	23SCSVAC 1	VAC-1	Value Education	1	1+0+0	15	25
	23PSYVAC101	VAC-2	Counselling Skill Workshop-I	1	0+0+1	30	25
	Total			22	22	405	600
II	23PSYMAJ103	Major	Basic Psychological Processes-II	4	3+0+1	45+30	100
	23PSYMAJ104	Major	Life Span Development	4	3+1+0	60	100
	23PSYMIN101	Minor	Psychology and Learning in Human Life	4	4+0+0	60	100
	23PSYMDC102	MDC	Sports Psychology	3	2+0+1	30+30	100
	23PSYSEC102	SEC	Psychological testing and assessment	3	2+0+1	30+30	100
	23AECE101	AEC	Alternative English	2	0+0+2	30	50
	23SCSVAC3	VAC-3	Value Education	1	1+0+0	15	25
	23PSYVAC102	VAC-4	Counselling Skill Workshop-II	1	0+0+1	30	25
	Total			22	22	405	600

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	23PSYMAJ201	Major	Social Psychology	4	4+0+0	60	100
	23PSYMAJ202	Major	Counselling and Psychotherapy-I	4	2+1+1	45+30	100
	23PSYMIN201	Minor	Psychology of health and wellbeing	4	4+0+0	60	100
	23PSYMDC201	MDC	Career Guidance and Counselling	3	2+0+1	30+30	100
	23PSYSEC201	SEC	Emotional Intelligence	3	2+0+1	30+30	100
	23AECE201	AEC	Compulsory English	2	2+0+0	30	50
	23SCSVAC5	VAC-1	Value Education	1	1+0+0	15	25
	23PSYVAC201	VAC-2	Health and Wellness	1	0+0+1	30	25
	Total			22	22	405	600
IV	23PSYMAJ203	Major	Cognitive Psychology	4	4+0+0	60	100
	23PSYMAJ204	Major	Counselling and Psychotherapy- II	4	2+1+1	45+30	100
	23PSYMAJ205	Major	Internship-I	4	0+1+3	120	100
	23PSYMIN202	Minor	Psychology of Personal Growth and Development	4	4+0+0	60	100
	23AEAE202	AEC	Alternative English	2	2+0+0	30	50
	23SCSVAC-7		Value Education	2	0+0+2	30	25
	23PSYVAC202	VAC-3	Sports Psychology	2	0+1+1	15+30	25
	Total			22	22	405	600

V	23PSYMAJ301	Major	Basic Statistics in Psychology
	23PSYMAJ302	Major	Abnormal Psychology I
	23PSYMAJ303	Major	Industrial /OrganizationalPsychology I
	23PSYMIN301	Minor	Community Psychology
	23SCSVAC9	VAC-9	Value Education
	23VAC301	VAC-10	Communication Skills in Counselling
	23PSYINT301	INT-2	Internship - II
	23PSYELT301	ELT-1	Art Therapy
	23PSYELT302	ELT-2	School Counselling

VI	23PSYMAJ304	Major	Abnormal Psychology II
	23PSYMAJ305	Major	Industrial /OrganizationalPsychology II
	23PSYMAJ306	Major	Theories of Personality
	23PSYMIN302	Minor	Social Psychology
	23SCSVAC11	VAC-11	Value Education
	23PSYVAC301	VAC-12	Communication skills in Group Intervention
	23PSYINT301	INT-3	Internship - 3
	23PSYELT303	ELT-3	Wellness and Life Style Psychology
	23PSYELT304	ELT-4	Crisis counselling-suicide prevention, abuse treatment

VII	23PSYMAJ401	Major	Research Methodology
	23PSYMAJ402 23PSYMAJ403	Major	Health Psychology OR ForensicPsychology
	23PSYMAJ404	Major	Positive Psychology
	23PSYMIN401	Minor	Youth Gender and Identity
	23SCSVAC13	VAC-13	Value Education
	23PSYVAC401	VAC-14	Assertiveness Skill Training
	23PSYINT401	INT-4	Internship - 4
	23PSYELT401	ELT-5	Dance/Movement Therapy
	23PSYELT402	ELT-6	Music Therapy

With Research

VIII	23PSYMAJ404	Major	Neuropsychology OR
	23PSYMAJ405		FashionPsychology
	23PSYMAJ406	Major	Advanced Statistics
	23PSYMIN402	Minor	Media Psychology
	23PSYRS401	Project	Major Research
	23PSYVAC402	VAC-15	Journal Writing
	23PSYELT403	ELT-7	Psychodrama and performance arts psychology
	23PSYELT404	ELT-8	Grief Counselling
	23PSYELT405	ELT-9	Family Counselling and Marital Therapy

Without Research

VIII	23PSYMAJ404	Major	Neuropsychology OR
	23PSYMAJ405		FashionPsychology
	23PSYMAJ406	Major	Advanced Statistics
	23PSYMAJ407	Major	Organizational Processes OR Educational Psychology
	23PSYMAJ408		
	23PSYMAJ409	Major	Psychology of Disability OR Advanced Cognitive Psychology
	23PSYMAJ410		
	23PSYMAJ411	Major	Job Analysis Evaluation OR Cultural and Indigenous Psychology
	23PSYMAJ412		
	23PSYMIN402	Minor	Media Psychology
	23PSYVAC402	VAC-15	Project proposal preparation in Psychology
	23PSYELT403	ELT-7	Aviation Psychology
	23PSYELT404	ELT-8	Tourism and Travelers' Psychology
	23PSYELT405	ELT-9	Food/ culinary Psychology

SEMESTER I

Course Content

1. Course Description

23PSYMAJ101- Basic Psychological Processes-I

Course Code	23PSYMAJ101	
Course Title	Basic Psychological Processes-I	
Credits	04 (03 Theory+ 0 Tutorial+01 Practical)	
Lecture/Practical Hours	45-L (1 credit theory is 15 hours) 30-P (1 credit practical is 30 hours)	
Hours/Week	4	
Category	Major Core	
Semester	1	
Issue(s) Addressed	Gender, Human values, professional ethics	
Regulation	2023	
Course Overview:	This course – a) Identifies the basic concept of psychology. b) Explains the fundamental processes and core psychological concepts, models, classical theories, and varied perspectives in the study of human behaviour. c) Analyse the dynamics of human cognition and behaviour.	
Prerequisites:	Basic interest to learn Psychology	
Course Objectives:	The students will be able to – I. Describe the fundamental mental processes which are the base for behaviour. II. Explain the basic concept and knowledge about Psychology. III. Analyse and apply the concept of Psychology in various domains of life. IV. Design critical and analytical skills regarding the individual characteristics	
Course Outcomes (Cos) and Cognitive Level Mapping		
At the end of this course, the students will be able to		
Cos	STATEMENTS	BLOOM's LEVEL
CO1	Define the basic concept and fundamental mental processes for behavior	R
CO2	Explain the core psychological concepts, models, classical theories, varied perspectives in the study of human behaviour	U
CO3	Analyse the concept of Psychology and apply in various domains of life.	A1 A2
CO4	Design critical and analytical skills regarding individual characteristics	C

Syllabus				
UNITS	CONTENT	HOURS	Cos	RBT
Unit I	Introduction to Psychology - Definition, Goals and Historical development of Psychology - Perspectives: Psychodynamic, Behavioural, Humanistic, Sociocultural, Biological and Cognitive - Branches of Psychology	15	CO1 CO2 CO3 CO4	R U A1 A2 E C
Unit II	Sensation, Perception and Attention - Sensation: Definition and characteristics Psychophysics- Weber-Fechner law - Perception: Definition, Perceptual Constancies: Shape, Size and Brightness, Gestalt principles of perception, Depth perception: monocular cues, Binocular cues. - Attention: Definition, Characteristic and Types - Theories of Attention: Broadbent Filter Model	15	CO1 CO2 CO3	R U A1 A2 E C
Unit III	Learning, Memory and Forgetting - Definition, Theories of Learning: Classical Conditioning, Meaning, Experiment, elements and principles - Operant Conditioning: Meaning, Experiment and Schedules of Reinforcement, Cognitive Learning: Insight learning, Latent learning and Observational learning - Definition, Memory Processes and Types of Memory, Models of Memory: Information Processing, Levels of Processing - Reconstructive Memory, forgetting: Meaning, Forgetting Curve, Causes and Memory Improvement Techniques	15	CO1 CO2 CO3 CO4	R U A1 A2 E C
Unit IV	Practical based on the course theory Any two from the following - Muller-Lyer Illusion - Span of Attention - Maze Learning - Memory - Bilateral Transfer of Learning - Paired Associate Learning - Retroactive Inhibition	30	CO1 CO2 CO3 CO4	R U A1 A2 E C

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50 marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ102- Brain and Behaviour

Course Code	23PSYMAJ102	
Course Title	Brain and Behaviour	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	NA	
Course Offered to	Psychology	
Regulation	2023	
Course Overview	This course: a. Covers the basic concept of Physiological Psychology. b. Explains the structure and function of the nervous system. c. Explores the biological basis of psychological and cognitive processes. d. Focuses on the relationship between brain and behaviour	
Prerequisite	Basic knowledge about the human brain and behaviour.	
Course Objectives	A student will be able to: i. Understand the concept of physiological psychology. ii. Identify the structure and function of the nervous system. iii. Explain how messages are passed through neural impulses. iv. Discuss the relationship between brain and behaviour. v. Analyse the application of physiological psychology in understanding behaviour.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define physiological psychology.	R
CO2	Understand the concept of physiological psychology.	U
CO3	Interpret the relation between brain function and behaviour.	A1

CO4	Analyse the application of physiological psychology in understanding behaviour.	A2		
CO5	Critique the various methods used in studying the brain.	E		
CO6	Formulate an understanding of the relation between brain and behaviour.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Physiological Psychology:	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
	a. Definition and Nature			
	b. Branches of Biopsychology			
	c. Methods of Studying the Brain			
Unit II	Neurons and Nervous System	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
	a. Structure and function of Neurons			
	b. Neural Impulses			
	c. Synapse and Neurotransmitters			
	d. Structure and function of the Central Nervous System			
e. Structure and function of the Peripheral Nervous System				
Unit III	Understanding the Brain:	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
	a. Structure and functions: Hindbrain, Midbrain and Forebrain.			
	b. Structure and functions: Lobes			
	c. Hemispheric Specialization			
Unit IV	Endocrine System:	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
	a. The function and effect of the major endocrine glands: Pituitary, Thyroid, Adrenal, and Gonads			
Learning Resources: (Latest edition books listed in APA style: Seventh Edition)				

Text Books:

1. Carlson, N.R. (2013). Foundations of Physiological Behaviour. Boston: Cengage Learning.
2. Levinthal, C.F (2003). Introduction to physiological Psychology. New Delhi: Prentice Hall.
3. Pinel, J.P.J. (2011) Biopsychology. 8th Edition, Pearson Education, Inc., Boston, 75-98.

Suggested readings:

1. Carlson, N. R., and Carlson, N. R. (2007). Physiology of behaviour.
2. Ciccarelli, S. K., Misra, G., and White, J. N. (2009). *Psychology*. Pearson Education India.
3. Kalat, J. (2005). Biological Psychology. Boston: Cengage Learning.
4. Wickens, A. P. (2005). *Foundations of biopsychology*. Pearson Education.

Case studies:

1. Lewandowski, Alan G., Joshua D. Weirick, Caroline A. Lewandowski, and Jack Spector. "Phineas Gage: A Neuropsychological Perspective of a Historical Case Study." (2016).
2. Mohammed, N., Narayan, V., Patra, D. P., and Nanda, A. (2018). Louis Victor Leborgne ("Tan"). *World Neurosurgery*, 114, 121-125.
3. Teive, H lio AG, Renato P. Munhoz, and Paulo Caramelli. "Historical aphasia cases: "tan-tan", "vot-vot", and "cre nom!". *Arquivos de neuro-psiquiatria* 69 (2011): 555-558.
4. Watts, G. (2009). Henry Gustav Molaison, "HM". *The Lancet*, 373(9662), 456.

Assessment

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

23PLSMINPsychology and Learning in Human Life

Course Code	23PSYMIN101
Course Title	Psychology and Learning in Human Life
Credits	4
Total Hours	60
Hours per Week	4
Course Type	Minor
Semester	I
Intended Level	Certificate
Issue(s) Addressed	NA
Course Offered to	Other Departments
Regulation	2023
Course Overview	This course focuses on a) The study of human behaviour. b) As an introduction to the field of psychology, this course includes consideration of psychological principles, terminology, major theories, careers, methods of experimentation, and practical applications that comprise an introductory course in psychology. c) It is designed to help the students understand the social, emotional and cognitive processes that constitute learning and to understand the fundamentals of behavioural, mental, and social processes.
Prerequisite	Basic knowledge about psychology
Course Objectives	A student will be able to: i. Understand the basic concepts of psychology with an emphasis on applications of psychology in everyday life. ii. Describe the different cognitive and affective processes and identify the types of thinking. iii. Argue on the role of culture and the issues and challenges faced by today's youth. iv. Analyse the concepts of social cognition including schemas, bystander effect, heuristics, cognitive dissonance and experiment on any of the concepts.

	v. Implement the learned skills and techniques for better communication and enhance adjustment in life, work and stress.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
Cos	Statements	Cognitive Level Mapping		
CO1	Define the basic concepts of psychology. Compare the major perspectives in psychology: Recognize how each approach Views human thought and behaviour.	R U A2		
CO2	Identify the developing skills for applying psychological knowledge to real life situations.	A2		
CO3	Demonstrate command of the basic terminology, concepts, and principles of the discipline.	R		
CO4	Demonstrate adequate knowledge about issues related to stress, stress management and coping.	A2		
CO5	Apply the knowledge of psychology at work and environment.	A2		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Orientation to Psychology; Self and relationships a) Psychology: Definition and basics of psychology. b) Cognitive processes: Learning, memory and problem solving; Affective processes; Emotion, positive and negative; Thinking-types of thinking: convergent, divergent; counter factual thinking c) Importance of family and peer groups, Youth and Risk behaviours, relationship difficulties, Issues and challenges of relationships	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Unit II	Understanding and Evaluating the social world a) Role of culture, subjective, well-being, optimism, resilience b) Social cognition-schemas, heuristics, altruism, prosocial behaviour, bystander effect c) Cognitive dissonance, Concept and meaning of conformity, compliance	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
Unit III	Managing stress a) Definition; symptoms of stress, impact of stress on health b) Sources of stress c) Eustress d) Problem focused and emotion focused approaches.	15	CO1 CO2 CO3 CO4 CO5	C R U A1 A2 E
Unit IV	Practical based on the course theory a) Mindfulness b) Academic stress anxiety scale c) Jacobson's Progressive Muscle Relaxation Techniques (JPMR)	30	CO1 CO2 CO3 CO4 CO5	A1 A2

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Suggested Readings

1. Brown, B. B., and Larson, R.W. (2002). The Kaleidoscope of Adolescence: Experiences of the World's Youth at the beginning of the 21st Century. In Brown, B. B., R. Larson, and T. S. Saraswathi. (Eds.), The World's Youth: Adolescence in Eight Regions of The Globe(pp.1-19). Cambridge: Cambridge University Press
2. Ciccarelli, S. K., and Meyer, G.E. (2008). Psychology (South Asian Edition). New Delhi: Pearson
3. Morgan, C.T., King, R.A., Weiss, R.A., and Schopler, J. (2004). Introduction to Psychology(7thEdition). New York: Mc Graw Hill.
4. Taylor, S.E., Peplau, L.A.and Sears, D.O. (2006). Social Psychology (12thEd.). New Delhi: Pearson

Reference Books

1. Allen, F. (2011). Health Psychology and Behaviour. New Delhi Tata Mc Graw Hill
2. Anderson, A.A. and Bushman, B.J. (2002). Human Aggression. Annual Review of Psychology, 53(1), 27-51.
3. Atwater, E. and Grover, D. and Karen (1999). Psychology for living: Adjustment, growth and behavior

today.

4. Bansal, P. (2012). *Youth in Contemporary India: Images of Identity and Social Change*. New Delhi: Springer
5. Baron, R. A., Byrne, D. and Bhardwaj, G. (2010). *Social Psychology* (12th Ed.). New Delhi: Pearson
6. Ogden, J. (2012). *Health Psychology*. New York, McGraw-Hill.
7. Prentice Hall. Carr, A. (2004). *Positive Psychology: The science of happiness and human strength* UK: Routledge.
8. Taylor, S. E. (2006). *Health psychology*. (6th Ed). New Delhi: Tata Mc Graw Hill

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- c) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - d) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(Seal)

(Seal)

(College round seal in all pages)

23PSYMDC101-Team Building and Stress Management

Course Code	23PSYMDC101	
Course Title	TEAM BUILDING AND STRESS MANAGEMENT	
Credits	03	
Lecture Hours	45	
Hours/Week	3/4	
Category	Multidisciplinary course (MDC)	
Semester	1	
Issue(s) Addressed	Gender, Human values, professional ethics	
Regulation	2023	
Course Overview:	This course – a. Describes the importance of team building to make group process effective b. Identifies and explains the role of a leader and what makes a good leader c. Explains stress and helps students identify various types of stressors in everyday life d. Exposes students to the holistic approach of effective stress management techniques	
Prerequisites:	basic knowledge of team building and stress management	
Course Objectives:	The students will be able to – i. Inculcate the idea of group dynamics, and team building for effective group processes ii. Analyze the characteristics of a good leader and apply the leadership skills in their curriculum iii. Identify stressors in everyday life and will be able to tackle them with the help of effective stress management techniques	
Course Outcomes (Cos) and Cognitive Level Mapping At the end of tBooks7ourse, the students will be able to		
COs	STATEMENTS	BLOOM’s LEVEL
CO1	Understand team building Identify various stressors in their daily life	R
CO2	Discuss effective strategies for team building	U
CO3	Implement the concept of various models in describing stress	A1
CO4	Distinguish between stress and burnout	E
CO5	Formulate different coping strategies for stress	C

Syllabus				
UNITS	CONTENT	HOURS	COs	CLs
Unit I	Understanding group dynamics and team building - Concept of team building, group dynamics, and team decision-making - Leadership: nature and types, characteristics of a successful leader - Ingredients of effective teams, skills useful in team building	15	CO1 CO2 CO3 CO4 CO5	R U A 1 A 2 E C
Unit II	Understanding stress and health - Conceptualizing stress, types of stress, burnout stress syndrome - GAS model, source of stress – environmental, social, psychological, and physiological - Relationship between stress and health	15	CO1 CO2 CO3 CO4 CO5	R U A 1 A 2 E C
Unit III	Stress Prevention Strategies - Methods of reducing stress – yoga, meditation, biofeedback, relaxation techniques, exercise - Specific coping strategies - Emotion-focused coping strategies	30	CO1 CO2 CO3 CO4 CO5	R U A 1 A 2 E C
Suggested books - Marvin E Shaw, Rhona Robbin, James Belser. Group Dynamics: the psychology of small group behavior. McGraw hill., 1981 - Nagoski, E., and Nagoski, A. (2019). Burnout: the secret to unlocking the stresscycle. First edition. - Williams, J. M. G., and Penman, D. (2011). Mindfulness. Piatkus Books. Reference Books - A.K Srivastava. Management Of Occupational Stress: Theory and Practice. Gyan Publishing House., 1999 - Brian Clegg. Just In Time Stress. Kogan Page., New Delhi J. Maurus. Use Your Stress to Keep Away Distress. Better Yourself Books., Mumbai - Robert A Baron. Social Psychology (13th ed.). Dorling Kindersley (India) Pvt. Ltd. - Shelley E. Taylor. Health Psychology (6th ed.). Tata McGraw hill education private limited., 2006				
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

23PSYSEC101- Life Skill Education and Wellness

Course Code	23PSYSEC101	
Course Title	Life Skill Education and Wellness	
Credits	02	
Lecture	30-L (1 credit theory is 15 hours)	
Practical Hours	30-P (1 credit practical is 30 hours)	
Hours/Week	3	
Category	Skill Enhancement Course	
Semester	1	
Issue(s) Addressed	Gender, Human values, professional ethics	
Regulation	2023	
Course Overview: This course – a. Identifies WHO-based concepts of Life Skills and Wellness b. Discusses theoretical knowledge about each life skills c. Analyses practical sessions for exposure of life skills in various life situations d. formulates essentials of individual and community wellbeing		
Course Objectives: The students will be able to – i. Understand life skills training methods of the social and interpersonal skills to cope with the demands of everyday life. ii. Discuss self-confidence, encourage critical thinking, foster independence and help people to communicate more effectively and work effectively in groups at personal and professional level. iii. Apply the dimensions of health and wellbeing and describe their relationship to a positive lifestyle iv. Analyse and evaluate how life skills can be used for well being		
Prerequisites: Basic knowledge on various life situations and wellbeing practices		
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to		
COs	STATEMENTS	BLOOM's LEVEL
CO1	Define Life skills and wellness	R
CO2	Discuss various life skills in different life situations	U
CO3	Demonstrate different life skills and wellness practices in the context of life events	A1
CO4	Analyse and evaluate various process involved in training Life skills and wellness	A2 and E
CO5	Design wellness and stress management modules	C

Syllabus				
UNITS	CONTENT	HOURS	COs	REVISED BLOOM's TAXONOMY
Unit I	Conceptualize life skill training a. Life Skills definition, 10 life skills by WHO, thinking, emotional and social skills, creative thinking, critical thinking	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit II	Emotional, Social and Thinking skills a. Self-awareness, self-esteem, coping with emotions, coping with stress, b. Communication skill and interpersonal skill, c. decision making and problem solving.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit III	Wellness and Health compromising behaviours a. Introduction to Wellness Concept of health, wellbeing and wellness, illness- wellness continuum b. Determinants and Components of wellness (WHO) and wellbeing, c. Health compromising behaviours: Smoking, Alcoholism and substance abuse.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit IV	Practical a. Simulation of emotional, social and thinking skills in life situation b. Conducting life skill education training for high school students-mock session c. Preparing a module to practice Physical, Mental and Social Wellness among college students with Stress and its impact on health and wellbeing, mechanisms to deal with stress	30	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Suggested books

1. Barun K. Mitra, "Personality Development and Soft Skills", Oxford Publishers, Thirdimpression, 2017.
2. ICT Academy of Kerala, "Life Skills for Engineers", McGraw Hill Education (India) Private Ltd., 2016.
3. Larry James, "The First Book of Life Skills"; First Edition, Embassy Books, 2016.
4. Shalini Verma, "Development of Life Skills and Professional Practice"; First Edition; Sultan Chand (G/L) and Company, 2014.
5. Ansbaugh, D.J., HaMAJick, M.H., and Rosato, F.D. (2009). Wellness: Concepts andApplications, 7th ed., McGraw-Hill.

Reference Books

1. Life Skill Education, NIMHANS, Class 8,9,10 series,
2. Donatelle, R. J., and Davis, L. G. (2011). Health: the basics. Benjamin Cummings.
3. Edlin, G., and Golanty, E. (2007). Health and wellness (9th ed.). Jones and Bartlett Publishers.
4. Insel, P.M., and Roth, W.T. (2002). Core concepts in health (9th ed.). McGraw- Hill.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Five Short Questions to be answered out of eight given from lower order of RBT – (2 Marks). Three Long Questions to be answered out of five from higher order of RBT – (5 Marks).

Summative Assessment Time: 2 Hours for pen and paper test.

Practical – Viva and Practical Record Book (15 + 05= 20 marks)

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(Seal)

(Seal)

(college seal in all pages)

SEMESTER II

23PSYMAJ201-Basic Psychological Process II

Course Code	23PSYMAJ201			
Course Title	Basic Psychological Processes-II			
Credits	04 (03 Theory+ 0 Tutorial+01 Practical)			
Lecture/Practical Hours	45-L (1 credit theory is 15 hours) 30-P (1 credit practical is 30 hours)			
Hours/Week	4			
Category	Major Core			
Semester	II			
Issue(s) Addressed	Gender, Human values, professional ethics			
Regulation	2023			
Course Overview:	This course – a) Covers the basic concept of psychology b) Examines the fundamental processes and core psychological concepts, models, classical theories, varied perspectives in the study of human behaviour c) Explains the dynamics of human cognition and behaviour			
Course Objectives:	The students will be able to – i. Describe the dynamics of emotions and motivation. ii. Explain the theoretical concepts of Human Intelligence and Creativity. iii. Analyse the concepts of thinking, problem solving, to cognition iv. Argue on the dynamics of Personality v. Develop the skills of personality and Intelligence assessments			
Prerequisites: Basic knowledge on general psychology concepts				
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to				
COs	STATEMENTS		BLOOM's LEVEL	
CO1	Define the basic Concept of psychological phenomenon		R	
CO2	Explain and relate the core psychological concepts, models, classical theories, varied perspectives in the study of human behaviour		U	
CO3	Analyze and critically evaluate the core concept of Psychological Phenomenon		A1 and E	
CO4	Develop analytical skills in psychological assessments		C	
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
Unit I	Motivation and Emotion a) Motivation: Meaning, Definition and Basic Concept		CO1 CO2	R U

	b) Approaches to the Study of Motivation: Instincts, Needs, Drives, Incentives, Arousal and Humanistic c) Emotion: Meaning, Definition and Components of Emotions d) Theories of Emotions: James-Lange theory, Cannon-Bard theory, Schachter-Singer cognitive arousal theory and Lazarus's cognitive-Mediational Theory	15	CO3 CO4	A1 A2 E C
Unit II	Intelligence and Creativity a) Intelligence: Definition and Basic Concept b) Theories of intelligence: Spearman, Sternberg, Guilford, Gardner and Thurston; c) Measurement of Intelligence: Raven's, WAIS and Stanford- Binet d) Creativity: Definition and Process of e) Creative Thinking; Theories and Measures of Creativity	15	CO1 CO2 CO3 CO4	R U A1 A2 E C
Unit III	Personality a) Meaning, Definition and Determinants of Personality b) The Nature vs. Nurture Debate c) Approaches to the study of Personality: Type, Trait, Psychodynamic, Neo Freudian, Humanistic and Social Learning d) Assessment of personality: Interview, Projective test and Personality Inventories	15	CO1 CO2 CO3 CO4	R U A1 A2 E C
Unit IV	Practical based on the course theory any two from the following a) Motivation b) Emotion c) Intelligence d) Creativity e) Personality	30	CO1 CO2 CO3 CO4	R U A1 A 2 E C

Suggested books

Baron R.A. (2000) Psychology. Pearson Education India: New Delhi

Ciccarelli, S. K., White, J. N., & Ciccarelli, S. K. (2012). Psychology. Boston, Mass: Pearson Learning Solutions.

Morgan, C. T., King, R. A., Weiss, J. R. and Schopler, J. (2012). (Latest Edition). Introduction to Psychology. Tata McGraw Hill Education Pvt. New Delhi

Robert Feldman (2011) Essential of Understanding Psychology 10th Edition, ISBN-13-9781259003059/ISBN-10-1259003051

Reference Books

Baron, R.A. Psychology: The Essential Science. New York: Allyn & Bacon

Nataraj, P. (latest edition): Psychology for Beginners. Mysore : Srinivas publication

Passer, M.W. & Smith, R.E. (2010) Psychology: The science of mind and behaviour. New Delhi: Tata McGrawHill.

Parameshwaran, E. G., & Beena, C. (2010): An Invitation to Psychology, Neelkamal Pvt. Hyderabad

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College (theory 25 practical 25)

Summative Assessment: 50 marks

- Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

(seal)

23PSYMAJ202- Life Span Development

Course Code	23PSYMAJ202
Course Title	Life Span Development
Credits	4
Total Hours	60
Hours per Week	4
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	Gender, Human values, professional ethics
Course Offered to	Psychology
Regulation	2023
Course Overview	This course focuses on a) processes of change in individuals and groups across the lifespan b) . Topics of interest include developmental theories, patterns of development in physical, motor, cognitive and psychosocial domains within. c) It also covers the different perspective of cognitive and language development. d) The course also covers all the three dimensions of physical development, cognitive development and Social-Emotional development. e) It studies how individuals, groups and societies develop intellectually, socially and emotionally over a lifespan.
Prerequisite	Basic knowledge about human growth and development
Course Objectives	A student will be able to i. Understand the concept of growth and development and the processes and principles of lifespan development ii. Understand developmental foundations, physical growth and development throughout the lifespan.

	iii. Identify the various research methods and designs in developmental psychology. iv. Compare and debate the different perspectives of cognitive and language development.

Course Outcomes based on RBT and Cognitive Level Mapping

At the end of this course, a student will be able to:

COs	Statements	Cognitive Level Mapping
CO1	Understand the concept of human development across the life span and to discuss the various developmental perspectives.	U
CO2	Identify the different developmental theories and perspective including the methods and research designs used in developmental psychology.	R
CO3	Describe the developmental milestones at various stages of human life including the prenatal, neonatal and after.	R
CO4	Design activities and interventions based on the developmental needs of individuals, groups, and communities.	C
CO5	Design activities and techniques based on the needs of Interpersonal relationships.	A1

Course Content

Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Developmental Psychology a) Growth and Development; nature and nurture b) Period of lifespan development; principles of lifespan development c) theoretical perspectives-overview of theories of development d) Research in developmental psychology – methods and designs.	15	CO1 CO2 CO3 CO4 CO5	U R C A1
Unit II	Developmental foundations a) Biological foundations; multiple off springs; period of prenatal, hazards to prenatal, birth process/ stages of labor, neo-natal; heredity; environment and behaviour	15	CO1 CO2 CO3 CO4 CO5	U R E

	b) Infancy; reflexes; motor development c) Physical growth and development; childhood; adolescence; adulthood			A1
Unit III	Cognitive and Language Development a) Cognitive development- Piaget's Perspective; stages b) Vygotsky's Socio-cultural theory c) Information processing perspective d) Language development- nativist; behaviorist; interactional approach e) Temperament; functions of emotions, attachment f) Early emotional development- Smiling, laughter, attachment, fear, jealousy, aggression, Izard's Theory of Differential Emotions g) Kohlberg's theory of Moral Development h) Carol Gilligan's theory of Moral Development	15	CO1 CO2 CO3 CO4 CO5	U R A1 A1
Unit IV	Emotional and personality development a) Temperament; functions of emotions, attachment b) Early emotional development- Smiling, laughter, attachment, fear, jealousy, aggression, Izard's Theory of Differential Emotion c) Kohlberg's theory of Moral Development d) Carol Gilligan's theory of Moral Development	15	CO1 CO2 CO3 CO4 CO5	U R E A1 A2

Suggested readings

1. Conger, Muesen and Kagan, Basic and contemporary issues in Development Psychology, 1975.
2. Diagnostic and Statistical Manual - DSM IV, American Psychiatric Association, 1987.
3. Feldman, R. (2010). Development across the Lifespan. Pearson Education: Delhi
4. Hurlock, E., Developmental Psychology, Tata McGraw Hill, 1993.
5. Vatsyayan, Development Psychology, Kedar Nath Ram Nath Publishers, Meerut.

Reference Books

1. Berk, L. E. (2010). Child Development (9th Ed.). New Delhi: Prentice Hall of India
2. Feldman, R.S. and Babu.N. (2011). Discovering the Lifespan. New Delhi: Pearson
3. Mitchell, P. and Ziegler, F. (2007). Fundamentals of Development: The Psychology of Childhood. New York: Psychology Press.

4. Santrock, J. W. (2011). Child Development (13th Ed.). New Delhi: McGraw Hill.
Srivastava, A.K. (1997). Child Development: An Indian Perspective. New Delhi: NCERT.
5. Santrock, J.W. (2012). Life Span Development (13th Ed.) New Delhi: McGraw Hill.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creatin

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

23PSYMIN201- Environment Psychology

Course Code	23PSYMIN201	
Course Title	Environmental psychology	
Credits	04 (3+0+1)	
Lecture/Practical Hours	45+30	
Hours/Week	4	
Category	Minor Core	
Semester	II	
Issue(s) Addressed	Gender, Human values, professional ethics	
Regulation	2023	
Course Overview	This course a. Describes the Importance of positive environmental behaviour b. Explains the role of the environment on physical and mental well-being c. Recognizes the need to emphasize the negative effects of the environment d. Describes the current trends of environmental psychology	
Prerequisites:	Basic knowledge of the environment	
Course Objectives:	The students will be able to – I. State the scope and nature of environmental psychology II. Understand the importance of a positive environment III. Analyze the effect of the environment on mental health IV. Discuss the ways of tackling environmental issues V. Relate between environment and psychology	
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to		
COs	STATEMENTS	BLOOM's LEVEL
CO1	State environmental psychology	R
CO2	Discuss man-nature relationship	U
CO3	Elaborate on any environmental movement	A1
CO4	Analyze the effect of human space on mental well-being	A2and E
CO5	Formulate an idea that can bring out positive change in our environment	C

	Syllabus			
UNITS	CONTENT	HOURS	COs	CLs
Unit I	Conceptualize environmental psychology a) Origin and roots of environmental psychology b) Recent trends and future direction of environmental psychology c) Man-environment relationship	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit II	Environment health and wellbeing a) Overview of stress and health b) Sources of environmental stressors c) Environmental change: impact on human health and wellbeing	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit III	Human space a) Urban environment, urban stress b) Overview of architectural influence on well-being c) Psychological benefits of nature	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit IV	Practical any 2 from the following a) Bio composting b) Eco friendly place visit c) Plantation drive d) Solar Park	30	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Learning Resources: (Latest edition books listed in APA style: Seventh Edition)

Suggested Links and Books

1. Linda Steg and Judith Groot. Environmental Psychology. Second Edition. The British Psychological Society.,2019
2. <https://egyankosh.ac.in/bitstream/123456789/24084/1/Unit-2.pdf>
3. <https://egyankosh.ac.in/bitstream/123456789/24077/1/Unit-4.pdf>
4. Dr Gagandeep Kaur. Environmental Psychology. VIKAS® PUBLISHING HOUSE PVT. LTD., Noida

Reference Books

1. Dinesh Nagar. Environmental Psychology. Concept Publishing Company., New Delhi
2. Erach Bharucha. Environmental Studies. Bharati Vidyapeeth Institute of Environment Education and Research., Pune

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(S)

23PSYMDC201- Sports Psychology

Course Code	23PSYMDC201
Course Title	Sports Psychology
Credits	03
Lecture/Practical Hours	30-L (1 credit theory is 15 hours) 30-P (1 credit practical is 30 hours)
Hours/Week	3
Category	Multi-Disciplinary Course
Issue(s) Addressed	Gender, Human values, professional ethics
Semester	2
Regulation	2023

Course Overview:**This course –**

Define the basic concepts related to applying psychological principles in sports.

Explains how to develop an in-depth understanding about sports person's situations, demands, and problems.

Analyse how psychological knowledge can be utilised to stimulate sports personnel

Enables them to design intervention programs for those in sports field.

Course Objectives:**The students will be able to –**

Describe the scope and perspectives of sports psychology.

Understand the effect of arousal, anxiety and stress on performance.

Apply the cognitive and social psychological dimensions in sports.

Evaluate the effect of arousal, anxiety and stress on performance.

Create interventions for sports persons.

Prerequisites: Basic knowledge and interest about sports field and readiness to help sportspersonnel's mental health

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to

COs	STATEMENTS	BLOOM's LEVEL
CO1	Identify the scope and perspective of sports psychology	R
CO2	Discuss various issues of race, gender and sexual orientation in sports	U
CO3	Explain and relate group dynamics and aggression management in sports	A1
CO4	Analyse and evaluate various process involved in Arousal, Anxiety, Stress and Sporting Performance	A2 and E

Syllabus				
UNITS	CONTENT	HOURS	COs	REVISED BLOOM's TAXONOMY
Unit I	Introduction to Sports Psychology and Group Dynamics; a. History, Nature, and Scope of sports psychology; b. Recent perspectives -Issues of race, gender and sexual orientation in sports; c. Role of a sports psychologist. Groups and teams; Social facilitation; Negative effects of team leadership; Leadership	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit II	Aggression, Arousal, Anxiety, Stress and Sports Performance a. Theories of aggression; Aggression, injury, and addictive behaviours. b. Arousal, Anxiety, Stress and Sporting Performance; c. Definitions of arousal, anxiety and stress; Factors inducing anxiety and stress; d. Relationship between arousal and performance; Burnout, overtraining and overreaching; e. Retirement; Drug abuse in sport and exercise	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit III	Practical a. Trace the mental health history of any famous sports person of your choice; b. Collect a case study of psychological support given to a sportsman under stress or anxiety Conduct a focus group discussion with selected sportsmen/women from the college.	30	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Suggested books

1. Jarvis, Matt (2006) Sports psychology: A student's handbook. Routledge. Horn, T. S (Ed) (1992). Advances in sports psychology. Herman Kinetics.
2. Friends Murphy, E. (1995) Advances in sports psychology. Human Kinetics. Murphy, S. M. (1995) Sports psychological interventions. Herman Kinetics.
3. Weinberg, R. S. and Gould, D. (2007) Foundations of sport and exercise psychology. HumansKinetics.

Reference Books

1. Lynch, J. (2001). Creative coaching. Human Kinetics. Mohan, J. (1996) Recent Advances in sports psychology.
2. Murphy, S. M. (1995) Sports psychological interventions. Herman Kinetics.
3. Richard H. Cox. (2007) Sport psychology. McGraw Hill.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 25 marks (Theory 10 + Practical 15)

- a) Five Short Questions to be answered out of eight given from lower order of RBT – (5 Marks)
- b) One Long Questions to be answered out of two set from higher order of RBT – (5 Marks).Summative Assessment Time: 2 Hours for pen and paper test.
- c) Practical – Viva and Practical Record Book (10 + 5 = 15 marks)

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

23PSYSEC301-Psychological Testing and Assessment

23PSYSEC301 Psychological Testing and Assessment		
Course Code	23PSYSEC301	
Course Title	Psychological Testing and Assessment	
Credits	2 + 1 (2 = Theory, 1 = Practical)	
Total Hours	30+30	
Hours per Week	3	
Course Type	SEC	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	NA	
Course Offered to	Psychology	
Regulation	2023	
Course Overview	This course: a. Covers the basics of psychological testing and assessment. b. Focuses on the importance of measurement in psychology. c. Explains the steps of test construction and standardization. d. Identifies the ethical issues related to psychological testing.	
Prerequisite	Basic knowledge about psychological tests and instruments.	
Course Objectives	A student will be able to: Understand the basics of psychological testing. i. Learn scientific approach to assessment of individual differences through psychological testing. ii. Classify the various types and domains of testing. iii. Analyse the process of test construction and standardization. iv. Develop competencies in test construction in a scientific manner.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the various psychological tests and assessments.	R
CO2	Understand the basics of psychological testing.	U
CO3	Use psychological tests to assess human behaviour.	A1
CO4	Analyse the process of test construction and standardization.	A2
CO5	Critique the ethical issues involved in psychological testing	E
CO6	Develop competencies in test construction in a scientific manner.	C
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Psychological Testing: - Meaning, purpose and scope of psychological testing. - History of testing and psychological measurements. - Ethical Issues in psychological testing and assessment.	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Test Construction and Standardization: - Item writing - Meaning and types of items and their differences, guidelines for item writing. Response sets – Meaning, types and implications. - Item analysis – Meaning and purpose. - Item difficulty, Item discrimination and factors influencing them. - Reliability and Validity of tests – Meaning, types, methods and factors influencing them, Relation of validity to reliability. - Norms – Development and types of norms, Interpreting test scores.’	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Practical (out of any 2): - Eysenck’s Personality Questionnaire –R - Advanced Progressive Matrices - Distinctive Aptitude Test Battery	30	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Learning Resources:

Text Books:

1. Anastasi, A., Urbina, S. (2009). Psychological Testing. India: Pearson College Division.
2. Gregory, R. J. (2004). Psychological testing: History, principles, and applications. Pearson Education India.
3. Husain, A. (C.E) Psychological Testing. New Delhi: Pearson. ISBN: 978-81-317-7023-8.
4. Singh A.K. (2017). Tests measurements and Research Methods in Behavioral sciences. Patna: Bharati Bhavan Publishers and Distributors.

Suggested readings:

1. Aiken, L. R. (2009). *Psychological testing and assessment*. Pearson Education India.
2. Boring, E. G. (2008). *History of experimental psychology*. Genesis Publishing Pvt Ltd.
3. Hogan, T. P., Cannon, B. (2003). *Psychological Testing: A Practical Introduction*. United Kingdom: Wiley.
4. Loewenthal, K. M., and Lewis, C. A. (2018). *An introduction to psychological tests and scales*. Psychology press.
5. Urbina, S. (2014). *Essentials of psychological testing*. John Wiley and Sons.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks (Theory 30 + Practical 20)

Five Short Questions to be answered out of eight given from lower order of RBT – (2 Marks). Three Long Questions to be answered out of five from higher order of RBT – (5 Marks).

Summative Assessment Time: 2 Hours for pen and paper test.

Practical – Viva and Practical Record Book (15 + 05= 20 marks)

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(Seal)

(Seal)

(College seal in all pages)

Semester-III

23PSYMR106- Social Psychology

Course Code	23PSYMR106
Course Title	Social Psychology
Credits	04 (T)
Lecture/Practical Hours	60-L (1 credit theory is 15 hours)
Hours/Week	4
Category	Major Core
Semester	III
Regulation	2023

Course Overview:

This course –

- Covers the basic concept of social psychology.
- Examines the fundamental processes and core psychological concepts, models, classical theories, varied perspectives in the study of social behaviour.

Course Objectives:

The students will be able to –

- Understand the fundamental mental processes which are the base for social behaviour.
- Explain the basic concept and knowledge about social psychology.
- Analyze the applications of social psychology in various fields.
- Develop critical and analytical skills regarding the individual and group behaviour in social settings.

Prerequisites: Basic knowledge about General Psychology

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to

Cos	STATEMENTS	BLOOM's LEVEL
CO1	Define the basic concept and fundamental mental processes for social behavior.	R
CO2	Explain the core psychological concepts, models, classical theories, varied perspectives in the study of social behaviour.	U
CO3	Analyze the applications of social psychology in various fields.	A1 and A2
CO4	Develop critical and analytical skills regarding the individual/group and situational characteristics in determining social behaviour.	C
Cos	STATEMENTS	BLOOM's LEVEL

Syllabus				
UNITS	CONTENT	HOURS	Cos	REVISED BLOOM's TAXONOMY
Unit 1	Introduction to Social Psychology - Definition, and nature of social psychology - Approaches in the study of social behavior - Research methods: observation, Correlation and Experimental	15	CO1 CO2 CO3 CO4	R U and A1 U and A1 A1 and A2
Unit 2	Social Cognition - Definition, Heuristics its types and Schemas - Role of schemas in social cognition - Model of social cognition: Automatic and controlled processing - Biases in social cognition	15	CO1 CO2 CO3	R and U U and A1 U and A1
Unit 3	Attitude and Persuasion - Definition and types - Attitude formation - Persuasion: Definition and factors affecting persuasion - Cognitive processes underlying persuasion	15	CO1 CO2 CO3 CO4	R and U U and A1 U and A1 U and A1
Unit 4	Social Influence - Definition and nature - Conformity: meaning, factors and Solomon Asch study - Compliance: meaning, techniques and studies - Obedience: meaning, factors and Milgram's study	15	CO1 CO2 CO3 CO4	R and U U and A1 A2 and E U and A1
R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating Reference Books - Aronson E. Wilson, T. D. and Akert RM (2007) Social psychology. New Jersey : Pearson Education. - Bless, H. (2007). The Consequences of Mood on the Processing of Social Information. In A. Tesser, N. Schwarz (Eds.). Blackwell Handbook of Social Psychology: Intraindividual Processes (p 391-412). Blackwell Publishing Ltd. - Baron, R. A. Byrne D. (2002) "Social Psychology" Suggested books - Baron, R. A., Byrne, D., and Branscombe, N. R. (2006). Social Psychology. (11th edition).				

2. Feldman, R. S. (2001). Social Psychology. Prentice Hall.
3. Robert A. Barron, Nyla R. Branscombe, Donn Bysne, Gopa Bharadwaj (2010) Social Psychology, Prosocial Behaviour, Dorling Kindersley (India) Pvt. Ltd. of Pearson Education New Delhi.
4. Taylor, S. E. Peplau, L. A and Sears D. O. (2006). Social psychology (12th Edi) New Delhi. Pearson Education.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Theory (25 Marks).
- b) Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ202- Counselling and Psychotherapy-I

Course Code	23PSYMAJ202	
Course Title	Counselling and Psychotherapy I (T + P)	
Credits	4 (2+1+1)	
Total Hours	45 hours Theory + 30 hours Practical	
Hours per Week	4	
Course Type	Major	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Gender, Human values, professional ethics	
Course Offered to	Psychology	
Regulation	2023 - 24	
Course Overview	This course: a. Provides the student with an opportunity to gain knowledge and skills in counselling and psychotherapy b. Aims to provide each student the methods of practising counselling and psychotherapy using different approaches	
Prerequisite	i. Students are expected to adhere to American Psychological Association <i>Code of Ethics</i> . ii. Students are required to attend at least 75% of theory classes and practical sessions assigned for the course.	
Course Objectives	A student will be able to: i. Understand the theories of counselling and psychotherapy. ii. Understand the counselling process. iii. Understand therapeutic techniques of major psychotherapies	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the nature and methods of counselling and psychotherapy	R
CO2	Gain an understanding of counselling settings and counselling process.	U
CO3	Identify the different theoretical approaches used in counselling and psychotherapy.	A1
CO4	Demonstrate an appreciation of application of the theories of counselling in practice.	A2

CO5	Refine and identify their professional and scientific methods of different types of psychotherapies.	E		
CO6	Research various constructs and concepts used in counselling and psychotherapy	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to counselling and psychotherapy: - Meaning, goals, - importance of guidance, counselling and psychotherapy; - Levels of Helping; - Qualities of an effective counsellor; - Assessment in Counselling; - ACA ethics in Counselling	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	The Counselling Process: - Building Counselling relationships; - Working in a counselling relationship; - Termination of Counselling relationships.	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Psychodynamic and Relationship-Oriented Approaches - Psychoanalytic therapy; - Jungian Psychotherapy; - Adlerian Psychotherapy. - Existential therapy; - Rogerian Person-centered therapy; - Gestalt therapy.	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Behavioural and Cognitive Behavioural Therapy- theory and practice; - Behaviour therapy; - CBT; - REBT; - Reality therapy. - JPMR - Counselling Mock sessions	30	CO1 CO2 CO3 CO4 CO5 CO6	A1 A2 E C
Learning Resources: (Latest edition books listed in APA style: Seventh Edition) R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating				

Reference Books:

1. Corey, G. (1996). Theory and practice of counselling and psychotherapy (5th ed.). Pacific Grove, CA: Thomson-Brooks/Cole.
2. Gladding, S.T. (2009). Counselling: A Comprehensive Profession: New Delhi: Pearson Education.
3. Sharf, R.S. (2000). Theories of psychotherapy and counselling: Concepts and cases (2nd Ed.). Singapore: Brooks/Cole.

Suggested readings:

1. Brems, C. (2001). Basic skills in psychotherapy and counselling. Singapore: Brooks/Cole.
2. Ivey, A.E., Ivey, M.B., and Simek-Morgan, L. (1997). Counselling and psychotherapy: A multi-cultural perspective (4th ed.). Boston: Allyn and Bacon.
3. Miltenberger, R.G. (2001). Behaviour modification: Principles and procedures (2nd Ed.). Belmont, CA: Wadsworth/Thomson Learning.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMIN201- Psychology of Health and Wellbeing

Course Code	23PSYMIN201	
Course Title	Psychology of Health and Wellbeing	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Psychology of health issues, stress management	
Course Offered to	Psychology	
Regulation	2023-24	
Course Overview	This course: a. Introduces major theoretical and empirical perspectives on the psychology of health and wellbeing. b.Examines the psychosocial determinants of health and wellness. c. Focuses on psychological methods of health protection and illness prevention. d. Focuses on the role of health psychology in health care settings, behaviour, stress management and identification and treatment of chronic conditions and life-threatening illnesses will be covered.	
Prerequisite	Basic knowledge about health and illness.	
Course Objectives	A student will be able to: i. Understand the basic concepts of health and role of psychology in determining overall well-being. ii. Explain the spectrum of health and illness for better health management. iii. Examine psychosocial determinants of health and wellness, and see parallels with their own health priorities. iv. Comprehend and apply a broad and coherent body of knowledge of psychology, with depth of understanding of underlying principles, theories and concepts in the discipline, using a scientific approach, including psychological health and well-being.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define health, illness and wellbeing.	R
CO2	Understand the role of psychology in health and wellbeing.	U

CO3	Describe major concepts and theoretical approaches related to the biological and psychosocial determinants of health and wellbeing.	A1		
CO4	Demonstrate an appreciation of diversity and the impact of culture and context with regard to the psychology of health and wellbeing.	A2		
CO5	Critically evaluate health psychology research and develop arguments that can be supported by relevant research literature.	E		
CO6	Research and describe strategies for explaining and changing health risk and health enhancing behaviour.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction: a. Introduction to: Health Psychology, Illness, Health and Wellbeing. b. Health Continuum c. Models of Health and Illness: Medical and Biopsychosocial. d. Holistic Health	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Stress and Health Management: a. Nature and Sources of stress b. Effect of stress on physical and mental health. c. Coping and Stress Management: Relaxation techniques, Yoga, Meditation, Mindfulness and Cognitive Restructuring d. Health compromising behaviour e. Health enhancing behaviour and Illness management.	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Wellbeing: a. Nature and Constituents b. Hedonic and Eudaimonic well-being c. Positive Emotions d. Hope and Optimism	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Promoting Human Strengths and Life Enhancement: a. Human strengths and virtues b. Deconstructing Illness ideology c. Resilience	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

	d. Gainful Employment			
Learning Resources: (Latest edition books listed in APA style: Seventh Edition) Reference Books: 1. Carr, A. (2004). Positive Psychology: The science of happiness and human strength. UK: Routledge. 2. Misra, G. (1999). Stress and Health. New Delhi: Concept. 3. Taylor, S.E. (2006). Health psychology, 6th Edition. New Delhi: Tata McGraw Hill. Suggested readings: 1. DiMatteo, M. R. Martin, L.R. (2007). Health Psychology, Pearson Education, New Delhi. 2. Brannon, L. and Feist, J. (2010). Health Psychology: An Introduction to Behavior and Health. Wadsworth, Cengage Learning, USA. 3. Carr, A. (2004). Positive Psychology. London: Routledge. 4. Myers, D. G. (1992). The pursuit of Happiness: Discovering the pathway to fulfillment, well-being, and enduring personal joy. New York: Avon. 5. Compton, W. C. (2005). Introduction to Positive Psychology. 6. Sarafino, E.P. (2002). Health psychology: Bio psychosocial interactions (4th Ed.). NY: Wiley. 7. Snyder, C.R., and Lopez, S.J. (2007). Positive psychology: The scientific and practical explorations of human strengths. Thousand Oaks, CA: Sage. 8. Forshaw, M. (2003). Advanced Psychology: Health Psychology. London: Hodder and Stoughton. 9. Hick, J.W. (2005). Fifty signs of Mental Health. A Guide to understanding mental health. Yale University Press.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Five Very Short Questions to be answered out of eight given from lower order of RBT – (10 Marks).

Four Short Questions to be answered out of six set from higher order of RBT – (20 Marks).

Two Long Questions to be answered out of four set from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMDC201- Career Guidance and Counselling

Course Code	PSYMDC201			
Course Title	Career guidance and counselling			
Credits	2+0+1			
Lecture/Practical Hours	30+30			
Hours/Week	3			
Semester	III			
Course Overview: This course – a. Discuss the basics of guidance and counseling b. Explain the process of career guidance and counseling c. Conduct psychological assessments				
Course Objectives: The students will be able to – i. Describe the nature and types of guidance and counseling ii. Understand the process of career guidance and counseling. iii. Implement relevant psychological tests..				
Prerequisites: Knowledge of the basics of research				
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to				
Cos	STATEMENTS		BLOOM's LEVEL	
CO1	Describe the nature and types of guidance and counseling		R	
CO2	Understand the process of guidance and counseling		U	
CO3	Analyze the nature of career guidance and counseling		A1 and A2	
CO4	Implement relevant psychological tests		E and C	
Syllabus				
UNITS	CONTENT	HOURS	Cos	REVISED BLOOM's TAXONOMY
Unit 1	Introduction to Guidance and Counseling a. Definition, nature, functions, Importance, limitations, types and kinds of Guidance and Counseling. b. Difference between Guidance, Counseling and Psychotherapy. c. The Phases of the Counseling Process (Assessment, Intervention, and Termination) d. Characteristics of an Effective Counselor	15	CO1 and CO2	R and U U and A1 U and A1

				U and A1
Unit 2	Career Guidance and Counseling - Definition, Meaning, Nature, Scope and Importance of Career Counseling - Nature, Role and Training of Career Counselors - Career counseling with diverse population (Students, Adults, Specially Abled) - Ethics of Career Counseling	15	CO3	R, A2 and C R, A2 and C R, A2 and C R, A2 and C
Unit 3	Practical Assessment of career preference (Career Preference Record) Camp, Career Club formation, Club activities and Career Day)	30	CO4	E

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Reference Books

1. Kinra, Asha K. (2012). Guidance and Counselling, Pearson Publication.
2. Nathan, Robert and Hill, Linda (2012). Career Counselling, SAGE Publications
3. Nelson-Jones, Richard (2008). Basic Counselling Skills, A Helper's Manual, SAGE Publications India Pvt. Ltd.
4. Srivastava, Sushil Kumar (2007). Career Counselling, ATLANTIC Publishers and Distributors (P) LTD

Suggested books

1. Aggarwal, J.C. (1998). Career Information in Career Guidance: Theory and Practice, Doaba House, Delhi.
2. Cochran, Larry (1997). Career Counselling :A Narrative Approach, SAGE Publications
3. Gibson, Robert L. and Mitchell, Marianne H. (2012). Introduction to Guidance and Counselling, Prentice Hall of India, New Delhi.
4. Gupta, Manju (2003). Effective Guidance and Counselling modern Methods and Techniques, Mangal Deep Publications, India.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Five Very Short Questions to be answered out of eight given from lower order of RBT – (10 Marks).
- b) Four Short Questions to be answered out of six set from higher order of RBT – (20 Marks).
- c) Two Long Questions to be answered out of four set from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYSEC201- Emotional Intelligence

Course Code	23PSYSEC201				
Course Title	Emotional Intelligence				
Credits	03(2+0+1)				
Lecture/Practical Hours	30+30				
Hours/Week	3				
Category	SEC				
Semester	III				
Issue(s)Addressed	Self Awareness, self management, social awareness and relationship management.				
Regulation	2024				
Course Overview:	This course– a. helps them to acquaint with the knowledge of Emotional Intelligence and its importance to personal and professional success. b. Helps them to understand and regulate their own emotion as well as others. c. Helps them to develop positive relationships.				
Prerequisites:	Basic knowledge of Psychology and Emotion.				
Course Objectives:	I. Introduce the concept of emotional intelligence and its models and components. II. Understand the significance of emotional intelligence in self growth and building effective relationships. III. Identify the measures of emotional Intelligence.				
Course Outcomes (Cos)and Cognitive Level Mapping At the end of this course, the students will be able to					
Cos	STATEMENTS		BLOOM's LEVEL		
CO1	Explain the concept of EI.		R		
CO2	Understand the significance of EI in self Growth and building effective relationships.		U		
CO3	Discover personal competence and techniques of building EI.		A1 A2		
CO4	Gain insights into establishing and managing positive relationships.		C		
Syllabus					
UNITS	CONTENT		HOURS	Cos	RBT
Unit I	Concept of Emotional Intelligence. a. Concept, history of EI. b. Theories of EI- Mayer Salovey Caruso Emotional Intelligence, Goleman's theory of EI.		15	CO1 CO2 CO3 CO4	R U A 1 A2

Unit II	Intrapersonal and Interpersonal Awareness. a. Self awareness and Management- Observing and recognizing one's own feelings, knowing one's own strength and areas of development, managing own emotion. b. Social competence- social awareness, empathy, relationship management, effective communication and conflict management.	1 5	CO1 CO2 CO3	R U A 1 A2 E
Unit III	Measurement Of EI. (any one) a. Mayer Salovey Caruso Emotional Intelligence Test. b. Sevenfold EI Test	15 +1 5	CO3 CO4	A

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Reference Books

1. Emotional Intelligence- Mayer-Salovey-Caruso.
2. Emotional Intelligence-Daniel Goleman,1995, Why it can matter more than IQ. Bantman Doubleday Dell Publishing Group.
3. Daniel Goleman,2000, Working with EI. Bantman Doubleday Dell Publishing Group.
4. Gupta S K. 1980, Guidance and Counselling in Indian Education, New Delhi, NCERT.
5. Emotional Intelligence –Dileep Chowdhary.

Assessment

Formative Assessment: 50marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

*SummativeAssessment:*50marks

Four Short Questions to be answered out of eight given from lower order of RBT – (20Marks)

ThreeLongQuestionstobeansweredoutofsixsetfromhigherorderofRBT–(30Marks).

SummativeAssessmentTime:2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

Semester IV

23PSYMAJ203- Cognitive Psychology

Course Code	23PSYMAJ203			
Course Title	Cognitive Psychology			
Credits	04			
Lecture/Practical Hours	60			
Hours/Week	4			
Category	Major Core			
Semester	IV			
Regulation	2023			
Course Overview: This course – Is an introduction to basic concepts and major theories of cognitive psychology. It explores the field of human cognition. It provides a deep understanding of the processes underlying human mental activities, including perception, attention, memory, language, thinking, problem-solving, and decision –making. Students will delve into the theories, research-methods, and practical applications of cognitive psychology.				
Course Objectives: The students will be able to – i. Understand the fundamental principles and theoretical framework of cognitive psychology. ii. Analyze and evaluate the major theories and models of cognitive processes, such as perception, attention, memory, and language. iii. Apply cognitive principles and strategies to enhance learning and memory performance. iv. Investigate the impact of cognitive processes on everyday life, including learning, decision-making, and problem-solving.				
Prerequisites: Knowledge in basics of psychology				
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to				
Cos	STATEMENTS		BLOOM's LEVEL	
CO1	Demonstrate a comprehensive understanding of the fundamental principles, theories, and model of cognitive psychology.		A	
CO2	Apply cognitive principles and strategies to real-world scenarios, such as learning, problem-solving, and decision-making.		A2	
CO3	Identify and explain the neural mechanism and brain structures underlying various cognitive processes.		U,R and A1	
CO4	Engage in critical thinking and problem solving by analyzing and interpreting real-world phenomena through the lens of cognitive psychology.		A2	
Syllabus				
UNITS	CONTENT	HOURS	Cos	REVISED BLOOM's TAXONOMY
Unit 1	Introduction to Cognitive Psychology a. Historical overview of cognitive psychology	15	Co1	U R

	b. Key pioneers and their contributions c. Fundamental concepts and theories in cognitive psychology; Piaget; Vygotsky, Information Processing Perspective. d. Scientific methods used in cognitive research			
Unit 2	Thinking and Reasoning a. Thinking-types; convergent; divergent b. Decision making; Reasoning	15	Co2	U R
Unit 3	Memory and Forgetting a. Encoding, storage, and retrieval processes b. Sensory memory, short –term memory, and long-term memory c. Factors influencing memory formation and retention	15	Co3	A1 A2
Unit 4	Language and Thought a. The structure and components of language b. Language comprehension and production c. Language development and acquisition d. Language and thought interaction. e. Perspectives: Nativist; Interactional approach; Behaviorist.	15	Co4	U R C E A1 A2

Reference Books

1. Solso, R.L, (2006) Cognitive Psychology. New Delhi. Person Education
2. Morgan, C.T., King, R.A., Weisz, J.R. and Schopler, J. (1993) Introduction to Psychology. New Delhi; Tata McGraw Hill
3. Kellogg, R.T. (2012). Fundamentals of Cognitive Psychology. New Delhi: Sage Publications
4. Esgate, A., and Groome, D. (2005). An introduction to applied cognitive psychology. New York: Psychology Press.

Suggested Books

1. Cognitive Psychology (8th Ed.). Robert L. Solso. Dorling Kindersley(India) Pvt Ltd
2. Cognitive Psychology (5th Ed). Kathleen M. Galotti. Sage Publications.
3. Sternberg R. J. and Sternberg, K. (2012). Cognitive Psychology. Belmont, California: Cengage Learning.
4. Benjafield, J.G. (2007). Cognition. Delhi: Oxford University Press.
5. Goldstein B.E. (2008). Cognitive Psychology. London: Wadsworth.
6. Galotti, K.M. (2001). Cognitive Psychology in and out of the Laboratory. New Delhi: SAGE Publications.
7. Maltin, M.W. (2003). Cognition. London: Wiley Publication

Assessment

Formative Assessment: 50marks as per Assessment and Evaluation Framework Document of Salesian College (Theory-25 and practical -25)

Summative Assessment: 50marks

Four Short Questions to be answered out of eight given from lower order of RBT – (20Marks)

Three Long Questions to be answered out of six set from higher order of RBT – (30Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMAJ204- Counselling and Psychotherapy II

Course Code	23PSYMAJ204			
Course Title	Counselling and Psychotherapy II (T + P)			
Credits	4 (2+1+1)			
Total Hours	30 hours Theory +15 hours tutorial+ 30 hours Practical			
Hours per Week	4			
Course Type	Major			
Semester	IV			
Intended Level	Diploma			
Issue(s) Addressed	Gender, Human values, professional ethics, methods and techniques of group and family therapy			
Course Offered to	Psychology			
Regulation	2023 - 24			
Course Overview	This course: a. Provides the student with an opportunity to gain knowledge and skills in different types of psychotherapy. b. Aims to provide each student the methods of practising various methods of psychotherapy using different approaches.			
Prerequisite	i. Students are expected to adhere to American Psychological Association <i>Code of Ethics</i> . ii.Students are required to attend at least 75% of theory classes and practical sessions assigned for the course.			
Course Objectives	A student will be able to: i. Understand the theories of different types of psychotherapy. ii. Understand the group therapy process. iii. Understand major family therapies			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Identify the nature and methods of different types of psychotherapy	R		
CO2	Gain an understanding of group and family therapies	U		
CO3	Identify the different theoretical approaches used in group and family therapies.	A1		
CO4	Demonstrate an appreciation of application of the theories of group counselling and family therapy.	A2		
CO5	Refine and identify their professional and scientific methods of different types of group and family psychotherapies.	E		
CO6	Research various constructs and concepts used in group and family therapies.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT

Unit I	Introduction to different types of counselling: - Career counselling - Child counselling - Crisis Intervention: suicide, grief and sexual abuse	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Approaches in group therapy: - Group therapy theories; - Emergence of group therapy based interventions; - Brief forms of group therapy; - Group interventions techniques	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Approaches in Family therapy: - Family Therapy basics, case history taking and diagnosis - Theories-structural, psychodynamic, strategic, systemic and behavioural - Treatment of family and couples using Family therapy techniques. - Hypothesis formulation, circular questions, intervention plan	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Research and Application: - Research in family therapy; - Applications of group and family therapy; - Modern developments in family therapy - Mock group therapy-practical - Mock family counselling-practical	30	CO1 CO2 CO3 CO4 CO5 CO6	A1 A2 E C

Learning Resources: (Latest edition books listed in APA style: Seventh Edition)

Reference Books:

- Nichols, P.M and Schwartz C.R (2006). *Family Therapy –concepts and methods*, 7thedition, Allyn and Bacon, Boston, Pearson education, Inc.
- Corey, G (2008) *Theory and Practice of Group Psychotherapy*, 8TH edition, Pacific Grove, C A: Brooks/Cole.
- Agazarian, Y. M. (1997), *System-Centered Therapy for Groups*, Guilford Press
- Alonso, A., and Swiller, H.I. (1992) *Group Therapy in Clinical Practice*, American Psychiatric Press, Inc.

Suggested readings:

- Bernard, H. S. and Mac Kenzie, K.R. (eds.) (1999), *Basics of Group Psychotherapy*, Guilford Press.
- Bion, W.R. (1959) *Experiences in Groups and other Papers*. N.Y.: Basic Books.
- Corey, M. and Corey, G. (1997) *Groups: Process and Practice* (5th ed.) Pacific Grove, CA: Brooks/Cole.

4. Dies, R.R. and Mac Kenzie, K.R. (1983) *Advances in Group Psychotherapy: Integrating Research and Practice*. N.Y.: International University Press.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (25 Marks).

Practical and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(seal)

(seal)

23PSYMAJ205- Internship Training and Practice

Course Code	23PSYMAJ205	
Course Title	Internship (0+0+4)	
Credits	4	
Total Hours	120 hours	
Hours per Week	4	
Course Type	Major	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Psychology	
Regulation	2023 - 24	
Course Overview	This course: Provides the student with an opportunity to gain knowledge and skills from field experiences. Aims to provide each student practical experience in a standard work environment.	
Prerequisite	Students are expected to adhere to American Psychological Association <i>Code of Ethics</i>. Students are required to attend at least 75% of theory classes assigned for internship to be eligible for internship in the field.	
Course Objectives	A student will be able to: Successfully complete a 60 hour internship related to the field of psychology. Gain experience to become competent learners in the field of psychology. Document their experience of internship in the field of psychology. Demonstrate the capacity to integrate and apply theoretically sound approaches to real life equivalents. Demonstrate the capacity to communicate effectively orally and in writing.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Take case histories, MSEs, and write internship reports.	R

CO2	Gain an understanding of workplace dynamics, workplace expectations, and understand the influence of culture on both.	U		
CO3	Build proficiency in a range of skills appropriate to the field of internship, including professional communication through written, verbal and non-verbal means.	A1		
CO4	Demonstrate an appreciation of application of the theories of psychology in the real world.	A2		
CO5	Refine and identify their professional and career goals through critical analysis of their internship experience.	E		
CO6	Research various constructs and concepts of psychology throughout the internship experience.	C		
Course Content				
Content		Lecture Hours	COs	RBT
The students will be trained on: Internship in Clinical/Counselling: Case History and Mental Status Examination, Art and Play Therapy. Preparation of Internship Report. Upon completion of training the students will be deployed for internship in the field.		120	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Learning Resources: (Latest edition books listed in APA style: Seventh Edition)				
Suggested readings: Sadock, B. J. (2015). Kaplan and Sadock's synopsis of psychiatry: behavioural sciences/clinical psychiatry. Philadelphia, PA: Wolters Kluwer. Sethi, N. Psychiatric History Taking.				

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

c) Internship Report (25 Marks).

d) Presentation and Viva (25 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYMIN202- Psychology of Personal Growth and Development

Course Code	23PSYMIN202
Course Title	Psychology of Personal Growth and Development
Credits	4
Lecture/Practical Hours	60
Hours/Week	4
Category	Diploma
Issues Addressed	
Semester	IVth semester BA Honours
Regulation	2024

Course Overview:

- The course involves an introduction to processes of change in individuals and groups across the lifespan.
- Topics of interest include developmental theories, patterns of development in physical, motor, cognitive and psychosocial domains within

Course Objective:

To provide an understanding of normal mental development from human infancy to late childhood and adolescence. The social context and development will also be considered.

Course Outcomes (Cos) and Cognitive level mapping

At the end of this course, the students will be able to

COs	STATEMENTS	BLOOM'S LEVEL
CO1	Understand the concepts of human growth and development	R U
CO2	Identify developmental milestones/tasks at various stages of life	U A1 A2
CO3	Evaluate the different theoretical perspectives on the cognitive, emotional and psychosocial processes and development	R U A2 E
CO4	Evaluate and analyse the recent trends in the study of growth and development	A1 A2 E
CO5	Conduct research on different aspects of personal growth and development based on the theoretical understandings	C

UNITS	CONTENT	HOURS	COs	REVISED BLOOM'S TAXONOMY
Unit I	Introduction: - Importance of studying growth and development. - The nature of development: Biological, Cognitive and Socio-emotional processes; Periods of development; Developmental issues. - Genetic Foundations: Genetic processes and genetic principles. Prenatal Development: Course of prenatal development; Physical growth	15	CO1 CO2	R U
Unit II	Cognitive Development: - Cognitive Development (Birth- Adolescents): Piaget's and Vygotsky's theory of Cognitive Development. - Cognitive changes in Adulthood: Paige's view; Realistic and pragmatic thinking, Reflective and Realistic and Relativistic thinking - Cognitive changes in late adulthood	15	CO3	R U A2 E
Unit III	Emotional Development: - Introduction to the concept of emotion; - emotion regulation; emotional competence - Development of emotions: - Infancy, childhood, Middle and late childhood, Adolescence and Adulthood. Temperament and Attachment.	15	CO3	R U A2 E

Unit IV	Psychosocial Development: a. Erikson's theory of psychosocial development; Kohlberg's theory of Moral Development; Social learning theory b. Psychosocial development in adulthood. c. Recent trends in the field of development and growth; applications	15	CO3 CO4 CO5	R U A1 A2 E C

R: Remembering, Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Reference Books:

1. Berk, L. E. (2003). Child development. 6th edition, Pearson Education
2. Kail, R. V. (2001). Children and their development. Prentice Hall Inc.
3. Papalia, D.E., Olds S.W., and Feldman, R.D. (2004). Human Development. New Delhi: Tata McGraw Hill.
4. Feldman, R.S. (2016). Development across the Life Span. 8th Ed, New Delhi: Pearson.
5. Rathus, S. A. (2014). Child and Adolescent Development - CDEV, 2nd ed. Belmont, CA: Wadsworth.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

Theory (50 Marks).

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(seal)

(seal)

23PSYVAC202- Sports Psychology

Course Code	23PSYVAC202
Course Title	VAC
Credits	02
Lecture/Practical Hours	15 hours training+30 hours practical
Hours/Week	2
Category	Value added course
Issue(s) Addressed	Gender, Human values, professional ethics
Semester	IV
Regulation	2023

Course Overview:**This course –**

Define the basic concepts related to applying psychological principles in sports.
 Explains how to develop an in-depth understanding about sports person's situations, demands, and problems.
 Analyse how psychological knowledge can be utilised to stimulate sports personnel
 Enables them to design intervention programs for those in sports field.

Course Objectives:**The students will be able to –**

Describe the scope and perspectives of sports psychology.
 Understand the effect of arousal, anxiety and stress on performance. Apply the cognitive and social psychological dimensions in sports. Evaluate the effect of arousal, anxiety and stress on performance.
 Create interventions for sports persons.

Prerequisites: Basic knowledge and interest about sports field and readiness to help sports personnel's mental health

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to

COs	STATEMENTS	BLOOM's LEVEL
CO1	Identify the scope and perspective of sports psychology	R
CO2	Discuss various issues of race, gender and sexual orientation in sports	U
CO3	Explain and relate group dynamics and aggression management in sports	A1
CO4	Analyse and evaluate various process involved in Arousal, Anxiety, Stress and Sporting Performance	A2 and E
CO5	Design strategies to manage Burnout, overtraining and overreaching; Retirement; Drug abuse in sport and exercise.	C

Syllabus				
UNITS	CONTENT	HOURS	COs	REVISED BLOOM'S TAXONOMY
Unit I	Introduction to Sports Psychology and Group Dynamics; a. History, Nature, and Scope of sports psychology; b. Recent perspectives -Issues of race, gender and sexual orientation in sports; c. Role of a sports psychologist. d. Groups and teams; Social facilitation; e. Leadership	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit II	Aggression, Arousal, Anxiety, Stress and Sports Performance a. Theories of aggression; Aggression, injury, and addictive behaviours. b. Arousal, Anxiety, Stress and Sporting Performance: c. Definitions of arousal, anxiety and stress; Factors inducing anxiety and stress; d. Relationship between arousal and performance; Burnout, overtraining and overreaching; e. Retirement; Drug abuse in sport and exercise	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Unit III	Practical a. Collect a case study of psychological support given to a sportsman under stress or anxiety b. Conduct a focus group discussion with selected sportsman/ woman from the college.	30	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Reference Books

1. Lynch, J. (2001). Creative coaching. Human Kinetics. Mohan, J. (1996) Recent Advances in sports psychology.
2. Murphy, S. M. (1995) Sports psychological interventions. Human Kinetics. Richard H. Cox. (2007) Sport psychology. McGraw Hill.

Suggested books

1. Jarvis, Matt (2006) Sports psychology: A student's handbook. Routledge. Horn, T. S (Ed)(1992). Advances in sports psychology. Human Kinetics.
2. Friends Murphy, E. (1995) Advances in sports psychology. Human Kinetics. Murphy, S. M.(1995) Sports psychological interventions. Human Kinetics.
3. Weinberg, R. S. and Gould, D. (2007) Foundations of sport and exercise psychology. Human Kinetics.

Assessment

Formative Assessment: 50 marks as per Assessment and Evaluation Framework Document of Salesian College

Summative Assessment: 25 marks (Theory 10 + Practical 15)

Five Short Questions to be answered out of eight given from lower order of RBT – (5 Marks)

One Long Questions to be answered out of two set from higher order of RBT – (5 Marks). Summative Assessment Time: 2 Hours for pen and paper test.

Practical – Viva and Practical Record Book (10 + 5 = 15 marks)

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

SIGNATURE OF EXTERNAL EXPERTS	Prof. Satyananda Panda HOD Department of psychology Central University Sikkim	Dr Johnson Alex Associate Professor, Department of Psychology, Kannur University, Kerala	Dr Paramita Datta Rej Assistant Professor, Division of Applied Psychology, Faculty of Allied Health Sciences, Sri Ramachandra Institute of Higher Education and Research (Deemed to be University), Porur, Chennai-600116
SIGNATURE OF UNIVERSITY NOMINEE	Prof Jayanti Basu Department of Applied Psychology Rashbehary Shiksha Prangan University of Calcutta 92 APC Road Kolkata 700009		
SIGNATURE OF ALUMNI MEMBER	Ms. Vasudha Agrawal 2017 batch BA Psychology Alumni, Psychologist at Campion International School, Siliguri		
SIGNATURE OF INDUSTRY EXPERT	Mrs. Aditi Majumdaar, Consultant Clinical Psychologist, Jalpaiguri Govt Medical College and Hospital and 158 BASE Hospital, Army Base, Bendubi		
SIGNATURE OF HOD	Dr Prince C P Associate Professor and Head Department of Psychology		



Salesian College
(Autonomous)
Sonada - Siliguri

Curriculum Framework
For
Master of Arts in Education

Department of Education

Curriculum Document
2023 – 2024

VISION

To uphold the multidisciplinary nature through its diverse curriculum in order to fulfil the long-term goals of holistic development of every learner.

MISSION

To create a transformative educational experience for students focused on deep disciplinary knowledge.

1. Programme Overview

Master of Arts in Education is a two-years degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Grasp the theories of educational philosophy, sociology and psychology.
	PO02: Acquaint him/herself with the history of the Indian education system, its educational policies, commissions and committees.
	PO03: Relate his/her understanding of guidance and counselling, peace and value education in various classroom situations and societal experiences.
	PO04: Gain awareness about the various contemporary issues in education.
Skills	PO05: Demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes.
	PO06: Construct instructional designs, scholastic & co-scholastic curriculum designs.
	PO07: Integrate and apply ICT in learning process
	PO08: Acquaint him/herself with the diverse current educational problems and other related issues like SSA, Inclusive education, unemployment, population explosion, poverty, and national disintegration.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical knowledge of education subject and statistical techniques and pedagogical analysis.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as education is a lifelong process for empowering the student to face all challenges in his/her future endeavours.
	PO11: Develop concern for the society, nation as well as promote the feeling of internationalism by comparing our education system with that of other developed countries.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops a clear idea about the subject Education, like nature, scope and aim of Education, factors, different agencies of education and child centric Education.
	PSO2: A student gathers knowledge about Educational Psychology, theories and their implication in the field of education and education system.
	PSO3: A student develops knowledge about the detailed history of the Indian Education system.
	PSO3: A student develops knowledge about the detailed history of the Indian Education system.

	PSO4: A student internalises the basics of Sociology, relation between Sociology and Education and importance of Educational Sociology in the field of Education.
	PSO5: A student develops knowledge about basic of Indian as well as Western Philosophy. S/he also develops knowledge about the importance of different schools of philosophy in the field of Education.
	PSO6: A student develops the concept of guidance and counselling, various types of guidance and basic data necessary for guidance.
	PSO7: A student develops the concept of educational research and statistics to develop skill in analysing descriptive measures, concept of Normal Probability Curve and its uses in education, measures of relationship and organize relevant educational data and to represent educational data through graphs and to develop skill in analysing and displaying data.
Skills	PSO1: A student will develop a clear idea about the subject Education, like nature, scope and aim of Education, factors, different agencies of education and child centric Education.
	PSO2: A student will execute the educational implications of the theories of psychology.
	PSO3: A student will construct Instructional Designs, Scholastic and Co-Scholastic Curriculum designs.
	PSO4: A student will develop an understanding of educational technology, ICT and e-learning.
	PSO5: A student will advocate the importance of guidance and counselling.
	PSO6: A student will develop the skill of using computer in education and communication, ICT & e-learning.
	PSO7: A learner will exhibit an excellent communication skill, Skill for Democratic Citizenship and related theories, teaching skills, life skill education, peace and value education.
Competence	PSO1: A learner demonstrates competencies required to use computers in education, communication, ICT & e-learning for implementing instructional techniques and different models of teaching.
	PSO2: A student will analyse the detailed history of Indian education system.
	PSO3: A student will systematise the concepts of adjustment, maladjustment and the various interpretations of the psychological tests.
	PSO4: A student will correlate various qualitative and quantitative data for educational research.
	PSO5: A student will envision a society where people from all walks of life enjoy equal and equitable rights and opportunities.
	PSO6: A student will compute statistical analysis in the field of educational research.
	PSO7: A student will analyse the contemporary trends in education.

4. PROGRAMME MATRIX

➤ COURSE CODE & COURSE TITLE:

SEMESTER I		
Course Code	Course Type	Course Titles
EDUPG101	Core	Philosophical Foundations of Education
EDUPG102	Core	Psychological Foundations of Education
EDUPG103	Core	Introduction to Educational Research
EDUPGDSE104 EDUPGDSE105	Discipline Specific Elective	Teacher Education OR Educational Development in North Bengal
SEMESTER II		
EDUPG111	Core	Theories & Practices of Educational Philosophy
EDUPG112	Core	Theories & Practices of Educational Psychology
EDUPG113	Core	Educational Sociology
EDUPG114	Core	Quantitative Measures in Educational Research
SEMESTER III		
EDUPG201	Core	Educational Measurement & Evaluation
EDUPG202	Core	Curriculum Construction
EDUPG203	Core	History of Indian Education
EDUPGDSE204 EDUPGDSE205 EDUPGDSE206	Discipline Specific Elective	Educational Management & Administration OR Comparative Education OR Women Education
SEMESTER IV		
EDUPG221	Core	Educational Technology
EDUPG222	Core	Inclusive Education
EDUPG223	Core	Guidance & Counselling
EDUPG224	Core	Dissertation

➤ NEP Framework for Academic Year 2023- MA Education

Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Hours per Week	Total Hours	Total Marks
I	EDUPG101	Core	Philosophical Foundations of Education	05	05	75	100
	EDUPG102	Core	Psychological Foundations of Education	05	05	75	100
	EDUPG103	Core	Introduction to Educational Research	05	05	75	100
	EDUPGDSE104 EDUPGDSE105	Discipline Specific Elective	Teacher Education OR Educational Development in North Bengal	05	05	75	100
II	EDUPG111	Core	Theories & Practices of Educational Philosophy	05	05	75	100
	EDUPG112	Core	Theories & Practices of Educational Psychology	05	05	75	100
	EDUPG113	Core	Educational Sociology	05	05	75	100
	EDUPG114	Core	Quantitative Measures in Educational Research	05	05	75	100
III	EDUPG201	Core	Educational Measurement & Evaluation	05	05	75	100
	EDUPG202	Core	Curriculum Construction	05	05	75	100
	EDUPG203	Core	History of Indian Education	05	05	75	100
	EDUPGDSE204 EDUPGDSE205	Discipline Specific Elective	Educational Management & Administration OR	05	05	75	100

	EDUPGDSE206		Comparative Education OR Women Education				
IV	EDUPG221	Core	Educational Technology	05	05	75	100
	EDUPG222	Core	Inclusive Education	05	05	75	100
	EDUPG223	Core	Guidance & Counselling	05	05	75	100
	EDUPG224	Core	Dissertation	05	05	75	100
	Total			80	-----	-----	-----

Course Description

Course Code	EDUPG101
Course Title	PHILOSOPHICAL FOUNDATIONS OF EDUCATION
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Core
Semester	I
Intended Level	MA Semester I
Issue(s) Addressed	Human Values
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Estimates the importance, contribution, and significance of studying Philosophical Inquiry as the foundation of Education. • Explains the propositions of different philosophical schools in educational theories & and practices. • Identifies the interdependence between education and philosophy. • Describes the importance of National Values in Education.
Prerequisite	Basic knowledge of the term education and its importance in the life of an individual and society.
Course Objectives	A student will be able to: • Explain the basics of Philosophy and Education in relation to the meaning, nature, scope, and objectives of Education and Philosophy and their interrelationships.

	• Describe the importance of education and philosophy. • Analyze the Indian and Western Schools of Philosophy and their educational implications. • Evaluate the contributions of great Indian thinkers to Educational Philosophy. • Critically estimate the national values enshrined in the Indian Constitution with special reference to Education.
Course Outcomes	At the end of this course, a student will be able to: • State the meaning, nature, scope, and objectives of Education and Philosophy. • Explain the interrelationship between Education and Philosophy. • Evaluate the Indian and Western Schools of Philosophy and their educational implications. • Analyze the contributions of great Indian thinkers to Educational Philosophy. • Examine the national values enshrined in the Indian Constitution with special reference to Education.
Units	Course Content
Unit I	Basics of Philosophy and Education a) Meaning, Nature, Scope, and Objectives of Education. b) Meaning, Nature, Scope, and Objectives of Philosophy. c) Relation between Philosophy and Education. d) Concepts of Educational Philosophy & Philosophy of Education.
Unit II	Indian Schools of Philosophy a) Broad classification of Indian Schools of Philosophy. b) Nyaya- with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching). c) Sankhya- with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching). d) Yoga- with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching).

Unit III	Western Schools of Philosophy a) Idealism- with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching). b) Naturalism- with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching). c) Pragmatism- with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching). d) Marxism- with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching).
Unit IV	Great Indian Thinkers a) Swami Vivekananda. b) Rabindranath Tagore. c) Shri Aurobindo. d) M. K. Gandhi. e) Krishnamurthy.
Unit V	National Values in Education a) Introduction to the Indian Constitution. b) Socialism and the Indian Constitution. c) Secularism and the Indian Constitution. d) Justice and the Indian Constitution.
Learning Resources: Textbooks - 1. J. C. Aggarwal (2006). Basic Ideas in Education Shipra Publications, New Delhi. 2. S. P. Chaube & A. Chaube (2010). Foundations of Education, Vikas Publications, New Delhi. 3. J. C. Aggarwal & S. Gupta (2006). Great Philosophers and Thinkers on Education, Shipra Publications, New Delhi. 4. S. H. Ansari (2003). Philosophical Foundations of Education, Sanjay Prakashan, New Delhi. 5. J. C. Aggarwal (2017). Philosophical Foundations of Education, Book Man Publishers, New Delhi.	

6. Y. K. Singh, Philosophical Foundation of Education, APH Publishing House, New Delhi, 2007.
7. K. K. Shrivastava, Philosophical Foundations of Education, Kanishka Publishers, New Delhi, 2003.
8. S. C. Chatterjee & D. M. Datta (2012). An Introduction to Indian Philosophy, Rupa Publications, Kolkata.
9. V. P. Verma (2002)., Studies in The Philosophy of Education, Gyan Books Pvt. Ltd., New Delhi.
10. J. Sinha (2013). Outlines of Indian Philosophy, Central Book Agency, New Delhi, 2013.
11. V. R. Taneja (1995). Educational Thoughts and Practices, Sterling Publishers Pvt. Ltd., New Delhi.
12. R. R. Rusk (1962). The Philosophy Bases of Education, University of London Press, 1962.

Suggested readings-

1. Ravi, S. S. (2015). A Comprehensive Study of Education. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
2. Aggarwal, J. C. (2012). Philosophical and Sociological Bases of Education. Vikash Publication House Pvt. Ltd., New Delhi.
3. Aggarwal, J.C. (2013). Theory and principle of education. Vikash Publication House Pvt. Ltd., New Delhi.
4. Aggarwal, J.C. (2010). Psychological Philosophical and Sociological Foundations of Education (1st Edition). Shipra Publication House Pvt. Ltd., New Delhi.
5. Mishra, S. (2002). Philosophy of Education, Notion Press, California, USA.
6. Mishra, S., Modak, U. Goyal, M. (2021). Great Educators, ABS Books, New Delhi.
7. Mishra, S., Modak, U. Goyal, M. (2022). Philosophy of Education, ABS Books, New Delhi.

Assessment:

i. Formative Assessment: (50 marks)

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: (50 marks)

- a) Two questions to be answered out of four questions. Each answer will carry 20 marks.
- b) One question to be answered out of two questions. Each answer will carry 10 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Priya Topno Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakraborty Signature:

Course Description

Course Code	EDUPG102
Course Title	PSYCHOLOGICAL FOUNDATIONS OF EDUCATION
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Core
Semester	I
Intended Level	MA Semester I
Issue(s) Addressed	Understanding Individual Differences
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Develops an understanding about psychological basis of Education. • Conceptualizes individual differences of the learners in the light of various dimensions of Human Development & their Educational Implications. • Acquaints with psychological principles, techniques, theories of learning process and transfer of Learning to facilitate teaching-learning, • Discusses the emerging demands of Education of Exceptional Children
Prerequisite	Basic Knowledge of Human body and Sense Organs.

Course Objectives	The students will be able to – • Understand the concept and scope of Educational Psychology. • Explain the different theories of development. • Analyse the concept of Individual differences. • Develop knowledge on Personality theories. • Infer the knowledge of Exceptional Children.
Course Outcomes	At the end of this course, a student will be able to: • Define the concept of Educational Psychology. • Compile the methods of Educational Psychology. • Analyse the stages of development with reference to Infancy, childhood, Adolescence • Develop the knowledge on Intelligence theories. • Compose an essay on the concept of Individual differences taking creativity and Personality as examples. • Understand exceptional Children.
Units	Course Content
Unit I	Basics of Educational Psychology: a) Meaning, Nature, Scope and Objectives of Educational Psychology. b) Relationship between Psychology & Education - Schools of Psychology (Structuralism, Functionalism, Behaviourism, Cognitivism, Psychoanalysis and Humanistic), their basic concepts & Educational Contributions.
Unit II	Human Development: a) Concept of Growth & Development -Characteristics & Stages of Development. b) Factors influencing Development (Genetic, Biological and Environmental). c) Various Dimensions of Human Development (Physical, Motor, Language, Emotional and Aesthetic Development).

	d) Development of Concept formation, Logical reasoning, Problem solving and Creative thinking. e) Theories of Development (Piaget's Theory of Cognitive Development, Erickson's Theory of Psycho-Social Development, Kohlberg's Theory of Moral Development and Freud's Theory of Psycho-Sexual Development) & their Educational Implications.
Unit III	Learning process: a) Concept, Nature and Types of Learning -Factors influencing Learning Attention & Interest. b) Maturation & Motivation. c) Remembering & Forgetting. d) Behaviourist Learning Theories (Thorndike, Pavlov and Skinner), Gestalt Theory, Cognitive field Theories (Tolman & Lewin) Drive reduction (Hull), Reception learning (Ausubel), Modeling & Observation Learning (Bandura), Social Constructivist Learning (Vygotsky), Conditions of Learning (Gagne), Discovery Learning (Bruner) - Educational Implications.
Unit IV	Transfer of Learning: a) Concept, Importance, Nature and Types. b) Contemporary views of General transfer & Specific transfer. c) Theories of Transfer of learning (Thorndike, Judd, Gestalt and Bagley). d) Methods of enhancing Transfer in teaching-learning.
Unit V	Education of Exceptional Children: a) Concept, Nature, Detection or Identification and Remedial Education. b) Techniques of Exceptional Children - Creative, Gifted, Backward, Mentally Retarded and Children with Learning disabilities (Reading, Writing and Calculating).

Learning Resources:

Textbooks –

1. S. K. Mangal (2000). Advanced Educational Psychology, Prentice-Hall of India Pvt. Ltd., New Delhi.
2. S. K. Mangal (2011). Essentials of Educational Psychology, Prentice-Hall of India Pvt. Ltd., New Delhi.
3. S. S. Chauhan (1996). Advanced Educational Psychology, Vikas Publishing House Pvt. Ltd., New Delhi.
4. J. C. Aggarwal (2011). Essentials of Educational Psychology, Vikas Publishing House Pvt. Ltd., New Delhi.
5. E. B. Hurlock (1973). Adolescent Development, McGraw-Hill Inc., New York, U.S.

Suggested Readings –

1. S. Dandapani (2001). Advanced Educational Psychology, Second Edition, Anmol Publications Pvt. Ltd., New Delhi.
2. Anastasi & S. Urbina (2004). Psychological Testing, Fourth Edition, Pearson Education, New Delhi.
3. Woolfolk (2004). Educational Psychology, Ninth Edition, Pearson Education, New Delhi.
4. Woolfolk (2012). G. Misra & A.K. Jha, Fundamentals of Educational Psychology, Eleventh Edition, Pearson Education, New Delhi.
5. E. R. Hilgard & G. H. Bower (1977). Theories of Learning, Fourth Edition, Prentice-Hall of India Pvt. Ltd., New Delhi.
6. Mishra, S. (2003). Understanding Learning and Teaching, Notion Press, California, USA.
7. Mishra, S., Modak, U. (2021). Learner's Psychology, Notion Press, California, USA.
8. Mishra, S., Modak, U. Goyal, M. (2022). Philosophy of Education, ABS Books, New Delhi.

Assessment:

i. Formative Assessment: (50 marks)

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: (50 marks)

- a) Two questions to be answered out of four questions. Each answer will carry 20 marks.
- b) One question to be answered out of two questions. Each answer will carry 10 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ganga Parajuli Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakrabortty Signature:

Course Description

Course Code	EDUPG103
Course Title	INTRODUCTION TO EDUCATIONAL RESEARCH
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Core
Semester	I
Intended Level	MA Semester I
Issue(s) Addressed	Human Values and Professional Ethics
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Explains the basics of Educational Research. • Aids in planning for Educational Research. • Elaborates on sampling and tools and techniques of data collection. • Examine the various types of research designs. • Outline the different components of the research report.
Prerequisite	Basic knowledge of concepts related to Educational Research at the undergraduate level.
Course Objectives	A student will be able to: • Elaborate on the basic ideas of Research in Education. • Outline in detail the various steps of Educational Research. • Examine sampling and different tools and techniques of Educational Research. • Analyse the different designs used in Educational Research. • Evaluate the steps in the formulation of the Research Proposal and Research Report.
Course Outcomes	At the end of this course, a student will be able to: • Discuss Scientific Research and its type. • Elaborate on the concept and types of Educational Research.

	• Break down the different steps involved in the planning of Educational Research. • Identify the concept and types of Sampling. • Examine the different tools and techniques of Data Collection. • Evaluate the different Qualitative, Quantitative and Mixed Research Designs. • Design a Research Proposal.
Units	Course Content
Unit I	Basics of Educational Research a) Sources of Knowledge, Scientific Method, Scientific Theory. b) Types of Scientific Research (Exploratory, Explanatory and Descriptive). c) Educational Research (Meaning, Characteristics, Nature and Areas), Qualities of Researcher. d) Steps and Types of Educational Research (Fundamental, Applied & Action Research, Longitudinal & Cross-sectional Research, Quantitative, Qualitative & Mixed method Research).
Unit II	Planning of Educational Research a) Sources, Selection, Statement and Evaluation of a Research Problem. b) Concept, Nature, Sources, Types, Formulation and Testing of Hypothesis. c) Concept, Characteristics and Sources of Review of Related Literature. d) Concept & Types of Variables (Independent, Dependent, Extraneous, Intervening and Moderator).
Unit III	Sampling and Data Collection a) Concept of Population & Sample, Characteristics of a good sample. b) Techniques of Sampling & Sampling Error. c) Concept and Types of Data. d) Tools and Techniques of Data Collection (Rating & Attitude Scale, Aptitude & Achievement Test, Inventory, Questionnaire, Schedule, Checklist, Observation, Interview and Projective Techniques).

Unit IV	Research Designs a) Qualitative Research Designs: Concept, Nature, Steps, Merits and Demerits (Historical Research, Case Studies, Ethnography, Grounded Theory, Narrative Research Designs). b) Quantitative Research Designs: Concept, Nature, Steps, Merits and Demerits (Descriptive, Causal Comparative, Experimental Designs). c) Mixed Method Designs: Concept, Nature, Steps, Merits and Demerits. d) Qualitative Data Analysis (Data Reduction and Classification, Analytical Induction and Constant Comparison and Triangulation).
Unit V	Writing of Research Proposal and Research Report a) Code of Ethics in Research & Plagiarism. b) Referencing style & Bibliography. c) Publication of Research Findings. d) Steps of Writing Research Proposal and Research Report.

Learning Resources:

Textbooks -

1. A. K. Singh (2009). Tests, Measurements and Research Methods in Behavioural Sciences. Bharati Bhawan, New Delhi.
2. H. E. Garrett (2009). Statistics in Psychology and Education, Sixth Edition. Paragon International Publishers, New Delhi.
3. J. W. Best and J. V. Kahn (2006). Research in Education, Tenth Edition. Pearson Education, Boston, MA.
4. J. W. Creswell (2012). Educational Research- Planning, Conducting, and Evaluating Quantitative and Qualitative Approach. Pearson Education, Boston, MA.
5. K.S. Sidhu (2018). Methodology of Research in Education. Sterling Publishers Private Limited, New Delhi.
6. L. Koul (2009). Methodology of Educational Research, Fourth Edition. Vikas Publishing House Pvt. Ltd., New Delhi.
7. S. K. Mangal (2002). Statistics in Education & Psychology, Second Edition. Prentice Hall India Learning Private Ltd., New Delhi.

Suggested Readings –

1. C. R. Kothari (2004). Research Methodology: Methods and Techniques. New Age International Pvt. Ltd., New Delhi.
2. D. B. Van Dalen (1979). Understanding Educational Research: An Introduction, Fourth Edition, McGraw-Hill Inc., New York.

3. F. N. Kerlinger (1964). Foundations of Behavioural Research: Educational and Psychological Inquiry, Holt, Rinehart and Winston Inc., New York.
4. L. Cohen, L. Manion and K. Morrison (2007). Research Methods in Education, Sixth Edition, Routledge Publishers, London.
5. M. D. Gall, J. P. Gall and W. R. Borg (2007). Educational Research-An Introduction, Eighth Edition, Pearson Education, Boston, MA.
6. S. P. Sukhia, P. V. Mehrotra and R. N. Mehrotra (1976). Elements of Educational Research, Allied Publishers Ltd., New Delhi.
7. Y. P. Aggarwal (2012). Statistical Methods: Concepts, Application and Computation, Sterling Publishers Pvt. Ltd., New Delhi.

Assessment:

i. Formative Assessment: (50 marks)

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: (50 marks)

- a) Two questions to be answered out of four questions. Each answer will carry 20 marks.
- b) One question to be answered out of two questions. Each answer will carry 10 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Priscella Ghimiray Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakraborty Signature:

Course Description

Course Code	EDUPGDSE104
Course Title	TEACHER EDUCATION
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Discipline Specific Elective
Semester	I
Intended Level	MA Semester I
Issue(s) Addressed	Human Values and Professional Ethics
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Develop an understanding of the basic concepts of Teacher Education. • Familiarize with the evolution of Teacher Education. • Differentiate between Pre-Service and In-Service Teacher Education. • Conceptualize Pedagogy, Andragogy and their assessments. • Analyze the importance of research and the use of numerous technologies in Teacher Education.
Prerequisite	Basic knowledge of concepts related to Education as a discipline at the graduate level.
Course Objectives	A student will be able to: • Explain the concept of Teacher Education through different models of Teacher Education. • Examine the development of Teacher Education at various levels. • Outline the concepts of Pedagogy and Andragogy.

	• Integrate the principles of Instructional Objectives in determining the assessments of Pedagogy and Andragogy. • Summarise the various innovations of the Teacher Education.
Course Outcomes	At the end of this course, a student will be able to: • Discuss the various concepts related to Teacher Education. • Elaborate the various models of Teacher Education. • Analyse salient features and agencies of Pre-Service and In-Service Teacher Education. • Organise teaching at different levels. • Evaluate the different forms of assessment in Pedagogy and Andragogy • Categorize the different innovations in Teacher Education (Learning design, Pedagogical Analysis, Micro Teaching and Simulated Teaching)
Units	Course Content
Unit I	Introduction to Teacher Education a) Concept, Nature and Scope of Teacher Education. b) Changing the notion of Teachers in India (from Guru to Professional), Teacher Training vs Teacher Education. c) Teacher Education viewpoint of Schulman and Habermas. d) Models of Teacher Education (Behaviouristic, Competency-based and Inquiry Oriented).
Unit II	Development of Teacher Education a) Pre-Service and In-Service Teacher Education (concept, purpose, scope and planning). b) Roles & Functions of DIET, SSA, RMSA, SCERT, NCERT, NCTE, UGC, NAAC, NUEPA and UNESCO as agencies of Teacher Education. c) Teacher Education Transactional Approaches: Expository, Collaborative and Experiential learning. d) Concept of Professionalism and Professional Ethics, Total Quality Management.

Unit III	Pedagogy and Andragogy - Pedagogy (concept, characteristics and stages), Andragogy (concept, characteristics, principles and competencies). - Theories of Andragogy (Malcolm Knowles and The Dynamic Model of Learner Autonomy). - Concept & Need of Critical Pedagogy & its implications in Teacher Education. - Organizing Teaching (Memory Level-Herbartian, Understanding Level- Morrison, Reflective Level-Bigge and Hunt).
Unit IV	Assessment of Pedagogy and Andragogy - Taxonomy of Instructional Objectives, Assessment of Cognitive (Anderson & Krathwohl), Affective (Krathwohl) and Psychomotor Domains (Dave) of learning. - Meaning, Criteria and Types of Feedback Devices (Portfolios, Reflective Journal, Field Engagement using Rubrics and Competency-Based Evaluation). - Galloway's system of interaction analysis (Recording of Classroom Events, Construction and Interpretation of Interaction Matrix). - Teacher Evaluation (Product, Process and Presage criteria).
Unit V	Innovations in Teacher Education - Learning Design, Pedagogical Analysis. - Teaching skills, Micro teaching, Simulated Teaching. - Application of ICT in teaching-learning situations. - Research on Teacher Education in India.
Learning Resources: Textbooks - - M.S. Knowles (1984). Andragogy in Action. Jossey-Bass Publishers, London. R. Mohan (2011). Teacher Education. PHI Learning Pvt. Ltd., New Delhi. S. Mangla (2001). Teacher Education: Trends and Strategies. Radha Publications, New Delhi. Suggested Readings – J. C. Aggarwal (2010). Teacher and Education in a Developing Society. Vikas Publishing House. New Delhi. S. P. Sharma (2003). Teacher Education, Principles, Theories and Practices. Kanishka Publishers. New Delhi.	

Course Description

Course Code	EDUPGDSE105
Course Title	EDUCATIONAL DEVELOPMENT IN NORTH BENGAL
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Discipline Specific Elective
Semester	I
Intended Level	MA Semester I
Issue(s) Addressed	Human Values
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Estimates the importance, contribution, and significance of educational development in North Bengal. • Explains the development of Primary, Secondary, and Higher Education in North Bengal during the pre-independence and post-independence periods. • Traces the educational development among the Scheduled Tribes of North Bengal. • Evaluates the contribution of various stakeholders and agencies in the development of education in North Bengal.
Prerequisite	Basic information on the various districts of North Bengal.
Course Objectives	A student will be able to: • Develop an understanding about the Educational Development in different Districts of North Bengal during Pre-independence Period.

	• Explore the development of Primary, Secondary, and Higher Education in North Bengal during the Post-independence Period. • Analyse Educational Development among the Scheduled Tribes of North Bengal.
Course Outcomes	At the end of this course, a student will be able to: • State Educational Development in Darjeeling District (Pre-independence Period). • Explain the Educational Development in Cooch Behar District (Pre-independence Period). • Evaluate the Educational Development in Jalpaiguri District (Pre-independence Period). • Analyze the Development of Primary, Secondary, and higher Education in North Bengal (Post-independence Period). • Examine the Educational Development among the Scheduled Tribes of North Bengal.
Units	Course Content
Unit I	Educational Development in Darjeeling District (Pre-independence Period) a) Background. b) Govt. effort to spread Education. c) Contribution of the Christian Missionaries in the development of Education. d) Contribution of Private Enterprise in promoting Education.
Unit II	Educational Development in Cooch Behar District (Pre-independence Period) a) Background. b) Development of Primary, Secondary, and Higher Education. c) Artisan School, Sanskrit Tol, Women Education, Muslim Education. d) Religion and Social Position of the Students.
Unit III	Educational Development in Jalpaiguri District (Pre-independence Period) a) Background. b) Development of Primary and Secondary Education. c) Education of Tea Garden Labourers' Children. d) Activities of Christian Missionaries.
Unit IV	Development of Primary, Secondary & Higher Education in North Bengal (Post-independence Period) a) Contribution of the Christian Missionaries. b) Contribution of the family of Cooch Behar Prince.

Course Description

Course Code	EDUPG111
Course Title	THEORIES AND PRACTICES OF EDUCATIONAL PHILOSOPHY
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Core
Semester	II
Intended Level	MA Semester II
Issue(s) Addressed	Human Values
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Recognizes the propositions of Indian schools of Philosophy in Educational theories and practices. • Describe the oriental schools of Philosophy in Education. • Familiarize with the contribution of great Western thinkers to Educational Philosophy. • Describe the modern concept of philosophy and value enshrined in Indian Constitution
Prerequisite	Knowledge about Indian Oriental, Western and Modern concept of Philosophy in Educational theories and practices.
Course Objectives	A student will be able to: • Indian schools of philosophy with special reference to the concept of Knowledge, Reality and Values. • Relate between Indian schools of Philosophy and Oriental schools of Philosophy. • Analyse the Great Western thinkers to educational philosophy. • Evaluate the modern concept of Philosophy. • Create the various national values enshrined in the Indian constitution.

Course Outcomes	At the end of this course, a student will be able to: • State the meaning, nature, and scope of Carvaka, Vaiseshika, with special reference to concept of knowledge, reality and values. • Relate between Brahminic, Buddhism, Jainism and Islamic school of philosophy. • Explain the concepts of Dayanand Darshan and their aims, curriculum and their method of teaching. • Analyse the contribution of great Western thinkers to Educational Philosophy. • Evaluate the modern concept of Philosophy. • Create the various National values enshrined in the Indian Constitution.
Units	Course Content
Unit I	Indian school of Philosophy a) Meaning, nature of Carvaka with special reference to the concept of knowledge (Vidya, Reality, Values). b) Concept of Vaiseshika with special reference to the concept of knowledge (Vidya, Reality, Values). c) Concept of Vedanta with special reference to the concept of knowledge (Vidya, Reality, Values). d) Philosophy of Dayanand Darshan and his educational implication (Aims, curriculum and method of teaching).
Unit II	Oriental Schools of Philosophy a) Brahmanic with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching). b) Buddhism - with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching).

	c) Jainism - with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching). d) Islamic - with special reference to the concept of Knowledge, Reality, Values, and their Educational Implications (Aims, Curriculum, and Methods of Teaching).
Unit III	Great Western Thinkers a. Contribution of Rousseau to Educational Philosophy. b. Contribution of Dewey to Educational Philosophy. c. Contribution of Bertrand Russel, A.N Whitehead and Frobel. d. Montessori and Nel Nodding to Educational Philosophy.
Unit IV	Modern concept of Philosophy a) Logical analysis. b) Logical Empiricism. c) Positive Relativism. d) Morris L Prigge.
Unit V	Value enshrined in the Indian constitution a) Liberty in Indian Constitution. b) Equality in Indian Constitution. c) Democracy in Indian Constitution. d) Freedom in Indian Constitution.
Learning Resources: Text Books- 1. Aggarwal, J.C. (2006). Basic ideas in Education (1st Edition). Shipra Publication House Pvt. Ltd., New Delhi. 2. Bhat, M. A. (2014). Philosophical and Sociological Foundations of Education. APH Publication House Pvt. Ltd., New Delhi. 3. Aggarwal, J.C & Gupta, S. (2006) Shipra Publication House Pvt. Ltd., New Delhi. 4. Ansari, S. H. (2003). Philosophical Foundations of Education. Sanjay Prakashan Pvt. Ltd., New Delhi.	

5. Mohanty, J. (1982). Indian Education in Emerging Society. Sterling Publishing House Pvt. Ltd., New Delhi.
6. Singh, Y. K. (2007). Philosophical Foundations of Education. APJ Publication, Pvt. Ltd., New Delhi.

Suggested readings-

1. Ravi, S. S. (2015). A Comprehensive Study of Education. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
2. Aggarwal, J. C. (2012). Philosophical and Sociological Bases of Education. Vikash Publication House Pvt. Ltd., New Delhi.
3. Aggarwal, J.C. (2013). Theory and principle of education. Vikash Publication House Pvt. Ltd., New Delhi.
4. Aggarwal, J.C. (2010). Psychological Philosophical and Sociological Foundations of Education (1st Edition). Shirpa Publication House Pvt. Ltd., New Delhi.
5. Mishra, S. (2002). Philosophy of Education, Notion Press, California, USA.
6. Mishra, S., Modak, U. Goyal, M. (2021). Great Educators, ABS Books, New Delhi.
7. Mishra, S., Modak, U. Goyal, M. (2022). Philosophy of Education, ABS Books, New Delhi.

Assessment:

i. Formative Assessment: (50 marks)

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: (50 marks)

- a) Two questions to be answered out of four questions. Each answer will carry 20 marks.
- b) One question to be answered out of two questions. Each answer will carry 10 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Pratiksha Dewan	Name: Vivechana Dewan	Name: Ranita Chakraborty
Signature:	Signature:	Signature:

Course Description

Course Code	EDUPG112
Course Title	THEORIES & PRACTICES OF EDUCATIONAL PSYCHOLOGY
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Core
Semester	II
Intended Level	MA Semester II
Issue(s) Addressed	Understanding Individual Differences
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Covers the Concept and theories of Intelligence, Personality and Motivation. • Recognizes the Individual Differences. • Explains the Mental Health and Hygiene. • Distinguishes between Guidance and Counselling.
Prerequisite	Basic knowledge on psychology, Growth and Development and Learning.
Course Objectives	A student will be able to: • Understand the Concept, Nature and Theories and their Educational implications of Intelligence, Personality and Motivation. • Identify the Individual Differences. • Acquaint with the concept of Mental Health and Hygiene. • Realize the necessities of Guidance and Counselling. • Assess the process and techniques of Counselling.
Course Outcomes	At the end of this course, a student will be able to: • Explain the Concept, Theories and their Educational Implication.

	• Classify the different characteristics of individual Differences. • Acquaint the concept of Mental Health and Hygiene. • Analyse the necessities of Guidance and Counselling. • Apply the process and techniques of Counselling.
Units	Course Content
Unit I	Intelligence and its Measurement a) Intelligence: Meaning and Nature. b) Types of Intelligence. c) Theories of Intelligence: Spearman, Thurstone, Guilford, Sternberg and Gardener. d) Measurement of Intelligence: Verbal, Non-Verbal and Performance Tests.
Unit II	Personality a) Concept and Nature. b) Theories of Personality: Type Theory (Jung), Trait Theory (Allport & Big-five factors), Type-cum-Trait Theory (Eysenck), Psychoanalytic Theory (Freud). c) Humanistic Theory (Maslow & Rogers) and their Educational Implications. d) Measurement of Personality.
Unit III	Motivation a) Concept & Nature - Concept of Needs, Drives and Motives. b) Types of Motivation. c) Atkinson and McClelland Achievement Motivation Theory, Weiner's Attribution Theory. d) Techniques of Enhancing Learner's Motivation.
Unit IV	Individual differences a) Meaning and Concept. b) Type of Individual Differences. c) Role of heredity, environment. d) Role of a Teacher: Socio-emotional Climate of classroom.

Unit V	Mental Health & Guidance a) Concept of Mental Health & Hygiene. b) Factors affecting Mental Health (Home, Society & School). c) Concept, Principles and Types of Guidance and Counselling. d) Tools and Techniques of Guidance Records, Scales, Tests, Techniques and Interview).
Learning Resources: Textbooks - 1. J. C. Agarwal (2019). Essentials of Educational Psychology, Vikash Publication House Pvt. Ltd., New Delhi. 2. S.K. Mangal (2009). Essentials of Educational Psychology. PHI Learning Private Publication House Pvt. Ltd., New Delhi. 3. S.K. Mangal (2010). Advanced Educational Psychology PHI Learning Private Publication House Pvt. Ltd., New Delhi. 4. S.S. Chouhan (2009). Advanced Educational Psychology. Vikash Publishing House Pvt. Ltd., New Delhi. 5. A. Woolfolk (2011). Educational Psychology. Dorling Kindersley (India) Pvt. Ltd., Licensees of Pearson Education in South Asia. 6. J.W. Santrock (2017). Educational Psychology. McGraw Hill Education. 7. B.N. Dash & N. Dash (2013). A Test Book of Educational Psychology. Pragun Publications. Suggested Readings – 1. S. Dandapani (2001). Advanced Educational Psychology, Second Edition, Anmol Publications Pvt. Ltd., New Delhi. 2. A. Woolfolk (2012). G. Mishra & A.K. Jha Fundamentals of Educational Psychology, Eleventh Edition, Pearson Education, New Delhi. 3. E. B. Hurlock (1973). Adolescent Development, McGraw-Hill Inc., New York, U.S. 4. Mishra, S. (2003). Understanding Learning and Teaching, Notion Press, California, USA. 5. Mishra, S., Modak, U. (2021). Learner's Psychology, Notion Press, California, USA. 6. Mishra, S., Modak, U. Goyal, M. (2022). Philosophy of Education, ABS Books, New Delhi.	

Assessment:**i. Formative Assessment: (50 marks)**

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: (50 marks)

- a) Two questions to be answered out of four questions. Each answer will carry 20 marks.
- b) One question to be answered out of two questions. Each answer will carry 10 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Pratiksha Dewan Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakraborty Signature:

Course Description

Course Code	EDUPG113
Course Title	EDUCATIONAL SOCIOLOGY
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Core
Semester	II
Intended Level	MA Semester II
Issue(s) Addressed	Human Values
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Develops understanding about the basic Concepts of Educational Sociology. • Provides a Conceptual understanding of Social Change, Social Stratification, Social Mobility, Social Movements, Social Groups and their inter-relationship with Education. • Creates awareness of Social Movements and familiarizes the students with various Theories of Social Movement • Recognises the need to understand Social Equity and Equality of Educational Opportunities of Disadvantaged Groups.
Prerequisite	Basic knowledge about Education & Society.

Course Objectives	A student will be able to: • Explain the nature and scope of Educational Sociology and Sociology of Education. • Describe the constraints of Social Change in India. • Summarise the contributions of different theoretical perspectives on better understanding Social Movements. • Assess the factors influencing Social Groups. • Identify the problems of education of the Disadvantaged Groups. • Discuss Sociology of Education in National perspective and evaluate the role of the State in working towards Social Equity.
Course Outcomes	At the end of this course, a student will be able to: • Explain the nature and scope of Educational Sociology and Sociology of Education. • Describe the constraints of Social Change in India. • Summarise the contributions of different theoretical perspectives on better understanding Social Movements. • Assess the factors influencing Social Groups. • Identify the problems of education of the Disadvantaged Groups. • Discuss Sociology of Education in National perspective and evaluate the role of the State in working towards Social Equity.
Units	Course Content
Unit I	Basics of Educational Sociology a) Meaning, Nature & Scope of Educational Sociology & Sociology of Education. b) Education as a process of Socialization & Social-subsystem. c) Social Determinants of Education - Home, School, Peer Group, Community (Caste, Class, Culture, Language, Religion, Population, Regionalism) Politics (State-Policy, Economic Issues, Democracy) Media (Technology and Modernization). d) Approaches to Sociology of Education - Symbolic Interaction, Structural Functionalism and Conflict Theory.

Unit II	Social Change, Social Stratification & Mobility - Meaning, Nature and Factors of Social Change & Social Stratification. - Constraints of Social Change in India - Caste, Ethnicity, Class, Language, Religion and Regionalism. - Education as a Vehicle of Social Change. - Role of Education in Social Stratification & Mobility.
Unit III	Social Movements - Meaning & Nature of Social Movements. - Theories of Social Movements – - Relative Deprivation. - Resource Mobilization. - Political Process Theory. - New Social Movement Theory.
Unit IV	Social Groups - Nature & Types of Groups. - Formation of Classroom Groups & Cliques. - Group Dynamics in a Classroom Situation - Sociometry. - Factors affecting Social Groups – Impact of Groups on Education.
Unit V	Education and Social Equity - Social Equity & Equality of Educational Opportunities with special reference to Paulo Freire, Mary Wollstonecraft and Savitribai Phule. - Problems of Education of Disadvantaged People - Women, Transgender, Physically & Mentally Challenged, Social & Economic disadvantaged community, Backward Religious Minority, SC, ST & OBC. - Constitutional provisions in India - Education for National Integration and International understanding. - Education in tackling Terrorism and maintaining Global peace.

Learning Resources:

Textbooks -

1. J. C. Aggarwal (2006). Basic Ideas in Education. Shipra Publications, New Delhi.
2. Y. K. Sharma (2004). Philosophical & Sociological Foundations of Education. Kanishka Publishers, New Delhi.
3. K. L. Sharma (1997). Social Stratification in India: Issues & Themes. Sage Publication, New Delhi.
4. Y. K. Singh (2007). Sociological Foundation of Education. A.P.H. Publishing Corporation, New Delhi.
5. H. Talesra (2002). Sociological Foundations of Education. Kanishka Publishers, New Delhi.
6. N. Jayaram (2015). Sociology of Education in India. Rawat Publication, Jaipur.
7. Goel, S.K. (2013). Vocational Education, Training and Rehabilitation Services for Persons with Disabilities in India. Aaviskar Publishers.

Suggested Readings –

1. R. G. Burgess (1986). Sociology, Education and Schools: An Introduction to the Sociology of Education. B.T. Batsford Ltd., London.
2. S. P. Chaube (1981). Philosophical & Sociological Foundation of Education. Vinod Pustak Mandir, Agra.
3. B. D. Bhatt & S. R. Sharma (1993). Sociology of Education. Kanishka Publisher, New Delhi.
4. L. A. Cook & E. Cook (1950). A Sociological Approach to Education. McGraw Hill, New York.

Assessment:

i. Formative Assessment: (50 marks)

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: (50 marks)

- Two questions to be answered out of four. Each answer will carry 20 marks.
- One question to be answered out of two. Each answer will carry 10 marks.

Course Faculty	Head of the Department	Dean
(Prepared by)	(Checked and verified by)	(Approved by)
Name: Pratiksha Dewan	Name: Vivechana Dewan	Name: Ranita Chakraborty
Signature:	Signature:	Signature:

Course Description

Course Code	EDUPG114
Course Title	QUANTITATIVE METHODS IN EDUCATIONAL RESEARCH
Credits	05
Total Hours	75
Hours per Week	05
Course Type	Core
Semester	II
Intended Level	MA Semester II
Issue(s) Addressed	Professional Ethics
Course Offered to	MA Education
Regulation	2023
Course Overview	This course: • Covers the concept of Statistics in Educational Research. • Gives an exposure of Normal Distribution. • Explains the various inferences of Parametric & Non-parametric tests. • Studies the association through different types of Correlation & Regression Analysis.
Prerequisite	Statistical Treatment of Data & Quantitative Methods in Educational Research.
Course Objectives	A student will be able to: • Understand the basic treatment of data by Statistical & Graphical procedures.

	• Interpret Normal Distribution in Quantitative Measures. • Apply inferences through various Parametric & Non-parametric statistical procedures. • Assess the Degree of association through different types of Correlation. • Predict statistically through Regression analysis.
Course Outcomes	At the end of this course, a student will be able to: • Explain the basic treatment of data by Statistical & Graphical procedures. • Plot Normal Distribution in Quantitative Measures. • Draw inferences through various Parametric & Non-parametric statistical procedures. • Analyse the degree of association through different types of Correlation. • Estimate statistically through Regression analysis.
Units	Course Content
Unit I	Statistical treatment of data a) Concept & Need of Statistics in Educational Research. b) Tabular & Graphical Presentation of Data – Bar Diagram, Histogram, Polygon & Pie Diagram. c) Measures of Central Tendency – Mean, Median & Mode. d) Measures of Dispersion – Average Deviation, Quartile Deviation & Standard Deviation.
Unit II	Normal Distribution a) Concept, Characteristics and Uses of Normal Probability Curve. b) Deviation from Normality – Skewness & Kurtosis. c) Measures of Relative Positions – Sigma Score & Standard Scores (T & Z Scores). d) Percentile Point & Percentile Rank.
Unit III	Parametric Inferential Statistics a) Concept of Hypothesis, Null Hypothesis, Standard Errors & Fiduciary limits.

	b) Concept of Level of Significance, Degrees of Freedom, One-tailed and Two-tailed test. c) Parametric Testing – t test (Small, Large, Independent & Correlated Samples). d) Parametric Testing - z-test (One-Way & Two-Way ANOVA).
Unit IV	Non-parametric Inferential Statistics a) Concept & uses of Non-Parametric Test. b) Chi-square Test – Equality, Normality & Test of Independence. c) Concept & Uses of Median Test. d) The Mann-Whitney U Test.
Unit V	Relation & Prediction a) Spearman Rank Difference Method & Pearson’s Product Moment Method of Coefficient of Correlation. b) Biserial & Point-Biserial Correlation. c) The Tetrachoric & Phi (ϕ) Coefficient Correlation d) Concept of Regression Lines, regression equation, Multiple-Regression Equation & Prediction.
Learning Resources: Textbooks - 1. S. K. Mangal (2002). Statistics in Education & Psychology, Second Edition, Prentice Hall India Learning Private Ltd., New Delhi. 2. L. Koul (2009). Methodology of Educational Research, Fourth Edition, Vikas Publishing House Pvt. Ltd., New Delhi. 3. H. E. Garrett (2009). Statistics in Psychology and Education, Sixth Edition, Paragon International Publishers, New Delhi. 4. C. R. (2004). Research Methodology, Methods and Techniques, New Age International Pvt. Ltd., New Delhi. 5. S. P. Sukhia, P. V. Mehrotra & R. N. Mehrotra (1976). Elements of Educational Research Allied Publishers Ltd., New Delhi. 6. Y. P. Aggarwal (2012). Statistical Methods Concepts, Application and Computation, Sterling Publishers Pvt. Ltd., New Delhi.	

Suggested Readings –

1. M. D. Gall, J. P. Gall & W. R. Borg (2007). Educational Research-An Introduction, Eighth Edition, Pearson Education, Boston, MA.
2. J. W. Best & J. V. Kahn (2006). Research in Education, Tenth Edition, Pearson Education, Boston, MA.
3. J. W. Creswell (2012). Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Approach, Fourth Edition, Pearson Education, Boston, MA.
4. L. Cohen, L. Manion & K. Morrison (2007). Research Methods in Education, Sixth Edition, Routledge Publishers, London.
5. F. N. Kerlinger (1964). Foundations of Behavioural Research: Educational and Psychological Inquiry, Holt, Rinehart and Winston Inc., New York.
6. D. B. Van Dalen (1979). Understanding Educational Research - An Introduction, Fourth Edition, McGraw-Hill Inc., New York.

Assessment:

i. Formative Assessment: (50 marks)

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: (50 marks)

- a) Two questions to be answered out of four questions. Each answer will carry 20 marks.
- b) One question to be answered out of two questions. Each answer will carry 10 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Priscella Ghimiray Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakraborty Signature:

SIGNATURE OF EXTERNAL EXPERTS	Dr. Nita Mitra Associate Professor, Siliguri B.Ed College, Shivmandir, Siliguri	Dr. Savita Mishra Principal, Vidyasagar College of Education, Rupandighi, Siliguri	Dr. Reshma Khatun, Assistant Professor, Aliah University, Kolkata
SIGNATURE OF ALUMNI MEMBER	Ms. Shraddha Chettri Alumni Member		
SIGNATURE OF CHAIRPERSON	Ms. Ranita Chakraborty Dean of Social Sciences Salesian College (Autonomous) Siliguri		
SIGNATURE OF VICE CHAIRPERSON	Ms. Vivechana Dewan HoD, Department of Education Salesian College (Autonomous) Siliguri		
SIGNATURE OF SECRETARY	Ms. Priya Topno Assistant Professor, Department of Education Salesian College (Autonomous) Siliguri		



Salesian College
(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts in Education

Department of Education

Curriculum Document
2023 – 2024

VISION

To uphold the multidisciplinary nature through its diverse curriculum in order to fulfil the long-term goals of holistic development of every learner.

MISSION

To create a transformative educational experience for students focussed on deep disciplinary knowledge.

1. Programme Overview

Bachelor of Arts in Education is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: grasp the theories of educational philosophy, sociology and psychology.
	PO02: acquaint himself/herself with the history of the Indian education system, its educational policies, commissions and committees.
	PO03: relate his/her understanding of guidance and counselling, peace and value education in various classroom situations and societal experiences.
	PO04: gain awareness about the various contemporary issues in education.
Skills	PO05: demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes.
	PO06: construct instructional designs, scholastic & co-scholastic curriculum designs.
	PO07: integrate and apply ICT in learning process
	PO08: acquaint him/herself with the diverse current educational problems and other related issues like SSA, Inclusive education, unemployment, population explosion, poverty, and national disintegration.
Competence	PO09: explore new ideas and thoughts through the application of theoretical knowledge of education subject and statistical techniques and pedagogical analysis.
	PO10: initiate self-sufficiency, sincerity, independent thinking as education is a lifelong process for empowering the student to face all challenges in his/her future endeavours.
	PO11: develop concern for the society, nation as well as promote the feeling of internationalism by comparing our education system with that of other developed countries.

3. Programme Specific Objectives & Outcomes (PSOs)

After completion of the programme, a student will be able to:	
Knowledge	PSO1: develop a clear idea about the subject Education, like nature, scope and aim of Education, factors, different agencies of education and child centric education.
	PSO2: gather knowledge about Educational Psychology, theories and their implication in the field of education and education system.
	PSO3: develop knowledge about the detailed history of the Indian Education system.
	PSO4: develop knowledge about the detailed history of the Indian Education system.
	PSO5: internalise the basics of Sociology, relation between Sociology and Education and importance of Educational Sociology in the field of Education.

	PSO6: develop knowledge about the basics of Indian as well as Western Philosophy; develop knowledge about the importance of different schools of philosophy in the field of Education.
	PSO7: develop the concept of guidance and counselling, various types of guidance and basic data necessary for guidance.
	PSO8: develop the concept of educational research and statistics and the knowledge of analysing descriptive measures, concept of Normal Probability Curve and its uses in education.
Skills	PSO1: execute the educational implications of the theories of psychology.
	PSO2: construct Instructional Designs, Scholastic and Co-Scholastic Curriculum designs.
	PSO3: exhibit the skill of applying the knowledge of educational technology, ICT and e-learning.
	PSO4: advocate the importance of guidance and counselling.
	PSO5: develop the skill of using computer in education and communication, ICT & e-learning.
	PSO6: exhibit an excellent communication skill, Skill for Democratic Citizenship and related theories, teaching skills, life skill education, peace and value education.
Competence	PSO1: demonstrate competencies required to use computers in education, communication, ICT & e-learning for implementing instructional techniques and different models of teaching.
	PSO2: analyse the detailed history of Indian education system.
	PSO3: systematise the concepts of adjustment, maladjustment and the various interpretations of the psychological tests.
	PSO4: correlate various qualitative and quantitative data for educational research.
	PSO5: envision a society where people from all walks of life enjoy equal and equitable rights and opportunities.
	PSO6: compute statistical analysis in the field of educational research.
	PSO7: analyse the contemporary trends in education.

4. PROGRAMME MATRIX

➤ COURSE CODE & COURSE TITLE:

A. Major Courses

	Course Code	Course Titles
1	23EDUMAJ101	Philosophical Foundations of Education
2	23EDUMAJ102	Introduction to Educational Psychology
3	23EDUMAJ103	Sociological Foundation of Education
4	23EDUMAJ104	Educational Psychology and Mental Hygiene
5	23EDUMAJ201	History of Education in Ancient and Medieval India
6	23EDUMAJ202	Early Childhood Care and Education
7	23EDUMAJ203	History of Education in Pre-Independent India
8	23EDUMAJ204	Knowledge and Curriculum
9	23EDUMAJ205	Educational Technology
10	23EDUMAJ301	History of Education in Post Independent India
11	23EDUMAJ302	Educational Management and Administration
12	23EDUMAJ303	Educational Measurement and Evaluation
13	23EDUMAJ304	Comparative Education
14	23EDUMAJ305	Contemporary Issues in Education
15	23EDUMAJ306	Introduction to Educational Research
16	23EDUMAJ307	Curriculum Studies
WITH RESEARCH		
17	23EDUMAJ401	Advanced Educational Research
18	23EDUMAJ402	Quantitative Analysis of Data
19	23EDUMAJ403	Qualitative Analysis of Data
20	23EDUMAJ404	Guidance and Counselling
21	23EDUMAJ405	Inclusive Education
WITHOUT RESEARCH		
17	23EDUMAJ401	Peace and Value Education
18	23EDUMAJ402	Gender, School and Society

19	23EDUMAJ403	Distance Education
20	23EDUMAJ404	Human Rights Education
21	23EDUMAJ405	Guidance and Counselling Inclusive Education
22	23EDUMAJ406	Population Education
23	23EDUMAJ407	Guidance and Counselling
24	23EDUMAJ408	Lifelong Learning

B. Minor Course

	Course Code	Course Title
1	23EDUMIN101	Perspectives of Education
2	23EDUMIN102	Instructional Psychology

C. Multi-Disciplinary Course (MDC)

	Course Code	Course Title
1	23EDUOE101	Early Childhood Care and Education
2	23EDUOE102	Special Education

D. Skill Enhancement Course (SEC)

	Course Code	Course Title
1	23EDUSEC101	Skills of Teaching
2	23EDUSEC102	Pedagogy of Social Science

E. Value Added Course (VAC)

	Course Code	Course Title
1	23EDUVAC101	Teaching-Learning Materials

➤ NEP Framework for Academic Year 2023- Single Major (Education)

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23EDUMAJ101	Major	Philosophical Foundations of Education	4	5+0+0	60	100
	23EDUMAJ102	Major	Introduction to Educational Psychology	4	5+0+0	60	100
	23EDUMIN101	Minor	Subject A (Any Discipline other than Major)	4	4+0+0	60	100
	23EDUMDC101	MDC	Non-Discipline and not studied in +12	3	3+0+0	45	75
	23EDUAECE101	AEC	Compulsory English	2	2+0+0	30	50
	23EDUSEC101	SEC	Skills of Teaching	3	3+0+1	45	75
	23SCSVAC1	VAC-1	VAL EDU	1	2+0+0	15	25
	23EDUVAC101	VAC-2	TLMs; NSS; NCC; SPORTS; YOGA; MUSIC	1	0+0+2	30	25
	Total			22	25		
II	23EDUMAJ103	Major	Sociological Foundations of Education	4	5+0+0	60	100
	23EDUMAJ104	Major	Educational Psychology and Development	4	5+0+0	60	100
	23EDUMIN102	Minor	Subject B (Any Discipline other than Major)	4	4+0+0	60	100
	23EDUMDC102	MDC	Non-Discipline and not studied in +12	3	3+0+0	45	75
	23EDUAECE101	AEC	Alternative English	2	2+0+0	30	50
	23EDUSEC102	SEC	Pedagogy of Social Science	3	3+0+1	45	75
	23VACEVS100	VAC-3	LOC (VAL EDU)	1	2+0+0	30	25
	23VACCCA101	VAC-4	TLMs; NSS; NCC; SPORTS; YOGA; MUSIC	1	0+0+2	30	25
	Total			22	25		

Course Description:

Course Code	23EDUMAJ101	
Course Title	PHILOSOPHICAL FOUNDATIONS OF EDUCATION	
Credits	04	
Total Hours	60	
Hours per Week	04	
Course Type	Major Core	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Human Values	
Course Offered to	Education	
Regulation	2023	
Course Overview	This course: - Covers the basic concept of Education. - Recognizes the meaning of Philosophy and Philosophy of Education. - Explains the Indian Philosophy and Western Philosophy. - Covers the role of Educational Thinkers both Indian and Western.	
Prerequisite	Basic knowledge on education and philosophers.	
Course Objectives	A student will be able to: - Understand the meaning and concept of Education. - Discuss the various factors of Education. - Explain the relationship between Philosophy and Philosophy of Education. - Analyze the Indian Philosophy and Western Philosophy. - Develop an understanding of Educational Thinkers and their philosophy.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept of Education.	R
CO2	Discuss the various Factors of Education.	U
CO3	Explain the relationship between Philosophy and Philosophy of Education.	A1
CO4	Analyze the Indian Philosophy and Western Philosophy.	A2
CO5	Develop an understanding of Indian and Western Philosophy.	E
CO6	Develop a critical appreciation on the contribution of Great Educators	C
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit I	Concept, Scope and Aims of Education a) Meaning and Definition of Education b) Nature and Scope of Education c) Aims of Education: Individualistic and Socialistic d) Aims of Education with special reference to Delors Commission	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Factors of Education a) Meaning and Characteristics of Child centric education. b) Teacher: Roles of a Teacher. c) Curriculum: Meaning and Types. d) School: Its Role and Functions	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Philosophy and Education a) Meaning and Nature of Philosophy. b) Scope and Features of Philosophy of Education. c) Relationship between Philosophy and Education. d) Contribution of Philosophy to Education	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Schools of Philosophy: Indian and Western Philosophy - Indian Schools: a) Nyaya b) Carvaka - Western Schools: c) Idealism d) Pragmatism	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	Great Educators and their Educational Philosophy a) Swami Vivekananda b) Rabindranath Tagore c) Mahatma Gandhi d) Rousseau e) John Dewey	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Learning Resources: Textbooks - - Aggarwal, J. C. (2012). Philosophical and Sociological Bases of Education. Vikash Publication House Pvt. Ltd., New Delhi. - Aggarwal, J.C. (2013). Theory and Principle of Education. Vikash Publication House Pvt. Ltd., New Delhi				

3. Bhatia and Bhatia. (2002) Theory and Principles of Education. Doaba Book House., New Delhi.
4. Bhatia, K.K and Narang C.L. (2006) Principles of Education. Prakashan Brothers., Ludhiana.
5. Purkait, B. R. (2011) Principles and Practices of education. New Central Book Agency(P) Ltd., Kolkata.
6. Safaya and Shaida. (2014) Modern Theory and Principles of Education. Dhanpat Rai Publishing Company., New Delhi.
7. Chandra, S.S. and Sharma, K. R. (2002) Principles of Education. Atlantic Publishers and Distributors., New Delhi.
8. Sharma, S.N. (2015) Philosophical and Sociological Foundations of Education. Kanishka Publishers., New Delhi.
9. Siddiqui, M.H. (2016) Philosophical and Sociological Foundations of Education. APH Publishing Corporation., New Delhi.
10. Pathak, R.P. (2015) Philosophical and Sociological Foundations of Education. Kanishka Publishers., New Delhi.

Suggested Readings -

1. Chandra, S.S. and Sharma, K. R. (2002) Principles of Education. Atlantic Publishers and Distributors., New Delhi.
2. Sharma, S.N. (2015) Philosophical and Sociological Foundations of Education. Kanishka Publishers., New Delhi.
3. Siddiqui, M.H. (2016) Philosophical and Sociological Foundations of Education. APH Publishing Corporation., New Delhi.
4. Safaya and Shaida. (2014) Modern Theory and Principles of Education. Dhanpat Rai Publishing Company., New Delhi.
5. Purkait, B. R. (2011) Principles and Practices of education. New Central Book Agency(P) Ltd., Kolkata.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Pratiksha Dewan	Name Vivechana Dewan	Name Ranita Chakraborty
Signature:	Signature:	Signature:

Course Description:

Course Description:				
Course Code	23EDUMAJ102			
Course Title	INTRODUCTION TO EDUCATIONAL PSYCHOLOGY			
Credits	04			
Total Hours	60			
Hours per Week	04			
Course Type	Major Core			
Semester	I			
Intended Level	Certificate			
Issue(s) Addressed	Understanding Individual differences			
Course Offered to	Education			
Regulation	2023			
Course Overview	This course: • Covers the basic concept of Educational Psychology. • Explains the different theories of Child development. • Discusses the methods of Educational Psychology. • Studies the concept of Individual differences.			
Prerequisite	Basic knowledge on parts of the human body, sense organs.			
Course Objectives (total 5)	The students will be able to: • Understand the concept of Educational Psychology. • Discuss the concept of Educational Psychology and Psychology of Education. • Explain the different theories of development. • Analyze the concept of Individual differences. • Develop knowledge on Personality theories.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define the concept of Educational Psychology.	R		
CO2	Discuss the concept of Educational Psychology and Psychology of Education.	U		
CO3	Compile the methods of Educational Psychology.	A1		
CO4	Analyze the stages of development with reference to infancy, childhood, adolescence.	A2		
CO5	Develop the knowledge on Intelligence theories.	E		
CO6	Compose an essay on the concept of individual differences taking creativity and personality as examples.	C		
Course Content				
Units	Content	Lecture Hours	COs	RB T
Unit I	Introduction to Educational	12	CO1	R

	Psychology a) Concept, Nature and Scope of Educational Psychology b) Distinction between Psychology and Educational Psychology. c) Methods of studying learner behaviour: Survey, Observation, Case Study and Experimental.		CO2 CO3 CO4 CO5 CO6	U A1 A2 E C
Unit II	Growth and development a) Stages and aspects of development in human life b) Physical, Mental, Social, Emotional, Cognitive and Language development and educational implications in • Infancy • Childhood • Adolescence	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Theoretical Bases a) Piaget's theory of b) Cognitive Development. c) Erikson's Psycho-Social Theory. d) Bandura's Social Constructivist Theory.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Individual Differences a) Concept of ID b) Heredity & Environment as determinants of Individual Difference c) Creativity -Meaning and concept	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	Theories on Individual differences a)Personality - meaning, nature, scope and theories b)Intelligence - meaning, nature, scope and theories	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Learning Resources: Suggested Readings - 1. Aggarwal, J.C. (2019). Essentials of Educational Psychology. Vikash Publication House Pvt. Ltd., New Delhi.				

2. Mangal, S. K. (2009). Essentials of Educational Psychology. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
3. Mangal, S. K (2010). Advanced Educational Psychology PHI Learning Private Publication House Pvt. Ltd., New Delhi.
4. Chauhan, S.S. (2009). Advanced Educational Psychology. Vikash Publishing House Pvt. Ltd., New Delhi.
5. Woolfolk, A. (2011). Educational Psychology. Dorling Kindersley (India) Pvt. Ltd., licensees of Pearson Education in South Asia.
6. Santrock, J.W. (2017). Educational Psychology. McGraw Hill Education.
7. Dash, B.N. & Dash, N. (2013). A Test Book of Educational Psychology. Pragun Publications.
8. Bhatnagar, S. (2002); Advanced Educational Psychology, Agra: Bhargava Book House.
9. Sindhu, I. S. (2012). Educational Psychology. Pearson India.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks
 - c) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - d) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ganga Parajuli Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakrabortty Signature:

Course Description:

Course Description:		
Course Code	23EDUMAJ103	
Course Title	SOCIOLOGICAL FOUNDATIONS OF EDUCATION	
Credits	04	
Total Hours	60	
Hours per Week	04	
Course Type	Major Core	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Human Values	
Course Offered to	Education	
Regulation	2023	
Course Overview	This course: • Covers the basic concept of Educational Sociology. • Explains the different social groups and social processes involved in education. • Identifies the various roles of education and state in social development. • Gives an exposure of communication in social interactions.	
Prerequisite	Basic knowledge on Social System – family, school, community, society.	
Course Objectives	A student will be able to: • Understand the concept of Educational Sociology and Sociology of Education. • Explain the different social groups in education. • Analyze the social factors and issues involved in education. • Assess the role of education and state in social development. • Develop concerns about various factors of social development like social change, social stratification and social mobility.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept of Educational Sociology and Sociology of Education.	R
CO2	Discuss the different social groups in education.	U
CO3	Classify the role of education in culture and various social factors.	A1
CO4	Analyze the various social processes involved in education.	A2
CO5	Evaluate the importance of education and state in social development.	E

CO6	Develop concerns to various factors of social development like social change, social stratification and social mobility.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction of Educational Sociology a) Meaning, nature and scope of Educational Sociology. b) Relationship between Sociology and Education. c) Concept of Educational Sociology and Sociology of Education. d) Education as a subsystem of the society, school as a social system.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Social Groups a) Social Groups: meaning and definition. b) Types of Social groups – Primary, Secondary and Tertiary. c) Socialization: Meaning, process and factors of socialization. d) Role of family and school in socialization process.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Social factors, issues and Education a) Concept of Culture and role of education in culture. b) Meaning of Human Resource Development and its significance in the present society. c) Social issues: Unemployment and poverty. d) Education of socially and economically backward classes, disadvantaged sections of Indian society (SC, ST and OBC)	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Education and State a) Concept of Democracy and education in totalitarian and welfare state. b) Interrelationship of State and Education. c) Role of education in Nation Building. d) State Control of Education and Autonomy in Education.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	Social process and Education Concept of Social change, interrelationship between Social Change and Education. a) Education and Social stratification. b) Education and Social mobility.	12	CO1 CO2 CO3 CO4 CO5	R U A1 A2

	c) Role of Communication in Social interactions.		CO6	E C

Learning Resources:

Text Books -

1. Bhat, M. A. (2014). Philosophical and Sociological Foundations of Education. APH Publication House Pvt. Ltd., New Delhi.
2. Chand, J. (2010). Sociological Foundations of Education. Shirpa Publication House Pvt. Ltd., New Delhi.
3. Das, B.N. (2011). Foundation of education. Kalyani Publishing House Pvt. Ltd., New Delhi.
4. Mohanty, J. (1982). Indian Education in Emerging Society. Sterling Publishing House Pvt. Ltd., New Delhi.
5. Mathur, S.S. (2000). A Sociological Approach to Indian Education. AVPM Publication House Pvt. Ltd., New Delhi.
6. Koushik, V. K. & Sharma, S.R. (2005). Education and Social Change. Anmol Publication House Pvt. Ltd., New Delhi.

Suggested readings -

1. Ravi, S. S. (2015). A Comprehensive Study of Education. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
2. Aggarwal, J. C. (2012). Philosophical and Sociological Bases of Education. Vikash Publication House Pvt. Ltd., New Delhi.
3. Aggarwal, J.C. (2013). Theory and principle of education. Vikash Publication House Pvt. Ltd., New Delhi
4. Aggarwal, J.C. (2010). Psychological Philosophical and Sociological Foundations of Education (1st Edition). Shirpa Publication House Pvt. Ltd., New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment:** 50 marks
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Priscella Ghimiray Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakraborty Signature:

Course Description:

Course Code	23EDUMAJ104			
Course Title	EDUCATIONAL PSYCHOLOGY AND MENTAL HEALTH			
Credits	04			
Total Hours	60			
Hours per Week	04			
Course Type	Major Core			
Semester	I			
Intended Level	Certificate			
Issue(s) Addressed	Understanding Individual differences			
Course Offered to	Education			
Regulation	2023			
Course Overview	This course: • Explains the different theories of learning. • Discusses the application of learning theories in classroom. • Studies the concept of motivation as a factor of learning. • Develops an understanding on concept of Mental Health and Mental Hygiene. • Analyzes the role of stress and studies its causes.			
Prerequisite	Knowledge of Individual differences, concept of Growth and development and its different stages.			
Course Objectives (total 5)	The students will be able to: • Describe the meaning and concept of learning, its theories and factors. • Explain the application of learning theories in classroom situation. • Discuss the motivation and its application in learning. • Develops a concept of Mental Health and Hygiene. • Creates an understanding on stress management.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define the concept of Learning.	R		
CO2	Discuss the concept of Transfer of Learning.	U		
CO3	Compile the theories of learning.	A1		
CO4	Analyze the role of motivation in learning.	A2		
CO5	Develop the knowledge on mental health and its role in Education.	E		
CO6	Create an understanding of stress and its management for good mental health.	C		
Course Content				
Units	Content	Lecture Hours	COs	RB T
Unit I	Learning	12	CO1 CO2	R U

	a) Definition and characteristics of Learning; b) Factors influencing learning c) b) Theories of learning and Implications of learning theories. d) Classical and Operant conditioning, e) Trial and Error f) Insightful Learning		CO3 CO4 CO5 CO6	A1 A2 E C
Unit II	Transfer of Learning and Motivation a) Transfer of Learning: Concept & Types. b) Motivation: Types, factors and role of Motivation in learning.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Mental Health a) Meaning of Mental Health b) Nature and Characteristics of Mental Health c) Causes of Mental Ill-Health	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Mental Hygiene a) Meaning of Mental Hygiene b) Aims and Scope of Mental Hygiene c) Relation between Mental Health, Mental Hygiene and Education	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	Stress and Stressors a) Meaning of Stress and Stressors b) Effects of Stress on Mental Health c) Stress Management though Education	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Learning Resources:

Suggested Readings-

1. Aggarwal, J.C. (2014). Essentials of Educational Psychology. Vikash Publishing House Pvt. Ltd., New Delhi.
2. Mangal, S. K. (2009). Essentials of Educational Psychology. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
3. Mangal, S. K (2010) - Advanced Educational Psychology. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
4. Chauhan, S.S. (2009). Advanced Educational Psychology. Vikash

Publishing House Pvt. Ltd., New Delhi.

5. Woolfolk, A. (2011). Educational Psychology. Dorling Kindersley (India) Pvt. Ltd., licensees of Pearson Education in South Asia.

6. Santrock, J.W. (2017). Educational Psychology. McGraw Hill Education.

7. Dash, B.N. & Dash, N. (2013). A Text Book of Educational Psychology. Pragun Publications.

8. Bhatnagar, S. (2002); Advanced Educational Psychology. Agra: Bhargava Book House.

9. Sindhu, I. S. (2012). Educational Psychology. Pearson India.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ganga Parajuli Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakrabortty Signature:

Course Description:

Course Code	23EDUMIN101	
Course Title	PERSPECTIVES OF EDUCATION	
Credits	04	
Total Hours	60	
Hours per Week	04	
Course Type	Minor	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Human Values and Professional Ethics	
Course Offered to	Education	
Regulation	2023	
Course Overview	This course: • Recognizes the need to emphasize the core ideas of the foundational perspectives of education. • Describes the importance of education and philosophy. • Identifies the interdependence between education and society. • Describes the importance of education & psychology and education & technology.	
Prerequisite	Basic knowledge of the term education and its importance in the life of an individual and society.	
Course Objectives	A student will be able to: • State the meaning, nature, and scope of Education, Educational Philosophy, Education Sociology, Educational Psychology, Educational Technology, and the different aspects of education. • Relate the core concepts of Philosophy, Sociology, Psychology, and Technology with Education. • Analyze the importance of Educational Philosophy, Educational Psychology, and Educational Technology. • Evaluate the relevance of educational psychology for teachers and students. • Combine the various perspectives of education and formulate a broad concept of education.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	State the meaning, nature, and scope of Education, Educational Sociology, Educational Psychology, and Educational Technology.	R
CO2	Explain the concepts of Educational Philosophy, Educational Sociology, Educational Psychology, and Educational Technology. Estimate the need and significance of the various aspects of education.	U

CO3	Relate between Education & Philosophy, Education & Sociology, Education & Psychology, and Education & Technology.	A1		
CO4	Analyze the importance of Philosophy, Sociology, Psychology, and Technology in Education.	A2		
CO5	Evaluate the relevance of the foundational concepts of education upon the various aspects of education.	E		
CO6	Combine the various perspectives of education and formulate a broad concept of education.	C		
Course Content				
Units	Content	Lecture Hours	COs	RB T
Unit I	Education and Philosophy a)Meaning, Nature, and Scope of Education. b) Meaning and Scope of Educational Philosophy. c) Relation between Education and Philosophy. d) Report of Delors Commission (UNESCO, 1996).	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Education and Society a) Meaning, nature, and scope of Educational Sociology. b) Concept of Educational Sociology and Sociology of Education. c) Relationship between Sociology and Education. d) Education as a subsystem of society, school as a social system.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Educational Psychology a) Concept, Nature, and Scope of Educational Psychology. b) Distinction between Psychology and Educational Psychology. c) Relationship between Education and Psychology. d) Relevance of educational psychology for teachers and students.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Unit IV	Educational Technology a) Meaning, Nature, and Scope of Educational Technology. b) Relation between Technology in Education and Technology of Education. c) Approaches of Educational Technology: Hardware, Software, and System. d) Role of ICT in Education.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	Aspects of Education a) Child: meaning and characteristics of child-centric education. b) Teacher: qualities and duties of a good teacher. c) Curriculum: meaning and types, co-curricular activities. d) School: vision and functions.	12	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Learning Resources:

Text Books-

1. Aggarwal, J.C. (2010). Psychological, Philosophical and Sociological Foundations of Education (1st Edition). Shirpa Publication House Pvt. Ltd., New Delhi.
2. Bhat, M. A. (2014). Philosophical and Sociological Foundations of Education. APH Publication House Pvt. Ltd., New Delhi.
3. Chand, J. (2010). Sociological Foundations of Education. Shirpa Publication House Pvt. Ltd., New Delhi.
4. Das, B.N. (2011). Foundation of Education. Kalyani Publishing House Pvt. Ltd., New Delhi.
5. Mangal, S. K. (2009). Essentials of Educational Psychology. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
6. Mathur, S.S. (2000). A Sociological Approach to Indian Education. AVPM Publication House Pvt. Ltd., New Delhi.
7. Mohanty, J. (1982). Indian Education in Emerging Society. Sterling Publishing House Pvt. Ltd., New Delhi.
8. Koushik, V. K. & Sharma, S.R. (2005). Education and Social Change. Anmol Publication House Pvt. Ltd., New Delhi.

Suggested readings-

1. Ravi, S. S. (2015). A Comprehensive Study of Education. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
2. Aggarwal, J. C. (2012). Philosophical and Sociological Bases of Education. Vikash Publication House Pvt. Ltd., New Delhi.
3. Aggarwal, J.C. (2013). Theory and principle of education. Vikash Publication House Pvt. Ltd., New Delhi.
4. Aggarwal, J.C. (2010). Psychological Philosophical and Sociological Foundations of Education (1st Edition). Shirpa Publication House Pvt. Ltd., New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
Assessment:

i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. **Summative Assessment:** 50 marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
- b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Priya Topno Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakrabortty Signature:

Course Description:

Course Code	23EDUMIN102	
Course Title	INSTRUCTIONAL PSYCHOLOGY	
Credits	04	
Total Hours	60	
Hours per Week	04	
Course Type	Minor	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Professional Ethics	
Course Offered to	Education	
Regulation	2023	
Course Overview	This course: • Provides a conceptual understanding of science of teaching. • Makes the students aware of the relation between Teaching and Learning. • Provides understanding about the difference between Traditional teaching and Constructivist teaching. • Generates awareness of the importance of Classroom Communication. • Creates awareness of the various methods of teaching.	
Prerequisite	Basic knowledge of teaching and learning.	
Course Objectives	A student will be able to: • Develop understanding about the relationship between Teaching and Learning. • Explain the Phases and Levels of Teaching Task. • Discuss the Flanders’ Interaction Analysis. • Discuss the nature of classroom teaching, traditional teaching and Constructivist teaching. • Evaluate the various Teaching Methods. • Develop assignments where they critically evaluate the different aspects related to instructional psychology.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the relationship between teaching and learning.	R
CO2	Illustrate the phases and levels of teaching task.	U
CO3	Examine the applicability of Flanders’ Interaction Analysis in modification of teacher behaviour.	A1
CO4	Analyze the characteristics of Traditional teaching and Constructivist teaching.	A2

CO5	Evaluate the various teaching methods.	E		
CO6	Develop assignments where they critically evaluate the different aspects related to instructional psychology.	C		
Course Content				
Units	Content	Lecture Hours	COs	RB T
Unit I	Teaching a) Science of Teaching - Relationship between Teaching and Learning b) Criteria of good Teaching, Maxims of Teaching c) Systems Approach to Teaching	12	CO1 CO6	R U A1 A2 E C
Unit II	Task of Teaching a) Teaching Task - Meaning b) Phases of Teaching Task c) Levels of Teaching Task	12	CO2 CO6	R U A1 A2 E C
Unit III	Teacher Behaviour a) Teacher behaviour- Concept b) Modification of Teacher Behaviour c) Observation of Classroom Behaviour: Flanders' Interaction Analysis	12	CO3 CO6	R U A1 A2 E C
Unit IV	Teacher and Classroom Teaching a) Nature of Classroom Teaching b) Difference between Traditional teaching and Constructivist teaching c) Communication (Concept and Process), Classroom Communication	12	CO4 CO6	R U A1 A2 E C
Unit V	Teaching Methods a) Lecture Method (Concept, characteristics, merits and limitations) b) Demonstration Method (Concept, characteristics, merits and limitations) c) Project Method (Concept, characteristics, merits and limitations) d) Problem-solving Method (Concept, characteristics, merits and limitations)	12	CO5 CO6	R U A1 A2 E C
Learning Resources:				

Text Books -

1. Mangal, S.K. & Mangal, U. (2013). Essentials of Educational Technology. PHI Learning Private Limited, Delhi.
2. Aggarwal, J.C. (2010). Principles, Methods and Techniques of Teaching. Vikash Publishing House, Delhi.
3. Mangal, S.K. (2018). Essentials of Educational Psychology. PHI Learning Private Limited, Delhi.
4. Mangal, S.K. (2013). Advanced Educational Psychology. PHI Learning Private Limited, Delhi.
5. Aggarwal, J.C. (2015). Essentials of Educational Psychology. Vikas Publishing House Pvt. Ltd.
6. Woolfolk, A. (2011). Educational Psychology. Dorling Kindersley (India) Pvt. Ltd., licensees of Pearson Education in South Asia.

Suggested readings -

1. Mangal, S.K. & Mangal, U. (2018). Teaching of Social Studies. PHI Private Limited, New Delhi.
2. Aggarwal, J.C. (2006). Teaching of Social Studies: A Practical Approach. Vikas Publishing House Pvt Ltd, New Delhi.
3. Rao, U. (2008). Educational Technology. Himalaya Publishing House Pvt Ltd, Mumbai.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment:** 50 marks
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Vivechana Dewan Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakraborty Signature:

Course Description:

Course Code	23EDUOE101	
Course Title	EARLY CHILDHOOD CARE AND EDUCATION	
Credits	03	
Total Hours	45	
Hours per Week	03	
Course Type	Multidisciplinary Course (MDC)	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Human Values	
Course Offered to	Education	
Regulation	2023	
Course Overview	This course: • Recognizes the need to emphasize 0-6 years as the age of early learning with insights into the demographic and developmental perspective. • Describes the principles of growth and development and applies the same to understand the process of early care and early learning. • Identifies the significant domains of development and recognizes their interrelatedness in the development of young children. • Understands how education imparted at an early age can be the precursor of a productive adulthood.	
Prerequisite	Basic knowledge of human growth and development with special emphasis on the early years.	
Course Objectives	A student will be able to: • Describe the historical foundations of ECCE in India from conventional to contemporary philosophy. • Discuss the theoretical foundations and their implications for learning and development in the early years. • Discover the concept of play, its characteristics importance, and types. • Analyze the practicality of the theories of play and use the theories in planning the curriculum. • Integrate the various concepts and theories of ECCE with their practical implementation for learning and development in the early years.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the development of ECCE in India.	R

	State the objectives and principles of ECCE.	
CO2	Discuss the ECCE concerns. Explain the theoretical foundations and their implications for learning and development in the early years.	U
CO3	Implement the concept and types of play in ECCE.	A1
CO4	Analyze the curriculum of the play-way approach.	A2
CO5	Evaluate the curriculum of the play-way approach.	E
CO6	Design a strategy for teaching early literacy and numeracy skills using the play-way approach.	C

Course Content

Units	Content	Lecture Hours	COs	RB T
Unit I	Introduction to ECCE a) ECCE in India. b) Objectives and Principles of ECCE. c) ECCE concerns.	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Theoretical Foundations and Their Implications in ECCE a) Behaviourism and Social Learning. b) Piaget's Cognitive developmental theory. c) Ecological and Socio-cultural perspective	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Play in ECCE a) Concept, meaning, and benefits of play. b) Types of play and its values. c) Curriculum of play way approach- supporting communication skills, early literacy, numeracy, and reading skills.	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Learning Resources:

Text Books -

- Aggarwal, J.C. (2010). Psychological, Philosophical and Sociological Foundations of Education (1st Edition). Shirpa Publication House Pvt. Ltd., New Delhi.

2. Berk, L. E. (2018). Child Development. Pearson India Education Services, Tamil Nadu.
3. Mangal, S. K. (2009). Essentials of Educational Psychology. PHI Learning Private Publication House Pvt. Ltd., New Delhi.

Suggested readings-

1. Kaul, V. (2009). Early Childhood Education Programme. National Council of Educational Research and Training, New Delhi.
2. Santrock, J. W. (2018). Educational Psychology (6th Edition). McGraw-Hill Education, New York.

Open Online Resources-

1. <https://ncert.nic.in/dee/pdf/deethemebased.pdf>
2. <https://ncert.nic.in/dee/pdf/Earlychildhood.pdf>

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Priya Topno	Name: Vivechana Dewan	Name: Ranita Chakraborty
Signature:	Signature:	Signature:

Course Description:

Course Code	23EDUOE102	
Course Title	SPECIAL EDUCATION	
Credits	03	
Total Hours	45	
Hours per Week	03	
Course Type	Multi-Disciplinary Course (MDC)	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Human Values and Professional Ethics	
Course Offered to	Education	
Regulation	2023	
Course Overview	This course: • Enables the students to understand the basic concept of Exceptional Children. • Creates awareness amongst the students for the need of Special education. • Familiarizes the students with the individualised education program of physically exceptional children. • Makes the students aware of the need for individualised education program of mentally exceptional children.	
Prerequisite	Basic knowledge of Special Education and Exceptional Children	
Course Objectives	A student will be able to: • Discuss the concept of Exceptional Children. • Understand the basic concept and need of Special education. • Identify the Principles of Special Education. • Discuss the characteristics of physically and mentally exceptional children. • Analyze & evaluate the educational needs of physically and mentally exceptional children. • Assess the need for an Individualised Education Program for Special Children.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the term ‘Exceptional children’.	R
CO2	Discuss the concept and need for special education.	U
CO3	Demonstrate ethical practices in teaching special children by applying learned principles of Special Education.	A1
CO4	Analyze the contributions of the Special Schools made in educating the special children.	A2
CO5	Evaluate the role of a teacher in meeting the various educational needs of	E

	physically and mentally exceptional children.	
CO6	Develop assignments where they critically evaluate the different aspects related to Special Education and Exceptional Children.	C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Exceptional Children & Special Education a) Concept of Exceptional Children. b) Concept & need of Special Education c) Principles of Special Education d) Meaning of Disability, Handicap & Impairment	15	CO1 CO2 CO3	R U A1 A2 E C
Unit II	Education of Physically Exceptional Children a) Visual Impairment - Etiology, characteristics, identification, prevention, education & role of teacher. b) Hearing Impairment - Etiology, characteristics, identification, prevention, education & role of teacher.	15	CO4 CO5 CO6	R U A1 A2 E C
Unit III	Education of Mentally Exceptional Children a) Speech & Language Disorders - Etiology, characteristics, identification, prevention, education & role of teacher. b) Learning Disability - Etiology, characteristics, identification, prevention, education & role of teacher.	15	CO4 CO5 CO6	R U A1 A2 E C

Learning Resources:

Text Books -

1. Mangal, S.K. (2022). Educating Exceptional Children: An Introduction to Special Education. PHI Learning Pvt. Ltd., New Delhi.
2. Dash, M. (2012). Education of Exceptional Children. Atlantic Publishers & Distributors (P) Ltd, New Delhi.
3. Chauhan, S.S. (1993). Advanced Educational Psychology. Vikas Publishing House, New Delhi.

4. Agarwal, R. & Rao, B.V.L.N. (2011). Education for Disabled Children. Shipra Publications, New Delhi.
5. Panda, K.C. (1997). Education of Exceptional Children. Vikas Publication, New Delhi.
6. Werts, M.G., Culatta, R.A. & Tompkins, J.R. (2011). Fundamentals of Special Education: What Every Teacher Needs to Know. PHI Learning Private Limited, New Delhi.

Suggested readings -

1. Punati, B. & Rawal, N.S. (2000). Visual Impairment Handbook. Blind People's Association, Ahmedabad.
2. Pandey, R.S. & Advani, L. (1995). Perspectives in Disability and Rehabilitation. Vikas Publishing House, New Delhi.
3. Cohen, L.G. & Spenciner (2009). Assessment of Children and Youth with Special Needs. Pearson Education, New Delhi.
4. Richardson, J.G. & Powell, J.J.W. (2011). Comparing Special Education: Origins to Contemporary Paradoxes. Stanford University Press, USA.
5. Hallahan, D.P. & Kauffman, J.M. (2010). Exceptional Learners: An Introduction to Special Education. Oxford University Press, Oxford.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Vivechana Dewan Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakrabortty Signature:

Course Description:

Course Code	23EDUSEC101	
Course Title	SKILLS OF TEACHING	
Credits	03	
Total Hours	60	
Hours per Week	04	
Course Type	Skill Enhancement Course (SEC)	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Professional Ethics	
Course Offered to	Education	
Regulation	2023	
Course Overview	This course: • Covers the basic concepts of Micro teaching. • Explains the different steps involved in Micro teaching. • Discuss different micro teaching skills, simulated teaching and learning design. • Develop lesson plan for the micro teaching, preparation of learning design.	
Prerequisite	Basic knowledge on Skills of teaching, Micro teaching, simulated and learning design	
Course Objectives	A student will be able to: • Understand the concept of Micro teaching • Discuss the different steps involved in Micro teaching. • Explain the different Micro teaching skills. • Analyze the importance of simulated teaching. • Develop the micro lesson plan and learning design.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept of Micro teaching.	R
CO2	Discuss the steps involved in micro teaching.	U

CO3	Explain different Micro teaching cycles.	A1	
CO4	Analyze the simulated teaching and learning design.	A2	
CO5	Evaluate the learning design.	E	
CO6	Develop a micro lesson plan and develop a learning design on a topic suitable for Grade 6.	C	
Course Content			
Units	Content	Lecture Hours	COs
Unit I	Concept of Micro teaching - Meaning, definition and characteristics of Microteaching. - Phases and steps involved in Micro teaching. - Micro teaching cycle. - Micro teaching skills with emphasis on - - Set induction - Probing questions - Stimulus variation - Explaining - Examples with illustrations - Reinforcements.	15	CO1 CO 2 CO 3 CO 4 CO 5 CO 6
Unit II	Simulated teaching and learning design - Meaning, characteristics and importance of simulated teaching. - Meaning nature and types of learning design. - Preparation of learning design.	15	CO1 CO2 CO3 CO4 CO5 CO6

Practical (any two)	a) Preparation and execution of Micro-lesson plan: (one) Micro Lesson plan for the micro teaching skills taught b) Teaching simulation of (two lessons) secondary level curriculum in any school subject of your choice c) Preparation of (five learning designs) in any school subject of your choice.	30	CO6

Learning Resources:

Text Books -

1. Banerjee, K. & Deb, N.C. (2020). Pedagogy of Social Science. Rita Publications., Kolkata.
2. Rambabu, A. & Dandapani, S. (2013), Essentials of Micro teaching. Neelkamal Publications Pvt.Ltd., New Delhi.

Suggested readings -

- 1.Mangal, S.K. & Uma. (2009) Essentials of Educational Technology. PHI Learning Private Publication House Pvt. Ltd., New Delhi.
- 2.Rao, Usha. (2008) Educational Technology. Himalaya Publishing House Pvt Ltd., Mumbai.
- 3.Aggarwal, J.C. (1995). Essentials of Educational Technology: Teaching Learning Innovations in Education. Vikash Publication House Pvt. Ltd., New Delhi.
- 4.Mohanty, J. (1992) Educational Technology. Deep & Deep Publication Pvt. Ltd., New Delhi.
- 5.Bala, R. (2009) Educational Planning and Development. Bhat Alpha Publications Pvt. Ltd., New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Criteria for Evaluation

Sl	Criteria	Full Marks	Marks obtained
1	Choice of location/Field	5	
2	Relevance of the visit	5	
3	Duration	5	
4	Report	25	
5	Findings/Learnings/Observations	5	
6	Methodology & Analysis	5	
	TOTAL	50	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Moushumi Bhattacharjee Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakrabortty Signature:

Course Description:

Course Code	23EDUSEC102	
Course Title	PEDAGOGY OF SOCIAL SCIENCE	
Credits	03	
Total Hours	60	
Hours per Week	04	
Course Type	Skill Enhancement Course (SEC)	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Professional Ethics	
Course Offered to	Education	
Regulation	2023	
Course Overview	This course: ● Explain the foundations of teaching Social Science (Education, History, Sociology, Political Science, Psychology). ● Aids in planning for teaching and learning of Social Science (Education, History, Sociology, Political Science, Psychology). ● Elaborates on constructing appropriate learning designs in Social Science. ● Engages the student in actively participating in various activities pertaining to the pedagogy of social science.	
Prerequisite	Basic knowledge of: ● instructional psychology. ● social science content suitable for the age group of 11 to 18 years old.	
Course Objectives	A student will be able to: ● Describe the aims and objectives of Social Science Teaching. ● Present the interrelationship between various branches of Social Science Teaching. ● List the various Teaching Aids used in Social Science. ● Understand Anderson and Krathwohl’s Taxonomy for teaching and assessing. ● Analyze and evaluate the importance of Learning Design in Social Science. ● Develop a report based on a field trip to a place of significance with regard to any subject in social science.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Write the aims and objectives of Social Science Teaching.	R
CO3	Recall the various Teaching Aids used in Social Science.	

CO4	Illustrate using suitable examples Anderson and Krathwohl’s Taxonomy for teaching and assessing.	U		
CO2	Predict the interrelationship between various branches of Social Science Teaching.	A1		
CO5	Analyze the importance of Learning Design in Social Science. Evaluate learning designs in Social Science	A2 E		
CO6	Construct Learning Design in any Social Science subject. Prepare improvised Teaching Aids in any Social Science subject. Develop a report based on a field trip to a place of significance with regard to any subject in social science.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Foundations of Social Science Teaching (Education, History, Sociology, Political Science, Psychology) a) Aims and objectives of Social Science Teaching. b) Social Science Curriculum, Values of Social Science Teaching. c) Interrelationship between various branches of Social Science d) Importance of Social Science as a school discipline	15	CO1 CO2	R U A1 A2 E C
Unit II	Planning for Teaching & Learning Social Science (Education, History, Sociology, Political Science, Psychology) a) Teaching Aids in Social Science b) Anderson and Krathwohl’s Taxonomy for Teaching and Assessing c) Criteria for Writing Instructional Objectives d) Learning Design in Social Science	15	CO3 CO4 CO5 CO6	R U A1 A2 E C
Engagement with Field / Practicum (ANY TWO)	a. Preparation and demonstration of Learning Design (any 2) in any social science subject. b. Organization of field trip to a place	30	CO6	R U A1 A2 E

	of importance according to the relevant subject under social science, collection of data and report writing and presentation of the report. c. Development of Improvised Teaching Aids to teach a topic on a relevant subject area with principles of construction, use and studying its effectiveness.			C

Learning Resources:

Text Books -

1. Aggarwal, J.C. (2006). Teaching of Social Studies: A Practical Approach. Vikas Publishing House Pvt Ltd, New Delhi.
2. Kochar, S.K. (1998). The Teaching of Social Studies. Sterling Publishers, New Delhi.
3. Mangal, S.K. & Mangal, Uma (2018). Teaching of Social Studies. PHI Private Limited, New Delhi.

Suggested readings -

1. Dash, B.N. (2002). Content cum Methods of Teaching Social Studies. Kalyani Publishers, New Delhi.
2. Kohli, A.S. (2004). Teaching of Social Studies. Anmol Publications, New Delhi.
3. Paul, S. (2004). Effective Methods of Teaching Social Studies. ABD Publishers, Jaipur.
4. Saxena, N.R. and et. al. (2003). Teaching of Social Science. R. Lall Book Depot, Meerut.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Criteria for Evaluation

Sl	Criteria	Full Marks	Marks obtained
1	Choice of location/Field	5	
2	Relevance of the visit	5	
3	Duration	5	
4	Report	25	
5	Findings/Learnings/Observations	5	
6	Methodology & Analysis	5	
	TOTAL	50	

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ranita Chakrabortty Signature:	Name: Vivechana Dewan Signature:	Name: Ranita Chakrabortty Signature:

Course Description:**Course Code:** 23EDUVAC101**Course Title:** Teaching Learning Materials**Course Type:** Value Added Course**Credit:** 1**Total Hours:** 30**Hours per Week:** 2**Course Type:** Value Added Course**Objectives**

Teaching Learning Materials offer a range of resources and lesson materials that teachers can use to teach. The objective of TLMs is to make lessons interesting, learning easy and enable teachers to easily express concepts. They help in significantly increasing the learner's achievements by supporting learning.

This course aims to provide a conceptual understanding of Teaching Aids, to make the students aware of the characteristics of Teaching Aids, to recognise the effectiveness of using teaching aids in teaching-learning. It further aids in the construction of improvised teaching aids. This course has been designed to fulfil the criteria set by NEP 2020 for Value Added Course (VAC).

Detailed Module**Session 1: Understanding TLMs****(2 Hours)**

To introduce students to the concept of Teaching Learning Materials (TLMs) and help them understand the various principles and their significance in education.

Session 2: Types of TLMs**(2 Hours)**

To enable students to differentiate among various types of TLMs - Audio TLMs, Visual TLMs, Audio Visual TLMs.

Session 3: Selection & Evaluation of TLMs**(2 Hours)**

To enable students to learn how to select and evaluate appropriate TLMs based on learning objective, grade level and student's needs.

Session 4: Integration into Curriculum**(2 Hours)**

To demonstrate how TLMs can be effectively integrated into the curriculum to enhance teaching and learning outcomes.

Session 5: Creation of TLMs**(2 Hours)**

Phase 1 - Subject specific TLMs (Audio TLMs, Visual TLMs, Audio Visual TLMs)

Session 6: Creation of TLMs**(2 Hours)**

Phase 2 - Subject specific TLMs (Audio TLMs, Visual TLMs, Audio Visual TLMs)

**Session 7: Creation of TLMs
(2 Hours)**

Phase 3 - Subject specific TLMs (Audio TLMs, Visual TLMs, Audio Visual TLMs)

**Session 8: Creation of TLMs
(2 Hours)**

Phase 4 - Subject specific TLMs (Audio TLMs, Visual TLMs, Audio Visual TLMs)

**Session 9: Creation of TLMs
(2 Hours)**

Phase 5 - Subject specific TLMs (Audio TLMs, Visual TLMs, Audio Visual TLMs)

**Session 10: Creation of TLMs
(2 Hours)**

Phase 6 - Educational Level - Pre-Primary TLMs (Audio TLMs, Visual TLMs, Audio Visual TLMs)

**Session 11: Creation of TLMs
(2 Hours)**

Phase 7 -Educational Level - Primary (Audio TLMs, Visual TLMs, Audio Visual TLMs)

**Session 12: Creation of TLMs
(2 Hours)**

Phase 8 - Educational Level - Secondary (Audio TLMs, Visual TLMs, Audio Visual TLMs)

**Session 13: Creation of TLMs
(2 Hours)**

Phase 9 - Educational Level - Higher Secondary (Audio TLMs, Visual TLMs, Audio Visual TLMs)

**Session 14: Creation of TLMs
(2 Hours)**

Presentation of TLMs by the students.

**Session 15: Creation of TLMs
(2 Hours)**

Presentation of TLMs by the students.

This will form the basis for the evaluation.

Mode of Evaluation: Practical (Using Log Book)

Suggested Readings-

1. Lal, H. (2011). Manual of Low Cost Technological Aids. Sai Publications, Faridabad.
2. Kumar, K.L. (1996). Educational Technology. New Age International, New Delhi.



Salesian College
(Autonomous)
Sonada-Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts in Mass Communication and Journalism

DUAL MAJOR

Department of Mass Communication and Journalism

Curriculum Document
2024 –2025

Salesian College, Siliguri Campus
(Autonomous)
Department of Mass Communication and Journalism
New NEP Syllabus
Dual Major
(Semester- I - IV)

Department Vision:

The B.A. in Mass Communication & Journalism programme strives to offer an in-depth understanding of Media industry's activities and equip students with the necessary knowledge and expertise required to become an expert media professional, ready to take on the challenges of the industry. It also attempts to strengthen the fundamental concepts of media which encompasses the ethics and social responsibility of the media personnel in upholding the fabric of the contemporary society, followed by industry required skill building through a balanced mix of theory and practical classes, thereby harnessing the skills in key domain areas of media including print media, broadcast media, public relations, advertising, films and digital media.

Department Mission:

1. To facilitate towards knowledge generation and dissemination.
2. To fulfil human resource needs in the media industry and academics.
3. To inculcate understanding of contemporary media and its impact on society.
4. To encourage the spirit of inclusive and value based learning.
5. To imbibe the culture of ethical journalism and creativity amongst students.

1. Programme Overview

Bachelor of Arts in Mass communication and Journalism is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes(POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Grasp the theories of Mass Communication and Journalism.
	PO02 : Acquaint him/herself with the history of the Mass Media, its evolution and impact on the society.
	PO03: Relate his/her understanding of different types of communication process in various classroom and societal experience.
	PO04: Gain awareness about the various contemporary issues in Mass Media.
Skills	PO05: Demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes.
	PO06: Construct a deeper understanding of the subject and create media content like dummy newspaper, print advertisement, poster, radio jiggles, Photo essay, etc.
	PO07: Integrate and apply ICT in learning process
	PO08: Acquaint him/herself with the diverse current problems and issues related to mass media like convergence of media, explosion of information, future of print journalism, impact of media on culture, evolution of media, efficient use of media for development, and understanding international relations.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical knowledge of media studies and analysis of theories and models of mass media.
	PO10: Initiate self-sufficiency, sincerity, independent think in mass education is a lifelong process for empowering the student to face all challenges in his/her future endeavors.
	PO11: Develop concern for the society, nation as well as promote the feeling of internationalism by comparing our media system with that of other developed countries.

3. Programme Specific Objectives & Outcomes(PSOs)

Knowledge	PSO1: A student develops a clear idea about the subject Mass Communication and Journalism, like nature, scope, factors, and different agencies of Mass media and Journalism.
	PSO2: A student gathers knowledge about Mass Communication and Journalism, theories and their implication in the field of Mass Media and development communication.
	PSO3: A student develops knowledge about the history of the media and technical aspect of media.
	PSO4: A student internalizes the basics of communication, relation between media and society, and importance of development communication in the field of media studies.
	PSO5: A student develops knowledge about basic of Media and Cultural studies. She/he also develops knowledge about the importance of different schools of cultural studies in the field of media studies.
	PSO6 :A student will understand the skeletal framework of how a media industry works.
	PSO7: A student develops the concept of media research and analytical skills through descriptive measures to understand the use and impact of media on society by gathering relevant data and represent findings through graphs, to develop skills in analysing and

	displaying data.
Skills	PSO1: A student will develop a clear idea about the subject Mass Communication and Journalism, like nature, scope, factors, and different agencies of Mass Media.
	PSO2: A student will execute the educational implications of the theories of Mass Media.
	PSO3: A student will construct print, audio and audio visual productions.
	PSO4: A student will develop an understanding of media technology involved in print, audio and visual productions.
	PSO5: A student will advocate media ethics.
	PSO6: A student will develop the skill of using computer in media productions and communication.
	PSO7: A learner will exhibit an excellent communication skill, Skill for Democratic Citizenship and related theories, life skill, technical skill, peace and value education.
Competence	PSO1: A learner demonstrates competencies required to use computers in print and audio visual production for implementation of technical knowledge to industry ready.
	PSO2: A student will analyze the history of Media and Journalism.
	PSO3: A student will establish the concepts of Media industry management and convergence of Media.
	PSO4: A student will correlate various qualitative and quantitative data for Media research.
	PSO5: A student will envision a society where people from all walk so feeling joy equal and equitable rights and opportunities.
	PSO6: A student will compute statistical analysis in the field of Media research and cultural studies.
	PSO7: A student will analyze the contemporary trends in Mass communication and Journalism.

4. Programme Matrix

Semester	Course Code	Course Type	Title of the Course (40 characters including space)
I	24MCJMAJ101	Major	Introduction to Media and Communication
	24MCJSEC101	SEC	Basic of Communication Skills
	24MCJMDC101	MDC	Community Journalism
	24ENGAEC101	AEC (Lang)	Compulsory English
	24GEOAEC101	AEC (EVS)	Environmental Studies (Theory Only)
	24MCJVAC101	VAC	Desktop Publishing I (Word & PowerPoint)
II	24MCJMAJ102	Major	History of Media
	24MCJMAJ103	Major	Introduction to Journalism
	24MCJSEC102	SEC	Basic of Communication Skills
	24MCJMDC102	MDC	Basics of Media Technologies
	24 ENGAEC102	AEC(Lang)	Alt.Eng. / MIL / FL
	24GEOAEC10	AEC (EVS)	Environmental Studies (Fieldwork Only)
	24MCJVED101	VED	Value Education
III	24MCJMAJ201	Major	Media Law and Ethics
	24MCJSEC202	SEC	Newspaper Production
	24MCJMDC201	MDC	New Media and Artificial Intelligence
	24MCJVAC201	VAC	Desktop Publishing III (Adobe Illustrator)
IV	24MCJMAJ202	Major	News Reporting and Analysis
	24MCJMAJ203	Major	News Processing and Editing
	24MCJVAC202	VAC	Desktop Publishing IV(Adobe Photoshop)
V	24MCJMAJ301	Major	Advertising
	24MCJMAJ302	Major	Public Relations and Corporate Communication
	24MCJMAJ303	Major	Digital Marketing
VI	24MCJMAJ304	Major	Photography
	24MCJMAJ305	Major	Film Studies
	22MCJMAJ306	Major	Development Communication
VII (Without research)	24MCJMAJ401	Major	Media and Cultural Studies
	24MCJMAJ402	Major	Media, Gender and Human Rights
	24MCJMAJ403	Major	Indian Media and Politics
	24MCJMAJ404	Major	Global Media and Politics
VII (With	24MCJMAJ401	Major	Media and Cultural Studies
	24MCJMAJ402	Major	Media, Gender and Human Rights
	24MCJMAJ405	Major	Communication Research and

research)			Methods
VIII (Without research)	24MCJMAJ406	Major	Community Media
	24MCJMAJ407	Major	Media Industry and Management
	24MCJMAJ408	Major	Media Entrepreneurship
	24MCJMAJ409	Major	Event Management
VIII (With research)	24MCJMAJ407	Major	Media Industry and Management
	24MCJMAJ410	Major	Dissertation

Dept.: Mass Communication and Journalism

Course	Course Code	Course Title	Credits (L+T+P)	Mode of Exam
MAJOR 1	24MCJMAJ101	Introduction to Media and Communication	4+0+0=4	TH
SEC	24MCJSEC101	Basic of Communication Skills	1+0+2=3	Pract. with Viva
MDC	24MCJMDC101	Community Journalism	3+0+0=3	TH
AEC	24ENGAEC101	Compulsory English	2+0+0=2	TH
AEC	24GEOAEC101	Environmental Studies	2+0+0=2	TH
VAC	24MCJVAC101	Desktop Publishing I (Word & PowerPoint)	0+0+1=1	Pract. with Viva
V.ED	24MCJVED101			
BIBLE STUDIES	24VACBIB101			

Dual Major
Programme: BA
Semester: I
Subject: Framework

Dept.: Mass Communication and Journalism
Dual Major
Programme: BA
Semester: II
Subject: Framework

Course	Course Code	Course Title	Credits (L+T+P)	Mode of Exam
MAJOR 1	24MCJMAJ102	History of Media	4+0+0=4	TH
MAJOR 2	24MCJMAJ103	Introduction to Journalism	4+0+0=4	TH
SEC	24MCJSEC102	Basic of Communication Skills	3+0+0=3	Pract. with Viva
MDC	24MCJMDC102	Basics of Media Technologies	3+0+0=3	TH
AEC(Lang)	24 ENGAEC102	Alt.Eng. / MIL / FL	2+0+0=2	TH
AEC	24GEOAEC102	Environmental Studies	0+0+2=2	TH
V.ED	24MCJVED101	Value Education	1+0+0=1	TH
BIBLE STUDIES	23VACBIB102			

SEMESTER I

Course Code	24MCJMAJ101
Course Title	Introduction to Media and Communication
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	I
Regulation	2024
Course Overview: This course – • Introduces students to the fundamental concepts in communication studies. • Explains the basic communication theories and models. • Explores media and communication and their effect on society and culture. • Serves as a foundation for further studies in Mass Communication/Media Studies.	
Prerequisites and/or Note(s): • Basic knowledge of communication.	
Course Objectives: 1. To provide basic idea about mainstream media. 2. To identify and understand the involvement of technologies in Communication. 3. To understand the concept of Communication and especially Mass Communication. 4. To discuss the important theories and models of Communication. 5. To illustrate the need and use of media in everyday life.	

Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to-		
COs	Statements	RBT Level
CO1	Describe basic idea about mainstream media	R
CO2	Illustrate the need and use of media in everyday life	U
CO3	Apply the concept of Communication with special emphasis on Mass Communication	A1
CO4	Analyze the important theories and models of Communication	A2
CO5	Analyze the communication process	A2
CO6	Evaluate the usage of different kind of media and technology	E
CO7	Integrate the theories and models of communication in everyday life	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Introduction to Communication: Definition and Meaning of Communication; Types and Forms of Communication; Levels of Communication; Barriers to Communication; Mass Communication-its Characteristics, Functions and Processes.	10	CO1 CO2 CO3 CO5	R U A1 A2

UNIT – II	Media in Everyday Life: Media and everyday life in modern society, broadcasting as an institution in everyday life, early radio: the domestication of media technology; television and other forms: audiences and articulations; TV, geography and mobile privatizations; Media and Modernity, Identity, Tradition, and Media, the dynamics and consequences of mediated interactions	10	CO1 CO2 CO3 CO5 CO6	R U A1 A2 E
Unit III	Communication Theories: Bullet Theory Individual Difference Theory Personal Influence Theory Cognitive Dissonance Theory Agenda Setting Theory Cultivation Theory Uses and Gratification Theory Spiral of Silence Theory Two-Step Flow Theory Narcotic Dysfunction Theory	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Communication Models: Eastern and Western Communication Models Ancient Indian Model Aristotle and Plato's Model Laswell's Model Berlo's Model Shanon and Weaver's Model Schramm and Osgood Model Gerbner's Communication Model	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	Media and Technology: Brief history, character, and effects of Print, Radio, Television, Films, Mobile Phones, The Internet – Web 1.0 and Web 2.0; Mediated and Non-Mediated Communication, Media, and everyday life in a mediated reality; Technological Determinism; New Media and the transformative nature of the internet, User Generated Content and Reality.	10	CO1 CO2 CO3 CO4 CO6 CO7	R U A1 A2 E

Learning Resources:

Mc. Quail, D. (2000). *Mass Communication Theory*, London: Sage
Williams, K. (2003). *Understanding Media Theory*. United Kingdom: Arnold.
Kumar, K. J. (2000). *Mass Communication in India* (4th Edition). India: Jaico Publishing House.
Mehta, D.S. (2014). *Mass Communication and Journalism in India*: Allied Publishers Pvt. Ltd.
Agarwal. V. B. (2001). *Handbook of Journalism and Mass Communication*: Concept Publishing Company
Andal, N.(2015). *Communication Theories and Models*: Himalaya Publication House, New Delhi

Suggested Reading:

Ruffner, M. &Burgoon, M. (1981). *Interpersonal Communication*. New York: Holt, Rinehart, and Winston
McLuhan, M. (2016). *Understanding Media: The Extensions of Man*. New York: Create Space Independent Publishing Platform.

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - c) Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
	(Seal)	(Seal)

Course Code	24MCJSEC101	
Course Title	Basic Communication Skills	
Credits	03	
Lecture Hours	75	
Hours/Week	4	
Category	Skill Enhancement Course	
Semester	I/II	
Regulation	2024	
Course Overview: This course – - Provides basic communication skills, which will help them to gain critical communication life skills. - Aids in the knowledge of the various designing tools		
Prerequisites and/or Note(s): Basic knowledge of English language		
Course Objectives: 1. To understand the role of verbal and nonverbal communication 2. To improve Communication skills critical to human well-being and progress. 3. To develop basic skills of composition in designing		
COs	Statements	Dave's Taxonomy
CO 1	Follow instructions for behavioural change and technological knowledge	I
CO 2	Implement the knowledge of various designing tools and communication skills	M
CO 3	Demonstrate the designing tools and communication skills to another student	P

CO 4	Adaptation of technical knowledge and enhance communication skills	A
CO 5	Create and design a logo and a visiting card	N

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	DAVE'S TAXONOMY
UNIT – I	Non-Verbal Communication Language and nonverbal behaviour as organizers of social systems; behavioural aspects of interactions; acquisition of communicative behaviour, theoretical approaches to human interaction.	20	CO1 CO2 CO3 CO4	I M P A
UNIT – II	Verbal Communication Verbal Arts and their forms – oral and written; the role of the reader/audience/spectator; arrangement, style, and delivery (with examples from news reading, talk show, interview, dialogues, recitation):	20	CO1 CO2 CO3 CO4	I M P A
Unit III	Typography History of writing and typography; outline of typography – type, typeface; hierarchy using positions, size, weight, colour; type as image, rastering of a type; the rule of threetype-faces; using the right type; invisible typography, rivers of space; using justified type, flush-left, centred, asymmetrical and flush-right type, multicolumn text grid; typographic 'furniture'; margins and gutters and floating in space.	22	CO1 CO2 CO3 CO4 CO5	I M P A N

Unit IV	Aesthetics of Image (still and moving) Figure/ground, balance, emphasis, proportion, rhythm, unity, motifs, meaning and mood of colour; colour principles, learning from nature; Understanding colour in different media; the concept of RGB and CMYK.	13	CO1 CO2 CO3 CO4 CO5	I M P A N

Assessment:

Practical Exam:

- i. *Formative Assessment:* 25 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment:* 50 marks
 - PowerPoint presentation
 - Design the following
 - (1) A 'replacement' logo for a renowned business firm. For example, a 'replacement' logo for TATA
 - (2) Design a visiting card
 - (3) Design a poster for a campaign or an organisation
 - (4) Design a brochure for a service or a product of a company

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(Seal)

(Seal)

Course Code	24MCJMDC101		
Course Title	Community Journalism		
Credits	03		
Lecture Hours	45		
Hours/Week	3		
Category	Multi-Disciplinary Course (MDC)		
Semester	I		
Regulation	2024		
Course Overview:			
This course – - Aims to equip students with the knowledge and skills necessary to engage in Community journalism effectively - Develops a sense of community and fellow feeling. - Creates an understanding of the role of media in highlighting the local issues			
Prerequisites and/or Note(s):			
Basic understanding of community, identity, and belonging			
Course Objectives:			
- Understanding the role of media for community development - Construct various strategies for engaging with various stakeholders including community leaders, residents and organizations. - Explore the use of digital platforms to distribute news and foster community interactions - Aids in understanding the role and importance of traditional media for development.			
Course Outcomes (COs) and Cognitive Level Mapping			
At the end of this course, the students will be able to-			
COs	Statements		RBT Level

CO1	Draw an understanding of the role and significance of community journalism in providing hyper-local news	R
CO2	Explain the use of alternative media in highlighting community issues	U
CO3	Identify the role of media in community development	A1
CO4	Analyze different types of alternative media and their roles in the society	A2
CO5	Evaluate the prospects of Alternative media	E
CO6	Develop a program for alternative media, applicable in the region of North Bengal	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Basic Concepts Community: its concept and significance; Community as Place; Community as Identity/Belonging; Community as an Ideology; Demographics, changing nature of community, communities of interest, virtual communities.	8	CO1 CO2 CO3	R U A1
UNIT – II	Origin and Development Community Journalism: Origin and Development, concerns of community journalism (women, gender, economy, social, environmental, health, and nutrition, etc.); development support communication, skills of community journalists.	10	CO1 CO2 CO3 CO4	R U A1 A2 E
UNIT– III	Community Media as Alternative Media Concept, need, and origin; types of alternative media; alternative media vis-à-vis mainstream media	8	CO1 CO2 CO3 CO4	R U A1 A2 E

UNIT–V	Community Media Space Alternative Print Media – strengths, weakness, prospects, examples; Alternative audio-visual media – strengths, weakness, prospects, examples; Alternative Radio – strengths, weakness, prospects, examples with particular focus on community radio	10	CO1 CO2 CO3 CO4	R U A1 A2 E
UNIT–V	Traditional Media Meaning, the importance of traditional media in Communication, different forms of traditional media, and types of traditional media in North Bengal.	9	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Learning Resources:

Atton, C. Alternative Journalism, Sage Publications

Suggested Reading:

Lauterer, J. (2009). *Community Journalism: Relentlessly Local*. United States: University of North Carolina Press.

Abernathy, P. M. (2014). *Saving Community Journalism: The Path to Profitability*. United States: University of North Carolina Press.

Pavarala, V. & Malik, K. K. (2007). *Other Voices: The Struggle for Community Radio in India*. India: SAGE Publications.

Udupa, S. (2015). *Making News in Global India: Media, Publics, and Politics*. United Kingdom: Cambridge University Press.

Malik, K. K, &Pavarala, V. (2020). *Community Radio in South Asia: Reclaiming the Airwaves*. United States: Taylor & Francis.

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	24MCJVAC101
Course Title	Desktop Publishing I (Word & PowerPoint)
Credits	1
Lecture Hours	30
Sessions	15
Hours/Week	2
Category	Value Added Course (VAC-1)
Semester	I
Regulation	2024
Course Overview: This course – • Introduces students to the fundamental concepts in Desktop Publishing, • Explains the basic of software used in desktop publishing like Microsoft Word. • Explores basics of report writing and publishing.	
Prerequisites and/or Note(s): • Basic understanding of technological progress made in the field of Media and Communication	
Course Objectives: The course is designed to help learners to: • Understand the concept and industry of desktop publishing. • Develop essential skills and knowledge on how to use the essential software. • Create an design professional print productions. • Nurture a creative mind-set essential to design. • Familiarize the learners about the latest computing technologies required in the field.	

Course Outcomes:

The course is designed to help learners to:

1. Critically examine various newspaper and magazine formats, print production materials.
2. Learn and demonstrate and create using different industry standard software.
3. Understand basics of desktop publishing and develop their own designing aesthetic.
4. Apply different theories and elements to while designing.
5. Create meaningful industry standard print publications and showcasing them online.

COURSE CONTENT

SESSION	CONTENT	HOURS
1.	Introductory session about the course and the tools to be used Students will be asked about any experiences in design during their school tenure like use of Microsoft Word.	2
2.	Introduction to basics of MS Word How to access MS Word.	2
3.	Introduction to basics of MS PowerPoint Basics of MS PowerPoint interface.	2
4.	Work Space Essentials of MS Word - 1 Introduction to different panels and tools in MS Word.	2
5.	Work Space Essentials of MS Word - 2 Introduction to different panels and tools in MS Word.	2
6.	Work Space Essentials of MS PowerPoint -1 Introduction to different panels and tools in MS PowerPoint.	
7.	Work Space Essentials of MS PowerPoint - 2 Introduction to different panels and tools in MS PowerPoint.	
8.	Working with Photos and Graphics in MS Word Using photos and graphics to enhance a Document Quality.	2
9.	Working with Photos, Videos and Graphics in MS PowerPoint Using photos and graphics to enhance a Document Presentation Quality.	2
10.	Creation of a Report Using MS Word Students will be asked to make a report using MS Word	2
11.	Creation of a Transition and Animation Slides Using MS PowerPoint Students will be asked to make a PPT and show slide transitions using MS PowerPoint	2
12.	Creation of a CV Using MS Word Students will be asked to make a CV using MS Word	2
13.	Creation of charts and info-graphics in MS PowerPoint Students will be asked to make a data report using MS PowerPoint	2

14.	Newsletter production on MS Word Learn to create a newsletter. Students will be asked to design a newsletter	2
15.	Presentation on a particular topic through MS PowerPoint Students will be asked to make a poster using MS Word.	2

Assessment:

Formative Assessment: 10 internal + 5 attendances.

Summative Assessment: Assignment submission 30 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

SEMESTER II

Course Code	24MCJMAJ102
Course Title	History of Media
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	II
Regulation	2024
Course Overview: This course – • Explains the history of Journalism. • Covers the role of Journalism in the National Freedom Movement. • Aids in understanding the evolution of media.	
Prerequisites and/or Note(s): • Basic knowledge of English language.	
Course Objectives: 1. To tell the history of Indian and International Print media. 2. To understand the role of media during Indian Freedom Movement. 3. To examine the role of media in the post-independence era. 4. To evaluate the evolution of media in world and India.	
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to-	

COs	Statements	RBT Level
CO1	Describe the history of Indian and world print media	R
CO2	Discuss the interdependence of media and freedom movement	U
CO3	Compute the contribution of media in the freedom movement	A1
CO4	Analyze the role and effect of media in post-independence era	A2
CO5	Evaluate the contribution of media in the freedom movement	E
CO6	Develop the idea of evolution in media	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	History of Print Media Media and Modernity: Print Revolution, Telegraph, Morse Code, History of the Press in India	10	CO1 CO2 CO3 CO5	R U A1 E
UNIT – II	National Freedom Movement – I National Freedom Movement, Colonial Period, Gandhi, Nehru and Ambedkar, Tagore as a Journalist	10	CO1 CO2 CO3 CO5	R U A1 E

UNIT – III	National Freedom Movement – II Baptist Missionary, Buckingham, Metcalfe, Tilak, Hickey, Raja Rammohun Roy, Aurobindo, Surendranath Banerjee, Statesman, Amrita Bazar Patrika, Hindu Patriot, Derozians, The Hindu	15	CO1 CO2 CO3	R U A1 A2 E
Unit IV	Media in the Post-Independence Era Emergency and Post Emergency Era Changing Readership, Print Cultures, Language Press, Media during emergency	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
Unit V	Evolution of Media Evolution of Radio, Television, Film, Internet Evolution of News Agencies- AFP, Reuters, AP, PTI, UNI, ANI	15	CO1 CO2 CO3 CO6	R U A1 A2 E C

Learning Resources:

1. Bruce D. Itule and Douglas A. Anderson. *News writing and reporting for today's media*; McGraw Hill Publication, 2000.
2. M.L. Stein, Susan Paterno & R. Christopher Burnett. *News writer's Handbook: An Introduction to Journalism*; Blackwell Publishing, 2006.
3. George Rodmann. *Mass Media in a Changing World*; McGraw Hill Publication, 2007
4. Carole Flemming and Emma Hemmingway. *An Introduction to Journalism*; Vistaar Publications, 2006
5. Priyanka Wadhwa. *History of Journalism*, Murari Lal & Sons, 2007

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - c) Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
	(Seal)	(Seal)

Course Code	24MCJMAJ103	
Course Title	Introduction to Journalism	
Credits	04	
Lecture Hours	60	
Hours/Week	04	
Category	Major Course	
Semester	II	
Regulation	2024	
Course Overview: This course – - Introduces students to the basic principles and practices of Journalism. - Instructs on the news media's vital role in democracy. - Develops an understanding of news production, dissemination, and presentation.		
Prerequisites and/or Note(s): - An understanding of the role of newspaper journalism - An understanding of the crucial role of journalism in a democracy		
Course Objectives: - To interpret basic concepts of journalism, its functions, principles, and ethics. - To compile news writing in different styles - To analyze the role of journalism in a democracy - To evaluate the role of newspaper journalism in society		
Course Outcomes (COs) and Cognitive Level Mapping At the end of this course, the students will be able to-		
COs	Statements	RBT Level

CO1	Define news and its elements	R
CO2	Discuss the evolution of print journalism	U
CO3	Classify different types of journalism	A1
CO4	Analyse the language and structure of news	A2
CO5	Examine the technical terms and jargons of journalism used in different media platforms	E
CO6	Develop an understanding about the role of media in democracy	C

COURSE CONTENT

UNITS	CONTENT	HOURS	Cos	REVISED BLOOMS TAXONOMY
UNIT – I	Understanding News News: meaning, definition, elements, nature, the news process: from the event to the reader (how news is carried from the event to the reader); hard news vs. soft news; basic components of a news story – attribution, embargo, verification, balance and fairness, brevity, dateline, credit line, by-line.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E

UNIT – II	Different Forms of Print-A Historical Perspective The Print Revolution in Context; The media and the Public Sphere in Early Modern Europe, From Steam to Electricity; Processes and Patterns, Yellow Journalism, Penny press, tabloid press; Information, Education, Entertainment, Convergence, Multimedia .	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
UNIT– III	Understanding the Structure and Construction of News Organizing a news story, 5W's and 1H, Inverted pyramid; Criteria for newsworthiness, principles of news selection, use of archives, sources of news/news beats, the internet and its role in transforming journalism, Balancing the news.	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
UNIT–IV	Different media platform – an introduction Language and principles of news writing and presentation: print and electronic media, and new media, convergence journalism, mobile journalism (MOJO), alternative journalism.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
UNIT–V	Role of Media in a Democracy Responsibility to Society, Press and Democracy, Corporatization of the news media: Challenges to press freedom	10	CO2 CO3 CO5 CO6	R U A1 A2 E C

Learning Resources:

1. Bruce D. Itule and Douglas A. Anderson. *News writing and reporting for today's media*; McGraw Hill Publication, 2000.
2. M.L. Stein, Susan Paterno & R. Christopher Burnett. *News writer's Handbook: An Introduction to Journalism*; Blackwell Publishing, 2006.
3. George Rodmann. *Mass Media in a Changing World*; McGraw Hill Publication, 2007.
4. Carole Flemming and Emma Hemmingway. *An Introduction to Journalism*; Vistaar Publications, 2006.
5. Richard Keeble. *The Newspaper's Handbook*; Routledge Publication, 2006

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
	(Seal)	(Seal)

Course Code	24MCJSEC102	
Course Title	Basic Communication Skills	
Credits	03	
Lecture Hours	75	
Hours/Week	4	
Category	Skill Enhancement Course	
Semester	II	
Regulation	2024	
Course Overview: This course – - Provides basic communication skills, which will help them to gain critical communication life skills. - Aids in the knowledge of the various designing tools		
Prerequisites and/or Note(s): Basic knowledge of English language		
Course Objectives: 4. To understand the role of verbal and nonverbal communication 5. To improve Communication skills critical to human well-being and progress. 6. To develop basic skills of composition in designing		
COs	Statements	Dave's Taxonomy
CO 1	Follow instructions for behavioural change and technological knowledge	I
CO 2	Implement the knowledge of various designing tools and communication skills	M
CO 3	Demonstrate the designing tools and communication skills to another student	P

CO 4	Adaptation of technical knowledge and enhance communication skills	A
CO 5	Create and design a logo and a visiting card	N

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	DAVE'S TAXONOMY
UNIT – I	Non-Verbal Communication Language and nonverbal behaviour as organizers of social systems; behavioural aspects of interactions; acquisition of communicative behaviour, theoretical approaches to human interaction.	20	CO1 CO2 CO3 CO4	I M P A
UNIT – II	Verbal Communication Verbal Arts and their forms – oral and written; the role of the reader/audience/spectator; arrangement, style, and delivery (with examples from news reading, talk show, interview, dialogues, recitation):	20	CO1 CO2 CO3 CO4	I M P A
Unit III	Typography History of writing and typography; outline of typography – type, typeface; hierarchy using positions, size, weight, colour; type as image, rastering of a type; the rule of threotype-faces; using the right type; invisible typography, rivers of space; using justified type, flush-left, centred, asymmetrical and flush-right type, multicolumn text grid; typographic 'furniture'; margins and gutters and floating in space.	22	CO1 CO2 CO3 CO4 CO5	I M P A N

Unit IV	Aesthetics of Image (still and moving) Figure/ground, balance, emphasis, proportion, rhythm, unity, motifs, meaning and mood of colour; colour principles, learning from nature; Understanding colour in different media; the concept of RGB and CMYK.	13	CO1 CO2 CO3 CO4 CO5	I M P A N

Assessment:

Practical Exam:

- iii. *Formative Assessment:* 25 marks as per Assessment & Evaluation Framework Document of Salesian College
- iv. *Summative Assessment:* 50 marks
 - PowerPoint presentation
 - Design the following
 - (5) A 'replacement' logo for a renowned business firm. For example, a 'replacement' logo for TATA
 - (6) Design a visiting card
 - (7) Design a poster for a campaign or an organisation
 - (8) Design a brochure for a service or a product of a company

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(Seal)

(Seal)

Course Code	24MCJMDC102
Course Title	Basics of Media Technologies
Credits	03
Lecture Hours	45
Hours/Week	3
Category	Multi-Disciplinary Course (MDC)
Semester	II
Regulation	2024
Course Overview: This course – - Introduces students to the fundamental concepts in communication studies, - Explains the basic communication theories and models. - Explores media and communication and their effect on society and culture - Serves as a foundation for further studies in Mass Communication/Media Studies.	
Prerequisites and/or Note(s): Basic understanding of technological progress made in the field of Media and Communication	
Course Objectives: - To provide basic idea about mainstream media - To identify and understand the involvement of technologies in Communication - To understand the concept of Communication and especially Mass Communication - To discuss the important theories and models of Communication - To illustrate the need and use of media in everyday life	
Course Outcomes (COs) and Cognitive Level Mapping At the end of this course, the students will be able to-	

COs	Statement	RBT Level
CO1	Identify different types of media technologies used in Journalism.	R
CO2	Discuss the different types of media technologies.	U
CO3	Apply the knowledge of media technologies to examine its evolution and growth.	A1
CO4	Analyze the convergence of media technologies.	A2
CO5	Evaluate the evolution of media and its impact on the society.	E
CO6	Develop the understanding of media convergence and its influence on the society.	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Print Technologies Evolution of Print Media, Invention of the Printing Press, Gutenberg Printing Press, Digital Printing, Large Format, Screen Printing; Newspapers and Magazines; modern Printing Processes, DTP (Desktop Publishing)	10	CO1 CO2 CO3 CO5	R U A1 E
UNIT – II	Audio Technologies Emergence of Radio, Radio Technology, Types and Functions, AM, FM, Shortwave, Medium wave, Longwave, Satellite, e-radio; Radio Broadcasting. Podcast, Studio Console, Basics of Sound, Types of sound-sync, Non-Sync, Natural sound, Ambience Sound; Introduction to microphones. Characteristics of Radio as a medium; Radio Broadcast Formats (Programmes).	8	CO1 CO2 CO3 CO5	R U A1 E

UNIT – III	Audio Visual Technologies Introduction to audio fundamentals and acquisition technologies, video fundamentals and acquisition technologies, live program production, display technology; Video Streaming; Platform independent Audio; Characteristics of TV, Films, OTT as audio visual mediums	8	CO1 CO2 CO3 CO5	R U A1 E
UNIT – IV	Convergence Media Technologies The emergence of convergence, why and how convergence is emerging, convergent journalism and multi-media storytelling, case studies of convergence, technology, and convergence; the smart newsroom: convergence and the future of journalism.	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
UNIT – V	Mobile Journalism Mobile Journalism Screen sizes & responsive web, Information multimedia and web architecture, Marketing websites, corporate websites, web feature stories, key points for web interactive narrative, interactive users vs linear narratives, elements of an interactive writer	9	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Learning Resources: Kamath, M.V. (2009). <i>The Journalist's Handbook</i> . New Delhi: Vikas Publishing House Pvt. Limited Gupta, V. S. (2003). <i>Handbook of Reporting and Communication Skills</i> . India: Concept Publishing Company Roy, B. (2004). <i>Modern Student Journalism</i> . India: Pointer Publishers. Aggarwal, V.B. (2006) <i>Essentials of Practical Journalism</i> , Concept Publishing Company Smith, J. (2007) <i>Essential Reporting</i> , Sage publications Suggested Readings: Boczkowski, Pablo J. (2014), and Kirsten A. (2014). Technologies. <i>Essays on Communication, Materiality, and Society</i> . Massachusetts, London: MIT Press Cambridge Hemchand Pant (2019) <i>Writing For Audio-Visual Media (For Bachelor In Journalism And Mass Communication)</i> ,				

Stanley R. Alten(1981) *Audio in Media*,
Bruce Block (2001) *The Visual Story: Creating the Visual Structure of Film, TV and Digital Media*,
John V. Pavlik and Shawn McIntosh (2018) *Converging Media*

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal) (Seal)

SEMESTER III

Course Code	24MCJMAJ201		
Course Title	Media Law and Ethics		
Credits	04		
Lecture Hours	60		
Hours/Week	04		
Category	Major Course		
Semester	III		
Regulation	2024		
Course Overview:			
This course – 1. Explores ethical dilemmas and considerations that arise in the practice of journalism 2. Aids in understanding the ethical responsibilities associated with journalism 3. Develops critical understanding about the role of media in democracy			
Prerequisites and/or Note(s): • Basic knowledge of civic studies			
Course Objectives: 1. To familiarize the students with the fundamentals of press laws and media related laws. 2. To provide an understanding of knowledge of the Indian constitution. 3. To analyze the codes of ethics of various regulatory bodies in the field of print, advertising, and broadcast. 4. To inculcate the knowledge of the socio-cultural issues and the representation of the marginalized section of the society in media.			
Course Outcomes (COs) and Cognitive Level Mapping			
At the end of this course, the students will be able to-			
COs	Statements		RBT Level
CO1	Describe the ethical framework of Mass media		R

CO2	Discuss the various media laws	U
CO3	Apply the knowledge of media laws and ethics to examine case study	A1
CO4	Examine the laws related to representation of gender in media	A2
CO5	Evaluate the media reportage of marginalized sections	E
CO6	Develop the knowledge of socio-cultural issues and representation of the marginalized section of the society in media	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Ethical Framework and Media practice Freedom of expression (Article 19(1)(a) and Article 19(1)(2)) Freedom of expression and defamation- Libel and slander Issues of privacy and Surveillance in Society Right to Information Idea of Fair Trial/Trial by Media Parliamentary Privilege Contempt of Court Intellectual Property Rights Media ethics and cultural dependence	10	CO1 CO2 CO3	R U A1 A2 E
UNIT – II	Media (Reporting) Technology and Ethical Parameters Live reporting and ethics Legality and Ethicality of Sting Operations, Phone Tapping etc. Ethical issues in Social media (IT Act 2000, Sec 66 A and the verdict of The supreme court) Discussion of Important cases-e.g.- Operation Westend Some Related laws- Relevant sections of Broadcast Bill, NBA guidelines	15	CO1 CO2 CO3 CO5	R U A1 A2 E C

UNIT– III	Representation and ethics Advertisement and Women Pornography Related Laws and case studies- Indecent representation of Women (Prohibition) Act, 1986 and rules 1987, Protection of Women against Sexual Harassment Act, 2013, Sec 67 of IT Act 2000 and 292 IPC etc. Objectionable Advertisements, Drugs Magic Remedies Intermediary Guidelines and Digital Media Ethics Code	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
UNIT–IV	Media and Regulation Regulatory bodies, Codes and Ethical – ASCI, TRAI, RNI Guidelines Self-Regulation Media Content- Debates on morality and Accountability: Taste, Culture and Taboo Censorship and media debates	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
UNIT–V	Media and Social Responsibility Economic Pressures Media reportage of marginalized sections- children, dalits, tribals, Gender Media coverage of violence and related laws - inflammatory writing (IPC 353), Sedition incitement to violence, hate Speech. Relevant Case Studies – Muzaffarpur Riots, Attack on civil liberties of individuals and social activists	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Learning Resources:

1. Thakurta, ParanjyGuha, *Media Ethics*, Oxford University Press, 2009
2. Barrie Mc Donald and Michel Petheran*Media Ethics*,mansell,1998.
3. Austin Sarat*Where Law Meets Popular Culture* (ed.), The University of Alabama Press ,. 2011
4. VikramRaghvan, *Communication Law in India*, Lexis Nexis Publication,2007.
5. IyerVekat, *Mass Media Laws and Regulations* in India-Published by AMIC, 2000.
6. William Mazzarella, *Censorium: Cinema and the Open Edge of Mass Publicity*.
7. RaminderKaur, William Mazzarella, *Censorship in South Asia: Cultural Regulation from.Sedition to Seduction*
8. Linda Williams, *Hard Core: Power, Pleasure, and the "Frenzy of the Visible"*

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
	(Seal)	(Seal)

Course Code	23MCJSEC201	
Course Title	Newspaper Production	
Credits	03	
Lecture Hours	75	
Hours/Week	4	
Category	Skill Enhancement Course	
Semester	III/IV	
Regulation	2023	
Course Overview: This course – Has been designed for students to get a theoretical understanding and practical training in producing an in-house newspaper.		
Prerequisites and/or Note(s): • Basic knowledge of report writing • Basic computer knowledge		
Course Objectives: 1. To define various elements of a newspaper 2. To understandbasicsof the various newspaper formats and design 3. To implement various technological process involved in the production of a newspaper 4. To produce a newspaper		
Course Outcomes (COs) and Cognitive Level Mapping At the end of this course, the students will be able to-		
COs	Statement	Dave’s Taxonomy
CO1	Follow the instructor to create a newspaper layout	I

CO2	Execute the knowledge of newspaper designing	M
CO3	Demonstrate the various aspects of newspaper designing and photo editing	P
CO4	Formulate layout design of a dummy newspaper	A
CO5	Create a four page dummy newspaper comprising of an Op- Ed and six reports	N

COURSE ONTENT

UNITS	CONTENT	HOURS	COs	DAVE'S TAXONOMY
UNIT – I	Newspaper Designing Terminology Dateline, credit line, print line, editorial and Op-Ed page, columns, cartoons, jumpy copies, marriage of copies; Types of headlines – Stepped, tombstone, flush left, centered, pyramid, reverse pyramid, waist, reverse waist.	12	CO 1 CO 2 CO 3	I M P
UNIT – II	Principles of Newspaper Designing I Designing, different types of newspaper layouts, eye movement, The Z Pattern - Measuring in Design, Determining Type Readability, Marking up Reporter's Copy, Determining Copy Depth, Using a Copy Log, Determining Headline Size, Determining Headline Depth, Scaling Artwork, Dummying with Symbols	18	CO 1 CO 2 CO 3 CO 4	I M P A

Unit III	Principles of Newspaper Designing II Horizontal Page Design, the Quadrant Page Design, the Modular Page Design, the Single Theme Page, the Editorial Page, the Sports Page, the Single-Page Feature, the Photo Features Page, Dealing with Ads, and Introduction to Adobe InDesign	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N
Unit IV	Photo Editing Photo Editing -The Single Image and the Photo-story - The paradox of the photo-story, word, image, caption writing, photographs in newspapers. The Production process - the photo-story, the equipment, the fieldwork, return to the editorial desk, editing and final touch-offs, and the photo desk; Introduction to Adobe Photoshop	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N
Unit V	Designing and Production Design and produce a 4-page newspaper comprising of an Op-Ed page. Include six news reports from the following news beats: - Political Reporting - Entertainment Reporting - Education Reporting - Health Reporting - Sports Reporting - Human Interest Reporting	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N

Learning Resources:

Kamath, M.V. (2009). *The Journalist's Handbook*. New Delhi: Vikas Publishing House Pvt. Limited
Gupta, V. S. (2003). *Handbook of Reporting and Communication Skills*. India: Concept Publishing Company
Roy, B. (2004). *Modern Student Journalism*. India: Pointer Publishers.
Aggarwal, V.B. (2006) *Essentials of Practical Journalism*, Concept Publishing Company
Smith, J. (2007) *Essential Reporting*, Sage publications

Suggested Reading:

Baker, J. (2021). *Essential Journalism: The NCTJ Guide for Trainee Journalists*. United Kingdom: Taylor & Francis
Hasan, S. (2020). *Mass Communication: Principles and Concepts*. India: CBS Publishers & Distributors.
Horst, M., Viet, K. (2017). *Journalism Basics: An Introduction to Print Journalism*. Poland: CreateSpace Independent Publishing Platform
Saltz, I. (2019). *Typography Essentials Revised and Updated: 100 Design Principles for Working with Type*. United States: Rockport Publishers.

Assessment:**Practical Exam:**

- i. *Formative Assessment*: 25 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment*: 50 marks
 - Design the following:
 - Design a Tabloid newspaper
 - Design a Cover page of a magazine

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	24MCJMDC201	
Course Title	New Media and Artificial Intelligence	
Credits	03	
Lecture Hours	45	
Hours/Week	3	
Category	Multi-Disciplinary Course (MDC)	
Semester	III	
Regulation	2024	
Course Overview: - Exposure to Digital media, Co- relation between Media and Artificial Intelligence, New Media Over Traditional Media, - Investigate emerging trends in new media, covering the characteristics of the information society. - Examine the intersection of virtual cultures and digital journalism, and ethical consideration in new media practices. - Learn about visual and content design principles for news media. - Evaluate the role of educational technology in news media, and the use of new media for developmental purposes.		
Prerequisites and/or Note(s): Basic Knowledge in Computer and mobile applications.		
Course Objectives: Define and explain fundamental concepts and principles of AI - Analyze how AI is influencing and shaping the landscape of new media. - Explore the integration of AI technologies in various forms of media, including social media, journalism, entertainment, and advertising. - Analyze how AI is employed to enhance user experience and engagement in new media.		
Course Outcomes (COs) and Cognitive Level Mapping		
COs	Statements	RBT Level

CO1	Defining what is new media and artificial intelligence	R
CO2	Explain the shift of audience to new media rather than following traditional media.	U
CO3	Classify the need of new media in the present era	A1
CO4	Analyze the correlation of AI and new media	A2
CO5	Defend the rise in demand of new media and AI	E
CO6	Create a new capsule and advertisement using all the elements taught in this course	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Key Concepts and Theory Defining new media, terminologies and their meanings – Digital media, new media, online media et al.; Information society and new media, Technological Determinism, Computer mediated-Communication (CMC), Networked Society, ICT;	15	CO1 CO2 CO3	R U A1
UNIT – II	Digitization of Journalism Authorship and what it means in a digital age, Piracy, Copyright, Copy left and Open Source, Digital archives, New Media and Ethics	15	CO1 CO2 CO3 CO4	R U A1 A2 E
UNIT– III	Introduction to AI, Types of AI platform AI in NEW MEDIA, Demand of AI, AI and Interaction, AI and Advertisement, Rise of AI in social Media, Trends in Media AI generation; AI and photography; Content Generation (Chat GPT); AI curated Photograph and Content Making: Cyber Journalism;	15	CO1 CO2 CO3 CO4	R U A1 A2 E

Suggested Reading:

- Vincent Miller. *Understanding digital culture*. Sage Publications, 2011.
- Lev Manovich. 2001. "What is New Media?" *In The Language of New Media*. Cambridge: MIT Press. pp. 19-48.
- Siapera, Eugenia. *Understanding new media*. Sage, 2011. Introduction.
- Baym, Nancy K. *Personal Connections in the Digital Age*. Polity, 2010. Chapter 3. Goldsmith, Jack, and Tim Wu. 2006. *Who Controls the Internet? Illusions of Borderless World*. Oxford University Press US.
- O'Reilly, Tim. (2005). *What is web 2.0: Design patterns and business models for the next generations software*. Oreilly.com, retrieved from
- Grossman, "Iran Protests: Twitter, the Medium of the Movement" Lemann, Nicholas. 2006. *Amateur Hour: Journalism without Journalists*.

Assessment:

Formative Assessment: 25 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	23MCJVAC 201
Course Title	Desktop Publishing (Adobe Indesign)
Credits	1
Lecture Hours	30
Sessions	15
Hours/Week	2
Category	Value Added Course (vac-II)
Semester	III
Regulation	2024
Course Overview: This course – - Introduces students to the fundamental concepts of Desktop Publishing - Explains the basics of software used in desktop publishing, Especially Adobe Indesign 2021+ - Explores different elements of graphics and Layout designing	
Prerequisites and/or Note(s): Basic understanding of using a Windows PC and Word processing softwares	
Course Objectives: The course is designed to help learners to- - Understand the concept and industry of desktop publishing - Develop essential skills and knowledge about using the desktop publishing software - Create professional print productions - Nurture a creative mindset essential to design - Familiarize the learners about the latest computing technologies required in the field	
Course Outcomes: The course is designed to help learners to: - Critically examine various newspaper and magazine formats, print production materials - Learn, demonstrate and create using different industry standard software - Understand the basics of desktop publishing and develop their own designing aesthetic - Apply different theories and elements while designing - Create meaningful industry standard print publications and showcasing them online in a portfolio	

Course Content

Session	Content	Hours
1	Introductory session about the course, Syllabus and Adobe Indesign Students will be asked about any experiences in graphics design and layout during their school tenure and will shown the basics of Software	2
2	Introduction to the Adobe Indesign Interface I Essentials of Adobe Indesign Workspace Toolbar, Control Bar, Layer bar, Color bar	2
3	Introduction to the Adobe Indesign Interface II Customizing the workspace according to the need, display options, effects, locking the selections, Color	2
4	Essentials of Adobe Indesign Toolbar I	2

	Working with Adobe Indesign Tools, Drawing and Typing with Adobe Indesign	
5	Essentials of Adobe Indesign Toolbar II Placing images and managing images with Adobe Indesign	2
6	Essentials of Adobe Indesign Toolbar III Alignment, Paragraph, Page Information, Page Set Up	2
7	Essentials of PNG Placement and Wrap Placing PNG images in Adobe Indesign, Working with Royalty free websites	2
8	Essentials of Typography Working with different typefaces and Typography composition	2
9	Essentials of Typography II Downloading external typefaces and working with them	2
10	Essentials of Poster Design Principles of Poster designing	2
11	Essentials of Poster Design II Designing a poster using Adobe Indesign	2
12	Essentials of Newspaper Designing Principles of newspaper designing	2
13	Essentials of Newspaper Designing II Elements of a newspaper	2
14	Essentials of Newspaper Designing III Designing a College newspaper using adobe Indesign	2
15	Creation of Final Copy of the Newspaper	2

Assessment:

Formative Assessment: 10 internal +5 attendances.

Summative Assessment: Assignment submission 30 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

SEMESTER IV

Course Code	24MCJMAJ202
Course Title	News Reporting and Analysis
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	IV
Regulation	2024
Course Overview: - Introduces students to the fundamental concepts in News Reporting and interpretation of news. - Explains the function of editorial department. - Serves as a foundation for understanding the requirement of gate keeping. - To introduce students to specialized reporting skills and reporting analysis.	
Prerequisites and/or Note(s): Basic Ideas of news	
Course Objectives: - Comprehend the fundamental principles of responsible reporting, including accuracy, fairness, objectivity, ethics, and cultural sensitivity. - Understand different reporting styles and techniques - Gain competence in interview techniques and reporting. Understand the legal frameworks and ethical guidelines governing reporting practices in relevant contexts	
Course Outcomes (COs) and Cognitive Level Mapping At the end of this course, the students will be able to-	

COs	Statement	RBT Level
CO1	Demonstrate proficiency in interviewing techniques and extracting valuable information from diverse sources	
CO2	Craft compelling reports in different styles and formats, effectively adapting to specific media requirements	
CO3	Demonstrate awareness of relevant legal and ethical frameworks applicable to their reporting	
CO4	Identify and list different reporting styles and techniques appropriate for various media platforms and audiences	
CO5	Evaluate the credibility and bias of information sources and perspectives in reporting.	

COURSE ONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	News: Beat and Source: definitions, Principles of News (Report) Writing: Intro, Lead; types of lead, Principles of News Agency ; Interviewing: Research, planning, framing questions, writing the piece;Feature: Definition, Types;Advertorials. Media Literacy; Genuine News and Fake News; Comparative writing for media, print, electronic, online;	10	CO1 CO2 CO3 CO5	R U A1 E
UNIT – II	Positions, qualities, duties and responsibilities of: Correspondents: reporters, Special Correspondent, District Correspondent, Foreign Correspondent; Columnist, Photo Journalist, News Coordinator, Bureaus;; Chief of news bureau: head of the reporters;	10	CO1 CO2 CO3 CO5	R U A1 E

Unit III	Specialization in Journalism: Interpretative and Investigative Journalism, Political Journalism, Crime and Legal Journalism, Public Affairs Reporting, Human Interest Stories and Human Rights Reporting, Corporate, Financial and Business Journalism.	15	CO1 CO2 CO3 CO5	R U A1 E
Unit IV	Agriculture Journalism, Science Journalism, Sports Journalism, Film Journalism, Environment Journalism, Fashion and Entertainment Journalism, Page-3 Reporting, Column Writing, Writing for Magazine, Special and supplementary Pages. Segregate column writing;	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	News reporting professionalism: political, economical, sociological; professional norms and ethics; Style of Reporting- Style book of an Organization;	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Suggested Readings:

- John Hohenberg: *Professional Journalists*; Thomson Learning.
- M.V. Kamath: *Professional Journalism*; Vikas Publishing, New Delhi.
- Leonard Ray: *Into the Newsroom*; Globe Pequot Pr; Subsequent edition.
- Sourin Banerjee: *Reporting and Editing Practice*;
- M.K. Joseph: *Outline of Reporting*;
- K.M. Srivastava *News Reporting and Editing*; Sterling Publishers Pvt Ltd (2003).
- Sourin Banerjee: *Journalism Update*; PragatishilProkashak.
- Lynette Sheridan Burns: *Understanding Journalism*; Vistaar Publications;

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)

- b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
	(Seal)	(Seal)

Course Code	24MCJMAJ203
Course Title	News Processing and Editing
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	IV
Regulation	2023
Course Overview: This course – • Introduces students to the fundamental concepts in editing news story, • Explains the function of editorial department. • Serves as a foundation for understanding the requirement of gate keeping.	
Course Objectives: • To provide basic idea about news editing process • To identify and understand the function of editorial department in press • To understand the art of writing news stories with clarity, accuracy, and adherence to journalistic standards • To understand the inverted pyramid structure and its application in news writing • To illustrate the need and use of editorial skills for refining and improving news content Prerequisites and/or Note(s): • Basic idea about ‘NEWS’.	

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Introduction to Editing: Editing: Nature and need for editing. Principles of editing, editorial desk, functions of editorial desk, copy-editing, preparation of copy for press - style sheet - editing symbols, proof readingsymbols and their significance.	10	CO1 CO2 CO3 CO5	R U A1 A2
UNIT – II	Editorial Department: Structure and functions of a typical newsroom. Editor/executive editor, roles of editor, news editor, chief sub-editor, sub-editor, sections in editorial,supplements editingExecutive Editor, Assistant Editor, Chief Reporter, Chief Sub-Editor, Sub-Editor, News Editor, Chief of News Bureau; Headline: types, importance, writing headline for newspaper; Principle of writing an Editorial, Post Editorial; Principles of Sub-Editing;	10	CO1 CO2 CO3 CO5 CO6	R U A1 A2 E
Unit III	Layout and Design: Headlining - writing headlines, different types of headlines principles, types and techniques. Principles of Layout and Design. DTP, Page Making, Structure of the newspaper: page making;	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E
Unit IV	Page Makeup: Solace, ear panels, teasers, masthead, deadline, firing of the page, going to bed, panels, folios, lead, , cross head, sub-head, kicker/deck, brief, bastardisation, tint, hamper, flyer, dummy, power jacket, kerning, template, by-line, blurb, date-line, credit-line, attribution, quotation, imprint line,agency/wire services; Page maker: editing terminologies;	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E

Unit V	Editing Process: Re-writing, Proof reading, Style book/sheet..., printing process, different methods of printing – letter press, off-set and gravure.	10	CO1 CO2 CO3 CO4 CO6 CO7	R U A1 A2 E

Suggested Readings:

- VirBala Agarwal: *Essentials of Pracical Journalism*, Concept Publishing House, 2006.
- Usha – Raman *Writing for the Media*. - Oxford (15 December 2009)
- K.M. Shrivastava – *News Reporting and Editing*. - Sterling Publishers Pvt Ltd (1 January 2003)
- M. V. Kamat – *Professional Journalism*. - Vikas Publication House Pvt Ltd;
- First edition (2009)
- B. N. Ahuja – *Theory and Practice of Journalism*. - Surjeet Publication, 2009
- Richard Keeble – *The Newspapers Handbook*. - Routledge; 3 edition (17 May 2001)

** Note(s): The syllabus changes yearly and may be modified during the term, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.*

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to-

COs	Statements	RBT Level
CO1	Describe basic idea about news editing	R
CO2	Illustrate the need and importance of editing report	U

CO3	Apply the concept of editing special emphasis on Mass Communication	A1
CO4	Analyze the editing process	A2
CO5	Evaluate the usage of different kind terminology in editing	E

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	23MCJSEC202	
Course Title	Newspaper Production	
Credits	03	
Lecture Hours	75	
Hours/Week	4	
Category	Skill Enhancement Course	
Semester	III/IV	
Regulation	2023	
Course Overview: This course – Has been designed for students to get a theoretical understanding and practical training in producing an in-house newspaper.		
Prerequisites and/or Note(s): • Basic knowledge of report writing • Basic computer knowledge		
Course Objectives: 5. To define various elements of a newspaper 6. To understandbasics of the various newspaper formats and design 7. To implement various technological process involved in the production of a newspaper 8. To produce a newspaper		
Course Outcomes (COs) and Cognitive Level Mapping At the end of this course, the students will be able to-		
COs	Statement	Dave’s Taxonomy
CO1	Follow the instructor to create a newspaper layout	I

CO2	Execute the knowledge of newspaper designing	M
CO3	Demonstrate the various aspects of newspaper designing and photo editing	P
CO4	Formulate layout design of a dummy newspaper	A
CO5	Create a four page dummy newspaper comprising of an Op- Ed and six reports	N

COURSE ONTENT

UNITS	CONTENT	HOURS	COs	DAVE'S TAXONOMY
UNIT – I	Newspaper Designing Terminology Dateline, credit line, print line, editorial and Op-Ed page, columns, cartoons, jumpy copies, marriage of copies; Types of headlines – Stepped, tombstone, flush left, centered, pyramid, reverse pyramid, waist, reverse waist.	12	CO 1 CO 2 CO 3	I M P
UNIT – II	Principles of Newspaper Designing I Designing, different types of newspaper layouts, eye movement, The Z Pattern - Measuring in Design, Determining Type Readability, Marking up Reporter's Copy, Determining Copy Depth, Using a Copy Log, Determining Headline Size, Determining Headline Depth, Scaling Artwork, Dummying with Symbols	18	CO 1 CO 2 CO 3 CO 4	I M P A

Unit III	Principles of Newspaper Designing II Horizontal Page Design, the Quadrant Page Design, the Modular Page Design, the Single Theme Page, the Editorial Page, the Sports Page, the Single-Page Feature, the Photo Features Page, Dealing with Ads, and Introduction to Adobe InDesign	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N
Unit IV	Photo Editing Photo Editing -The Single Image and the Photo-story - The paradox of the photo-story, word, image, caption writing, photographs in newspapers. The Production process - the photo-story, the equipment, the fieldwork, return to the editorial desk, editing and final touch-offs, and the photo desk; Introduction to Adobe Photoshop	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N
Unit V	Designing and Production Design and produce a 4-page newspaper comprising of an Op-Ed page. Include six news reports from the following news beats: g. Political Reporting h. Entertainment Reporting i. Education Reporting j. Health Reporting k. Sports Reporting l. Human Interest Reporting	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N

Learning Resources:

Kamath, M.V. (2009). *The Journalist's Handbook*. New Delhi: Vikas Publishing House Pvt. Limited
Gupta, V. S. (2003). *Handbook of Reporting and Communication Skills*. India: Concept Publishing Company
Roy, B. (2004). *Modern Student Journalism*. India: Pointer Publishers.
Aggarwal, V.B. (2006) *Essentials of Practical Journalism*, Concept Publishing Company
Smith, J. (2007) *Essential Reporting*, Sage publications

Suggested Reading:

Baker, J. (2021). *Essential Journalism: The NCTJ Guide for Trainee Journalists*. United Kingdom: Taylor & Francis
Hasan, S. (2020). *Mass Communication: Principles and Concepts*. India: CBS Publishers & Distributors.
Horst, M., Viet, K. (2017). *Journalism Basics: An Introduction to Print Journalism*. Poland: CreateSpace Independent Publishing Platform
Saltz, I. (2019). *Typography Essentials Revised and Updated: 100 Design Principles for Working with Type*. United States: Rockport Publishers.

Assessment:**Practical Exam:**

- iii. *Formative Assessment*: 25 marks as per Assessment & Evaluation Framework Document of Salesian College
- iv. *Summative Assessment*: 50 marks
 - Design the following:
 - Design a Tabloid newspaper
 - Design a Cover page of a magazine

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Department of Mass Communication and Journalism
Dual Major
Salesian College Autonomous Siliguri
Semester I

Course Code and Name	Paper Setter	Examiner	Board of Moderator	Head Examiner/Scrutinizer	Post Publication Reviewer	Third Examiner
24MCJMAJ101 Introduction to Media and Communication	Ms. Shikshita Dewan	Mr. Ravi Bhushan Singh	Ms. Nawaneeta Subba	Mr. Bhabya Chandra Khati	Ms. Nawaneeta Subba	Mrs. Mirnalini Sharma
24MCJSEC101 Basic of Communication Skills	Ms. Nawaneeta Subba	Ms. Nawaneeta Subba	Only if Applicable	Mr. Ravi Bhushan Singh	Mr. Bhabya Chandra Khati	Mrs. Mirnalini Sharma
24MCJMDC101 Community Journalism	Mrs. Mirnalini Sharma	Ms. Nawaneeta Subba	Mr. Bhabya Chandra Khati	Mr. Ravi Bhushan Singh	Mr. Bhabya Chandra Khati	Ms. Shikshita Dewan
24ENGAEC101 Compulsory English	NA	Mr. Simon Subba	NA	Mr. Bhabya Chandra Khati	Ms. Nawaneeta Subba	Ms. Shikshita Dewan
24GEOAEC101 Environmental Studies	NA	Mr. Simon Subba	NA	Ms. Nawaneeta Subba	Mr. Bhabya Chandra Khati	Mr. Simon Subba
24MCJVAC101 Desktop Publishing I (Word & PowerPoint)	NA	Mr. Simon Subba	NA	Mr. Bhabya Chandra Khati	Mr. Ravi Bhushan Singh	Ms. Nawaneeta Subba

Semester II

Course Code and Name	Paper Setter	Examiner	Board of Moderator	Head Examiner/Scrutinizer	Post Publication Reviewer	Third Examiner
24MCJMAJ102 History of Media	Ms. Shikshita Dewan	Mr. Bhabya Chandra Khati	Ms. Nawaneeta Subba	Mr. Ravi Bhushan Singh	Ms. Nawaneeta Subba	Mrs. Mirnalini Sharma
24MCJMAJ103 Introduction to Journalism	Mr. Simon Subba	Ms. Nawaneeta Subba	Mr. Bhabya Chandra Khati	Mr. Ravi Bhushan Singh	Mr. Bhabya Chandra Khati	Mrs. Mirnalini Sharma
24MCJSEC102 Basic of Communication Skills	Mr. Simon Subba	Mr. Simon Subba	Only if Applicable	Mr. Ravi Bhushan Singh	Mr. Bhabya Chandra Khati	Ms. Shikshita Dewan
24MCJMDC102 Basics of Media Technologies	Mr. Bhabya Chandra Khati	Mr. Ravi Bhushan Singh	Ms. Nawaneeta Subba	Mr. Simon Subba	Ms. Nawaneeta Subba	Ms. Shikshita Dewan
24 ENGAEC102 Alt.Eng. / MIL / FL	NA	Mr. Simon Subba	NA	Ms. Nawaneeta Subba	Mr. Bhabya Chandra Khati	Mr. Simon Subba
24GEOAEC102 Environmental Studies	NA	Mr. Simon Subba	NA	Mr. Bhabya Chandra Khati	Mr. Ravi Bhushan Singh	Ms. Nawaneeta Subba



Salesian College
(Autonomous)
Sonada-Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts in Mass Communication and Journalism

Department of Mass Communication and Journalism

Curriculum Document
2023 –2024

Salesian College, Siliguri Campus
(Autonomous)
Department of Mass Communication and Journalism
New NEP Syllabus
(Semester- III & IV)

Department Vision:

The B.A. in Mass Communication & Journalism programme strives to offer an in-depth understanding of Media industry's activities and equip students with the necessary knowledge and expertise required to become an expert media professional, ready to take on the challenges of the industry. It also attempts to strengthen the fundamental concepts of media which encompasses the ethics and social responsibility of the media personnel in upholding the fabric of the contemporary society, followed by industry required skill building through a balanced mix of theory and practical classes, thereby harnessing the skills in key domain areas of media including print media, broadcast media, public relations, advertising, films and digital media.

Department Mission:

1. To facilitate towards knowledge generation and dissemination.
2. To fulfil human resource needs in the media industry and academics.
3. To inculcate understanding of contemporary media and its impact on society.
4. To encourage the spirit of inclusive and value based learning.
5. To imbibe the culture of ethical journalism and creativity amongst students.

1. Programme Overview

Bachelor of Arts in Mass communication and Journalism is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Grasp the theories of Mass Communication and Journalism.
	PO02 : Acquaint him/herself with the history of the Mass Media, its evolution and impact on the society.
	PO03: Relate his/her understanding of different types of communication process in various classroom and societal experience.
	PO04: Gain awareness about the various contemporary issues in Mass Media.
Skills	PO05: Demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes.
	PO06: Construct a deeper understanding of the subject and create media content like dummy newspaper, print advertisement, poster, radio jiggles, Photo essay, etc.
	PO07: Integrate and apply ICT in learning process
	PO08: Acquaint him/herself with the diverse current problems and issues related to mass media like convergence of media, explosion of information, future of print journalism, impact of media on culture, evolution of media, efficient use of media for development, and understanding international relations.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical knowledge of media studies and analysis of theories and models of mass media.
	PO10: Initiate self-sufficiency, sincerity, independent think in mass education is a lifelong process for empowering the student to face all challenges in his/her future endeavors.
	PO11: Develop concern for the society, nation as well as promote the feeling of internationalism by comparing our media system with that of other developed countries.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops a clear idea about the subject Mass Communication and Journalism, like nature, scope, factors, and different agencies of Mass media and Journalism.
	PSO2: A student gathers knowledge about Mass Communication and Journalism, theories and their implication in the field of Mass Media and development communication.
	PSO3: A student develops knowledge about the history of the media and technical aspect of media.
	PSO4: A student internalizes the basics of communication, relation between media and society, and importance of development communication in the field of media studies.
	PSO5: A student develops knowledge about basic of Media and Cultural studies. She/he also develops knowledge about the importance of different schools of cultural studies in the field of media studies.
	PSO6 :A student will understand the skeletal framework of how a media industry works.
	PSO7:A student develops the concept of media research and analytical skills through descriptive measures to understand the use and impact of media on society by gathering relevant data and represent findings through graphs, to develop skills in analysing and

	displaying data.
Skills	PSO1: A student will develop a clear idea about the subject Mass Communication and Journalism, like nature, scope, factors, and different agencies of Mass Media.
	PSO2: A student will execute the educational implications of the theories of Mass Media.
	PSO3: A student will construct print, audio and audio visual productions.
	PSO4: A student will develop an understanding of media technology involved in print, audio and visual productions.
	PSO5: A student will advocate media ethics.
	PSO6: A student will develop the skill of using computer in media productions and communication.
	PSO7: A learner will exhibit an excellent communication skill, Skill for Democratic Citizenship and related theories, life skill, technical skill, peace and value education.
Competence	PSO1: A learner demonstrates competencies required to use computers in print and audio visual production for implementation of technical knowledge to industry ready.
	PSO2: A student will analyze the history of Media and Journalism.
	PSO3: A student will establish the concepts of Media industry management and convergence of Media.
	PSO4: A student will correlate various qualitative and quantitative data for Media research.
	PSO5: A student will envision a society where people from all walk so feeling joy equal and equitable rights and opportunities.
	PSO6: A student will compute statistical analysis in the field of Media research and cultural studies.
	PSO7: A student will analyze the contemporary trends in Mass communication and Journalism.

4. Programme Matrix

Semester	Course Code	Course Type	Title of the Course (40 characters including space)
I	23MCJMAJ101	Major	Introduction to Media and Communication
	23MCJMAJ102	Major	History of Media
	23MCJMIN101	Minor	Basics of Journalism
	23MCJMDC101	MDC	Community Journalism
	23AECE101	AEC	
	23MCJSEC101	SEC	Basic of Communication Skills
	23MCJVAC100	VAC	Desktop Publishing I (Basics)
II	23MCJMAJ103	Major	Introduction to Journalism
	23MCJMAJ104	Major	Media Law and Ethics
	23MCJMIN102	Minor	Basics of Journalism
	23MCJMDC102	MDC	Basics of Media Technologies
	23AECE102	AEC	
	23MCJSEC102	SEC	Newspaper Production
	23MCJVAC101	VAC	Desktop Publishing II (Adobe InDesign)
III	23MCJMAJ201	Major	News Reporting and Analysis
	23MCJMAJ202	Major	News Processing and Editing
	23MCJSEC201	SEC	Radio Production and Podcast
	23MCJMDC201	MDC	New Media and Artificial Intelligence
	23MCJMIN201	Minor	Introduction to Media and Communication
	23MCJVAC201	VAC	Desktop Publishing III (Adobe Illustrator)
IV	23MCJMAJ203	Major	Multimedia Journalism
	23MCJMAJ204	Major	Introduction to Broadcast Media
	23MCJMAJ205	Major	Introduction to New Media
	23MCJMIN201	Minor	Introduction to Media and Communication
	23MCJVAC202	VAC	Desktop Publishing IV(Adobe Photoshop)
V	23MCJMAJ301	Major	Advertising
	23MCJMAJ302	Major	Public Relations and Corporate Communication
	23MCJMAJ303	Major	Digital Marketing

VI	23MCJMAJ304	Major	Photography
	23MCJMAJ305	Major	Film Studies
	23MCJMAJ306	Major	Development Communication
VII (Without research)	23MCJMAJ401	Major	Media and Cultural Studies
	23MCJMAJ402	Major	Media, Gender and Human Rights
	23MCJMAJ403	Major	Indian Media and Politics
	23MCJMAJ404	Major	Global Media and Politics
VII (With research)	23MCJMAJ401	Major	Media and Cultural Studies
	23MCJMAJ402	Major	Media, Gender and Human Rights
	23MCJMAJ405	Major	Communication Research and Methods
VIII (Without research)	23MCJMAJ406	Major	Community Media
	23MCJMAJ407	Major	Media Industry and Management
	23MCJMAJ408	Major	Media Entrepreneurship
	23MCJMAJ409	Major	Event Management
VIII (With research)	23MCJMAJ407	Major	Media Industry and Management
	23MCJMAJ410	Major	Dissertation

Semester I

Course Code	23MCJMAJ101
Course Title	Introduction to Media and Communication
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	I
Regulation	2023
Course Overview: This course – • Introduces students to the fundamental concepts in communication studies. • Explains the basic communication theories and models. • Explores media and communication and their effect on society and culture. • Serves as a foundation for further studies in Mass Communication/Media Studies.	
Prerequisites and/or Note(s): • Basic knowledge of communication.	
Course Objectives: 1. To provide basic idea about mainstream media. 2. To identify and understand the involvement of technologies in Communication. 3. To understand the concept of Communication and especially Mass Communication. 4. To discuss the important theories and models of Communication. 5. To illustrate the need and use of media in everyday life.	

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to-

COs	Statements	RBT Level
CO1	Describe basic idea about mainstream media	R
CO2	Illustrate the need and use of media in everyday life	U
CO3	Apply the concept of Communication with special emphasis on Mass Communication	A1
CO4	Analyze the important theories and models of Communication	A2
CO5	Analyze the communication process	A2
CO6	Evaluate the usage of different kind of media and technology	E
CO7	Integrate the theories and models of communication in everyday life	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Introduction to Communication: Definition and Meaning of Communication; Types and Forms of Communication; Levels of Communication; Barriers to Communication; Mass Communication-its Characteristics, Functions and Processes.	10	CO1 CO2 CO3 CO5	R U A1 A2

UNIT – II	Media in Everyday Life: Media and everyday life in modern society, broadcasting as an institution in everyday life, early radio: the domestication of media technology; television and other forms: audiences and articulations; TV, geography and mobile privatizations; Media and Modernity, Identity, Tradition, and Media, the dynamics and consequences of mediated interactions	10	CO1 CO2 CO3 CO5 CO6	R U A1 A2 E
Unit III	Communication Theories: Bullet Theory Individual Difference Theory Personal Influence Theory Cognitive Dissonance Theory Agenda Setting Theory Cultivation Theory Uses and Gratification Theory Spiral of Silence Theory Two-Step Flow Theory Narcotic Dysfunction Theory	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Communication Models: Eastern and Western Communication Models Ancient Indian Model Aristotle and Plato’s Model Laswell’s Model Berlo’s Model Shanon and Weaver’s Model Schramm and Osgood Model Gerbner’s Communication Model	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	Media and Technology: Brief history, character, and effects of Print, Radio, Television, Films, Mobile Phones, The Internet – Web 1.0 and Web 2.0; Mediated and Non-Mediated Communication, Media, and everyday life in a mediated reality; Technological Determinism; New Media and the transformative nature of the internet, User Generated Content and Reality.	10	CO1 CO2 CO3 CO4 CO6 CO7	R U A1 A2 E

Learning Resources:

Mc. Quail, D. (2000). *Mass Communication Theory*, London: Sage
Williams, K. (2003). *Understanding Media Theory*. United Kingdom: Arnold.
Kumar, K. J. (2000). *Mass Communication in India* (4th Edition). India: Jaico Publishing House.
Mehta, D.S. (2014). *Mass Communication and Journalism in India*: Allied Publishers Pvt. Ltd.
Agarwal. V. B. (2001). *Handbook of Journalism and Mass Communication*: Concept Publishing Company
Andal, N.(2015). *Communication Theories and Models*: Himalaya Publication House, New Delhi

Suggested Reading:

Ruffner, M. & Burgoon, M. (1981). *Interpersonal Communication*. New York: Holt, Rinehart, and Winston
McLuhan, M. (2016). *Understanding Media: The Extensions of Man*. New York: Create Space Independent Publishing Platform.

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - c) Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
	(Seal)	(Seal)

Course Code	23MCJMAJ102
Course Title	History of Media
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	I
Regulation	2023
Course Overview: This course – • Explains the history of Journalism. • Covers the role of Journalism in the National Freedom Movement. • Aids in understanding the evolution of media.	
Prerequisites and/or Note(s): • Basic knowledge of English language.	
Course Objectives: 1. To tell the history of Indian and International Print media. 2. To understand the role of media during Indian Freedom Movement. 3. To examine the role of media in the post-independence era. 4. To evaluate the evolution of media in world and India.	
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to-	

COs	Statements	RBT Level
CO1	Describe the history of Indian and world print media	R
CO2	Discuss the interdependence of media and freedom movement	U
CO3	Compute the contribution of media in the freedom movement	A1
CO4	Analyze the role and effect of media in post-independence era	A2
CO5	Evaluate the contribution of media in the freedom movement	E
CO6	Develop the idea of evolution in media	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	History of Print Media Media and Modernity: Print Revolution, Telegraph, Morse Code, History of the Press in India	10	CO1 CO2 CO3 CO5	R U A1 E
UNIT – II	National Freedom Movement – I National Freedom Movement, Colonial Period, Gandhi, Nehru and Ambedkar, Tagore as a Journalist	10	CO1 CO2 CO3 CO5	R U A1 E

UNIT – III	National Freedom Movement – II Baptist Missionary, Buckingham, Metcalfe, Tilak, Hickey, Raja Rammohun Roy, Aurobindo, Surendranath Banerjee, Statesman, Amrita Bazar Patrika, Hindu Patriot, Derozians, The Hindu	15	CO1 CO2 CO3	R U A1 A2 E
Unit IV	Media in the Post-Independence Era Emergency and Post Emergency Era Changing Readership, Print Cultures, Language Press, Media during emergency	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
Unit V	Evolution of Media Evolution of Radio, Television, Film, Internet Evolution of News Agencies- AFP, Reuters, AP, PTI, UNI, ANI	15	CO1 CO2 CO3 CO6	R U A1 A2 E C

Learning Resources:

1. Bruce D. Itule and Douglas A. Anderson. *News writing and reporting for today's media*; McGraw Hill Publication, 2000.
2. M.L. Stein, Susan Paterno & R. Christopher Burnett. *News writer's Handbook: An Introduction to Journalism*; Blackwell Publishing, 2006.
3. George Rodmann. *Mass Media in a Changing World*; McGraw Hill Publication, 2007
4. Carole Flemming and Emma Hemmingway. *An Introduction to Journalism*; Vistaar Publications, 2006
5. Priyanka Wadhwa. *History of Journalism*, Murari Lal & Sons, 2007

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b) Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- c) Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature: (Seal)	Name: Signature: (Seal)

Course Code	23MCJMIN101	
Course Title	Basics of Journalism	
Credits	04	
Lecture Hours	60	
Hours/Week	4	
Category	Minor Course	
Semester	I/II	
Regulation	2023	
Course Overview: This course- - Introduces the basic concept of news, news selection, production and news worthiness. - Aids in the understanding of the principles and styles of news writing. - Explores the process of newspaper designing, page makeup, and various forms of print media, including tabloid journalism.		
Prerequisites and/or Note(s): Basic knowledge of English language		
Course Objectives: - To introduce students to the basics of journalism. - To understand the practice of gathering information and writing news - To familiarise the students with the ethics of journalism - To enhance the understanding of the technical aspects of Journalism - To develop the knowledge of elements and skills of journalism		
COs	Statements	RBT Level
CO1	Describe the aspects of modern journalism	R
CO2	Explain the different aspects of journalistic practices	U
CO3	Apply the knowledge and practice of gathering information and writing news	A1
CO4	Analyze the different types of reporting	A2
CO5	Examine different characteristic of journalism	A2
CO6	Critique the freedom of press in India	E
CO7	Compose the articles of a newspaper	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Print Journalism- An Introduction Journalism defined, principles of modern journalism; ethics of journalism; the print industry - yesterday, today, and tomorrow; the structure of the print industry; profits and the public interest - the business of newspapers and magazines	10	CO1 CO2	R U A1
UNIT – II	Understanding News Definition of news; different types of news: hierarchy of news, sources of news; headline writing, Leads – Types of lead, inverted pyramid news writing style with 5 W's and 1 H.	12	CO1 CO2 CO3 CO4	R U A1 A2 E C
Unit III	Reporting and Editing Reporter, the news story, news gathering, reporting beats, press releases, reporting speeches, press conferences, interview, feature: human interest and depth reporting, development reporting, news at the desk, the digital era. The news desk – the editor, news editor, chief sub-editor, sub-editor, the leader writer, the rewrite person, copyeditor, proof-reader, the cartoonist, Page editor, supplement editors	15	CO1 CO2 CO3 CO4	R U A1 A2 E C
Unit IV	Designing Newspaper Evolution of newspaper design, publication style, production processes, pre-planning and copy tasting, designing pages, master pages, templates and style-sheets; typography, words in type, using pictures, using colour, publishing ethics	11	CO1 CO2 CO3 CO4	R U A1 A2 E
Unit V	Journalism and Journalists Journalism, Journalists, and Society; Responsibilities and Rights of Journalists:	12	CO1 CO2	R U

	Media Houses and Journalists; Journalism of verification; independence from faction, monitoring power and offering voices to the voiceless, journalism as a public forum, making news comprehensive and proportional; journalists and journalism of conscience; rights and privileges of journalists.		CO3 CO4 CO5 CO6	A1 A2 E
Learning Resources: Kamath, M.V. (2009). <i>The Journalist's Handbook</i> . New Delhi: Vikas Publishing House Pvt. Limited Gupta, V. S. (2003). <i>Handbook of Reporting and Communication Skills</i> . India: Concept Publishing Company Roy, B. (2004). <i>Modern Student Journalism</i> . India: Pointer Publishers. Aggarwal, V.B. (2006) <i>Essentials of Practical Journalism</i> , Concept Publishing Company Smith, J. (2007) <i>Essential Reporting</i> , Sage publications Suggested Reading: Baker, J. (2021). <i>Essential Journalism: The NCTJ Guide for Trainee Journalists</i> . United Kingdom: Taylor & Francis Hasan, S. (2020). <i>Mass Communication: Principles and Concepts</i> . India: CBS Publishers & Distributors.				

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
(Seal)	(Seal)	

Course Code	23MCJSEC101	
Course Title	Basic Communication Skills	
Credits	03	
Lecture Hours	75	
Hours/Week	4	
Category	Skill Enhancement Course	
Semester	I	
Regulation	2023	
Course Overview: This course – - Provides basic communication skills, which will help them to gain critical communication life skills. - Aids in the knowledge of the various designing tools		
Prerequisites and/or Note(s): Basic knowledge of English language		
Course Objectives: 1. To understand the role of verbal and nonverbal communication 2. To improve Communication skills critical to human well-being and progress. 3. To develop basic skills of composition in designing		
COs	Statements	Dave’s Taxonomy
CO 1	Follow instructions for behavioural change and technological knowledge	I
CO 2	Implement the knowledge of various designing tools and communication skills	M
CO 3	Demonstrate the designing tools and communication skills to another student	P

CO 4	Adaptation of technical knowledge and enhance communication skills	A
CO 5	Create and design a logo and a visiting card	N

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	DAVE'S TAXONOMY
UNIT – I	Non-Verbal Communication Language and nonverbal behaviour as organizers of social systems; behavioural aspects of interactions; acquisition of communicative behaviour, theoretical approaches to human interaction.	20	CO1 CO2 CO3 CO4	I M P A
UNIT – II	Verbal Communication Verbal Arts and their forms – oral and written; the role of the reader/audience/spectator; arrangement, style, and delivery (with examples from news reading, talk show, interview, dialogues, recitation):	20	CO1 CO2 CO3 CO4	I M P A
Unit III	Typography History of writing and typography; outline of typography – type, typeface; hierarchy using positions, size, weight, colour; type as image, rastering of a type; the rule of three type-faces; using the right type; invisible typography, rivers of space; using justified type, flush-left, centred, asymmetrical and flush-right type, multicolumn text grid; typographic 'furniture'; margins and gutters and floating in space.	22	CO1 CO2 CO3 CO4 CO5	I M P A N

Unit IV	Aesthetics of Image (still and moving) Figure/ground, balance, emphasis, proportion, rhythm, unity, motifs, meaning and mood of colour; colour principles, learning from nature; Understanding colour in different media; the concept of RGB and CMYK.	13	CO1 CO2 CO3 CO4 CO5	I M P A N

Assessment:

Practical Exam:

- i. *Formative Assessment:* 25 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment:* 50 marks
 - PowerPoint presentation
 - Design the following
 - (1) A ‘replacement’ logo for a renowned business firm. For example, a ‘replacement’ logo for TATA
 - (2) Design a visiting card
 - (3) Design a poster for a campaign or an organisation
 - (4) Design a brochure for a service or a product of a company

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	23MCJMDC101		
Course Title	Community Journalism		
Credits	03		
Lecture Hours	45		
Hours/Week	3		
Category	Multi-Disciplinary Course (MDC)		
Semester	I		
Regulation	2023		
Course Overview:			
This course –			
• Aims to equip students with the knowledge and skills necessary to engage in Community journalism effectively • Develops a sense of community and fellow feeling. • Creates an understanding of the role of media in highlighting the local issues			
Prerequisites and/or Note(s):			
Basic understanding of community, identity, and belonging			
Course Objectives:			
1. Understanding the role of media for community development 2. Construct various strategies for engaging with various stakeholders including community leaders, residents and organizations. 3. Explore the use of digital platforms to distribute news and foster community interactions 4. Aids in understanding the role and importance of traditional media for development.			
Course Outcomes (COs) and Cognitive Level Mapping			
At the end of this course, the students will be able to-			
COs	Statements		RBT Level

CO1	Draw an understanding of the role and significance of community journalism in providing hyper-local news	R
CO2	Explain the use of alternative media in highlighting community issues	U
CO3	Identify the role of media in community development	A1
CO4	Analyze different types of alternative media and their roles in the society	A2
CO5	Evaluate the prospects of Alternative media	E
CO6	Develop a program for alternative media, applicable in the region of North Bengal	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Basic Concepts Community: its concept and significance; Community as Place; Community as Identity/Belonging; Community as an Ideology; Demographics, changing nature of community, communities of interest, virtual communities.	8	CO1 CO2 CO3	R U A1
UNIT – II	Origin and Development Community Journalism: Origin and Development, concerns of community journalism (women, gender, economy, social, environmental, health, and nutrition, etc.); development support communication, skills of community journalists.	10	CO1 CO2 CO3 CO4	R U A1 A2 E
UNIT– III	Community Media as Alternative Media Concept, need, and origin; types of alternative media; alternative media vis-à-vis mainstream media	8	CO1 CO2 CO3 CO4	R U A1 A2 E

UNIT-V	Community Media Space Alternative Print Media – strengths, weakness, prospects, examples; Alternative audio-visual media – strengths, weakness, prospects, examples; Alternative Radio – strengths, weakness, prospects, examples with particular focus on community radio	10	CO1 CO2 CO3 CO4	R U A1 A2 E
UNIT-V	Traditional Media Meaning, the importance of traditional media in Communication, different forms of traditional media, and types of traditional media in North Bengal.	9	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Learning Resources:

Atton, C. *Alternative Journalism*, Sage Publications

Suggested Reading:

Lauterer, J. (2009). *Community Journalism: Relentlessly Local*. United States: University of North Carolina Press.

Abernathy, P. M. (2014). *Saving Community Journalism: The Path to Profitability*. United States: University of North Carolina Press.

Pavarala, V. & Malik, K. K. (2007). *Other Voices: The Struggle for Community Radio in India*. India: SAGE Publications.

Udupa, S. (2015). *Making News in Global India: Media, Publics, and Politics*. United Kingdom: Cambridge University Press.

Malik, K. K, & Pavarala, V. (2020). *Community Radio in South Asia: Reclaiming the Airwaves*. United States: Taylor & Francis.

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
(Seal)	(Seal)	

Course Code	23MCJVAC100
Course Title	Desktop Publishing
Credits	1
Lecture Hours	30
Sessions	15
Hours/Week	2
Category	Value Added Course (VAC-1)
Semester	I
Regulation	2023
Course Overview: This course – - Introduces students to the fundamental concepts in Desktop Publishing, - Explains the basic of software used in desktop publishing like Microsoft Word. - Explores basics of report writing and publishing.	
Prerequisites and/or Note(s): Basic understanding of technological progress made in the field of Media and Communication	
Course Objectives: The course is designed to help learners to: - Understand the concept and industry of desktop publishing. - Develop essential skills and knowledge on how to use the essential software. - Create an design professional print productions. - Nurture a creative mind-set essential to design. - Familiarize the learners about the latest computing technologies required in the field.	

Course Outcomes:

The course is designed to help learners to:

1. Critically examine various newspaper and magazine formats, print production materials.
2. Learn and demonstrate and create using different industry standard software.
3. Understand basics of desktop publishing and develop their own designing aesthetic.
4. Apply different theories and elements to while designing.
5. Create meaningful industry standard print publications and showcasing them online.

COURSE CONTENT

SESSION	CONTENT	HOURS
1	Introductory session about the course and the tools to be used Students will be asked about any experiences in design during their school tenure like use of Microsoft Word and Corel Draw.	2
2	Introduction to basics of windows and MS Word How to access MS Word.	2
3	Work Space Essentials of MS Word - 1 Basics of MS Word interface.	2
4	Work Space Essentials of MS Word - 2 Introduction to different panels in MS Word.	2
5	Page Set-up in MS Word Setting up page in MS Word.	2
6	Typing in MS Word Fundamentals of typing in MS Word.	2
7	Saving a Document in MS Word Essentials of Saving a Document	2
8	Working with Photos and Graphics in MS Word Using photos and graphics to enhance a Document Quality.	2
9	Working with Tables in MS word Table creation and drawing in MS Word.	2
10	Creation of a Report Using MS Word Students will be asked to make a report using MS Word	2
11	Creation of a CV Using MS Word Students will be asked to make a CV using MS Word	2
12	Creation of an Invoice Slip Using MS Word Students will be asked to make an Invoice Slip using MS Word	2
13	Creation of a Poster Using MS Word Students will be asked to make a poster using MS Word.	2

14	Creation of a formal and informal letter Using MS Word Students will be asked to make a formal and informal letter using MS Word	2
15	Newsletter production Learn to create a newsletter. Students will be asked to design a newsletter	2

Assessment:

Formative Assessment: 10 internal +5 attendances.

Summative Assessment: Assignment submission 30 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
(Seal)	(Seal)	

SEMESTER II

Course Code	23MCJMAJ103
Course Title	Introduction to Journalism
Credits	04
Lecture Hours	60
Hours/Week	04
Category	Major Course
Semester	II
Regulation	2023
Course Overview: This course – • Introduces students to the basic principles and practices of Journalism. • Instructs on the news media's vital role in democracy. • Develops an understanding of news production, dissemination, and presentation.	
Prerequisites and/or Note(s): • An understanding of the role of newspaper journalism • An understanding of the crucial role of journalism in a democracy	
Course Objectives: • To interpret basic concepts of journalism, its functions, principles, and ethics. • To compile news writing in different styles • To analyze the role of journalism in a democracy • To evaluate the role of newspaper journalism in society	
Course Outcomes (COs) and Cognitive Level Mapping At the end of this course, the students will be able to-	

COs	Statements	RBT Level
CO1	Define news and its elements	R
CO2	Discuss the evolution of print journalism	U
CO3	Classify different types of journalism	A1
CO4	Analyse the language and structure of news	A2
CO5	Examine the technical terms and jargons of journalism used in different media platforms	E
CO6	Develop an understanding about the role of media in democracy	C

COURSE CONTENT

UNITS	CONTENT	HOURS	Cos	REVISED BLOOMS TAXONOMY
UNIT – I	Understanding News News: meaning, definition, elements, nature, the news process: from the event to the reader (how news is carried from the event to the reader); hard news vs. soft news; basic components of a news story – attribution, embargo, verification, balance and fairness, brevity, dateline, credit line, by-line.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E

UNIT – II	Different Forms of Print-A Historical Perspective The Print Revolution in Context; The media and the Public Sphere in Early Modern Europe, From Steam to Electricity; Processes and Patterns, Yellow Journalism, Penny press, tabloid press; Information, Education, Entertainment, Convergence, Multimedia .	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
UNIT– III	Understanding the Structure and Construction of News Organizing a news story, 5W's and 1H, Inverted pyramid; Criteria for newsworthiness, principles of news selection, use of archives, sources of news/news beats, the internet and its role in transforming journalism, Balancing the news.	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
UNIT–IV	Different media platform – an introduction Language and principles of news writing and presentation: print and electronic media, and new media, convergence journalism, mobile journalism (MOJO), alternative journalism.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E
UNIT–V	Role of Media in a Democracy Responsibility to Society, Press and Democracy, Corporatization of the news media: Challenges to press freedom	10	CO2 CO3 CO5 CO6	R U A1 A2 E C

Learning Resources:

1. Bruce D. Itule and Douglas A. Anderson. *News writing and reporting for today's media*; McGraw Hill Publication, 2000.
2. M.L. Stein, Susan Paterno & R. Christopher Burnett. *News writer's Handbook: An Introduction to Journalism*; Blackwell Publishing, 2006.
3. George Rodmann. *Mass Media in a Changing World*; McGraw Hill Publication, 2007.
4. Carole Flemming and Emma Hemmingway. *An Introduction to Journalism*; Vistaar Publications, 2006.
5. Richard Keeble. *The Newspaper's Handbook*; Routledge Publication, 2006

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	23MCJMAJ104		
Course Title	Media Law and Ethics		
Credits	04		
Lecture Hours	60		
Hours/Week	04		
Category	Major Course		
Semester	II		
Regulation	2023		
Course Overview:			
This course – 1. Explores ethical dilemmas and considerations that arise in the practice of journalism 2. Aids in understanding the ethical responsibilities associated with journalism 3. Develops critical understanding about the role of media in democracy			
Prerequisites and/or Note(s): • Basic knowledge of civic studies			
Course Objectives: 1. To familiarize the students with the fundamentals of press laws and media related laws. 2. To provide an understanding of knowledge of the Indian constitution. 3. To analyze the codes of ethics of various regulatory bodies in the field of print, advertising, and broadcast. 4. To inculcate the knowledge of the socio-cultural issues and the representation of the marginalized section of the society in media.			
Course Outcomes (COs) and Cognitive Level Mapping			
At the end of this course, the students will be able to-			
COs	Statements		RBT Level
CO1	Describe the ethical framework of Mass media		R

CO2	Discuss the various media laws	U
CO3	Apply the knowledge of media laws and ethics to examine case study	A1
CO4	Examine the laws related to representation of gender in media	A2
CO5	Evaluate the media reportage of marginalized sections	E
CO6	Develop the knowledge of socio-cultural issues and representation of the marginalized section of the society in media	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Ethical Framework and Media practice Freedom of expression (Article 19(1)(a) and Article 19(1)2) Freedom of expression and defamation- Libel and slander Issues of privacy and Surveillance in Society Right to Information Idea of Fair Trial/Trial by Media Parliamentary Privilege Contempt of Court Intellectual Property Rights Media ethics and cultural dependence	10	CO1 CO2 CO3	R U A1 A2 E
UNIT – II	Media (Reporting) Technology and Ethical Parameters Live reporting and ethics Legality and Ethicality of Sting Operations, Phone Tapping etc. Ethical issues in Social media (IT Act 2000, Sec 66 A and the verdict of The supreme court) Discussion of Important cases-e.g.- Operation Westend Some Related laws- Relevant sections of Broadcast Bill, NBA guidelines	15	CO1 CO2 CO3 CO5	R U A1 A2 E C

UNIT– III	Representation and ethics Advertisement and Women Pornography Related Laws and case studies- Indecent representation of Women (Prohibition) Act, 1986 and rules 1987, Protection of Women against Sexual Harassment Act, 2013, Sec 67 of IT Act 2000 and 292 IPC etc. Objectionable Advertisements, Drugs Magic Remedies Intermediary Guidelines and Digital Media Ethics Code	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
UNIT–IV	Media and Regulation Regulatory bodies, Codes and Ethical – ASCI, TRAI, RNI Guidelines Self-Regulation Media Content- Debates on morality and Accountability: Taste, Culture and Taboo Censorship and media debates	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
UNIT–V	Media and Social Responsibility Economic Pressures Media reportage of marginalized sections- children, dalits, tribals, Gender Media coverage of violence and related laws - inflammatory writing (IPC 353), Sedition incitement to violence, hate Speech. Relevant Case Studies – Muzaffarpur Riots, Attack on civil liberties of individuals and social activists	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Learning Resources:

1. Thakurta, Paranjay Guha, *Media Ethics*, Oxford University Press, 2009
2. Barrie Mc Donald and Michel Petheran *Media Ethics*, mansell, 1998.
3. Austin Sarat *Where Law Meets Popular Culture* (ed.), The University of Alabama Press, ., 2011
4. Vikram Raghvan, *Communication Law in India*, Lexis Nexis Publication, 2007.
5. Iyer Vekat, *Mass Media Laws and Regulations in India*-Published by AMIC, 2000.
6. William Mazzarella, *Censorium: Cinema and the Open Edge of Mass Publicity*.
7. Raminder Kaur, William Mazzarella, *Censorship in South Asia: Cultural Regulation from Sedition to Seduction*
8. Linda Williams, *Hard Core: Power, Pleasure, and the "Frenzy of the Visible"*

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
(Seal)	(Seal)	

Course Code	23MCJSEC102	
Course Title	Newspaper Production	
Credits	03	
Lecture Hours	75	
Hours/Week	4	
Category	Skill Enhancement Course	
Semester	II	
Regulation	2023	
Course Overview: This course – Has been designed for students to get a theoretical understanding and practical training in producing an in-house newspaper.		
Prerequisites and/or Note(s): • Basic knowledge of report writing • Basic computer knowledge		
Course Objectives: 1. To define various elements of a newspaper 2. To understand basics of the various newspaper formats and design 3. To implement various technological process involved in the production of a newspaper 4. To produce a newspaper		
Course Outcomes (COs) and Cognitive Level Mapping At the end of this course, the students will be able to-		
COs	Statement	Dave’s Taxonomy
CO1	Follow the instructor to create a newspaper layout	I

CO2	Execute the knowledge of newspaper designing	M
CO3	Demonstrate the various aspects of newspaper designing and photo editing	P
CO4	Formulate layout design of a dummy newspaper	A
CO5	Create a four page dummy newspaper comprising of an Op- Ed and six reports	N

COURSE ONTENT

UNITS	CONTENT	HOURS	COs	DAVE'S TAXONOMY
UNIT – I	Newspaper Designing Terminology Dateline, credit line, print line, editorial and Op-Ed page, columns, cartoons, jumpy copies, marriage of copies; Types of headlines – Stepped, tombstone, flush left, centered, pyramid, reverse pyramid, waist, reverse waist.	12	CO 1 CO 2 CO 3	I M P
UNIT – II	Principles of Newspaper Designing I Designing, different types of newspaper layouts, eye movement, The Z Pattern - Measuring in Design, Determining Type Readability, Marking up Reporter's Copy, Determining Copy Depth, Using a Copy Log, Determining Headline Size, Determining Headline Depth, Scaling Artwork, Dummying with Symbols	18	CO 1 CO 2 CO 3 CO 4	I M P A

Unit III	Principles of Newspaper Designing II Horizontal Page Design, the Quadrant Page Design, the Modular Page Design, the Single Theme Page, the Editorial Page, the Sports Page, the Single-Page Feature, the Photo Features Page, Dealing with Ads, and Introduction to Adobe InDesign	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N
Unit IV	Photo Editing Photo Editing -The Single Image and the Photo-story - The paradox of the photo-story, word, image, caption writing, photographs in newspapers. The Production process - the photo-story, the equipment, the fieldwork, return to the editorial desk, editing and final touch-offs, and the photo desk; Introduction to Adobe Photoshop	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N
Unit V	Designing and Production Design and produce a 4-page newspaper comprising of an Op-Ed page. Include six news reports from the following news beats: a. Political Reporting b. Entertainment Reporting c. Education Reporting d. Health Reporting e. Sports Reporting f. Human Interest Reporting	15	CO 1 CO 2 CO 3 CO 4 CO 5	I M P A N

Learning Resources:

Kamath, M.V. (2009). *The Journalist's Handbook*. New Delhi: Vikas Publishing House Pvt. Limited
Gupta, V. S. (2003). *Handbook of Reporting and Communication Skills*. India: Concept Publishing Company
Roy, B. (2004). *Modern Student Journalism*. India: Pointer Publishers.
Aggarwal, V.B. (2006) *Essentials of Practical Journalism*, Concept Publishing Company
Smith, J. (2007) *Essential Reporting*, Sage publications

Suggested Reading:

Baker, J. (2021). *Essential Journalism: The NCTJ Guide for Trainee Journalists*. United Kingdom: Taylor & Francis
Hasan, S. (2020). *Mass Communication: Principles and Concepts*. India: CBS Publishers & Distributors.
Horst, M., Viet, K. (2017). *Journalism Basics: An Introduction to Print Journalism*. Poland: Create Space Independent Publishing Platform
Saltz, I. (2019). *Typography Essentials Revised and Updated: 100 Design Principles for Working with Type*. United States: Rockport Publishers.

Assessment:**Practical Exam:**

- i. *Formative Assessment*: 25 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment*: 50 marks
 - Design the following:
 - Design a Tabloid newspaper
 - Design a Cover page of a magazine

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	23 MCJMDC102
Course Title	Basics of Media Technologies
Credits	03
Lecture Hours	45
Hours/Week	3
Category	Multi-Disciplinary Course (MDC)
Semester	II
Regulation	2023

Course Overview:

This course –

- Introduces students to the fundamental concepts in communication studies,
- Explains the basic communication theories and models.
- Explores media and communication and their effect on society and culture
- Serves as a foundation for further studies in Mass Communication/Media Studies.

Prerequisites and/or Note(s):

- Basic understanding of technological progress made in the field of Media and Communication

Course Objectives:

1. To provide basic idea about mainstream media
2. To identify and understand the involvement of technologies in Communication
3. To understand the concept of Communication and especially Mass Communication
4. To discuss the important theories and models of Communication
5. To illustrate the need and use of media in everyday life

Course Outcomes (COs) and Cognitive Level Mapping

At the end of this course, the students will be able to-

COs	Statement	RBT Level
CO1	Identify different types of media technologies used in Journalism.	R
CO2	Discuss the different types of media technologies.	U
CO3	Apply the knowledge of media technologies to examine its evolution and growth.	A1
CO4	Analyze the convergence of media technologies.	A2
CO5	Evaluate the evolution of media and its impact on the society.	E
CO6	Develop the understanding of media convergence and its influence on the society.	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Print Technologies Evolution of Print Media, Invention of the Printing Press, Gutenberg Printing Press, Digital Printing, Large Format, Screen Printing; Newspapers and Magazines; modern Printing Processes, DTP (Desktop Publishing)	10	CO1 CO2 CO3 CO5	R U A1 E
UNIT – II	Audio Technologies Emergence of Radio, Radio Technology, Types and Functions, AM, FM, Shortwave, Medium wave, Longwave, Satellite, e-radio; Radio Broadcasting. Podcast, Studio Console, Basics of Sound, Types of sound-sync, Non-Sync, Natural sound, Ambience Sound; Introduction to microphones. Characteristics of Radio as a medium; Radio Broadcast Formats (Programmes).	8	CO1 CO2 CO3 CO5	R U A1 E

UNIT – III	Audio Visual Technologies Introduction to audio fundamentals and acquisition technologies, video fundamentals and acquisition technologies, live program production, display technology; Video Streaming; Platform independent Audio; Characteristics of TV, Films, OTT as audio visual mediums	8	CO1 CO2 CO3 CO5	R U A1 E
UNIT – IV	Convergence Media Technologies The emergence of convergence, why and how convergence is emerging, convergent journalism and multi-media storytelling, case studies of convergence, technology, and convergence; the smart newsroom: convergence and the future of journalism.	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
UNIT – V	Mobile Journalism Mobile Journalism Screen sizes & responsive web, Information multimedia and web architecture, Marketing websites, corporate websites, web feature stories, key points for web interactive narrative, interactive users vs linear narratives, elements of an interactive writer	9	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Learning Resources:

Kamath, M.V. (2009). *The Journalist's Handbook*. New Delhi: Vikas Publishing House Pvt. Limited

Gupta, V. S. (2003). *Handbook of Reporting and Communication Skills*. India: Concept Publishing Company

Roy, B. (2004). *Modern Student Journalism*. India: Pointer Publishers.

Aggarwal, V.B. (2006) *Essentials of Practical Journalism*, Concept Publishing Company

Smith, J. (2007) *Essential Reporting*, Sage publications

Suggested Readings:

Boczkowski, Pablo J. (2014), and Kirsten A. (2014). Technologies. *Essays on Communication, Materiality, and Society*. Massachusetts, London: MIT Press Cambridge

Hemchand Pant (2019) *Writing For Audio-Visual Media (For Bachelor In Journalism And Mass Communication)*,

Stanley R. Alten(1981) *Audio in Media*,
Bruce Block (2001) *The Visual Story: Creating the Visual Structure of Film, TV and Digital Media*,
John V. Pavlik and Shawn McIntosh (2018) *Converging Media*

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature: (Seal)	Name: Signature: (Seal)	Name: Signature:

Course Code	23MCJVAC 101
Course Title	Desktop Publishing (Adobe Indesign)
Credits	1
Lecture Hours	30
Sessions	15
Hours/Week	2
Category	Value Added Course (vac-II)
Semester	II
Regulation	2024
Course Overview: This course – - Introduces students to the fundamental concepts of Desktop Publishing - Explains the basics of software used in desktop publishing, Especially Adobe Indesign 2021+ - Explores different elements of graphics and Layout designing	
Prerequisites and/or Note(s): Basic understanding of using a Windows PC and Word processing softwares	
Course Objectives: The course is designed to help learners to- - Understand the concept and industry of desktop publishing - Develop essential skills and knowledge about using the desktop publishing software - Create professional print productions - Nurture a creative mindset essential to design - Familiarize the learners about the latest computing technologies required in the field	
Course Outcomes: The course is designed to help learners to: - Critically examine various newspaper and magazine formats, print production materials - Learn, demonstrate and create using different industry standard software - Understand the basics of desktop publishing and develop their own designing aesthetic - Apply different theories and elements while designing - Create meaningful industry standard print publications and showcasing them online in a portfolio	

Course Content

Session	Content	Hours
1	Introductory session about the course, Syllabus and Adobe Indesign Students will be asked about any experiences in graphics design and layout during their school tenure and will shown the basics of Software	2
2	Introduction to the Adobe Indesign Interface I Essentials of Adobe Indesign Workspace Toolbar, Control Bar, Layer bar, Color bar	2
3	Introduction to the Adobe Indesign Interface II Customizing the workspace according to the need, display options, effects, locking the selections, Color	2
4	Essentials of Adobe Indesign Toolbar I Working with Adobe Indesign Tools, Drawing and Typing with Adobe Indesign	2

5	Essentials of Adobe Indesign Toolbar II Placing images and managing images with Adobe Indesign	2
6	Essentials of Adobe Indesign Toolbar III Alignment, Paragraph, Page Information, Page Set Up	2
7	Essentials of PNG Placement and Wrap Placing PNG images in Adobe Indesign, Working with Royalty free websites	2
8	Essentials of Typography Working with different typefaces and Typography composition	2
9	Essentials of Typography II Downloading external typefaces and working with them	2
10	Essentials of Poster Design Principles of Poster designing	2
11	Essentials of Poster Design II Designing a poster using Adobe Indesign	2
12	Essentials of Newspaper Designing Principles of newspaper designing	2
13	Essentials of Newspaper Designing II Elements of a newspaper	2
14	Essentials of Newspaper Designing III Designing a College newspaper using adobe Indesign	2
15	Creation of Final Copy of the Newspaper	2

Assessment:

Formative Assessment: 10 internal +5 attendances.

Summative Assessment: Assignment submission 30 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

SEMESTER III

Course Code	23MCJMAJ201
Course Title	News Reporting and Analysis
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	III
Regulation	2024
Course Overview: • Introduces students to the fundamental concepts in News Reporting and interpretation of news. • Explains the function of editorial department. • Serves as a foundation for understanding the requirement of gate keeping. • To introduce students to specialized reporting skills and reporting analysis.	
Prerequisites and/or Note(s): • Basic Ideas of news	
Course Objectives: 1. Comprehend the fundamental principles of responsible reporting, including accuracy, fairness, objectivity, ethics, and cultural sensitivity. 2. Understand different reporting styles and techniques 3. Gain competence in interview techniques and reporting. Understand the legal frameworks and ethical guidelines governing reporting practices in relevant contexts	
Course Outcomes (COs) and Cognitive Level Mapping At the end of this course, the students will be able to-	

COs	Statement	RBT Level
CO1	Demonstrate proficiency in interviewing techniques and extracting valuable information from diverse sources	
CO2	Craft compelling reports in different styles and formats, effectively adapting to specific media requirements	
CO3	Demonstrate awareness of relevant legal and ethical frameworks applicable to their reporting	
CO4	Identify and list different reporting styles and techniques appropriate for various media platforms and audiences	
CO5	Evaluate the credibility and bias of information sources and perspectives in reporting.	

COURSE ONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	News: Beat and Source: definitions, Principles of News (Report) Writing: Intro, Lead; types of lead, Principles of News Agency ; Interviewing: Research, planning, framing questions, writing the piece; Feature: Definition, Types; Advertorials. Media Literacy; Genuine News and Fake News; Comparative writing for media, print, electronic, online;	10	CO1 CO2 CO3 CO5	R U A1 E
UNIT – II	Positions, qualities, duties and responsibilities of: Correspondents: reporters, Special Correspondent, District Correspondent, Foreign Correspondent; Columnist, Photo Journalist, News Coordinator, Bureaus;; Chief of news bureau: head of the reporters;	10	CO1 CO2 CO3 CO5	R U A1 E
Unit III	Specialization in Journalism: Interpretative and Investigative Journalism, Political Journalism, Crime and Legal Journalism, Public Affairs Reporting, Human Interest Stories and Human Rights Reporting, Corporate, Financial and Business Journalism.	15	CO1 CO2 CO3 CO5	R U A1 E

Unit IV	Agriculture Journalism, Science Journalism, Sports Journalism, Film Journalism, Environment Journalism, Fashion and Entertainment Journalism, Page-3 Reporting, Column Writing, Writing for Magazine, Special and supplementary Pages. Segregate column writing;	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	News reporting professionalism: political, economical, sociological; professional norms and ethics; Style of Reporting- Style book of an Organization;	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Suggested Readings:

- John Hohenberg: *Professional Journalists*; Thomson Learning.
- M.V. Kamath: *Professional Journalism*; Vikas Publishing, New Delhi.
- Leonard Ray: *Into the Newsroom*; Globe Pequot Pr; Subsequent edition.
- Sourin Banerjee: *Reporting and Editing Practice*;
- M.K. Joseph: *Outline of Reporting*;
- K.M. Srivastava *News Reporting and Editing*; Sterling Publishers Pvt Ltd (2003).
- Sourin Banerjee: *Journalism Update*; Pragatishil Prokashak.
- Lynette Sheridan Burns: *Understanding Journalism*; Vistaar Publications;

Formative Assessment: 50 marks as per Assessment & Evaluation Framework
Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature: (Seal)	Name: Signature: (Seal)	Name: Signature:

Course Code	23MCJMAJ202
Course Title	News Processing and Editing
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	III
Regulation	2023
Course Overview: This course – • Introduces students to the fundamental concepts in editing news story, • Explains the function of editorial department. • Serves as a foundation for understanding the requirement of gate keeping.	
Course Objectives: • To provide basic idea about news editing process • To identify and understand the function of editorial department in press • To understand the art of writing news stories with clarity, accuracy, and adherence to journalistic standards • To understand the inverted pyramid structure and its application in news writing • To illustrate the need and use of editorial skills for refining and improving news content Prerequisites and/or Note(s): • Basic idea about ‘NEWS’.	

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Introduction to Editing: Editing: Nature and need for editing. Principles of editing, editorial desk, functions of editorial desk, copy-editing, preparation of copy for press - style sheet - editing symbols, proof reading symbols and their significance.	10	CO1 CO2 CO3 CO5	R U A1 A2
UNIT – II	Editorial Department: Structure and functions of a typical newsroom. Editor/executive editor, roles of editor, news editor, chief sub-editor, sub-editor, sections in editorial, supplements editing Executive Editor, Assistant Editor, Chief Reporter, Chief Sub-Editor, Sub-Editor, News Editor, Chief of News Bureau; Headline: types, importance, writing headline for newspaper; Principle of writing an Editorial, Post Editorial; Principles of Sub-Editing;	10	CO1 CO2 CO3 CO5 CO6	R U A1 A2 E
Unit III	Layout and Design: Headlining - writing headlines, different types of headlines principles, types and techniques. Principles of Layout and Design. DTP, Page Making, Structure of the newspaper: page making;	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E
Unit IV	Page Makeup: Solace, ear panels, teasers, masthead, deadline, firing of the page, going to bed, panels, folios, lead, , cross head, sub-head, kicker/deck, brief, bastardisation, tint, hamper, flyer, dummy, power jacket, kerning, template, by-line, blurb, date-line, credit-line, attribution, quotation, imprint line, agency/wire services; Page maker: editing terminologies;	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E

Unit V	Editing Process: Re-writing, Proof reading, Style book/sheet., printing process, different methods of printing – letter press, off-set and gravure.	10	CO1 CO2 CO3 CO4 CO6 CO7	R U A1 A2 E
Suggested Readings: • VirBala Agarwal: <i>Essentials of Pracical Journalism</i>, Concept Publishing House, 2006. • Usha – Raman <i>Writing for the Media</i>. - Oxford (15 December 2009) • K.M. Shrivastava – <i>News Reporting and Editing</i>. - Sterling Publishers Pvt Ltd (1 January 2003) • M. V. Kamat – <i>Professional Journalism</i>. - Vikas Publication House Pvt Ltd; • First edition (2009) • B. N. Ahuja – <i>Theory and Practice of Journalism</i>. - Surjeet Publication, 2009 • Richard Keeble – <i>The Newspapers Handbook</i>. - Routledge; 3 edition (17 May 2001)				
<i>* Note(s): The syllabus changes yearly and may be modified during the term, depending on the circumstances. However, students will be evaluated only on the basis of topics covered in the course.</i>				
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to-				
COs	Statements	RBT Level		
CO1	Describe basic idea about news editing	R		
CO2	Illustrate the need and importance of editing report	U		

CO3	Apply the concept of editing special emphasis on Mass Communication	A1
CO4	Analyze the editing process	A2
CO5	Evaluate the usage of different kind terminology in editing	E

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	23MCJSEC201
Course Title	Radio Production and Podcast
Credits	03
Lecture Hours	75
Hours/Week	4
Category	Skill Enhancement Course
Semester	III
Regulation	2024
Course Overview: This course – • Describe Basic Information and skills involves in Radio Production. • Explain stages of podcast creation • Demonstrate how the mixing and editing process is done • Deconstruct popular and trending podcast series	
Prerequisites and/or Note(s): • Basic knowledge of English language and the broadcast Media.	

Course Objectives:

4. To understand the Broadcast production technique.
5. To develop the basic skills
6. To develop basic skills of composition in designing

COs	Statements	Dave's Taxonomy
CO 1	Follow instructions for behavioural change and technological knowledge	I
CO 2	Implement the knowledge of various design tools.	M
CO 3	Demonstrate the designing tools and Radio production.	P
CO 4	Adaptation of technical knowledge and enhance the skills regarding radio production.	A
CO 5	Create and design a podcast.	N

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	DAVE'S TAXONOMY
UNIT – I	Broadcast Production Technique; Working of a production control Room and Studio; Types and functions, acoustic, input, and output chain, Studio Console recording and mixing; Personnel in Production process- Roles and Responsibilities.	20	CO1 CO2 CO3 CO4	I M P A

UNIT – II	Stages of Radio Production, Pre-production (Idea, Research, Radio, Script); Production - Creative sound, Listening, Recording, Using archived sound, (execution, requisite, challenges); Editing, Creative use of Sound Editing; Broadcast Formats- Radio Magazine, Interview, Talk Show, Discussion, feature, Documentary, Radio Drama, Public Service Advertisement, Jingles, Introduction to Podcast, History of Podcast, Equipment and software, writing and planning;	20	CO1 CO2 CO3 CO4	I M P A
Unit III	Practical: Recording (IN) Practice, Sound (Editing, Mixing, Music) Branding and Ethics, Production, Editing workshop (Revising, Executive and finishing touches)	22	CO1 CO2 CO3 CO4 CO5	I M P A N

Suggested Reading:

- Aspinall, R. (1971) *Radio Production*, Paris: UNESCO.
- Flemming, C. (2002) *The Radio Handbook*, London: Routledge.
- Keith, M. (1990) *Radio Production, Art & Science*, London: Focal Press.
- McLeish, R. (1988) *Techniques of Radio Production*, London: Focal Press.
- Nisbett, A. (1994) *Using Microphones*, London: Focal Press.
- Reese, D.E. & Gross, L.S. (1977) *Radio Production Work*, London: Focal Press.
- Siegel, E.H. (1992) *Creative Radio Production*, London: Focal Press

Assessment:

- Formative Assessment*: 25 marks as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment (50 marks)*: Project Submission (40 marks) + Viva (10 marks)
- Create a Podcast, with own original content, Editing and mixing.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name:	Name:	Name:
Signature:	Signature:	

		Signature:

(Seal)

(Seal)

Course Code	23MCJMDC201	
Course Title	New Media and Artificial Intelligence	
Credits	03	
Lecture Hours	45	
Hours/Week	3	
Category	Multi-Disciplinary Course (MDC)	
Semester	III	
Regulation	2024	
Course Overview: - Exposure to Digital media, Co- relation between Media and Artificial Intelligence, New Media Over Traditional Media, - Investigate emerging trends in new media, covering the characteristics of the information society. - Examine the intersection of virtual cultures and digital journalism, and ethical considerations in new media practices. - Learn about visual and content design principles for news media. - Evaluate the role of educational technology in news media, and the use of new media for developmental purposes.		
Prerequisites and/or Note(s): Basic Knowledge in Computer and mobile applications.		
Course Objectives: Define and explain fundamental concepts and principles of AI - Analyze how AI is influencing and shaping the landscape of new media. - Explore the integration of AI technologies in various forms of media, including social media, journalism, entertainment, and advertising. - Analyze how AI is employed to enhance user experience and engagement in new media.		
Course Outcomes (COs) and Cognitive Level Mapping		
COs	Statements	RBT Level

CO1	Defining what is new media and artificial intelligence	R
CO2	Explain the shift of audience to new media rather than following traditional media.	U
CO3	Classify the need of new media in the present era	A1
CO4	Analyze the correlation of AI and new media	A2
CO5	Defend the rise in demand of new media and AI	E
CO6	Create a new capsule and advertisement using all the elements taught in this course	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Key Concepts and Theory Defining new media, terminologies and their meanings – Digital media, new media, online media et al.; Information society and new media, Technological Determinism, Computer mediated-Communication (CMC), Networked Society, ICT;	15	CO1 CO2 CO3	R U A1
UNIT – II	Digitization of Journalism Authorship and what it means in a digital age, Piracy, Copyright, Copy left and Open Source, Digital archives, New Media and Ethics	15	CO1 CO2 CO3 CO4	R U A1 A2 E
UNIT– III	Introduction to AI, Types of AI platform AI in NEW MEDIA, Demand of AI, AI and Interaction, AI and Advertisement, Rise of AI in social Media, Trends in Media AI generation; AI and photography; Content Generation (Chat GPT); AI curated Photograph and Content Making; Cyber Journalism;	15	CO1 CO2 CO3 CO4	R U A1 A2 E

Suggested Reading:

- Vincent Miller. *Understanding digital culture*. Sage Publications, 2011.
- Lev Manovich. 2001. “*What is New Media?*” In *The Language of New Media*. Cambridge: MIT Press. pp. 19-48.
- Siapera, Eugenia. *Understanding new media*. Sage, 2011. Introduction.
- Baym, Nancy K. *Personal Connections in the Digital Age*. Polity, 2010. Chapter 3. Goldsmith, Jack, and Tim Wu. 2006. *Who Controls the Internet? Illusions of Borderless World*. Oxford University Press US.
- O’Reilly, Tim. (2005). *What is web 2.0: Design patterns and business models for the next generations software*. Oreilly.com, retrieved from
- Grossman, “*Iran Protests: Twitter, the Medium of the Movement*” Lemann, Nicholas. 2006. *Amateur Hour: Journalism without Journalists*.

Assessment:

Formative Assessment: 25 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Course Code	23MCJVAC201
Course Title	Desktop Publishing (Adobe Illustrator)
Credits	1
Lecture Hours	30
Sessions	15
Hours/Week	2
Category	Value Added Course (VAC-III)
Semester	III
Regulation	2024
Course Overview: This course – - Introduces students to the fundamental concepts of Desktop Publishing - Explains the basics of software used in desktop publishing, Especially Adobe Illustrator 2021+ - Explores different elements of graphics and Layout designing	
Prerequisites and/or Note(s): Basic understanding of using a Windows PC, Internet and access to Adobe Illustrator	
Course Objectives: The course is designed to help learners to- - Understand the concept and industry of desktop publishing - Develop essential skills and knowledge about using the desktop publishing software - Create professional print productions - Nurture a creative mindset essential to design - Familiarize the learners about the latest computing technologies required in the field	
Course Outcomes: The course is designed to help learners to: - Critically examine various newspaper and magazine formats, print production materials - Learn, demonstrate and create using different industry standard software - Understand the basics of desktop publishing and develop their own designing aesthetic - Apply different theories and elements while designing - Create meaningful industry standard print publications and showcasing them online in a portfolio	

COURSE CONTENT

Session	Content	Hours
1	Introductory session about the course, Syllabus and Adobe Illustrator Students will be asked about their experience from the previous DTP classes and will show the basics of accessing Adobe Illustrator	2
2	Introduction to the Adobe Illustrator Interface I Introduction Adobe Photoshop Workspace and Different panels	2
3	Introduction to the Adobe Illustrator Interface II Essentials of Tools bar	2
4	Designing in Adobe Illustrator I Designing Principles in Adobe Illustrator	2
5	Designing in Adobe Illustrator II Setting up Pages in Adobe Illustrator	2

6	Designing in Adobe Illustrator III Working with Shapes in Adobe Illustrator	2
7	Saving and Exporting Projects in Adobe Illustrator Instructions and essentials of saving a project in Illustrator	2
8	Working with Typography I Basic Typing in Adobe Illustrator	2
9	Working with Typography II Typeface Essentials in Adobe Illustrator	2
10	Working with Pictures in Adobe Illustrator Importing photos in Adobe Illustrator	2
11	Creating Graphics Design in Illustrator I Creation of a Business Card	2
12	Creating Graphics Design in Illustrator II Creation of a Poster	2
13	Drawing in Adobe Illustrator Essentials of Drawing in Adobe Illustrator	2
14	Drawing in Adobe Illustrator Essentials of Brushes in Adobe Illustrator	2
15	Creating a Logo in Adobe Illustrator Creation of a Final Logo-	2

Assessment:

Formative Assessment: 10 internal + 5 attendances.

Summative Assessment: Assignment Submission 30 marks

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

SEMESTER IV

Course Code	23MCJMAJ203
Course Title	Multimedia Journalism
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	IV
Regulation	2024
Course Overview: This Course- • Explores the world of multimedia journalism, focusing on its interactive nature and significance. • Teaches the essentials of multimedia reporting for today's dynamic newsrooms. • Showcases the crucial audio, photo, and video production skills demanded by contemporary media. • Cultivates creativity by brainstorming and crafting compelling story ideas across various platforms. • Helps to develop a versatile portfolio showcasing proficiency in both print and online journalism.	
Prerequisites and/or Notes(s): • Exposure in Electronic Media, and Digital Media.	
Course Objectives: 1. Understand multimedia journalism and its interactive elements. 2. Learn multimedia reporting basics for modern newsrooms. 3. Brainstorm and develop compelling story ideas. 4. Grasp legal and ethical considerations in journalism, focusing on diversity. 5. Master the process of multimedia production for various platforms. 6. Create engaging multimedia narratives, incorporating audio, video, and web elements.	

Course Outcomes (Cos) and Cognitive Level Mapping		
At the end of this course, the students will be able to-		
COs	Statements	RBT Level
CO1	Key concepts related to multimedia journalism	R
CO2	Understand the significance of multimedia and interactivity in journalism.	U
CO3	Critically evaluate the effectiveness of different multimedia storytelling techniques.	E
CO4	Principles of composition, focal points, and visual design in multimedia storytelling.	A1
CO5	Analyze the process of multimedia production from conception to publication.	A2
CO6	Creating multimedia content for various platforms, including web and broadcast.	C

COURSE CONTENT

UNITS	CONTENTS	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT I	Introduction to Multimedia Journalism Understanding Multimedia and Interactivity Basics of Multimedia Reporting Importance of Audio, Photo, and Video Production Skills in Contemporary Newsrooms Brainstorming Story Ideas Developing a Portfolio for Print and Online Platforms Diversity in Media: Media Law, Ethics, Multicultural Sensitivity	10	CO1 CO2 CO3 CO5 CO6	R U E A2 C
UNIT II	Process of Production Decision Making and Skills for Multi-Platform Communications Paraphrases, Quotes, and Attribution in Media Writing Leads and Nut Graphs Content Development Sources and Online Research Story Organization Effective Interviewing Techniques and Notetaking Ethics of User-Generated Content	10	CO1 CO2 CO3 CO4 CO5	R U E A1 A2
UNIT III	Photo on Screen	10	CO1 CO2	R U

	Understanding Composition: Rule of Thirds, Focal Points Photography as a Narrative Tool Increasing Importance of Photojournalism Photography and Outline in Storytelling Visual Design Principles Placements and Visual Aesthetics		CO3 CO4 CO5	E A1 A2
UNIT IV	Audio and Video Storytelling Focus on Audio Recording Techniques Telling Stories with Natural Sound and Sources Editing and Placement of Audio Storytelling with Video: Collecting Content, Structuring Stories Writing for Broadcasting/Webcasting Video Editing Techniques with Interviews and B-Roll Streaming Platforms and Technologies Live Reporting and Streaming Technologies Virtual Reality (VR) and Augmented Reality (AR) in Storytelling	15	CO1 CO2 CO3 CO4 CO5 CO6	R U E A1 A2 C
UNIT V	Web Multimedia and Interactive Narratives Understanding Screen Sizes and Responsive Web Design Information Multimedia and Web Architecture Marketing and Corporate Websites Web Feature Stories: Key Elements and Strategies Interactive Narratives: Linear vs. Non-Linear Approaches Elements of Interactive Writing User Engagement in Multimedia Narratives Social Media Integration in Journalism	15	CO1 CO2 CO3 CO5 CO6	R U E A2 C

Suggested Readings:

1. Savage, Terry Michael, and Karla E. Vogel. *An Introduction to Digital Multimedia*. Jones & Bartlett Publishers, 2013.
2. Christin, Anne-Marie, ed. *A History of Writing: From Hieroglyph to Multimedia*. FlammarionPere Castor, 2002.
3. Korolenko, Michael. *Writing for Multimedia: A Guide and Source Book for the DigitalWriter*. Pearson. 2005.
4. Garrand, Timothy. *Writing for Multimedia and the Web: A Practical Guide to Content Development for Interactive Media*. CRC Press, 2006.
5. Chapman and Chapman, *Digital Multimedia*, Wiley Publication.
6. James C. Foust, *Online Journalism: Principles and Practices of News for the Web.3* Scottsdale, AZ: Holcomb Hathaway.
7. Lyndra Felder (2011). *Writing for the Web Creating, Compelling Web Content Using Words, Pictures and Sound*, New Riders, Denmark

Formative Assessment: 50 marks as per Assessment & Evaluation Framework
Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
(Seal)	(Seal)	

Course Code	23MCJMAJ204
Course Title	Broadcast Media
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	IV
Regulation	2024
Course Overview: This Course- • Dive into the history and significance of radio and television in the Foundations of Broadcast Media. • Explore broadcasting techniques, equipment, and transmission technologies in Broadcasting Techniques and Technologies. • Discover strategies for creating engaging content and analyzing audience behaviour in Programming and Audience Engagement. • Navigate legal and ethical considerations in content creation and journalism with Regulation and Ethics in Broadcast Media. • Stay updated on digital broadcasting, streaming services, and industry innovations in Emerging Trends in Broadcast Media.	
Prerequisites and/or Notes(s): • Basic knowledge in Mass Communication. • Basic Idea about Radio and Television.	
Course Objectives: • Understand sound fundamentals and techniques for broadcast media. • Differentiate types of sounds and grasp microphone characteristics. • Analyze visual elements and changing image ecology in broadcasting. • Master writing and editing news stories for radio and television. • Evaluate critical issues in broadcast news and its evolution.	

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to-

COs	Statements	RBT Level
CO1	Recognize basic visual elements in broadcasting, such as electronic images and characteristics of television as a medium.	R
CO2	Comprehend the changing ecology of images in contemporary society and the importance of visual culture in broadcast media.	U
CO3	Evaluate the role of public service broadcasters such as AIR and DD News in shaping national discourse.	E
CO4	Apply writing and editing skills to craft radio news stories, including gathering, reporting, and editing techniques specific to radio broadcasting.	A1
CO5	Analyse news as an event, performance, and construction in broadcast media.	A2
CO6	Create visually engaging television news stories by applying camera techniques, visual grammar principles, and editing software effectively.	C

COURSE CONTENT

UNITS	CONTENTS	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT I	Basics of Sound Concepts of sound-scape, sound culture Types of Sound-Sync, Non-Sync, Natural sound, Ambience Sound Sound Design-Its Meaning with examples from different forms, Techniques for recording sound Introduction to microphones Characteristics of Radio as a medium	10	CO1 CO2 CO4 CO5	R U A1 A2
UNIT II	Basics of Visual What is an image, electronic image, television image? Digital image, Edited Image (politics of an image) What is a visual? (still to moving), Visual Culture Changing ecology of images today Characteristics of Television as a medium	10	CO1 CO2 CO4 CO5	R U A1 A2

UNIT III	Writing and Editing Radio News Elements of a Radio News Story: Gathering, Writing/Reporting, Elements of a Radio News Bulletins, Working in a Radio News Room Introduction to Recording and Editing sound. (Editing news-based capsule only). Introduction to Sound editing Software (Audacity, Adobe audition, etc.)	15	CO1 CO2 CO3 CO4 CO5 CO6	R U E A1 A2 C
UNIT IV	Writing and Editing Television News Basics of a Camera- (Lens & accessories) Electronic News Gathering (ENG) & Electronic field Production (EFP) (Concept) Visual Grammar – Camera Movement, Types of Shots, Focusing, Visual Perspective. Elements of a Television News Story: Gathering, Writing/Reporting. Elements of a Television News Bulletins Basics of Editing for TV- Basic Soft-wares and Techniques (for editing a news capsule).	15	CO1 CO2 CO4 CO5 CO6	R U A1 A2 C
UNIT V	Broadcast News: Critical Issues and Debates, Public Service Broadcasters - AIR and DD News - Voice of India? (Analysis of News on National Broadcasters) Changing Character of Television News (24 -hrs news format, News Production cycle, News 'Lingo', News 'Formulae'? News as Event, Performance and Construction. Making of TV news Capsule;	10	CO1 CO2 CO4 CO6	R U A2 C

Suggested Readings:

1. Zettl Herbert, *Television Production Handbook*. (Pgenos: 20-80, 85-135)
2. Robert Allen and Annette Hill (Ed- 2004), *The Television Reader*, Routledge (Pgenos: 10-40)
3. P.C Chatterjee, *Broadcasting in India*, New Delhi, Sage 1987(Page nos- 25- 78)
4. Carrol Fleming, *The Radio Handbook*, Rout ledge (London & New York 2002) (Pgenos: 47- 105)

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a. Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b. Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- c. Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

Course Code	23MCJMAJ205
Course Title	Introduction to New Media
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Major Core
Semester	IV
Regulation	2024
Course Overview: This Course- • Explore foundational concepts and theories in news media, including definitions of digital, new, and online media. • Investigate emerging trends in new media, covering the characteristics of the information society. • Examine the intersection of virtual cultures and digital journalism, and ethical considerations in new media practices. • Learn about visual and content design principles for news media. • Evaluate the role of educational technology in news media, and the use of new media for developmental purposes.	
Prerequisites and/or Notes(s): • Basic Knowledge in Internet, and computer and mobile applications.	
Course Objectives: • To demonstrate a god overview and command of all essential knowledge, theory and skills within the specific area of new media • To define key concepts and terminologies related to new media • To discuss various aspects of new media and its diverse social implications • To examine the ethical aspects of digital journalism	

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to-

COs	Statements	RBT Level
CO1	Understand concepts and terminologies related to new media	U
CO2	Critically analyse and evaluate the impact of new media trends on society, communication practices, and digital cultures.	A2
CO3	Students will be equipped with the knowledge and skills to critically analyse and engage with virtual cultures and digital journalism	A1
CO4	Students will demonstrate proficiency in visual and content design for new media platforms.	A1
CO5	Students will be able to create content for new media platforms that aligns with ethical principles and best practices within digital communities.	C
CO6	Evaluate the advantages and disadvantages of Information and Communication Technologies (ICT) in educational contexts, considering factors such as accessibility, flexibility, interactivity, and scalability.	E
CO7	Identify the characteristics of the information society, including the New World Information Order and the concept of a networked society.	R

COURSE CONTENT

UNITS	CONTENTS	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT I	Key Concepts and Theory Defining new media, terminologies and their meanings – Digital media, new media, online media et al.; Internet and its Beginnings, Remediation and New Media technologies, New Media and Digital Divide Media Convergence, Technological Determinism	15	CO1 CO2 CO3 CO5 CO6	R U E A2 C

UNIT II	Educational Technology Information and Communication Technologies Advantages and Disadvantages of ICT Online courses, open learning platforms (Egyankosh, Sodhganga, etc), E-commerce, New media and development: Use of new media for Development.	15	CO1 CO2 CO3 CO4 CO5	R U E A1 A2
UNIT III	Trends in New Media Information society and new media: Characteristics of Information Society New World Information Order, Networked Society, Computer Mediated Communication (CMC): Characteristics and Advantages of CMC Social Media and Web 2.0, User Generated Content, Intro to web 3.0; Social Networking Sites, Virtual community	10	CO1 CO2 CO3 CO4 CO5	R U E A1 A2
UNIT IV	Understanding Virtual Cultures and Digital Journalism Networked Journalism, Alternative Journalism; Social Media in Context, Activism and New Media, New Media and Democracy, E-democracy, New Media and Ethics, Digital Archives	10	CO1 CO2 CO3 CO4 CO5 CO6	R U E A1 A2 C
UNIT V	Visual and Content Design Content creation for new media- Writing Techniques, Website planning and visual design, History of Blogging, Creating and Promoting a Blog	10	CO1 CO2 CO3 CO5 CO6	R U E A2 C

Suggested Readings:

1. Lev Manovich. 2001. *“What is New Media?”* In *The Language of New Media*. Cambridge: MIT Press. 19-48.
2. Siapera, Eugenia. *Understanding new media*. Sage, 2011. Introduction.
3. Baym, Nancy K. *Personal Connections in the Digital Age*. Polity, 2010. Chapter 3. Goldsmith, Jack, and Tim Wu. 2006. *Who Controls the Internet? Illusions of Borderless World*. Oxford University Press
4. O'Reilly, Tim. (2005). *What is web 2.0: Design patterns and business models for the next generations software*. Oreilly.com, retrieved from <http://oreilly.com/web2/archive/whatisweb-20.html>
5. Grossman, *“Iran Protests: Twitter, the Medium of the Movement”* Lemann, Nicholas. 2006. *Amateur Hour: Journalism without Journalists*.
6. The New Yorker, August 7. Available at http://www.newyorker.com/archive/2006/08/07/060807fa_fact1
7. Xiang, Biao. 2005. *Gender, Dowry and the Migration System of Indian*
8. Chaturvedi B. K. *New Media Technology And Communication*, Global Vision Publishing House 2010.
9. Wilson P. Jr. *Dizard. Old Media New Media: Mass Communications in the Information Age*, Allyn & Bacon 1999.
10. Vince John A *Digital Convergence: The Information Revolution*, University Of Bournemouth UK: Springer Verlag.

Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Summative Assessment: 50 marks

- a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
 - c) Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:
(Seal)	(Seal)	

Course Code	23MCJMIN201
Course Title	Introduction to Media and Communication
Credits	04
Lecture Hours	60
Hours/Week	4
Category	Minor Core
Semester	III/IV
Regulation	2024
Course Overview: This course – • Introduces students to the fundamental concepts in communication studies. • Explains the basic communication theories and models. • Explores media and communication and their effect on society and culture. • Serves as a foundation for further studies in Mass Communication/Media Studies.	
Prerequisites and/or Note(s): • Basic knowledge of communication.	
Course Objectives: 6. To provide basic idea about mainstream media. 7. To identify and understand the involvement of technologies in Communication. 8. To understand the concept of Communication and especially Mass Communication. 9. To discuss the important theories and models of Communication. 10. To illustrate the need and use of media in everyday life.	
Course Outcomes (Cos) and Cognitive Level Mapping At the end of this course, the students will be able to-	

COs	Statements	RBT Level
CO1	Describe basic idea about mainstream media	R
CO2	Illustrate the need and use of media in everyday life	U
CO3	Apply the concept of Communication with special emphasis on Mass Communication	A1
CO4	Analyze the important theories and models of Communication	A2
CO5	Analyze the communication process	A2
CO6	Evaluate the usage of different kind of media and technology	E
CO7	Integrate the theories and models of communication in everyday life	C

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOMS TAXONOMY
UNIT – I	Introduction to Communication: Definition and Meaning of Communication; Types and Forms of Communication; Levels of Communication; Barriers to Communication; Mass Communication-its Characteristics, Functions and Processes.	10	CO1 CO2 CO3 CO5	R U A1 A2
UNIT – II	Media in Everyday Life: Media and everyday life in modern society, broadcasting as an institution in everyday life, early radio: the domestication of media technology; television and other forms: audiences and articulations; TV, geography and mobile privatizations; Media and Modernity, Identity, Tradition, and Media, the dynamics and consequences of mediated interactions	10	CO1 CO2 CO3 CO5 CO6	R U A1 A2 E

Unit III	Communication Theories: Bullet Theory Individual Difference Theory Personal Influence Theory Cognitive Dissonance Theory Agenda Setting Theory Cultivation Theory Uses and Gratification Theory	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit IV	Communication Models: Ancient Indian Model Aristotle and Plato's Model Laswell's Model Berlo's Model Shanon and Weaver's Model Schramm and Osgood Model Gerbner's Communication Model	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit V	Media and Technology: Brief history, character, and effects of Print, Radio, Television, Films, Mobile Phones, The Internet – Web 1.0 and Web 2.0; Mediated and Non-Mediated Communication, Media, and everyday life in a mediated reality; Technological Determinism; New Media and the transformative nature of the internet, User Generated Content, Reality and virtual reality;	10	CO1 CO2 CO3 CO4 CO6 CO7	R U A1 A2 E

Learning Resources:

McQuail, D. (2000). *Mass Communication Theory*, London: Sage
Williams, K. (2003). *Understanding Media Theory*. United Kingdom: Arnold.
Kumar, K. J. (2000). *Mass Communication in India* (4th Edition). India: Jaico Publishing House.
Mehta, D.S. (2014). *Mass Communication and Journalism in India*: Allied Publishers Pvt. Ltd.
Agarwal. V. B. (2001). *Handbook of Journalism and Mass Communication*: Concept Publishing Company
Andal, N. (2015). *Communication Theories and Models*: Himalaya Publication House, New Delhi

Suggested Reading:

Ruffner, M. & Burgoon, M. (1981). *Interpersonal Communication*. New York: Holt, Rinehart, and Winston
McLuhan, M. (2016). *Understanding Media: The Extensions of Man*. New York: CreateSpace Independent Publishing Platform.

Assessment

Formative Assessment: 50 marks as per Assessment & Evaluation Framework
Document of Salesian College

Summative Assessment: 50 marks

- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- Four Long Questions to be answered out of six given from mid order of RBT – (20 Marks)
- Two Essay Questions to be answered out of four from higher order of RBT – (20 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature: (Seal)	Name: Signature: (Seal)

Course Code	23MCJVAC202
Course Title	Desktop Publishing (Adobe Photoshop)
Credits	1
Lecture Hours	30
Sessions	15
Hours/Week	2
Category	Value Added Course (VAC-IV)
Semester	IV
Regulation	2024
Course Overview: This course – - Introduces students to the fundamental concepts of Desktop Publishing - Explains the basics of software used in desktop publishing, Especially Adobe Photoshop 2021+ - Explores different elements of graphics and Layout designing	
Prerequisites and/or Note(s): Basic understanding of using a Windows PC, Internet and access to Adobe Photoshop	
Course Objectives: The course is designed to help learners to- - Understand the concept and industry of desktop publishing - Develop essential skills and knowledge about using the desktop publishing software - Create professional print productions - Nurture a creative mind-set essential to design - Familiarize the learners about the latest computing technologies required in the field	
Course Outcomes: The course is designed to help learners to: - Critically examine various newspaper and magazine formats, print production materials - Learn, demonstrate and create using different industry standard software - Understand the basics of desktop publishing and develop their own designing aesthetic - Apply different theories and elements while designing - Create meaningful industry standard print publications and showcasing them online in a portfolio	

COURSE CONTENT

Session	Content	Hours
1	Introductory session about the course, Syllabus and Adobe Photoshop Students will be asked about their experience from the previous DTP classes and will show the basics of accessing Adobe Photoshop	2
2	Introduction to the Adobe Photoshop Interface I Introduction Adobe Photoshop Workspace and Different panels	2
3	Introduction to the Adobe Photoshop Interface II Customizing the workspace according to the need	2
4	Basic Editing in Adobe Photoshop I Editing Photos in Adobe Photoshop, Resizing	2
5	Basic Editing in Adobe Photoshop II Editing Photos using Adobe Camera RAW, Color Correction	2
6	Basic Editing in Adobe Photoshop III Editing photos using Photoshop Preset	2

7	Saving and Exporting Projects in Adobe Photoshop Instructions and essentials of saving a project in Photoshop	2
8	Page Setup in Adobe Photoshop Creating and Working on a blank Canvas	2
9	Essentials of Layers and Effects I Understanding and Using Layers	2
10	Essentials of Layers and Effects II Understanding and Using Effects	2
11	Color Setup in Adobe Photoshop Understanding Color Profile CMYK and RGB and their use	2
12	Graphics Design using Adobe Photoshop I Understanding different tools in Adobe Photoshop	2
13	Graphics Design using Adobe Photoshop II Benefits and drawbacks of designing using Photoshop, Embed Project, Vector and Raster	2
14	Graphics Design using Adobe Photoshop III Designing a Poster using Adobe Photoshop	2
15	Final Design Creating an Advertisement copy for Newspaper	2

Assessment:

Formative Assessment: 10 internal +5 attendances.

Summative Assessment: Assignment Submission 30 marks

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

Department of Mass Communication and Journalism
Salesian College Autonomous Siliguri
Semester III

Course Code and Name	Paper Setter	Examiner	Board of Moderator	Head Examiner	Post Publication Reviewer	Third Examiner
23MCJMAJ201 News Reporting and Analysis	Mrinalini Sharma	Nawaneeta Subba	Simon Subba	Bhabya Chandra Khati	Nawaneeta Subba	Simon Subba
23MCJMAJ202 News Processing and Editing	Shikshita Dewan	Simon Subba	Nawaneeta Subba	Ravi Bhushan Singh	Bhabya Chandra Khati	Nawaneeta Subba
23MCJSEC201 Radio Production and Podcast	Md. Irfan-E-Azam	Md. Irfan-E-Azam	Only if Applicable	Simon Subba	Ravi Bhushan Singh	Bhabya Chandra Khati
23MCJMDC201 New Media and Artificial Intelligence	Simon Subba	Ravi Bhushan Singh	Bhabya Chandra Khati	Nawaneeta Subba	Ravi Bhushan Singh	Mr. Ravi Bhushan Singh
23MCJMIN201 Introduction to Media and Communication	Nawaneeta Subba	Simon Subba	Bhabya Chandra Khati	Ravi Bhushan Singh	Bhabya Chandra Khati	Mr. Ravi Bhushan Singh
AEC (EVS)	(Only for Geog-Dept)	Simon Subba	(Only for Geog-Dept)	Nawaneeta Subba	Bhabya Chandra Khati	Mr. Ravi Bhushan Singh
23MCJVAC201 Desktop Publishing III (Adobe Illustrator)	Simon Subba		(Only if Applicable)	Bhabya Chandra Khati	Nawaneeta Subba	Mr. Ravi Bhushan Singh

Department of Mass Communication and Journalism
Salesian College Autonomous Siliguri
Semester IV

Course Code and Name	Paper Setter	Examiner	Board of Moderator	Head Examiner	Post Publication Reviewer	Third Examiner
23MCJMAJ203 Multimedia Journalism	Mrinalini Sharma	Nawaneeta Subba	Bhabya Chandra Khati	Ravi Bhushan Singh	Ravi Bhushan Singh	Simon Subba
23MCJMAJ204 Introduction to Broadcast Media	Shikshita Dewan	Simon Subba	Nawaneeta Subba	Ravi Bhushan Singh	Bhabya Chandra Khati	Nawaneeta Subba
23MCJMAJ205 Introduction to New Media	Bhabya Chandra Khati	Md. Irfan-E-Azam	Simon Subba	Nawaneeta Subba	Ravi Bhushan Singh	Bhabya Chandra Khati
23MCJMIN201 Introduction to Media and Communication	Simon Subba	Nawaneeta Subba	Bhabya Chandra Khati	Ravi Bhushan Singh	Simon Subba	Mr. Ravi Bhushan Singh
23MCJVAC202 Desktop Publishing IV(Adobe Photoshop)	Simon Subba	Simon Subba	(Only if applicable)	Ravi Bhushan Singh	Bhabya Chandra Khati	Mr. Ravi Bhushan Singh
AEC (EVS)	(Only for Geog-Dept)	Bhabya Chandra Khati	(Only for Geog-Dept)	Nawaneeta Subba	Bhabya Chandra Khati	Mr. Ravi Bhushan Singh

Salesian College, Autonomous, Siliguri

Department of Mass Communication and

Journalism

2nd Board of Studies (BOS) Meeting

Minutes of Board of Studies Meeting

Programme: B.A.in Mass Communication and Journalism

Venue: J.P.M Hall

Date:27th, February,2024

Time:01:00p.m.

The Department of Mass Communication and Journalism in following autonomy status of Salesian College and the directives of the Government has framed the curriculum based on NEP, 2020 framework. The faculty members have formulated the new syllabus content and submitted the same for the approval for the Board of Studies. The suggestions made by the Board have been incorporated in the curriculum for the academic year 2024-2025.

Agenda for BoS Meeting:

1. Proposal for the approval of the Curriculum Document by the HoD, Siliguri Campus and seconding of the proposal document by any one member.
2. Any other.

Members Present

BoS Panel Members		
Sl No.	Name	Role
1	Mr. Ravi Bhushan Singh, Dean of Humanities, Salesian College	BoS Chairperson
2	Mr. Bhabya Chandra Khati, HoD Department of Mass Communication Siliguri Campus	Vice Chairperson
3	Ms. Nawaneeta Subba, Assistant Professor, Dept. of Mass Communication and Journalism.	Secretary, Faculty Member
4	Prof.(Dr.)Mrityunjoy Chatterjee, Head, University Project, Ramkrishna Vivekananda Mission, Kolkata	Subject Expert

5	Mr. Subhrajyoti Kundu, Assistant Professor, University of North Bengal, Siliguri.	Subject Expert

6	Dr. Uma Shankar Pandey, Associate Professor And Head, Dept. of Mass communication and Journalism Surendranath College for Women, University of Calcutta.	Subject Expert
7	Mr. Md. Irfan-e-Azam, Chief Reporter cum Sub-Editor, Dainik Jagran, Siliguri.	Industrial/Organizational Expert
8	Mr. Avijit Sarkar, Founder and owner News at Nine, Siliguri.	Industrial/Organizational Expert
9	Mr. Divya Darshan Chhetri, Sub-Editor, Mirik Channel Television, Mirik, Darjeeling	Alumni Member
10	Mr. Simon Subba, Assistant Professor, Dept. of Mass communication and Journalism, Siliguri Campus	Faculty Member
11	Mr. Ranit Sarkar, Assistant Professor, Dept. of Mass communication and Journalism, Sonada Campus	Faculty Member
12	Miss Shikshita Dewan, Assistant Professor, Dept. of Mass communication and Journalism, Siliguri Campus	Faculty Member
13	Miss Mrinalini Sharma, Assistant Professor, Dept. of Mass communication and Journalism, Sonada Campus	Faculty Member

Welcome and Opening Remarks

Mr. Bhabya Chandra Khati, Vice Chairman, opened the meeting with a welcome address and introduced the Board Studies of Members. He also presented the Curriculum document.

The following Matrix mentions the required changes to be made/ suggestions given by the panel:

<u>SEMESTER-III</u>			
Course Code	Course Type	Title of the Course	Suggestions/Corrections to be made

23MCJMA J201	Major	News Reporting and Analysis	a. In Course overview- Add “analysis” to the point Introduces students to the fundamental concepts in News Reporting. Addition of topics in the following Units:- b. Types of leads in Unit I c. Media literacy in Unit I d. Duties and responsibilities of reporters in Unit II e. Column writing in Unit IV f. Style of reporting with reference to stylebook of a new organization in Unit V
23MCJMA J202	Major	News Processing and Editing	a. Chief of news Bureau-add this topic in New Reporting paper. b. Give a sub heading “Headlining “to Unit II. c. Add-Structure of the newspaper and page making in Unit II. d. Rephrase the headline of Unit IV as “Page Makeup”. e. Add topics-Solus, ear panel, teaser in Unit IV.
23MCJSE C201	SEC	Radio Production and Podcast	a. Add topics-Introduction to Podcast, History of Podcast in Unit III.
23MCJMD C201	MDC	New Media and Artificial Intelligence	a. Rephrase the Course Objective -Explain the shift of audience to new media rather than following traditional media. b. Addition of topics in Unit III: c. i)AI curated photography and content making. d. ii) Cyber journalism.
23MCJMI N201	MINOR	Introduction to Media and Communicati on	N/A

23MCJVA C201	VAC	Desktop Publishing III(Adobe Illustrator)	
<u>SEMESTER–IV</u>			
Course Code	Course Type	Title of the Course	Suggestions/Corrections to be made
23MCJMA J203	Major	Multimedia Journalism	Addition of topic in Unit III:- Photo on Screen Understanding Composition: Rule of Thirds, Focal Points Photography as a Narrative Tool Increasing Importance of Photojournalism Photography and Cut lines in Storytelling Visual Design Principles Placements and Visual Aesthetics
23MCJMA J204	Major	Introductio n n to Broadcast Media	a. Addition of topic in Unit III- Introduction to any one sound editing Software-Audacity or Adobe Audition (use of raw images-Da Vinci Resolve) b.Addition of topic in Unit V-Making a Television news capsule.
23MCJMA J205	Major	Introductio n to New Media	a. Addition of topic in the following Units: a. IntroductiontoWeb3.0inUnitII. b. Democratization of ICT – Community Participation in Unit III c. Place Unit V in Unit II. Unit II will be Unit III.

23MCJMI N201	Minor	Introduction to Media and Communicati on	a. Delete the following topics from Unit III: Spiral of Silence Theory Two-Step Flow Theory Narcotic Dysfunction Theory b. Eastern and Western Communication Models from Unit IV. c. Add topic Mediated and Non-Mediated media in Unit V
23MCJVA C201	VAC	Desktop Publishing IV (Adobe Photoshop)	

The meeting was concluded by vote of thanks extended by, Mr. Bhabya Chandra Khati, Vice Chairman and HoD dept. of Mass Communication and Journalism.



Salesian College
(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts in Social Work

Department of Social Work

Curriculum Document
2023 – 2024

Vision

The vision of the department is to envision a society that upholds the values of equality, diversity, inclusiveness, democracy and concern for the welfare of the society, strengthening human relationships and promoting social justice.

Mission

The mission of the department is to make collective and quality learning to the students accessible to students, contributing to the development and dissemination of Social Work knowledge and skills, thereby moulding the students into effective, ethical and professional Social Workers.

1. Programme Overview

Bachelor of Arts in Social Work is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Grasp the theories of Social Work, sociology, and psychology.
	PO02: Acquaint him/herself with the history of the Social Work.
	PO03: Relate his/her understanding of guidance and principles of Social Work.
	PO04: Gain awareness about the various contemporary issues in Social Work.
Skills	PO05: Demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes.
	PO06: Construct instructional designs, scholastic & co-scholastic curriculum designs.
	PO07: Integrate and apply ICT in learning process.
	PO08: Acquaint him/herself with the diverse current social problems and other related issues such as drug addiction, poverty, unemployment, human trafficking.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical knowledge of Social Work subject and statistical techniques and pedagogical analysis.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as Social Work is a lifelong process for empowering the student to face all challenges in his/her future endeavours.
	PO11: Develop concern for the community, society, and nation.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops a clear idea about the subject Social Work, like nature, scope and aim of Social Work, factors, different areas of Social Work practice.
	PSO2: A student gathers knowledge about Psychology, theories, and their implication in the field of Social Work.
	PSO3: A student develops knowledge about the detailed history of the evolution of Social Work in USA, UK and India.
	PSO4: A student internalises the basics of Sociology, relation between Sociology and Social Work and its importance in understanding the current challenges.
	PSO5: A student develops knowledge about basic of social case work as well as group work.
	PSO6: A student develops the sociological concept for Social Work education and practice.
	PSO7: A student develops the concept of youth and the various intervention in the field to work with youth.
Skills	PSO1: A student will develop a clear idea about the subject Social Work, like nature, scope and aim of Social Work, factors, different agencies of Social Work.
	PSO2: A student will execute the theories of psychology in the areas of practice.
	PSO3: A student will develop skills on documentation, reporting and filing.
	PSO4: A student will develop an understanding of educational technology, ICT, and e-learning.
	PSO5: A student will advocate the importance of guidance and counselling.
	PSO6: A student will develop the skill of intervention in various areas of practice.

	PSO7: A learner will exhibit an excellent communication skill, life skill and value education.
Competence	PSO1: A learner demonstrates competencies required to use computers in research, communication, ICT & e-learning for implementing instructional techniques and different models of Social Work.
	PSO2: A student will analyse the detailed history of Social Work.
	PSO3: A student will systematise the concepts of adjustment, maladjustment, and the various interpretations of the psychological tests.
	PSO4: A student will correlate various qualitative and quantitative data for research.
	PSO5: A student will envision a society where people from all walks of life enjoy equal and equitable rights and opportunities.
	PSO6: A student will compute statistical analysis in the field of research.
	PSO7: A student will analyse the contemporary trends in Social Work practice.

4. Programme Matrix

Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23BSWMAJ101	Major	Concepts, History and Philosophies of Social Work	4	4+0+0	60	100
	23BSWMAJ102	Major	Field Work Practicum- 1	4	0+0+4	60	100
	23BSWMIN101	Minor	Sociology for Social Work	4	4+0+0	60	100
	23BSWMDC101	MDC	Social Work Profession	3	3+0+0	45	75
	23BSWAEC100	AEC	Compulsory English	2	2+0+0		50
	23BSWSEC101	SEC	Life Skills for Social Workers	3	3+0+0	45	75
	23SCSVAC1	VAC1	Value Education	1	1+0+0		25
	23BSWVAC101	VAC2	Values and Ethics in Social Work Practice	1	0+0+1		
	Total			22		210	
II	23BSWMAJ103	Major	Working with Individuals	4	4+0+0	60	100
	23BSWMAJ104	Major	Field Work Practicum- 2	4	4+0+0	60	100
	23BSWMIN102	Minor	Dynamics of Human Growth and Behaviour	4	4+0+0	60	100
	23BSWMDC102	MDC	Social Work Profession	3	3+0+0	45	75
	23BSWAEC101	AEC	Alt Eng	2		50	
	23BSWSEC102	SEC	Computer Application for Social Work	3	2+0+1	45	75

	23SCSVAC3	VAC-3		1			25
	23BSWVAC102	VAC-4					
	Total			22			

Course Content

SEMESTER 1

1. Course Description

Course Code	23BSWMAJ101	
Course Title	Concepts, History and Philosophies of Social Work	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Social Work	
Regulation	2023	
Course Overview	This course: a. Covers the core values, ethics, and theoretical frameworks of Social Work practice. b. Recognizes various areas of Social Work, including direct practice, community development, social policy, and research. c. Explores the historical development and emergence of Social Work as a profession.	
Prerequisite	Basic understanding of values and ethics and empathetic attitude towards society.	
Course Objectives	A student will be able to: i. Understand the basic concepts of Social Work. ii. Describe an overview of history of Social Work. iii. Explain the role of professional Social Work. iv. Explain various principles of Social Work. v. Understand various challenges of professional Social Work.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Define the basic objectives and historical background of Social Work.	R
CO2	Explain various concept of Social Work.	U
CO3	Execute the role of professional Social Work.	A1
CO4	Analyse the various principles of Social Work.	A2
CO5	Critique various social policies.	E

CO6	Integrate strategies in order to work with clients from various ethnic, racial, and socioeconomic backgrounds.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	History and Basic Concepts of Social Work a. Definition, objectives, philosophies, and scope of Social Work. b. Emergence of professional Social Work in Europe and U.S.A. c. Emergence of Professional Social Work and Social Work Education in India.	12	CO1	R U A1 A2 E C
Unit II	Fundamentals of Social Work a. Values of Social Work. b. Basic skills of Social Work practice. c. Functions of Social Work. d. Principles of Social Work.	12	CO1	R U A1 A2 E C
Unit III	Social Work and Inter-related Concepts a. Social welfare and Social development. b. Social service and Social Work. c. Scope and concerns of Social Work practice.	12	CO2 & CO5	R U A1 A2 E C
Unit IV	Social reform movements and Social Work philosophy a. Role of social reform movements of the nineteenth century and early twentieth century in India: Brahmo Samaj, Bhakti Movement, Theosophical Society. b. Philosophies of Swami Vivekananda and Rabindranath Tagore. c. Religious Philosophies – Islam and Buddhism.	12	CO4	R U A1 A2 E C
Unit V	Professionalization and Challenges a. Attributes of a profession. b. Social Work as a profession and challenges. c. Roles of professional Social Worker.	12	CO3 & CO6	R U A1 A2 E C
Learning Resources: (Latest edition books listed in APA style: Seventh Edition)				
Text Books Bhattacharya, S. (2013). Social Work: an integrated approach. Deep and Deep Publications. Dubois, Brenda and Kalra, Krogurnd, Micky (2011): Social Work: An Empowering Profession 7 th Edition. Pearson				

Suggested readings

Kumar, Hajira (2014): Social Work: An Experience and Experiment in India. Gitanjali Publishing House

Morales, A.T., Sheafor, B.W. and Scott, M.E. (2010): Social Work: A Profession of Many Faces. London. Allyn and Bacon.

Videos

https://www.youtube.com/watch?v=hqnUohxXV0I&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F

https://www.youtube.com/watch?v=AxUgUBaipRA&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F&index=6

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment:* 50 marks
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Richayanti P Lepcha Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Course Code	23BSWMAJ102	
Course Title	Field Work Practicum- 1	
Credits	4	
Total Hours	120	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Social Work	
Regulation	2023	
Course Overview	This course: a. Is a practical training course designed to provide students with hands-on experience in their respective fields of study. b. Aims to bridge the gap between theoretical knowledge acquired in the classroom and real-world applications.	
Prerequisite	• Ability to communicate with people. • Ability to record keeping and documentation • Basic photography and videography skills	
Course Objectives	A student will be able to: i. Orient themselves with Social Work lexicon and prepare themselves with requisite value orientation ii. To develop understanding of field and field work; and role of various types of agencies iii. To develop understanding of social structure and social systems iv. Understand the challenges faced by NGOs v. Understand the difference between Social Work and social service	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Demonstrate the ability to apply theoretical concepts and principles learned in the classroom to real-world situations encountered during the fieldwork placement.	R
CO2	Demonstrate Professionalism: Exhibit professionalism, ethical behaviour, and cultural sensitivity while interacting with individuals in the fieldwork environment	U

CO3	Execute the role of professional Social Work	A1		
CO4	Analyse and interpret the data collected during the fieldwork to draw meaningful conclusions and make informed recommendations.	A2		
CO5	Critique various social policies	E		
CO6	Apply appropriate methods and techniques in the fieldwork setting to collect relevant data and information	C		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
FW I	Orientation program to NGOs.	12	CO1	R U A1 A2 E C
FW II	Agency/ Community Visit.	12	CO2	R U A1 A2 E C
FW III	Understanding Agency Structures and Organizational Activities.	12	CO3	R U A1 A2 E C
FW IV	Perspective Building, Workshop & Social Sensitization Workshop.	12	CO3	R U A1 A2 E C
FW V	Report Writing and Documentation.	12	CO4, CO5 & CO6	R U A1 A2 E C

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Richayanti P Lepcha	Name: Dr. Brian Gomes	Name: Ranita Chakraborty
Signature:	Signature:	

		Signature:

Course Code	23BSWMIN101	
Course Title	SOCIOLOGY FOR SOCIAL WORK	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Social Work	
Regulation	2023	
Course Overview	This course: a. Covers the key sociological concepts and theories that are relevant to the field of Social Work. b. Aims to equip students with a sociological lens through which they can analyze social issues, understand social structures, and develop interventions for social change. c. Explores how individuals learn and internalize the values, norms, and roles of their society through socialization processes. d. Discusses the relationship between culture and society.	
Prerequisite	• Keen interest in understanding society. • Basic understanding of social institutions.	
Course Objectives	A student will be able to: i. Understand and develop insight about sociological concepts for Social Work education and practice. ii. Analyze social structure and social system. iii. Explain the processes of social change. iv. Develop knowledge on social institutions such as family, education, religion, economy, and politics. v. Understand classical and contemporary sociological theories.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	State the sociological theories and concepts.	R
CO2	Explain social structure and social system.	U
CO3	Relate between sociology and Social Work.	A1
CO4	Analyze and evaluate various role of social institution.	A2
CO5	Critique the role of social institution in society.	E

CO6	Integrate strategies in order to work with clients from various ethnic, racial, and socioeconomic backgrounds.	C		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit I	Basic Concepts of Sociology a. Social Groups, Community, Association, and Institution b. Culture: Meaning, components and relationship with individual and society c. Social Structure and agency	12	CO1	R U A1 A2 E C
Unit II	Understanding Society and Social Institution a. Society: meaning and characteristics b. Approaches to understanding of society c. Relevance of Understanding Sociology for Social Work d. Definition of social institutions e. The significance of social institutions in society f. Types of Social Institution- Family, Education, Religion and Media	12	CO1 & CO3	R U A1 A2 E C
Unit III	Social Process a. Meaning and types of social process b. Social Control: Concept, Theories and Agencies c. Socialization: Meaning and Agencies	12	CO2	R U A1 A2 E C
Unit IV	Social Stratification a. Concept and theories of social stratification b. Forms of stratification: Caste, Class, Power, Gender c. Social change and social mobility	12	CO4	R U A1 A2 E C
Unit V	Sociological Theories a. Functionalism Theory- Contribution of Emile Durkheim, Talcott Parson and Robert K Merton b. Conflict theory- Contribution of Karl Marx, Dahrendorf and Coser c. Interpretive theory- Contribution of Max Weber	12	CO5 & CO6	R U A1 A2 E C
Learning Resources: (Latest edition books listed in APA style: Seventh Edition)				
Text Books Giddens, A., & Griffiths, S. (2006). <i>Sociology</i> . Polity. Ritzer, G., & Murphy, W. W. (2019). <i>Introduction to sociology</i> . SAGE publications. Berger,P.L. (2013): <i>An Invitation to Sociology: An Humanistic Perspective</i> . Harmondsworth. Penguin.				

Bottommore, T.B. (2015): Sociology: A Guide to Problem and Literature. George Allen and Unwin. Bombay.

Suggested readings

MacIver & Page (2014): Society: An Introductory Analysis, Macmillan India Ltd. Jaipur.

Mills, Theodor (2011): Sociology of Groups. Prentice Hall. New Delhi.

Robertson Ian (2017): Sociology (3rd ed). Worth Publisher. USA.

Videos

https://www.youtube.com/watch?v=s_0X0wlvqVM

<https://www.youtube.com/watch?v=lsDu8SUAf-0>

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. *Summative Assessment*: 50 marks

a. Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b. Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Helena C Lepcha Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Course Code	23BSWMDC101	
Course Title	SOCIAL WORK PROFESSION	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Other Departments	
Regulation	2023	
Course Overview	This course: a) Explores the historical development, theoretical foundations, and contemporary issues and challenges within the field of Social Work. b) Aims to equip students with the knowledge and skills necessary to engage in effective and ethical Social Work practice. c) Emphasize the significance of cultural competence in Social Work practice.	
Prerequisite	Keen interest in understanding Social Work as a profession.	
Course Objectives	i. Describe the concept, meaning, and definitions of Social Work. ii. Discuss the guiding principles of Social Work and their application in diverse socio-cultural, socio-economic, and socio-political settings. iii. Explore the professionalization of Social Work in the Indian context and the associated issues and challenges. iv. Integrate policy advocacy, community organizing, and activism to address social issues v. Describe the role of Social Workers as advocates for social justice and equality	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Define the concept, meaning, and definitions of Social Work.	R
CO2	Explain the guiding principles of Social Work and their application in diverse socio-cultural, socio-economic, and socio-political settings.	U
CO3	Execute the role of Social Work profession in the field.	A1
CO4	Analyse the professionalization of Social Work in the Indian context and the associated issues and challenges.	A2

CO5	Critique various role of Social welfare administration.	E		
CO6	Integrate policy advocacy, community organizing, and activism to address social issues.	C		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit I	An Introduction to Social Work a. Social Work: Concept, Meaning, Definitions, Objectives, Goals, Assumptions and Functions b. Social Work: Philosophy, Nature, Scope. c. Historical development and emergence of Social Work in UK, USA, India, and Global Perspective	10	CO1	R U A1 A2 E C
Unit II	Principles and Values of Social Work a. Guiding Principles of Social Work and their application in diverse socio-cultural, socio-economic and socio-political settings b. Values and Ethics of Social Work c. Social Work and its Relation to Human Rights and Social Justice	10	CO2	R U A1 A2 E C
Unit III	Social Work Profession in India a. Professionalization of Social Work in the Indian Scenario: Issues and Challenges b. Perspectives of Social Work Profession in Indian context and Opportunities c. Professional Organisations in India interlinked with international organisations	9	CO4	R U A1 A2 E C
Unit IV	Methods of Social Work a. Social casework and Social groupwork b. Community Organization and Social welfare administration c. Social action and Social research	8	CO3 & CO5	R U A1 A2 E C
Unit V	Fields of Social Work practice a. Community Development, b. Correctional Settings, Medical and Psychiatric Social Work, c. Family, Women and Child centered Social Work, Social Work in Industries.	12	CO3 & CO6	R U A1 A2 E C

Learning Resources: (Latest edition books listed in APA style: Seventh Edition)

Text Books

Barsky, A. E. (2019). *Ethics and values in Social Work: An integrated approach for a comprehensive curriculum*. Oxford University Press.

Desai, Murli (2005): *Ideologies and Social Work: Historical and Contemporary Analysis*. Rawat Publication.

Dubois, Brenda and Kalra, Krogurnd, Micky (2011). *Social Work: An Empowering Profession* Pearson Publication.

Suggested readings

Higham, Patricia (2004): *Social Work: Introducing Professional Practice*. Sage.

Kumar, Hajira (2014): *Social Work: An Experience and Experiment in India*. Gitanjali Publishing House

Videos

https://www.youtube.com/watch?v=LKkoEliMWgw&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F&index=16

https://www.youtube.com/watch?v=FmoU1j6Y3Y0&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F&index=15

https://www.youtube.com/watch?v=ped-ullw_24&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F&index=17

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment:* 50 marks
 - a. Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b. Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Rini Bhadra Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Course Code	23BSWSEC101	
Course Title	Life Skills for Social Workers	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	SEC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Social Work	
Regulation	2023	
Course Overview	This course: a. aims at inculcating in the students both personal and professional skill b. Focuses on psychosocial competencies and interpersonal skills that help human beings to make informed decision, solve problems, think critically and creatively, communicate effectively, build healthy interpersonal relationships, empathize with others, and manage their lives in a healthy and productive manner.	
Prerequisite	Keen interest in understanding life skills for Social Work practice	
Course Objectives	A student will be able to: i. To enhance one’s ability to understand self, values and attitudes and explore choice made to express self in own environment and reflect on ways to enhance it ii. To increase one’s knowledge and awareness of emotional competency and emotional intelligence at place of study/work. iii. To provide opportunity for realizing one’s potential through practical experience. iv. To develop interpersonal skills and adopt good leadership behavior for empowerment of self and others. v. To develop positive life skills and practice self-help methods for integration and for stress reduction	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Ability to appraise concepts of Life Skills realizing its importance with students’ life.	R
CO2	Identify the importance of Self-awareness and practice it consciously In their daily endeavor.	U
CO3	Demonstrate consistent practice for Physical, social, emotional, and spiritual wellbeing.	A1

CO4	Analyse oneself in terms of life coping skills and create committed leaders	A2		
CO5	Demonstrate efforts in improved communication and interpersonal relationship for better team performance	E		
CO6	Outline the value of accepting diversity across cross-cultural society.	C		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit I	Fundamentals of Life Skills and values Life skills – a. Definition, need and importance of life skills in Higher Education b. Life skills for youth, behaviour prevention and positive development c. Moral development, empathy, social intelligence	12	CO1	R U A1 A2 E C
Unit II	Thinking Skills and Coping Skills a. Creative and Critical Thinking: Importance, Process. b. Decision Making: Need, Importance, consequences of Decision Making. c. Coping with emotions: Types, emotional intelligence, importance, coping strategies. d. Coping with stress: Stressors, sources of stress, factors in stress reaction, importance, coping Strategies.	12	CO2	R U A1 A2 E C
Unit III	Social Skills a. Leadership Skills, b. Appreciating diversity - Respect for culture, religion and languages c. Team Building and Team work, Enhancing team performance	12	CO3 & CO5	R U A1 A2 E C
Unit IV	Professional skills a. Work Ethics – Reliability, Personal responsibility, Sustaining motivation in work. Career Development skills	9	CO4 & CO6	R U A1 A2

	including b. Preparation for Employment: Curricula Vitae formulation, Facing Interviews. c. Documentation, Blend of Competence, commitment with compassion.			E C
Learning Resources: (Latest edition books listed in APA style: Seventh Edition) Text Books Hurlock, B. Elizabeth, (2007), <i>Personality Development</i> , Tata McGraw - Hill Publishing Company Limited, New Delhi O'Hare, T. (2016). <i>Essential skills of Social Work practice: Assessment, intervention, and evaluation</i> . Lyceum Books. Suggested readings Dubois, Brenda and Kalra, Krogurnd, Micky (2011). <i>Social Work: An Empowering Profession</i> Pearson Publication. Kumar, Hajira (2014): <i>Social Work: An Experience and Experiment in India</i> . Gitanjali Publishing House Videos https://www.youtube.com/watch?v=xHxNO253dy4&list=PLJC9mPd_80wsamrH9pJyg9eZWdkI5zjKe https://www.youtube.com/watch?v=4UDbo1w1KP4&list=PLJC9mPd_80wsamrH9pJyg9eZWdkI5zjKe&index=2 https://www.youtube.com/watch?v=wDOvmhqvIA8				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
 - ii. *Summative Assessment*: 50 marks
 - a. Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b. Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Brian Gomes Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Second Semester

1. Course Description

Course Code	23BSWMAJ103	
Course Title	WORKING WITH INDIVIDUALS	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Social Work	
Regulation	2023	
Course Overview	This course: a. Covers the basic concepts and methods of social casework. b. Explain the systematic approach to working with individuals, families, and groups in need of social support and intervention. c. Covers the development of individualized intervention plans based on clients' unique circumstances	
Prerequisite	Keen interest in understanding the basic concept of social casework and basic Understanding of individuals and clients.	
Course Objectives	A student will be able to: i. Understand social case work as a method of Social Work. ii. Develop abilities to critically analyze problems of individuals, families and factors affecting them. iii. Enhance understanding of the basic concepts, tools techniques skills and process. iv. Develop ability of establishing and sustaining a working relationship with the client v. Identifies the roles and responsibilities of a social caseworker	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Define the social case work as a method of Social Work.	R
CO2	Explain the personality development of individuals	U
CO3	Execute the role of professional Social Work with their clients with the help of tools, techniques, and skills of social case work	A1
CO4	Analyse the strategies and skills of social case work	A2

CO5	Critique various process of Social Case Work Practice	E		
CO6	Integrate strategies in order to work with clients from various ethnic, racial, and socioeconomic backgrounds.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Social Case Work a. Concept of social casework: meaning, evolution, nature, and objectives b. Principles of social case work c. Components of social case work: person, problem, place, and process	12	CO1	R U A1 A2 E C
Unit II	Understanding Clients a. Human needs and problems faced by individuals and families b. Factors impacting personality development of individuals c. Concept of social role and reasons for poor role performance	12	CO2	R U A1 A2 E C
Unit III	Tools, Techniques and Skills of Social Case Work a. Case work tools: observation, listening, communication, home-visit and client worker relationship b. Case work techniques: supportive techniques, resources enhancing techniques and counselling techniques c. Skills of case work: communication, resource mobilization, rapport building, case work recording	12	CO3 & CO4	R U A1 A2 E C
Unit IV	Schools of Social Case Work and Phases of Casework Process a. Schools of Social Casework: Diagnostic Vs Functionalist School b. Phases of case work process: study, assessment, intervention, termination, and evaluation.	12	CO5	R U A1 A2 E C
Unit V	Theoretical Approaches and Casework Setting a. Approaches to Case Work: psycho-social, problem solving , task-centered, client centered and Behavior Modification Therapy b. Casework Settings: Education, Industrial setting, community Setting , Health and Correctional Setting	12	CO6	R U A1 A2 E C
Learning Resources: (Latest edition books listed in APA style: Seventh Edition)				

Text Books

Bhattacharya, S. (2013). *Social Work: an integrated approach*. Deep and Deep Publications.

Hamilton, G. (2006). *Theory and Practice of Social Casework*. New York: Columbia University Press.

Mathew, G. (2002). *An Introduction to Social Casework*. Bombay: Tata Institute of Social Sciences.

Suggested readings

Kumar, Hajira (2014): *Social Work: An Experience and Experiment in India*. Gitanjali Publishing House

Morales, A.T., Sheafor, B.W. and Scott, M.E. (2010): *Social Work: A Profession of Many Faces*. London. Allyn and Bacon.

Videos

https://www.youtube.com/watch?v=pttHSJCl4Ks&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F&index=32

https://www.youtube.com/watch?v=1J4dKnYYIYk&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F&index=34

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment*: 50 marks
 - a. Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b. Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Richayanti P Lepcha Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Course Code	23BSWMAJ104	
Course Title	Field Work Practicum- 2	
Credits	4	
Total Hours	120	
Hours per Week	4	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Social Work	
Regulation	2023	
Course Overview	This course: a. Is a practical training course designed to provide students with hands-on experience in their respective fields of study. b. Aims to bridge the gap between theoretical knowledge acquired in the classroom and real-world applications.	
Prerequisite	• Ability to communicate with people. • Ability to record keeping and documentation • Basic photography and videography skills	
Course Objectives	A student will be able to: i. Orient themselves with Social Work lexicon and prepare themselves with requisite value orientation ii. To develop understanding of field and field work; and role of various types of agencies iii. To Develop understanding of social structure and social systems iv. Understand the challenges faced by NGOs v. Understand the difference between Social Work and social service	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Demonstrate the ability to apply theoretical concepts and principles learned in the classroom to real-world situations encountered during the fieldwork placement.	R
CO2	Demonstrate Professionalism: Exhibit professionalism, ethical behaviour, and cultural sensitivity while interacting with individuals in the fieldwork environment	U
CO3	Execute the role of professional Social Work	A1
CO4	Analyse and interpret the data collected during the fieldwork to draw meaningful conclusions and make informed recommendations.	A2
CO5	Critique various social policies	E

CO6	Apply appropriate methods and techniques in the fieldwork setting to collect relevant data and information	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
FW I	Orientation program to NGOs	12	CO1	R U A1 A2 E C
FW II	Agency/ Community Visit	12	CO2	R U A1 A2 E C
FW III	Understanding Agency Structures, Organizational Activities	12	CO3	R U A1 A2 E C
FW IV	Perspectives Building Workshop & Social Sensitization Workshop	12	CO3	R U A1 A2 E C
FW V	Report Writing and documentation	12	CO4, CO5 & CO6	R U A1 A2 E C

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Richayanti P Lepcha Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Course Code	23BSWMIN102	
Course Title	DYNAMICS OF HUMAN GROWTH AND BEHAVIOUR	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Social Work	
Regulation	2023	
Course Overview	This course: a. Explores the theory of Human behaviour that are relevant to the field of Social Work. b. Explains the biological and psychological factors that shape human behaviour, including genetics, brain functions, and cognitive processes. c. Cover theories of personality and how individual differences contribute to variations in behaviour and responses to various situations.	
Prerequisite	Keen interest in understanding human behaviour	
Course Objectives	A student will be able to: i. Understand the dynamics of human behavior and its complexities ii. Examine the theories and frameworks that explain human behavior iii. Analyze the role of cognition, emotions, and motivation in shaping human behavior. iv. Identifies the influence of social and cultural factors on human behavior. v. Understand factors influencing physical and emotional development	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Define the complexities of human behavior.	R
CO2	Explain different theories and frameworks that explain human behavior.	U
CO3	Execute the role of professional Social Work with their clients with the help of psychological theories of human behaviour.	A1
CO4	Analyse the role of cognition, emotions, and motivation in shaping human behaviour.	A2
CO5	Critique the influence of social and cultural factors on human behaviour.	E
CO6	Integrate strategies in order to work with clients suffering from mental wellbeing.	C
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit I	Basic concepts in Psychology a. Definition, Meaning and scope of Psychology b. Importance of psychology for Social Work practice c. Concepts of human behaviour	12	CO1	R U A1 A2 E C
Unit II	Unit 2 Psychological Processes in Behavior a. Needs, motives and drives b. Feelings and emotions c. Perception, intelligence, learning and motivation of Psychological Processes in Behavior	12	CO2	R U A1 A2 E C
Unit III	Developmental Psychology- I a. Concept of growth and development b. Factors influencing physical and emotional development, hazards in development c. Theories of human development: Sigmund Freud's psychoanalytical theory, Erik Erikson's Psychosocial development theory, Abraham Maslow's hierarchical needs theory.	12	CO3 & CO4	R U A1 A2 E C
Unit IV	Developmental Psychology- II a. Early stages of development: pre-natal, post-natal, infancy, babyhood, early childhood, late childhood b. Late stages of development: adolescence, adulthood, middle age, old age	12	CO5	R U A1 A2 E C
Unit V	Mental Health and Mental Illness a. Concept of normality and abnormality b. Coping and Defense mechanisms c. Mental illness and Disorders: Dementia, Schizophrenia, Bipolar Affective Disorder, Anxiety disorders, Substance abuse, Personality disorders, and Sexual deviation.	12	CO6	R U A1 A2 E C

Learning Resources: (Latest edition books listed in APA style: Seventh Edition)

Text Books

Atkinson, R. L., Atkinson, R. C., Smith, E. E., Bem, D. J. and Hilgard, E. R. (2013) *Introduction to Psychology*. New York: H. B. J. Inc.

O'Brien, E. Z. (2020). *Psychology, Human Growth and Development for Social Work: A Comprehensive Guide*. Bloomsbury Publishing.

Suggested readings

Mangal, S. K. (2007) *General Psychology*, New Delhi: Sterling Publisher Pvt. Ltd.

Morgan, C.T., King, R.A. Weisz, J.R., Schopler, J. (2001). *Introduction to Psychology*. New Delhi: Tata McGraw and Hill.

Videos

https://www.youtube.com/watch?v=pttHSJCl4Ks&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F&index=32

https://www.youtube.com/watch?v=1J4dKnYYIYk&list=PLJC9mPd_80wskI4Lj2oOIsEjtKTwQb11F&index=34

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. *Summative Assessment*: 50 marks

a. Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b. Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Helena C Lepcha Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Course Code	23BSWMDC102	
Course Title	SOCIAL WORK PROFESSION	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Multi-Disciplinary	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Other Departments	
Regulation	2023	
Course Overview	This course: a. Explores the historical development, theoretical foundations, and contemporary issues and challenges within the field of Social Work. b. Aims to equip students with the knowledge and skills necessary to engage in effective and ethical Social Work practice. c. Emphasize the significance of cultural competence in Social Work practice.	
Prerequisite	Keen interest in understanding Social Work as a profession.	
Course Objectives	A student will be able to: i. Describe the concept, meaning, and definitions of Social Work. ii. Discuss the guiding principles of Social Work and their application in diverse socio-cultural, socio-economic, and socio-political settings. iii. Explore the professionalization of Social Work in the Indian context and the associated issues and challenges. iv. Integrate policy advocacy, community organizing, and activism to address social issues. v. Describe the role of Social Workers as advocates for social justice and equality.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Define the concept, meaning, and definitions of Social Work.	R
CO2	Explain the guiding principles of Social Work and their application in diverse socio-cultural, socio-economic, and socio-political settings.	U
CO3	Execute the role of Social Work profession in the field.	A1

CO4	Analyse the professionalization of Social Work in the Indian context and the associated issues and challenges.	A2		
CO5	Critique various role of social welfare administration.	E		
CO6	Integrate policy advocacy, community organizing, and activism to address social issues.	C		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit I	An Introduction to Social Work a. Social Work: Concept, Meaning, Definitions, Objectives, Goals, Assumptions and Functions b. Social Work: Philosophy, Nature, Scope. c. Historical development and emergence of Social Work in UK, USA, India, and Global Perspective	10	CO1	R U A1 A2 E C
Unit II	Principles and Values of Social Work a. Guiding Principles of Social Work and their application in diverse socio-cultural, socio-economic, and socio-political settings b. Values and Ethics of Social Work c. Social Work and its Relation to Human Rights and Social Justice	10	CO2 & CO4	R U A1 A2 E C
Unit III	Social Work Profession in India a. Professionalization of Social Work in the Indian Scenario: Issues and Challenges b. Perspectives of Social Work Profession in Indian context and Opportunities c. Professional Organisations in India interlinked with international organisations	9	CO4	R U A1 A2 E C
Unit IV	Methods of Social Work a. Social casework and Social groupwork b. Community Organization and Social welfare administration c. Social action and Social research	8	CO3 & CO5	R U A1 A2 E C
Unit V	Fields of Social Work practice a. Community Development, b. Correctional Settings, Medical and Psychiatric Social Work, c. Family, Women and Child centered Social Work, Social Work in Industries.	12	CO3 & CO6	R U A1 A2 E C

Learning Resources: (Latest edition books listed in APA style: Seventh Edition)

Text Books

Barsky, A. E. (2019). *Ethics and values in Social Work: An integrated approach for a comprehensive curriculum*. Oxford University Press.

Desai, Murli (2005): *Ideologies and Social Work: Historical and Contemporary Analysis*. Rawat Publication.

Dubois, Brenda and Kalra, Krogurnd, Micky (2011). *Social Work: An Empowering Profession* Pearson Publication.

Suggested readings

Higham, Patricia (2004): *Social Work: Introducing Professional Practice*. Sage.

Kumar, Hajira (2014): *Social Work: An Experience and Experiment in India*. Gitanjali Publishing House

Videos

https://www.youtube.com/watch?v=s_0X0wlvqVM

<https://www.youtube.com/watch?v=lsDu8SUAf-0>

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

- i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment*: 50 marks
 - a. Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b. Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Brian Gomes Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Course Code	23BSWSEC102			
Course Title	Computer Application for Social Work			
Credits	3			
Total Hours	45			
Hours per Week	3			
Course Type	SEC			
Semester	II			
Intended Level	Certificate			
Issue(s) Addressed				
Course Offered to	Social Work			
Regulation	2023			
Course Overview	This course: a. Aims to provide a basic understanding of fundamental concepts and functioning of computer devices b. Explores the various roles of operating system and windows. c. Explain the importance of learning MS word, Excel and PowerPoint for research and documentation purpose in the discipline of social work			
Prerequisite	keen interest in basic skills of computer			
Course Objectives	A student will be able to: i. Understand the fundamental concepts and functioning of computer ii. Define the concept as well as the utility of operating system and windows. iii. Know about the facilities and services provided by an Internet and Email. iv. To develop skills in office automation processes v. To learn how to maintain data systematically			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
Cos	Statements	Cognitive Level Mapping		
CO1	Define the basic concepts of a computer system	R		
CO2	Understand the functions and significances of Operating system	U		
CO3	Execute the skills of using internet and Microsoft Office	A1		
CO4	Analyse the role of Internet and Microsoft Office	A2		
CO5	Critique the role of Internet	E		
CO6	Integrate strategies to over the problem of digital divide	C		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit I	INTRODUCTION OF COMPUTER	8	CO1	R

	APPLICATION: - Types of Computer, Hardware, Storage Device, Software & their types - Causes and Utility of Computer in Social Science		&	U A1 A2 E C
Unit II	OPERATING SYSTEM AND IT'S FUNCTION: - Meaning of Operating System, DOS commands, Internal DOS Commands and External DOS Commands - Components of Windows - Basic Tasks of Windows	12	CO2	R U A1 A2 E C
Unit III	USAGES OF INTERNET: - Internet: History of Internet, Essential components of Internet, Uses of Internet, Internet Service Provider. - E-mail- users and Advantages of E-mail	8	CO3, CO5 & CO4	R U A1 A2 E C
Unit IV	IMPORTANCE OF MS-WORD AND EXCEL - Introduction to MS-Word, editing a Document, Previewing documents, Printing Documents - Creating worksheets in Excel, Inserting data in excel, Managing Worksheets	8	CO3 & CO4	R U A1 A2 E C
Unit V	IMPORTANCE OF POWER POINT - Utility of Power Point - Customizing Power Point, Preparing slides for Power Point presentation	9	CO3, CO4 &CO6	R U A1 A2 E C

Learning Resources: (Latest edition books listed in APA style: Seventh Edition)

Text Books

Sarna, D. E. (2010). *Implementing and developing cloud computing applications*. CRC Press.

Madon, S. (2013). Introducing administrative reform through the application of computer-based information systems: A case study in India. *Public Administration and Development*, 13(1), 37-48.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment:

i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. *Summative Assessment*: 50 marks

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Rini Bhadra Signature:	Name: Dr. Brian Gomes Signature:	Name: Ranita Chakraborty Signature:

Department of Social Work
UG Course Curriculum- BSW 3 year /4-year Course NEP

Major Papers

Semester	Course Code	Course Name
I	23BSWMAJ101	Concept, History and Philosophy of Social Work
I	23BSWMAJ102	Field Work 1
II	23BSWMAJ201	Working With Individuals
II	23BSWMAJ202	Field Work 2
III	23BSWMAJ301	Working with Communities
III	23BSWMAJ302	Field Work -3
IV	23BSWMAJ401	Working with Groups
IV	23BSWMAJ402	Social Action and Social Movements
IV	23BSWMAJ403	Field work 4: Rural Camp/Community Engagement
V	23BSWMAJ501	Social Welfare Administration
V	23BSWMAJ502	Introduction to Social Research for Social Work
V	23BSWMAJ503	Disaster Management and Social Work
V	23BSWMAJ504	Field Work 5
VI	23BSWMAJ601	Mental Health and Social Work
VI	23BSWMAJ602	Criminal Justice and Social Work
VI	23BSWMAJ603	Fieldwork 6
VII (with Research)	23BSWMAJ701	Counselling in Social Work
VII (without Research)	23BSWMAJ701	Environmental Social Work
VII (with Research)	23BSWMAJ702	Empowerment and Development of Marginalized.
VII (without Research)	23BSWMAJ702	International Social Work
VII (with and without Research)	23BSWMAJ703	Fieldwork 7
VIII (With research)	23BSWMAJ801	Advanced Qualitative and Quantitative Research
VIII (With out research)	23BSWMAJ801	Human Resource Management
VIII (With research)	23BSWMAJ802	Dissertation
VIII (With out research)	23BSWMAJ802	Field work 8: Block Placement
VIII (With	23BSWMAJ803	Occupational Social Work

out research)		
VIII (With out research)	23BSWMAJ804	Child Rights and Protection

Minor Papers

I	23BSWMIN101	Sociology for Social Work
II	23BSWMIN201	Dynamics of Human Growth and Behavior
III	23BSWMIN301	Economic Policy and Social Problems
IV	23BSWMIN401	Social Development
V	23BSWMIN501	Social Policy and Planning
VI	23BSWMIN601	Human Rights and Social Legislation
VII	23BSWMIN701	Civil Society and Philanthropy
VIII	23BSWMIN801	Palliative Care in Social Work

MDC Papers

I	23BSWMDC101	Social Work Profession
II	23BSWMDC201	Social Work Profession
III	23BSWMDC301	Social Work Profession

SEC Papers

I	23BSWSEC101	Life Skills for Social Workers
II	23BSWSEC201	Computer Application for Social Work
III	23BSWSEC301	Skills and Techniques in Fieldwork Practice

Value Added course

1	23BSWVAC101	Values and Ethics in Social Work

Signature of Head

Signature of External Experts

Signature of Alumni



Salesian College
(Autonomous)
Sonada - Siliguri

**National Education Policy (NEP) 2020 Curriculum Framework
For
Bachelor of Science/Arts in Economics**

Department of Economics

**Curriculum Document
2023 – 2024**

Vision

The Department envisions to develop an academic environment that is conducive to promote high quality education and research, and to offer educational opportunities to the students so as to develop them into accomplished professionals with an economic bent of mind, who can be successful across different avenues.

Mission

The mission of the department to achieve high academics excellence, create an environment for holistic development of the students, instil critical thinking, foster a better understanding of global, national, and local socioeconomic conditions and problems, and establish a research-oriented ecosystem for the students.

1. Programme Overview

Bachelor of Science/Arts in Economics is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Develop a foundational understanding of economic principles to analyse economic systems and principles.
	PO02: Build quantitative skills necessary for economic analysis, such as mathematics, statistics and econometrics, to effectively interpret economic data.
	PO03: Foster critical thinking skills to evaluate economic issues, policies and arguments, and to make informed decisions based on economic arguments.
	PO05: Gain a historical context for economic theories and policies, allowing students to understand the evolution of economic thought and institutions.
	PO05: Explore ethical dimensions of economic decisions and policies, including issues related to social justice, environmental sustainability and economic equality.
Skills	PO06: Develop effective written and oral communication skills to convey economic ideas, theories, and research findings clearly and persuasively.
	PO07: Gain proficiency in using economic software, data analysis tools, and technology, relevant to economic research and analysis.
	PO07: Demonstrate financial literacy and understanding of personal finance, including budgeting, investing, and retirement planning.
	PO08: Apply economic principles to real world scenarios, including case – studies, projects and research assignments.
Competence	PO09: Develop problem solving skills that are applicable across various fields and industries, emphasizing the ability to address practical economic challenges.
	PO10: Initiate a life as an independent economic thinker, staying updated on the latest economic theories, policies and trends.
	PO11: Develop critical thinking and problem solving skills, to identify economic problems and to conduct independent research.

3. Programme Specific Objectives & Outcomes (PSOs)

By the end of the Course, the students will be able to:	
Knowledge	PSO1: Develop understanding of the microeconomic and macroeconomic theories.
	PSO2: Build quantitative skills to understand economic theories, using mathematics, statistics and economics.
	PSO3: Gain the historical and contemporary knowledge about Indian Economy, issues and progress.
	PSO3: A Develop a deep knowledge about development theories.
	PSO4: Gain comprehensive understanding of public finance principles and government budgeting.
	PSO5: Master International Trade theories, exchange rates and global economic institutions.
	PSO6: understand the economic dimensions of gender inequality, including the gender wage gap, labour force participation, and gender based discrimination.
	PSO7: Acquire deep understanding of the healthcare systems, including their organisation, financing and delivery systems.
Skills	PSO1: Analyse and model microeconomic scenarios, evaluate market outcomes and apply microeconomic principles to real world situations.
	PSO2: Analyse macroeconomic trends and indicators, assess the impact of govt policies on the economy and predict economic fluctuations.
	PSO3: Formulate and solve mathematical economic models and apply mathematical optimisation techniques.
	PSO4: Design and conduct economic surveys, analyse economic data using statistical software.
	PSO5: Analyse Indian Economic data and trends and formulate policies for Indian Context.
	PSO6: Assess the impact of development policies and analyse development indicators.
	PSO7: Assess the impact of exchange rate fluctuations.
	PSO8: Evaluate Govt budgets and fiscal policies and analyse the economic impact of public programs.
	PSO9: Evaluate healthcare cost effectiveness and analyse healthcare market dynamics.
	PSO10: Able to analyse gender based economic disparities and assess environmental policy impacts.
Competence	PSO1: Formulate and assess economic policies and micro level.
	PSO2: Have critical evaluation of macroeconomic policies and prescription.
	PSO3: Conduct economic analysis using advanced mathematical methods.
	PSO4: Present and interpret statistical findings in economics.
	PSO5: Have critical evaluation on international trade policies.
	PSO6: Design efficient public policies and fiscal strategies.
	PSO7: Contribute to healthcare policy and management decisions.
	PSO8: Promote gender sensitive and environmentally sustainable economic policies.
	PSO9: Conduct independent research.

4. PROGRAMME MATRIX

➤ COURSE CODE & COURSE TITLE:

4.1. Major Courses

	Course Code	Course Titles
1	23ECNMAJ101	Introductory Microeconomics
2	23ECNMAJ102	Mathematical Economics - I
3	23ECNMAJ103	Introductory Macroeconomics
4	23ECNMAJ104	Mathematical Economics - II
5	23ECNMAJ201	Intermediate Microeconomics - I
6	23ECNMAJ202	Intermediate Macroeconomics - I
7	23ECNMAJ203	Intermediate Microeconomics - II
8	23ECNMAJ204	Intermediate Macroeconomics - II
9	23ECNMAJ205	Mathematical Economics - III
10	23ECNMAJ301	Indian Economy - I
11	23ECNMAJ302	Development Economics
12	23ECNMAJ303	Statistics - I
13	23ECNMAJ304	Indian Economy - II
14	23ECNMAJ305	International Economics
15	23ECNMAJ306	Statistics and Econometrics
16	23ECNMAJ307	Sample Survey
WITH RESEARCH		
17	23ECNMAJ401	Economic Thought
18	23ECNMAJ402	Environmental Economics
19	23ECNMAJ403	Tourism Economics
20	23ECNMAJ404	Agricultural Economics
21	23ECNMAJ405	Gender Economics
WITHOUT RESEARCH		
17	23ECNMAJ401	Economic Thought
18	23ECNMAJ402	Environmental Economics

19	23ECNMAJ403	Tourism Economics
20	23ECNMAJ404	Agricultural Economics
21	23ECNMAJ405	Economics of Health and Education
22	23ECNMAJ406	Public Economics
23	23ECNMAJ407	Economic History of India
24	23ECNMAJ408	Tribal Economics

4.2. Minor Course

	Course Code	Course Title
1	23ECNMIN101	Microeconomics

4.3. Multi-Disciplinary Course (MDC)

	Course Code	Course Title
1	23ECNMDC101	Microfinance
2	23ECNMDC102	Public Economics and Policy Analysis

4.4. Skill Enhancement Course (SEC)

	Course Code	Course Title
1	23ECNSEC101	Basic Computer Applications
2	23ECNSEC102	Travel and Tourism

4.5. Value Added Course (VAC)

	Course Code	Course Title
1	23ECNVAC101	Economic Debate and Discussion

5. Programme Matrix

Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23ECNMAJ101	Major	Introductory Microeconomics	4	4+0+0	60	100
	23ECNMAJ102	Major	Mathematical Economics - I	4	4+0+0	60	100
	23ECNMIN101	Minor	Microeconomics	4	4+0+0	60	100
	23ECNMDC101	MDC	Microfinance	3	3+0+0	45	100
	23AECE101	AEC	Compulsory English	2	2+0+0		50
	23ECNSEC101	SEC	Basic Computer Applications	3	2+0+2	45	100
	23SCSVAC1	VAC	Value Education	1	1+0+0	15	25
	23ECNVAC101	VAC	Economic Debate and Discussion	1	0+0+2	30	25
	Total						
II	23ECNMAJ103	Major	Introductory Macroeconomics	4	4+0+0	60	100
	23ECNMAJ104	Major	Mathematical Economics – II	4	4+0+0	60	100
	23ECNMDC102	MDC	Public Economics and Policy Analysis	3	3+0+0	45	100
	23ECNAEC102	AEC	ALT Eng	2	2+0+0		50
	23ECNSEC102	SEC	Travel and Tourism	3	2+0+2	45	100
	23SCSVAC2	VAC	Environmental Education	1			25
	23ECNVAC102	VAC		1			25
	Total						

6. Course Content

6.1 Course Description

Course Code	23ECNMAJ101	
Course Title	Introductory Microeconomics	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Economics	
Regulation	2023	
Course Overview	This course: a) Introduces economics. b) Discusses the concepts of Demand and supply. c) Covers the theory of Consumers Behaviour. d) Covers the theory of producers Behaviour.	
Prerequisite	Students should possess proficiency in the English language and effective communication skills.	
Course Objectives	The objectives of the course are to: a. Introduce economics as a subject to the students. b. Provide the students with the concepts of Demand and Supply. c. Provide the students with the understanding of Market Elasticity. d. Provide the students with the understanding of the theories of consumers behaviour. e. Provide the students with the understanding of the theory of producers’ behaviour.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define Economics.	R, U
CO2	Discuss the concepts of Demand and Supply and discuss the factors affecting demand and supply.	R, U, A1
CO3	Explain and calculate the elasticities of demand and supply.	R, U, A1, A2
CO4	Analyse consumers behavior using cardinal and ordinal theories.	R, U, A1, A2
CO5	Analyse producers’ behavior.	R, U, A1, A2
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit I	Exploring the Subject Matter of Economics: a. Scope and method of economics b. The economic problem: scarcity and choice c. Opportunity cost and decision making d. Decision takers: Households, firms and Central authorities	5	CO1	R U
Unit II	Demand and Supply: a. Determinants of individual demand and supply b. Law of demand and Law of supply c. Demand and supply schedule demand and supply curve d. Market versus individual demand and supply e. Shifts in the demand and supply curve. f. Market equilibrium and stability of equilibrium.	15	CO2	R U A1 A2
Unit III	Elasticity of demand & supply: a. The concept of elasticity of demand b. Point and arc elasticity, cross price elasticity and income elasticity of demand c. Elasticity of supply	5	CO3	R U A1 A2 E
Unit IV	Consumer and Households Behaviour: a. Cardinal utility theory: Law of diminishing Marginal Utility, derivation of Marshallian demand curve. b. Ordinal utility theory: Indifference curves and their properties, budget line, consumers' equilibrium. c. Income Consumption Curve, price consumption curve and Engel's curve. d. Demand elasticity and classification of commodities, Normal, Inferior and Giffen goods, Income and Substitution effect e. Revealed Preference Theory.	20	CO4	R U A1 A2 E
Unit V	Producer/Firm Behaviour: a. The concepts of Total Revenue, Marginal Revenue and Average Revenue b. Production function c. Law of variable proportion d. Fixed co-efficient production function e. Returns to a factor, returns to scale, iso-quant and its properties, iso-cost line. f. Marginal rate of technical substitution g. Equilibrium of the producer	15	CO5	R U A1 A2 E

	h. Constrained output maximization and constrained cost minimization i. Expansion path j. Elasticity of substitution k. Cobb-Douglas and CES production function.			

Learning Resources:

- Ahuja, H.L. (2010). Modern Economics. S. Chand and Co. Ltd.
- Gravelle, & Rees. Microeconomics. Pearson.
- Henderson, & Quandt. Microeconomic Theory. McGraw Hill.
- Stiglitz, J.E., & Walsh, C.E. Economics. W.W. Norton.
- Case, K.E., & Fair, R.C. Principles of Economics. Pearson Education Inc.
- Koutsoyiannis. Microeconomic Theory. Macmillan.
- Lipsey, & Chrystal. An Introduction to Positive Economics. OUP.
- Madalla, & Miller. Microeconomics-Theory and Applications. McGraw Hill.
- Mankiw, N.G. Economics: Principles and Applications. India edition by South Western.
- Pindyck, Rubinfeld, & Mehta. Microeconomics. Pearson Education Asia. (CTB)
- Salvatore, D. Microeconomics. OUP.
- Varian, H.R. Intermediate Microeconomics: A Modern Approach. (CTB)
- Gould, & Lazear. Micro Economics.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

6.1.1 Assessment

- Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment:* 50 marks (Time: 2 hours)

Marks distribution as follows:

- Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.
- Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
- Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Mr. Bickey Sharma Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

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6.2 Course Description

Course Code	23ECNMAJ102	
Course Title	Mathematical Economics - I	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Core	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Economics	
Regulation	2023	
Course Overview	This course: a. Covers the concepts of Sets, Matrix and Determinants. b. Explores Basic calculus and its application in Economics. c. Covers Maxima and Minima and its application in Economics.	
Prerequisite	Students need to have had studied either mathematics or business mathematics and business economics in class 12.	
Course Objectives (total 5)	The objectives of the course are: a. Enable students to understand the concepts of Sets and solve mathematical problems related to them. b. Enable students to understand the concepts of matrices and determinants and solve mathematical problems related to them. c. To provide the knowledge of basic calculus to the students, including differential Calculus, integral calculus and maxima and minima. d. Enable students to apply the concepts of differential calculus, integral calculus and to solve problems in economics. e. Enable students to apply the concepts of maxima and minima and to solve problems in economics.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define sets and solve mathematical problems related to them.	R
CO2	Explain the concepts of matrices and determinants and solve mathematical problems related to them.	U & AI
CO3	Demonstrate the knowledge of basic calculus to the students, including differential Calculus, integral calculus and maxima and minima.	A2

CO4	Apply the concepts of differential calculus, integral calculus and to solve problems in economics.	E		
CO5	Apply the concepts of maxima and minima and to solve problems in economics.	R		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Theory of Sets: a. Sets, Set Notations, Set Operations. b. Convex Sets and their Properties. c. Relations, Functions and their Properties. d. The Number System.	15	CO1	R U A1 A2 E
Unit II	Matrices and Determinants: a. Vectors and Matrices, Matrix operations, Determinants. b. Inverse Matrix, Solution of a system of linear equation. c. Bordered Hessian Determinant and Cramer’s rule. d. Applications in Economics: Comparative Static Analysis and Derivation of Slutsky Equation.	15	CO2	R U A1 A2 E
Unit III	Differential Calculus and Applications in Economics: a. Derivative of a Function, Rules of Differentiation, Partial and Total Differentiation, Euler’s Theorem. b. Applications in Economics: Demand Function, Elasticity of Demand, Marginal Revenue, Marginal Utility, Marginal Cost, Slope and Curvature of Indifference Curve, Point of Inflexion, Returns to Scale. c. Homogeneous Functions and their Properties, Cobb-Douglas Production Function and their Properties.	10	CO3	R U A1 A2 E
Unit IV	Integral Calculus and Applications in Economics: a. Concept of Integration, Rules of Integration, Definite and Indefinite Integral. b. <i>Applications in Economics:</i> Finding out Total Revenue Functions, Total Cost Function. Consumption Function	10	CO4	R U A1 A2 E

	and Saving Function when Marginal Functions are given. c. Consumer's Surplus and Producer's Surplus.			
Unit V	Maxima and Minima and Applications in Economics: - Extreme Values of Bi-variate Functions, Sufficient Condition for Extreme Values, First and Second Order Conditions for Optimization without Constraints. - Constraints Optimization Problems in Economics: Lagrange Multiplier Method, Utility Maximization subject to Budget Constraint, Output Maximization subject to Cost Constraint, Cost Minimization subject to an Output Constraint. - Relation between AP and MP, Relation between AC and MC, Expansion Path. - Derivation of Ordinary and Compensated demand curves.	10	CO5	R U A1 A2 E

Learning Resources:

- Allen, R. G. D. Mathematical Analysis for Economics. Macmillan.
- Archibald, & Lipsey. An Introduction to the Mathematical Treatment of Economics. AITBS.
- Bailey, D. Mathematics in Economics. McGraw Hill.
- Baumol, W. J. Operations Research – An Introduction. Prentice Hall.
- Chiang, A. C., & Wainwright, K. Fundamental Methods of Mathematical Economics. McGraw Hill. (CTB)
- Dorfman, R. P., Samuelson, P. A., & Solow, R. M. Linear Programming and Economics Analysis. McGraw Hill.
- Geoff, Renshaw. Maths for Economics. OUP.
- Henderson, J. M., & Quandt, R. D. Micro Economic Theory – A Mathematical Approach. McGraw Hill. (CTB)
- Hoy, M., Livernois, J., McKenna, C., Rees, R., & Stengos, T. Mathematics for Economics. Prentice Hall.
- Mukherjee, B., & Pandit, V. Mathematical Methods for Economic Analysis. Allied.
- Silberberg, E. The Structure of Economics – A Mathematical Analysis. McGraw Hill. (CTB).
- Taha, H. A. Operations Research – An Introduction. Prentice Hall.
- Yamane, T. Mathematics for Economists – An Elementary Survey. Prentice Hall.
- Sydsæter, K., & Hammond, P. Mathematics for Economic Analysis. Pearson E. Asia, New Delhi. (CTB)

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

6.2.1 Assessment

- i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

- ii. *Summative Assessment*: 50 marks (Time: 2 hours)

Marks distribution as follows:

- a. Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.

- b. Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.

Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Mr. Phu Tshering Sherpa Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

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6.3 Course Description

Course Code	23ECNSEC101	
Course Title	Basic Computer Applications	
Credits	3	
Total Hours	60	
Hours per Week	4	
Course Type	Skill Enhancement Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Economics	
Regulation	2023	
Course Overview	This course: a. Covers introduction to computers. b. Discusses the storage devices. c. Introduces word processing. d. Discusses worksheets. e. Covers Presentation graphics. f. Covers application of computer applications in economics.	
Prerequisite	Students should possess proficiency in the English language and effective communication skills.	
Course Objectives	The objectives of the course are to: a. Introduce the concept of computers to the students. b. Enable students to understand storage devices. c. Provide the basics of word processing to the students. d. Provide the basics of spreadsheets to the students. e. Provide the knowledge of graphic presentation to the students. f. Enable students to apply computer applications in economics.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of the course, the student will be able to:		
COs	Statements	Cognitive Level Mapping
C01	Discuss the history, concepts and characteristics of computing systems	R,U
C02	Discuss storage devices	R,U
C03	Explain the techniques of operating on a MS Word worksheet	R,U,A1,A2,E
C04	Outline the steps in operating on MS Excel Work	R,U,A1,A2,E
C05	Create powerpoint presentations	R,U,A1,A2,C
C06	Apply computer applications in economics	R,U,A1,A2,C

Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Computer: a. History of development of Computers. b. Concepts of Computer System, Characteristics; Capabilities and limitations. c. Generations of Computers. d. Basic components of Computer System	5	C01	R U
Unit II	Storage Devices: a. Storage fundamentals; Primary vs Secondary. b. Data Storage and Retrieval methods. c. Sequential, Direct and Index Sequential and Various Storage Devices	5	C02	R U
Unit III	Word Processing - MS Word: a. Introduction to Word Processing. b. Introduction to MS Word: Features. c. Creating, Saving and Opening documents in Word, Interface, Toolbars, Ruler, Menus, Keyboard, Shortcut. d. Editing a Document, Selecting, Inserting, Deleting, Moving text. e. Previewing documents, printing documents, shrinking a document to fit a page. f. Formatting Documents: Paragraph formats, Aligning Text and Paragraph, Borders and Shading, Headers and Footers, Multiple Columns.	15	C03	R U A1 A2 E
Unit IV	Worksheet & MS Excel: a. Worksheet basics, creating worksheet, entering data into worksheet, heading information, data, text, dates, cell formatting values, saving & protecting worksheet. b. Working with single and multiple workbook – coping, renaming, moving, adding and deleting, coping entries and moving between workbooks, c. Working with formulas & cell referencing, Formatting of worksheet. Previewing & Printing worksheet, Graphs and charts, various charts type, formatting grid lines & legends, previewing & printing charts.	15	C04	R U A1 A2 E

Unit V	Presentation Graphics - MS Power Point a. Features and various versions, Creating presentation using Slide master and template in various colour scheme, b. Working with different views and menus of power point, Working with slides. c. Drawing and inserting objects using Clip Art's pictures and charts. d. Custom Animation, slide transition effects and other animation effects.	10	C05	R U A1 A2 C
Unit VI	Applications in Economics: a. Population census versus sample surveys. b. Random sampling, Frequency distribution and summary Statistics, Data entry. c. Mathematical Functions, Financial functions, Statistical Functions. d. Creating simple Line, Bar and Pie charts, Simple two variable regressions.	10	CO6	R U A1 A2 C
Learning Resources: • Rajaraman, V. (2014): Fundamental of Computer, Prentice Hall India Pvt. Limited, New Delhi. (CTB) • Dubey, Manoj (2013): P C Packages, Kamal Prakashan, Indore. • Mansoor, A. I. T. (2014): Tools and Applications, Pragya Publications, Matura. • Ash Narayan Sah (2012): Data Analysis Using Microsoft, Excel Books, India. (CTB)				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

6.3.1 Assessment

i. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. *Summative Assessment:* 50 marks

ii. i. Theory paper of 50 marks, scaled down to 25 marks.(Time: 2 hours)

a. Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.

b. Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.

c. Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$

ii. ii. Practical paper of 50 marks, scaled down to 25 marks. Marks distribution as follows:

a. Lab report: 10 marks b. Viva-voce: 10 marks c. Department/subject specific questions: 30 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Ms. Ashiya Thapa Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

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6.4. Course Description

Course Code	23ECNVAC101
Course Title	Economic Debate and Discussion
Credits	1
Total Hours	30
Hours per Week	2
Course Type	Skill Enhancement Course
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Economics
Regulation	2023
Course Overview	This course is designed to engage students in meaningful debates and discussions on various economic topics, enabling them to develop critical thinking skills and a deeper understanding of economic concepts. Through constructive debates and open dialogues, students will explore controversial issues, analyze multiple perspectives, and build their ability to formulate and defend informed opinions. This module aims to create a dynamic learning environment where students actively participate in analyzing real-world economic challenges and policy decisions.
Course Objectives	By the end of this course, students will: • Develop critical thinking skills by evaluating economic arguments, identifying logical fallacies, and analyzing complex economic issues from multiple viewpoints. • Deepen their understanding of fundamental economic concepts by applying them to realworld scenarios and debating their implications. • Improve their ability to communicate complex economic ideas persuasively and concisely in both written and verbal forms. • Enhance research skills through in-depth exploration of economic topics, data analysis, and evidence-based argumentation. • Cultivate an atmosphere of respectful and constructive debate, where differences in opinion are valued, and students learn to engage in civil discourse. • Cultivate an atmosphere of respectful and constructive debate, where differences in opinion are valued, and students learn to engage in civil discourse. • Apply economic principles to contemporary economic challenges and policy decisions, gaining practical insights into real-world economic issues. • Encourage independent thinking and the ability to question prevailing economic wisdom by examining the strengths and weaknesses of various economic theories and policies. • Develop a global perspective by exploring economic debates from international and cross-cultural angles, recognizing the interconnectedness of economies.

	• Synthesize knowledge gained throughout the module to critically evaluate the economic policies and decisions made by governments, organizations, and individuals.
Session 1: Introduction to economic debate. Importance of Economic Debates. Rules of constructive debates and respectful discourse. Session 2: Debate on economic systems – Capitalism vs Socialism vs mixed economies. Debate on importance of Government in an economy. Pros and cons of Economic systems. Session 3: Discussion on the causes and consequences of Income Inequality. Policy Debates on addressing Income Inequality. Discussion on role of taxation, minimum wages and wealth redistribution. Session 4: Debate on contemporary economic topics. Session 5: Debate on Economic Growth vs Environmental Sustainability. Debate on Sustainable Development. Session 6: Discussion on benefits and challenges of Globalisation. Debate on Free Trade vs Protectionism. Debate on the impacts of international trade on local industries and labour market. Session 7: Debate on Public vs Private healthcare systems. Debate on the current healthcare system in India. Session 8: Debate on contemporary economic topics. Session 9: Discussion on the role of education in economics development. Debate on Public vs Private education systems. Debate on the present education system in India. Session 10: Discussion on the minimum wage and labour market challenges in India. Discussion on the history of the plantation labour systems in the tea gardens in North Bengal. Discussions on contemporary challenges faced by the tea garden labours in the North Bengal region. Session 11: Debate on the impact of automation on employment. Debate on the role of technology on economics Development. Session 12: Debate on contemporary economic topics. Session 13: Discussion on Sustainable tourism. Debate on the impact of tourism in the North Bengal region. Urban tourism vs rural tourism. Session 14: Debate on emerging economic issues like climate change. Student-led debate on pressing economic topics. Reflection and takeaways. Session 15: Final discussion and feedback.	

6.4.1 Assessment

The course carries 25 marks. The evaluation will be done continuously by the course instructor based on the individual performance and participation of the students in each session. A final score will be tabulated and assigned by the end of the course bases on the evaluators observation through it.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Mr. Bickey Sharma Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:

(Seal)

(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

6.5. Course Description

Course Code	23ECNMAJ103	
Course Title	Introductory Macroeconomics	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Economics	
Regulation	2023	
Course Overview	This course: a. Introducesmacroeconomics b. ExplainsNational IncomeAccounting c. Discussetheclassicaltheoryofmacroeconomics d. Explainsthefundamentals oftheKeynesiantheoryofincomeandemployment	
Prerequisite	Students should have understanding of English language	
Course Objectives	The objectives of the course are to: i. Enable students to define macroeconomics, understand its nature and to differentiate it from microeconomics. ii. Provide the students with the concept of national income accounting. iii. Provide the students with the understanding of the classical theory of macroeconomics. iv. Introduce and explain to the students the Keynesian theory of macroeconomics. v. Provide the students with the concept of the Keynesian Multiplier.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	DefineMacroeconomics and Differentiate it from Microeconomics.	R
CO2	DiscusstheconceptsofNational Income Accounting.	U
CO3	Explainthe Classical Theory of Income and Employment.	A1
CO4	Demonstrate deep understanding of the Simple Keynesian Model.	A2
CO5	Discuss the Simple Keynesian Multiplier	E
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Macroeconomics: a. Nature of Macroeconomics b. Scope and Importance of Macroeconomics c. Difference between microeconomics and macroeconomic.	6	CO1	R U
Unit II	National Income Accounting: a. Definitions of National Income, Concepts of GNI, GDP, GNP, NDP, NNP and NNP at factor cost and at market price, three methods of GNP b. Methods of measuring National Income, c. Difficulties in the measurement of National Income d. Price indices: CPI, WPI and GDP deflator, e. Nominal GNP and real GNP f. Saving-Investment gap and its relation with budget deficit and trade surplus. g. National income as a measure of welfare.	15	CO2	R U A1 A2
Unit III	The Classical Theory: a. Basic ideas of Classical Macroeconomics b. Say's Law c. Quantity Theory of Money, Loanable fund theory d. The Classical Theory of Income and Employment determination e. Full Employment and wage-price flexibility f. Classical Dichotomy and Neutrality of Money.	10	CO3	R U A1 A2 E
Unit IV	The Simple Keynesian Model (SKM) in a Closed Economy: a. The Simple Keynesian Model (SKM) in a Closed Economy without Government b. The Keynesian Consumption Function c. The Keynesian Saving Function d. Income determination in SKM e. Stability of equilibrium f. The concept of effective demand- the concept of demand-determined output.	15	CO4	R U A1 A2 E
Unit V	Multiplier: a. The Simple Keynesian Multiplier b. Static vs. dynamic multiplier c. The paradox of thrift d. The SKM in a Closed Economy with	14	CO5	R U A1 A2 E

	Government; government expenditure and tax e. The government expenditure multiplier and the tax rate multiplier f. The balanced budget multiplier g. The budget surplus h. Effects of tax changes and government purchases on budget surplus i. The full employment budget			
Learning Resources: - Ahuja, H. L. (2010). Modern Economics. S. Chand and Co. Ltd. - Ackley, (CTB). Macroeconomic Theory and Policy, 2nd Edition. - D'Souza, E. (2009). Macroeconomics. Pearson Education. - Mankiw, N. Gregory. (2010). Macroeconomics, 7th Edition. Worth Publishers. - Blanchard, Olivier. (2009). Macroeconomics, 5th Edition. Pearson Education, Inc. - Dornbusch, R., & Fischer, S. (CTB). Macroeconomics, 4th Edition. McGraw Hill. - Froyen, Richard T. (2005). Macroeconomics, 2nd Edition. Pearson Education Asia. - Sikdar, S. (CTB). Principles of Macroeconomics. Oxford University Press. - Branson, W. H. (2nd Edition). Macroeconomic Theory and Policy. All India Traveler Bookseller. - Pal, Tapas Kr. (2018). Macroeconomics-Theory & Policy. Platinum Publisher, Kolkata.				

6.5.1 Assessment

- Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment:* 50 marks (Time: 2 hours)

Marks distribution as follows:

- Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.
- Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
- Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Mr. Bickey Sharma Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

(College round seal in all pages)

6.6. Course Description

Course Code	23ECNMAJ104	
Course Title	Mathematical Economics - II	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Economics	
Regulation	2023	
Course Overview	This course: a. Covers and explores the concepts of difference equations. b. Explores the concepts of differential equations. c. Covers theory of games.	
Prerequisite	Students need to have had studied either mathematics or business mathematics and business economics in class 12.	
Course Objectives	The objectives of the course are to: i. Provide the students with the concept of first order differential equations and enable them to apply the same in economics. ii. Provide the students with the concept of second order differential equations and enable them to apply the same in economics. iii. Provide the students with the understanding of first order difference equations and enable them to apply the same in economics. iv. Provide the students with the understanding of second order difference equations and enable them to apply the same in economics. v. To provide the students with the understanding of the theory of games.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Demonstrate understanding of Differential Equations and apply it in Economics.	R
CO2	Explain the concept of second order differentials and apply it in economics.	U & AI
CO3	Solve problems involving first order difference equations and apply it in economics.	A2
CO4	Solve problems involving second order difference equations and apply it in	E

	economics.			
CO5	Explain the theory of games, solve problems involving games and apply the theory of games in economics.	R		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Differential Equations: a. Definition of Differential Equation, Definition of First Order and Solution of First Order Differential Equations. b. <i>Applications in Economics:</i> Time Path of Price and Quantity in Comparative Markets, Time Path of Income in Simple Keynesian Model, Stability Model, Time Path of Inflation and Unemployment Rates, Harrod- Domar and Solow Growth Model.	10	CO1	R U A1 A2 E
Unit II	a. Definition of Second Order Differential Equation. b. Solution of Second Order Differential Equations and its applications in economics.	10	CO2	R U A1 A2
Unit III	Difference Equations: a. Definition of Difference Equation, Solution of Difference Equations, First Order Difference Equations. b. <i>Applications in Economics:</i> the Cobweb Model, the Dynamic Multiplier, Nature of the Time Path – A Graphical Analysis, Interpretation of the Time Path	10	CO3	R U A1 A2 E
Unit IV	a. Definition of Second order Difference Equation, Solution of Second order Difference Equations. b. Applications in Economics: The Multiplier Accelerator Interaction Model, Inflation and Unemployment in Discrete Case.	10	CO4	R U A1 A2 E
Unit V	Theory of Games: a. Introduction and Definition. b. Structure of Game, Pay-off Matrix, Two-Person Zero Sum Game, Non-Zero Sum Game. c. The Maximin and Minimax Principle, Games with an without Saddle Points.	20	CO5	R U A1 A2 E

	d. Dominance Property, Pure and Mixed Strategy, Graphical Solution of (2XN) and (MX2) Games.			
Learning Resources: • Allen, R. G. D. Mathematical Analysis for Economics. Macmillan. • Archibald, & Lipsey. An Introduction to the Mathematical Treatment of Economics. AITBS. • Bailey, D. Mathematics in Economics. McGraw Hill. • Baumol, W. J. Operations Research – An Introduction. Prentice Hall. • Chiang, A. C., & Wainwright, K. Fundamental Methods of Mathematical Economics. McGraw Hill. (CTB) • Dorfman, R. P., Samuelson, P. A., & Solow, R. M. Linear Programming and Economics Analysis. McGraw Hill. • Geoff, Renshaw. Maths for Economics. OUP. • Henderson, J. M., & Quandt, R. D. Micro Economic Theory – A Mathematical Approach. McGraw Hill. (CTB) • Hoy, M., Livernois, J., McKenna, C., Rees, R., & Stengos, T. Mathematics for Economics. Prentice Hall. • Mukherjee, B., & Pandit, V. Mathematical Methods for Economic Analysis. Allied. • Silberberg, E. The Structure of Economics – A Mathematical Analysis. McGraw Hill. (CTB). • Taha, H. A. Operations Research – An Introduction. Prentice Hall. • Yamane, T. Mathematics for Economists – An Elementary Survey. Prentice Hall. • Sydsæter, K., & Hammond, P. Mathematics for Economic Analysis. Pearson E. Asia, New Delhi. (CTB)				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

6.6.1 Assessment

- i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment*: 50 marks (Time: 2 hours)

Marks distribution as follows:

- a. Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.
- b. Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
- c. Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Mr. Phu Tshering Sherpa Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

6.7. Course Description

Course Code	23ECNSEC102	
Course Title	Travel and Tourism	
Credits	2	
Total Hours	45	
Hours per Week		
Course Type	Skill Enhancement Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Economics	
Regulation	2023	
Course Overview	This course: a. Covers introduction of tourism. b. Discusses the measurement of Tourism. c. Covers Cultural Heritages in India. d. Discusses special interest tourism. e. Discusses tourism in North Bengal	
Prerequisite	Students should possess proficiency in the English language and effective communication skills.	
Course Objectives	The objectives of the course are to: a. To introduce the concept tourism to the students. b. To enable students explain the measurement of tourism. c. To enable students to discuss the cultural heritage in India. d. To provide students with the concept of special interest tourism. e. To enable students to discuss the tourism in North Benga.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Discuss tourism	R,U
CO2	Explain the concept of measurement of tourism	R,U,A1,A2
CO3	Discuss the cultural heritage of India	R,U,A1,A2,E
CO4	Explain special interest tourism	R,U,A1,A2,E
CO5	Critically analyse the tourism in North Bengal	R,U,A1,A2,E

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Definition of Tourism: a. Definition of tourism, tourist, distinction between tourist and excursionist. b. Nature and scope of tourism management; functions of tourism management c. Historical development of tourism; Types of tourism, Forms of Tourism; Domestic tourism; International tourism; d. Tourism principle; Factors affecting the growth of tourism in India.	8	C01	R U
Unit II	Measurement of Tourism: a. Components of tourism, Tourism motivations, Tourism importance; b. Application of economics in tourism; c. Determinants of tourism demand and tourism supply; tourism demand forecasting and tourism supply forecasting; d. Employment and Income creation.	10	C02	R U A1 A2
Unit III	Cultural Heritage of India: a. Archaeological sites of India, Monuments; Forts; Palaces, Historical importance building. b. UNESCO and World heritage sites in India: Religious sites in India. c. Pilgrimage tourism and its significance in tourism. Handicrafts in tourism: Fairs and festivals in India and its importance in tourism. .	10	C03	R U A1 A2 E
Unit IV	Special Interest Tourism: a. Tourism market; Health tourism, Ecotourism, Village tourism, Sustainable tourism; b. National parks; Wildlife & bird sanctuaries in India;	10	C04	R U A1 A2 E

	c. Desert tourism; Mountain tourism; Beach tourism. d. Positive and Negative Impacts of Tourism; Socio cultural impact; Economic impact; Environmental and Ethnographical Impact.			
Unit V	Tourism North Bengal: a. Important tourism sites in W.B. Darjeeling and Dooars. b. Role of ecotourism in North Bengal	7	C05	R U A1 A2 E
Learning Resources: - Sinha, P.C. (Ed.) Tourism Management (Vol. 4). [Include any additional information about the edition, if applicable, e.g., (2nd ed.)] CTB. - Mill, J., & Morrison, A. Tourism Systems. - Gartner, R. (Ed.). Tourism Development. [Include any additional information about the edition, if applicable, e.g., (3rd ed.)] CTB. - Cooper, C., Fletcher, J., Gilbert, D., & Wanhill, S. Tourism: Principles and Practices. - World Tourism Organization (WTO). Sustainable Tourism Development, Guide for Local Planners. - Gupta, S.P., Lal, K., & Bhattacharya, M. Cultural Tourism in India. CTB. - Lumsdon, L. Tourism Marketing. - Holloway, J. C., & Robinson, C. Marketing for Tourism. - Kotler, P. Marketing Management Analysis, Planning and Control. PHI. - Kotler, P., & Armstrong, G. Principles of Marketing. PHI. - Stanton, W. J. Fundamentals of Marketing. McGraw Hill. - Bhattacharya, K. Sisir. Marketing Management. National Publishing House.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

6.7.1 Assessment

- i. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment:* 50 marks
 - ii. i Theory paper of 50 marks, scaled down to 25 marks. (Time: 2 hours)
 - a. Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.
 - b. Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - c. Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$

- ii. ii. Project work of 50 marks, scaled down to 25 marks. Marks distribution as follows:
 a. Project report: 10 marks b. Viva-voce: 10 marks c. Department/subject specific questions: 30 marks.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Ms. Ashiya Thapa Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

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6.8. Course Description

Course Code	23ECNMN101			
Course Title	Microeconomics			
Credits	4			
Total Hours	60			
Hours per Week	4			
Course Type	Minor			
Semester	I			
Intended Level	Certificate			
Issue(s) Addressed				
Course Offered to	Other than Economics Major			
Regulation	2023			
Course Overview	This course: a. Introduces economics b. Discusses the concepts of Demand and supply c. Covers the theory of Consumers Behaviour d. Covers the theory of producers Behaviour			
Prerequisite	Students should possess proficiency in the English language and effective communication skills.			
Course Objectives (total 5)	A student will be able to: i. Provide the students with the fundamentals of demand analysis. ii. Provide the students with the understanding of utility and consumption. iii. Enable students to understand the theory of production. iv. Enable students to understand the theory of cost. v. Enable students to understand the different types of market structures.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Explain the fundamentals of Demand theory.	R		
CO2	Discuss the concepts of utility and consumption.	U		
CO3	Discuss the theory of Production.	A1		
CO4	Display the understanding of the theory of cost.	A2		
CO5	Discuss the different types of market structure.	E		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Demand Analysis: a. Definition of Demand b. Determinants of Demand, Demand Curve and Demand Function, Law of Demand. c. Measurement of Own price	15		R U

	elasticity of Demand, Cross price elasticity of Demand and Income elasticity of Demand. d. Factors determining Elasticity of Demand.			
Unit II	Consumption and Utility: a. Definition of Total Utility (TU) and Marginal Utility (MU), Relationship between TU and MU, b. Law of Diminishing Marginal Utility, c. Condition of Equilibrium of the Consumer. d. Indifference Curve Analysis: Definition and Characteristics of Indifference Curve (IC). e. Marginal Rate of Substitution (MRS), Budget Line, Consumer's Equilibrium, f. Price Effect, Income Effect, Substitution Effect, Consumer Surplus.	15	CO2	R U A1 A2
Unit III	Theory of Production: a. Definition of Production Function. b. Definition of Total Product (TP), Average Product (AP) and Marginal Product (MP), c. Derivation of AP and MP from TP Curve. d. Law of Variable Proportions, Producer's equilibrium, Expansion Path, Laws of Returns to Scale.	10	CO3	R U A1 A2 E
Unit IV	Theory of cost: a. Fixed Cost and Variable Cost, Average Cost and Marginal Cost, Shape of Cost Curves, Relation between Average Cost and Marginal Cost. b. Definitions of Total Revenue (TR), Average Revenue (AR) and Marginal Revenue (MR) and relationship among AR, MR and Price Elasticity of Demand.	10	CO4	R U A1 A2 E
Unit V	Perfect and Imperfect Competition: a. Classifications of Markets, Characteristics of Perfect Competition, Short-run and Long-run Equilibrium of the Firm, Short run Supply Curve of the Firm, Price Determination in a Perfectly Competitive Market.	10		R U A1 A2 E

	b. Monopoly: Characteristics, Price and Output Determination in Monopoly, Basic Concepts of Price Discrimination. c. Characteristics of Monopolistic Competition, Oligopoly and Duopoly markets.			
Learning Resources: - Ahuja, H.L. (2010): Modern Economics, S. Chand and Co. Ltd. - Ferguson and Gould (2001): Microeconomic Theory, published by All India Traveller Book Seller. - Joseph E. Stiglitz and Carl E. Walsh (2007): Economics, W.W. Norton & Company, Inc., New York, International Student Edition, 4th Edition. - Karl E. Case and Ray C. Fair (2007): Principles of Economics, Pearson Education Inc., 8th Edition. - Lipsey, R.G. (1963): An Introduction to positive Economics, Weidenfeld and Nicholson, London. N. Gregory Mankiw (2007): Economics: Principles and Applications, India edition by South Western, a part of Cengage Learning, Cengage Learning India Private Limited, 4th edition.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

6.8.1 Assessment

i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. *Summative Assessment*: 50 marks (Time: 2 hours)

Marks distribution as follows:

- Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.
- Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
- Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Mr. Bickey Sharma Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

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6.9. Course Description

Course Code	23ECNMDC101
Course Title	Microfinance
Credits	3
Total Hours	45
Hours per Week	3
Course Type	MDC
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	The students who haven't studied economics in their higher secondary level and do not have economics as their major or minor papers.
Regulation	2023
Course Overview	This course: a. Provides a comprehensive understanding of microfinance as a powerful tool for economic development. It explores the concept, history, and significance of microfinance in global and Indian contexts. Examine its impact on poverty alleviation and community development. b. Delves into the diverse microfinance models implemented in India, including Self-Help Groups (SHGs), the Grameen Model, ROSCA Model, Chit Funds, Village-Based Model, Intermediary Model, Cooperative Model, and Community Banking Model. c. Focuses on the intersection of financial inclusion and microfinance. Students will explore the relevance of financial inclusion for overall development, the importance of financial literacy, and the essential components of financial counselling d. Provides an in-depth examination of prominent financial inclusion schemes in India, including Pradhan Mantri Jan Dhan Yojana (PMJDY), Atal Pension Yojana (APY), Pradhan Mantri Mudra Yojana (PMMY), Sukanya Samridhi Yojana (SSY), and Pradhan Mantri Suraksha Yojana (PMSY).
Prerequisite	Students should possess proficiency in the English language and effective communication skills.
Course Objectives	A student will be able to: a. Understand the concept of microfinance and its role in fostering economic development.

	b. Understand the various microfinance models and their distinctive features. c. Emphasize the significance of financial inclusion in promoting economic development. d. Know the important financial inclusion schemes implemented by the Indian government.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Understand the fundamental principles and objectives of microfinance.	R		
CO2	Gain an in-depth understanding of multiple microfinance models and their operational mechanisms.	U		
CO3	Identify the key components of financial literacy and their role in enhancing financial access	A1 & A2		
CO4	Understand the objectives and features of major financial inclusion schemes in India.	E & C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	a. Microfinance as a tool for development, b. Evolution of microfinance in India, c. Microfinance products and services, d. Intermediation and Regulations of Microfinance, Microfinance, and Livelihood options.	9	CO1	R U A1 A2 E C
Unit II	a. Microfinance models in India: SHGs, Grameen Model, ROSCA model or Chit Funds. b. Village Based Model, Intermediary Model, Co-operative Model,	12	CO2	R U A1 A2 E C

	Community Banking Model. c. Differences Between SHG and JLG Model. d. Indian SHG: Problems and Issues. e. SHG-Bank Linkages programmed in India			
Unit III	a. Financial inclusion and rural credit: b. Rural credit– concept, need. c. Characteristics and sources of rural credit. d. Institutional and non-institutional rural credit–money lenders, cooperatives. Regional Rural Banks, Commercial Banks, NABARD	12	CO3	R U A1 A2 E C
Unit IV	a. Financial Inclusions Schemes in India: Pradhan Mantri Jan Dhan Yojana (PMJDY). b. Atal Pension Yojana (APY). c. Pradhan Mantri Mudra Yojana (PMMY). d. Sukanya Samridhi Yojana (SSY). e. Pradhan Mantri Suraksha Yojana (PMSY).	12	CO4	R U A1 A2 E C
Learning Resources • Bhaskaran, R. Microfinance: Perspectives and Operations. Macmillan Education. • Bhatnagar, A. Rural Microfinance and Microenterprise: Informal Revolution. Concept Publishing Company. • Carol Realini. Financial Inclusion at the Bottom of the Pyramid. FriesenPress. • Chakrabarty, K. C. Financial Inclusion and Banks: Issues and Perspectives. RBI Bulletin • Debadutta K. Panda. Understanding Microfinance. Wiley India. • Gangadharan, K. Financial Inclusion and Inclusive Growth: Scope and Dimension. Reference Press. • Indian Institute of Banking & Finance. Micro-Finance: Perspectives and Operations. Taxmann Publications.				

- Matthaus-Maier, I., & Von Pischke, J. D. Microfinance Investment Funds: Leveraging Private Capital for Economic Growth and Poverty Reduction. Springer.
- Karmakar, K. G., Banerjee, G. D., & Mohapatra, N. P. Towards Financial Inclusion in India.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

6.9.1. Assessment

ii. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College

iii. **Summative Assessment:** 50 marks (Time: 2 hours)

Marks distribution as follows:

- Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.
 - Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
- d. Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Mr. Palzor Dukpa Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Ms. Decha Kumari Signature:		

6.10. Course Description

Course Code	23ECNMDC102	
Course Title	Public economics and policy analysis	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	MDC	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	The students who haven’t studied economics in their higher secondary level and do not have economics as their major or minor papers.	
Regulation	2023	
Course Overview	This course: a. Introduces students to the principles of public economics and the analysis of government policies. b. Covers topics such as taxation, public spending, fiscal policies, public policy evaluation, and implementation. c. Provides students with a foundation for understanding how governments allocate resources and make policy decisions.	
Prerequisite	Students should possess proficiency in the English language and effective communication skills.	
Course Objectives	A student will be able to: a. Understand the scope and significance of public economics in the context of economics as a whole. b. Understand the tax system, revenue and policies. c. Know about the tax incidence, tax efficiency and resource allocation. d. Understand the public policy evaluation and implementation	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping

CO1	Define public economics and explain the role of government in market efficiency.	R		
CO2	Explain the different types of taxes and policies of the governments.	U		
CO3	Apply the principles of taxation and analyze their relevance in designing an efficient tax system	A1 & A2		
CO4	Evaluate economic rationalism behind public spending in areas such as education, healthcare, and infrastructure and suggest a effective measures of implication.	E & C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Public Economics a. Overview of public economics b. Role of government in the economy c. Market failures and public goods	9	CO1	R U A1 A2 E C
Unit II	Taxation, Public Revenue, and Fiscal Policies a. Types of taxes (income, sales, property, etc.) b. Tax incidence and efficiency c. Principles of taxation d. Fiscal policy tools and objectives	12	CO2	R U A1 A2 E C
Unit III	Public Spending and Resource Allocation a. Government expenditure categories b. Budgeting and resource allocation c. Public goods provision	12	CO3	R U A1 A2 E C
Unit IV	Public Policy Evaluation and Implementation a. Policy analysis and evaluation techniques	12	CO4	R U A1 A2

	b. Cost-benefit analysis c. Policy implementation challenges d. Case studies of policy success and failure			E C
Learning Resources: • Gruber, J. <i>Public Finance and Public Policy</i>. • Stiglitz, J. E., & Rosengard, J. K. <i>Public Economics</i> • Rosen, H. S., & Gayer, T. <i>Public Finance</i> • Pratt, J. W., & Kulsrud, W. N. <i>Taxation: Policy and Practice</i> • Hirsch, A. M. R. <i>Public Economics and the Quality of Life</i> • Tresch, R. W. <i>Public Finance</i>. • Weimer, D. L., & Vining, A. R. <i>Policy Analysis: Concepts and Practice</i> • Clark, S. G., & Elliott, R. J. R. <i>The Policy Process: A Practical Guide for Natural Resources Professionals</i>				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

6.10.1 Assessment

i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. *Summative Assessment*: 50 marks (Time: 2 hours)

Marks distribution as follows:

a. Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of RBT. $2 \times 5 = 10$.

b. Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.

a. Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Mr. Palzor Dukpa Signature:	Mr. Bickey Sharma Signature:	Mr. Subhajit Paul Signature:
	(Seal)	(Seal)

External Subject Expert	External Subject Expert	Industry Expert
Prof Jeta Sankrityayana Signature:	Dr. Shanti Chhetry Signature:	Mr. Swaraj Kumar Banerjee Signature:
Alumni		
Signature:		

Proposed Syllabus

For

B.Sc. (Honours) in Computer Science

Submitted

To



ENLIGHTENMENT TO PERFECTION

University of North Bengal

(Accredited by NAAC with grade A)

Under

Choice Based Credit System (CBCS)

[To be effect from the Session 2018-19]

Preamble

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. To enhance academic standards and quality in higher education, several significant measures i.e. innovation and improvements in curriculum, teaching-learning process, and examination and evaluation systems has been taken besides governance and other matters.

To improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India, the UGC has formulated various regulations and guidelines over the times. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. Introduction of uniform Choice Based Credit System (CBCS) by the UGC at Under Graduate (UG) level for different subjects recommended to be followed by the HEIs across the country is one of such significant step towards the goal. The HEIs must have the flexibility and freedom in designing the examination and evaluation methods that best fits the curriculum, syllabi and teaching-learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of learners. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the HEIs in the country. This creates difficulty for the academia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it has been followed in the top institutions in India and abroad. So it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines.

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CHOICE BASED CREDIT SYSTEM (CBCS):

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

Outline of Choice Based Credit System:

1. **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
2. **Elective Course:** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.
 - 2.1. **Discipline Specific Elective (DSE) Course:** Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).
 - 2.2. **Project/Dissertation:** An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work. A candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project. Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 6 credits. A Project/Dissertation work may be given in lieu of a discipline specific elective paper.
 - 2.3. **Generic Elective (GE) Course:** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is called a Generic Elective.
P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.
3. **Ability Enhancement Courses (AE)/ Ability Enhancement Courses Compulsory (AEC)/ Ability Enhancement Courses Elective- Skill Development Courses (SEC):** The Ability Enhancement (AE) Courses may be of two kinds: AE Compulsory Course (AEC) and AE Elective-Skill Based Course (SEC). "AEC" courses are the courses based upon the content that leads to Knowledge enhancement. They ((i) Environmental Science, (ii) English/MIL Communication) are mandatory for all disciplines. AEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.
 - 3.1. **AE Compulsory Course (AEC):** Environmental Science, English Communication/MIL Communication.
 - 3.2. **AE Elective Course- Skill Development (SEC):** These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based instruction.

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Details of courses under B.Sc.(Honors) in Computer Science				
Course Type	Course Category	Theory/Practical/Tutorial	*Credits	
			Theory+ Practical	Theory + Tutorial
1. Core Course (CC)	1.1 Core Course (CC)	CC Theory (14 Papers)	14X4= 56	14X5=70
		CC Practical / Tutorial* (14 Papers)	14X2=28	14X1=14
2. Elective Course	2.1 Discipline Specific Elective(DSE)	DSE Theory(4 Papers)	4X4=16	4X5=20
		DSE Practical / Tutorial*(4 Papers) (*Optional Dissertation or project work in place of one Discipline Specific Elective paper (6 credits) in 6 th Semester)	4 X 2=8	4X1=4
	2.2 Generic Elective/ Interdisciplinary (GE)	GE Theory(4 Papers)	4X4=16	4X5=20
		GE Practical / Tutorial*(4 Papers)	4 X 2=8	4X1=4
3. Ability Enhancement Courses (AECC)	3.1 Ability Enhancement Compulsory (AEC)	AEC (2 Papers)	2 X 2=4	2 X 2=4
	3.2 Ability Enhancement Elective - Skill Based (SEC)	SEC (Minimum 2 Papers)	2 X 2=4	2 X 2=4
Total credit			140	140
- Institute should evolve a system/policy about ECA/ General Interest/Hobby/Sports/NCC/NSS/ related courses on its own. *Wherever there is a practical there will be no tutorial and vice-versa				

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PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN B. Sc. Honours (Computer Science)					
Semester	Core Course (CC) (14 Pairs: Theory and Lab/Tutorial)	Discipline Specific Elective(DSE) (4 Pairs)	Generic Elective/ Interdisciplinary (GE) (4 Pairs)	Ability Enhancement Elective- Skill Based (SEC) (1 Pair)	Ability Enhancement Compulsory (AEC) (1 Pair)
I	Programming Fundamentals using C/C++		GE-1		Environmental Science
	Computer System Architecture				
II	Programming in JAVA		GE-2		English/MIL Communication
	Discrete Structures				
III	Data Structures		GE-3	SEC - 1	
	Operating Systems				
	Computer Networks				
IV	Design and Analysis of Algorithms		GE-4	SEC - 2	
	Software Engineering				
	Database Management Systems				
V	Internet Technologies	DSE - 1			
	Theory of Computation	DSE - 2			
VI	Artificial Intelligence	DSE - 3			
	Computer Graphics	DSE - 4			

Proposed paper with examination pattern for B.Sc. (H) in Computer Science							
Semester	Paper Code	Paper Title	Credit	Ins. Hrs /week	Examination Scheme and Marks Distribution		
					Term End Examination	Continuous Evaluation (Attendance: 5, Others: 20)	Total
I	AEC 11	Environmental Science	2	2	75	25	100
	CC 12	Programming Fundamentals using C/C++	4	4	75	25	100
	CC 13	Computer System Architecture	4	4	75	25	100
	GE 14	Step1: Choose only ONE discipline of interest for the entire 3-year program from the followings in consultation with the concerned college authority and faculty members: 1. Mathematics 2. Statistics 3. Operational Research 4. Physics 5. Electronics 6. Commerce 7. Economics Step 2: Then, for GE 14 , select one paper from the chosen discipline and follow the respective syllabus.	4/5	4/5	75	25	100
	CC 12L	Programming Fundamentals using C/C++ Lab	2	4	50	25	75
	CC 13L	Computer System Architecture Lab	2	4	50	25	75
	GE 14TL	GE 14TL is the corresponding Lab/Tutorial to the paper selected for GE 14.	2/1	4/2	50	25	75
	End Semester		20				625
II	AEC 21	English/MIL Communication	2	2	75	25	100
	CC 22	Programming in JAVA	4	4	75	25	100
	CC 23	Discrete Structures	5	5	75	25	100
	GE 24	For GE 24 , select another distinct paper from the previously chosen discipline during paper GE 14 and follow the respective syllabus.	4/5	4/5	75	25	100
	CC 22L	Programming in JAVA Lab	2	4	50	25	75
	CC 23T	Discrete Structure Tutorial	1	2	50	25	75
	GE 24TL	GE 24TL is the corresponding Lab/Tutorial to the paper selected for GE 24.	2/1	4/2	50	25	75
	End Semester		20				625
III	CC 31	Data Structures	4	4	75	25	100
	CC 32	Operating Systems	4	4	75	25	100
	CC 33	Computer Networks	4	4	75	25	100
	GE 34	For GE 34 , select another distinct paper from the previously chosen discipline during paper GE 14 and follow the respective syllabus.	4/5	4/5	75	25	100
	CC 31L	Data StructureLab	2	4	50	25	75
	CC 32L	Operating Systems Lab	2	4	50	25	75
	CC 33L	Computer Networks Lab	2	4	50	25	75
	GE 34TL	GE 34TL is the corresponding Lab/Tutorial to the paper selected for GE 34.	2/1	4/2	50	25	75
	SEC 35TL	Any ONE from the following list: • E1: Digital Electronics and System Maintenance	2	1T+2L	50	25	75

		E2: Website Design with HTML and PHP E3: Python Programming					
		End Semester	26				775
IV	CC 41	Design and Analysis of Algorithms	4	4	75	25	100
	CC 42	Software Engineering	4	4	75	25	100
	CC 43	Database Management Systems	4	4	75	25	100
	GE 44	For GE 44 , select another distinct paper from the previously chosen discipline during paper GE 14 and follow the respective syllabus.	4/5	4/5	75	25	100
	CC 41L	Design and Analysis of Algorithms Lab	2	4	50	25	75
	CC 42L	Software EngineeringLab	2	4	50	25	75
	CC 43L	Database Management Systems Lab	2	4	50	25	75
	GE 44TL	GE 44TL is the corresponding Lab/Tutorial to the paper selected for GE 44.	2/1	4/2	50	25	75
	SEC 45TL	Any ONE from the following list: E1: Android Programming E2: Programming in MATLAB E3: VB.NETProgramming	2	1T+2L	50	25	75
		End Semester	26				775
V	CC 51	Internet Technologies	4	4	75	25	100
	CC 52	Theory of Computation	5	5	75	25	100
	DSE 53	For DSE 53 , choose any ONE from the following E1: Microprocessor E2: Information Security E3: Modelling and Simulation	4	4	75	25	100
	DSE 54	For DSE 54 , choose any ONE from the following list: E1: Operational Research for Computer Science E2: Combinatorial Optimization E3: Numerical Methods	4	4	75	25	100
	CC 51L	Internet Technologies Lab	2	4	50	25	75
	CC 52T	Theory of Computation Tutorial	1	2	50	25	75
	DSE53L	Corresponding Lab of the paper chosen for DSE53: E1L: Microprocessor Lab E2L: Information Security Lab E3L: Modelling and SimulationLab	2	4	50	25	75
	DSE 54L	For DSE 54L , choose any ONE Lab from the list corresponding to selected for DSE 54 E1L: Operational Research for Computer Science Lab E2L: Combinatorial Optimization Lab E3L: Numerical Methods Lab	2	4	50	25	75
		End Semester	24				700
VI	CC 61	Artificial Intelligence	4	4	75	25	100
	CC 62	Computer Graphics	4	4	75	25	100
	DSE 63	For DSE 63 , choose any one from the list (E1-E4) E1: Digital Image Processing E2: Introduction to Data Sciences E3: Data Mining	4	4	75	25	100
	CC 61L	Artificial Intelligence Lab	2	4	50	25	75
	CC 62L	Computer Graphics Lab	2	4	50	25	75
	DSE 63L	For DSE 63L , choose any ONE Lab from the list corresponding to selected for DSE 63 E1L: Digital Image Processing Lab E2L: Introduction to Data Sciences Lab E3L: Data Mining Lab	2	4	50	25	75

	(DSE 64 and DSE 64TL) OR DSE 64P	DSE 64	For DSE 64 , choose any one from the list (E1-E3) • E1: Machine Learning • E2: System Programming • E3: Cloud Computing	4	4	75	25	100	
		AND							
		DSE 64L	For DSE 64L , choose any ONE Lab from the list corresponding to selected for DSE 64 • E1L: Machine Learning Lab • E2L: System Programming Lab • E3L: Cloud Computing Lab	2	4	50	25	75	
		OR							
		DSE 64P	Project	6	8	125	50	175	
		End Semester			24				700
		Total Course Credit			140				4200
Abbreviations		T: Theory, L: Laboratory, CC: Core Course, DSE: Discipline Specific Elective, GE: Generic Elective, TL: Theory and Lab, AEC: Ability Enhancement Compulsory, SEC: Skill Enhancement Compulsory, PJT: Project							
Mark Distribution and Nature of Continuous Evaluation		Marks (25) Distribution • 5 Marks shall be allocated for Attendance • 20 Marks Internal Evaluation through • For Theory Papers: Multiple Class Tests • For Lab Papers: Multiple Assignments							
Note		• Each Lecture/Lab to be assume of 1 hour duration							

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AEC 11: Environmental Science

[Credits: 2, Lectures: 50]

Unit 1: Introduction to environmental studies (2 lectures)

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

Unit 2: Ecosystems (6 Lectures)

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems :
 - a) Forest ecosystem
 - b) Grassland ecosystem
 - c) Desert ecosystem
 - d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 3: Natural Resources: Renewable and Non-renewable Resources (8 Lectures)

- Land resources and land use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and Conservation (8 Lectures)

- Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots
- India as a mega-biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 5: Environmental Pollution (8 Lectures)

- Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste.
- Pollution case studies.

Unit 6: Environmental Policies & Practices (7 Lectures)

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment (6 Lectures)

- Human population growth: Impacts on environment, human health and welfare.
- Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management: floods, earthquake, cyclones and landslides.
- Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Unit 8: Field work (Equivalent to 5 Lectures)

- Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
- Visit to a local polluted site---Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems---pond, river, Delhi Ridge, etc.

Suggested Readings:

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36--37.
7. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29--64). Zed Books.
8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
19. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
20. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press.

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CC 12: Programming Fundamentals using C/C++

[Credits: 4, Lectures: 60]

Unit 1: Introduction to C and C++ (3 Lectures)

History of C and C++, Overview of Procedural Programming and Object-Orientation Programming, Using main() function, Compiling and Executing Simple Programs in C++.

Unit 2: Data Types, Variables, Constants, Operators and Basic I/O (5 Lectures)

Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putchar), Formatted and Console I/O (printf(), scanf(), cin, cout), Using Basic Header Files (stdio.h, iostream.h, conio.h).

Unit 3: Expressions, Conditional Statements and Iterative Statements (5 Lectures)

Simple Expressions in C++ (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)

Unit 4: Functions and Arrays (10 Lectures)

Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments.

Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two-dimensional Arrays (Declaring, Defining and Initializing Two Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays

Unit 5: Derived Data Types (Structures and Unions) (3 Lectures)

Understanding utility of structures and unions, Declaring, initializing and using simple structures and unions, Manipulating individual members of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures from functions, Structure with union as members, Union with structures as members.

Unit 6: Pointers and References in C++ (7 Lectures)

Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with Pointers, Passing pointers as function arguments, Returning a pointer from a function, using arrays as pointers, Passing arrays to functions. Pointers vs. References, Declaring and initializing references, Using references as function arguments and function return values

Unit 7: Memory Allocation in C++ (3 Lectures)

Differentiating between static and dynamic memory allocation, use of malloc, calloc and free functions, use of new and delete operators, storage of variables in static and dynamic memory allocation

Unit 8: File I/O, Preprocessor Directives (4 Lectures)

Opening and closing a file (use of fstream header file, ifstream, ofstream and fstream classes), Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files, Understanding the Preprocessor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros

Unit 9: Using Classes in C++ (7 Lectures)

Principles of Object-Oriented Programming, Defining & Using Classes, Class Constructors, Constructor Overloading, Function overloading in classes, Class Variables & Functions, Objects as parameters, Specifying the Protected and Private Access, Copy Constructors, Overview of Template classes and their use.

Unit 10: Overview of Function Overloading and Operator Overloading (5 Lectures)

Need of Overloading functions and operators, Overloading functions by number and type of arguments, looking at an operator as a function call, Overloading Operators (including assignment operators, unary operators)

Unit 11: Inheritance, Polymorphism and Exception Handling (8 Lectures)

Introduction to Inheritance (Multi-Level Inheritance, Multiple Inheritance), Polymorphism (Virtual Functions, Pure Virtual Functions), Basics Exceptional Handling (using catch and throw, multiple catch statements), Catching all exceptions, Restricting exceptions, Rethrowing exceptions.

Suggested Readings:

1. HerbtzSchildt, "C++: The Complete Reference", Fourth Edition, McGraw Hill.2003
2. BjarneStroustrup, "The C++ Programming Language", 4th Edition, Addison-Wesley , 2013.
3. BjarneStroustrup, "Programming -- Principles and Practice using C++", 2nd Edition, Addison-Wesley 2014.
4. E Balaguruswamy, "Object Oriented Programming with C++", Tata McGraw-Hill Education, 2008.
5. Paul Deitel, Harvey Deitel, "C++ How to Program", 8th Edition, Prentice Hall, 2011.
6. John R. Hubbard, "Programming with C++", Schaum's Series, 2nd Edition, 2000.
7. Andrew Koeni, Barbara, E. Moo, "Accelerated C++", Published by Addison-Wesley , 2000.
8. Scott Meyers, "Effective C++", 3rd Edition, Published by Addison-Wesley, 2005.
9. Harry, H. Chaudhary, "Head First C++ Programming: The Definitive Beginner's Guide", First Create space Inc, O-D Publishing, LLC USA.2014
10. Walter Savitch, "Problem Solving with C++", Pearson Education, 2007.
11. Stanley B. Lippman, JoseeLajoie, Barbara E. Moo, "C++ Primer", Published by Addison-Wesley, 5th Edition, 2012

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Unit 1: Introduction (8 lectures)

Logic gates, boolean algebra, combinational circuits, circuit simplification, flip-flops and sequential circuits, decoders, multiplexers, registers, counters and memory units.

Unit 2: Data Representation and Basic Computer Arithmetic (10 lectures)

Number systems, complements, fixed and floating point representation, character representation, addition, subtraction, magnitude comparison, multiplication and division algorithms for integers

Unit 3: Basic Computer Organization and Design (13 lectures)

Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt, Interconnection Structures, Bus Interconnection design of basic computer.

Unit 4: Central Processing Unit (15 lectures)

Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control. Instruction formats, addressing modes, instruction codes, machine language, assembly language, input output programming, RISC, CISC architectures, pipelining and parallel architecture.

Unit 5: Memory Organization (6 lectures)

Cache memory, Associative memory, mapping.

Unit 6: Input-Output Organization (8 lectures)

Input / Output: External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, I/O Channels.

Suggested Readings:

1. M. Mano, Computer System Architecture, Pearson Education 1992
2. A. J. Dos Reis, Assembly Language and Computer Architecture using C++ and JAVA, Course Technology, 2004
3. W. Stallings, Computer Organization and Architecture Designing for Performance, 8th Edition, Prentice Hall of India, 2009
4. M.M. Mano, Digital Design, Pearson Education Asia, 2013
5. Carl Hamacher, Computer Organization, Fifth edition, McGrawHill, 2012.

[Top ^](#)**GE 14: General Elective - 1****[Theory: 60 Lectures]**

Step1: Choose only ONE discipline of interest for the entire 3-year program in consultation with the college authority and teacher(s) from the following:

1. Mathematics
2. Statistics
3. Operational Research
4. Physics
5. Electronics
6. Commerce
7. Economics

Step 2: Then, for GE 14, select one paper from the chosen discipline and follow the syllabus of the paper from the chosen discipline.

[Top ^](#)**CC 12L: Programming Fundamentals using C/C++ Lab****[Credit: 2, Lab Hours: 60]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the sum of the first n terms of the following series $S = 1 + 1/2 + 1/3 + 1/4 + \dots$
4. WAP to compute the sum of the first n terms of the following series $S = 1 - 2 + 3 - 4 + 5 - \dots$

5. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
6. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
7. WAP to compute the factors of a given number.
8. Write a macro that swaps two numbers. WAP to use it.
9. WAP to print a triangle of stars as follows (take number of lines from user):

```

      *
     ***
    *****
   ********
  *********
 
```

10. WAP to perform following actions on an array entered by the user:
 - a) Print the even-valued elements
 - b) Print the odd-valued elements
 - c) Calculate and print the sum and average of the elements of array
 - d) Print the maximum and minimum element of array
 - e) Remove the duplicates from the array
 - f) Print the array in reverse order

The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.

11. WAP that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
12. Write a program that swaps two numbers using pointers.
13. Write a program in which a function is passed address of two variables and then alter its contents.
14. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
15. Write a program to find sum of n elements entered by the user. To write this program, allocate memory dynamically using malloc() / calloc() functions or new operator.
16. Write a menu driven program to perform following operations on strings:
 - a) Show address of each character in string
 - b) Concatenate two strings without using strcat function.
 - c) Concatenate two strings using strcat function.
 - d) Compare two strings
 - e) Calculate length of the string (use pointers)
 - f) Convert all lowercase characters to uppercase
 - g) Convert all uppercase characters to lowercase
 - h) Calculate number of vowels
 - i) Reverse the string
17. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
18. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
19. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration
20. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
21. Create Matrix class using templates. Write a menu-driven program to perform following Matrix operations (2-D array implementation):
 - a) Sum b) Difference c) Product d) Transpose
22. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).
23. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.
24. Create a class Box containing length, breath and height. Include following methods in it:
 - a) Calculate surface Area
 - b) Calculate Volume
 - c) Increment, Overload ++ operator (both prefix & postfix)
 - d) Decrement, Overload -- operator (both prefix & postfix)

- e) Overload operator == (to check equality of two boxes), as a friend function
- f) Overload Assignment operator
- g) Check if it is a Cube or cuboid

Write a program which takes input from the user for length, breath and height to test the above class.

25. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.
26. Write a program to retrieve the student information from file created in previous question and print it in following format:

Roll No.	Name	Marks
27. Copy the contents of one text file to another file, after removing all whitespaces.
28. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void.
29. Write a program that will read 10 integers from user and store them in an array. Implement array using pointers. The program will print the array elements in ascending and descending order.

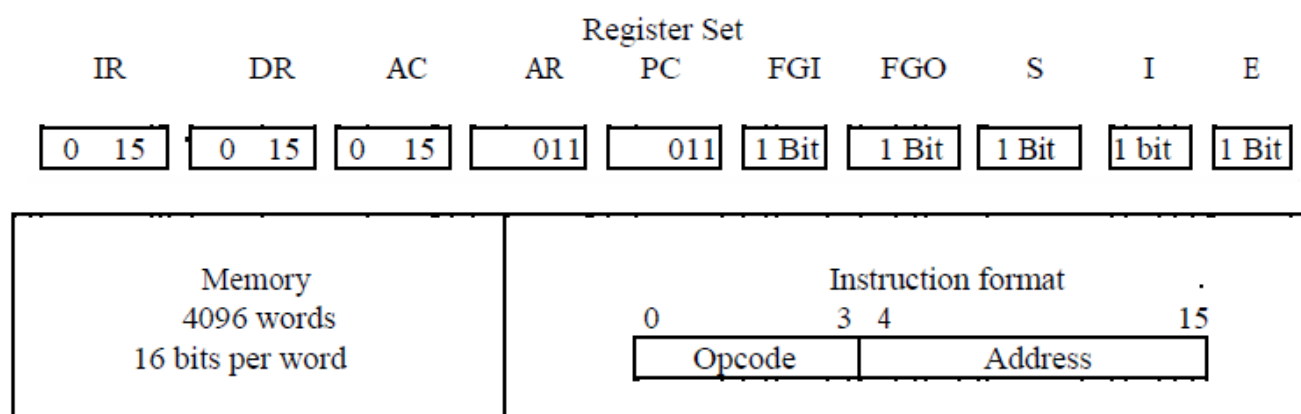
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CC 13L: Computer System Architecture Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Create a machine based on the following architecture:



Basic Computer Instructions

Memory Reference		Register Reference		Input-Output	
Symbol	Hex	Symbol	Hex	Symbol	Hex
AND	0xxx	Direct Addressing	CLA	INP	F80 0
ADD	2xxx		CLE	OUT	F40 0
LDA	4xxx		CMA	SKI	F20 0
STA	6xxx		CME	SKO	F10 0
BUN	8xxx		CIR	ION	F08 0
BSA	Axxx		CIL	IOF	F04 0
ISZ	Cxxx		INC		

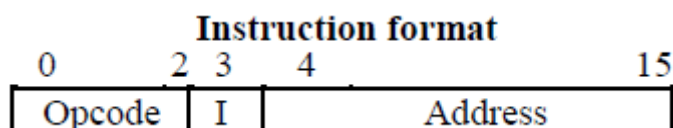
Optional

Basic Computer Instructions (Continued...)

Memory Reference		Register Reference		Input-Output	
Symbol	Hex	Symbol	Hex	Symbol	Hex
AND I	1xxx	Indirect Addressing	SPA	E010	
ADD I	3xxx		SNA	E008	
LDA I	5xxx		SZA	E004	
STA I	7xxx		SZE	E002	
BUN I	9xxx		HLT	E001	
BSA I	Bxxx				
ISZ I	Dxxx				

Optional

- Refer to Chapter-5 of Morris Mano for description of instructions.
- Create the micro operations and associate with instructions as given in the chapter (except interrupts). Design the register set, memory and the instruction set. Use this machine for the assignments of this section.
 - Create a Fetch routine of the instruction cycle.
 - Simulate the machine to determine the contents of AC, E, PC, AR and IR registers in hexadecimal after the execution of each of following register reference instructions: CLA
 - CLE
 - CMA
 - CME
 - CIR
 - CIL
 - INC
 - SPA
 - SNA
 - SZA
 - SZE
 - HLT
 - Initialize the contents of AC to $(A937)_{16}$, that of PC to $(022)_{16}$ and E to 1.
 - Simulate the machine for the following memory-reference instructions with I= 0 and address part = 082. The instruction to be stored at address 022 in RAM. Initialize the memory word at address 082 with the operand B8F2 and AC with A937. Determine the contents of AC, DR, PC, AR and IR in hexadecimal after the execution.
 - ADD
 - AND
 - LDA
 - STA
 - BUN
 - BSA
 - ISZ
 - Simulate the machine for the memory-reference instructions referred in above question with I= 1 and address part = 082. The instruction to be stored at address 026 in RAM. Initialize the memory word at address 082 with the value 298. Initialize the memory word at address 298 with operand B8F2 and AC with A937. Determine the contents of AC, DR, PC, AR and IR in hexadecimal after the execution.
 - Modify the machine created in Practical 1 according to the following instruction format:



- a. The instruction format contains a 3-bit op-code, a 1-bit addressing mode and a 12-bit address. There are only two addressing modes, I = 0 (direct addressing) and I = 1 (indirect addressing).
- b. Create a new register I of 1 bit.
- c. Create two new microinstructions as follows :
 - i. Check the op-code of instruction to determine type of instruction (Memory Reference/Register Reference/Input-Output) and then jump accordingly.
 - ii. Check the I bit to determine the addressing mode and then jump accordingly.

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GE 14TL: General Elective – I Tutorial or Lab

Tutorial or Lab corresponding to the chosen paper for GE 14. Thus follows the syllabus of the chosen discipline.

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----- End of Semester I-----

AEC 21: English/MIL Communication**[Credit: 2, Lecture Hours: 50]**

Preamble: The purpose of this course is to introduce students to the theory, fundamentals and tools of communication and to develop in them vital communication skills which should be integral to personal, social and professional interactions. One of the critical links among human beings and an important thread that binds society together is the ability to share thoughts, emotions and ideas through various means of communication: both verbal and non-verbal. In the context of rapid globalization and increasing recognition of social and cultural pluralities, the significance of clear and effective communication has substantially enhanced.

The present course hopes to address some of these aspects through an interactive mode of teaching-learning process and by focusing on various dimensions of communication skills. Some of these are:

Language of communication, various speaking skills such as personal communication, social interactions and communication in professional situations such as interviews, group discussions and office environments, important reading skills as well as writing skills such as report writing, notetaking etc.

While, to an extent, the art of communication is natural to all living beings, in today's world of complexities, it has also acquired some elements of science. It is hoped that after studying this course, students will find a difference in their personal and professional interactions.

The recommended readings given at the end are only suggestive; the students and teachers have the freedom to consult other materials on various units/topics given below. Similarly, the questions in the examination will be aimed towards assessing the skills learnt by the students rather than the textual content of the recommended books.

1. Introduction:

- Theory of Communication,
- Types and modes of Communication

2. Language of Communication:

- Verbal and Non-verbal (Spoken and Written)
- Personal, Social and Business
- Barriers and Strategies
- Intra-personal, Inter-personal and Group communication

3. Speaking Skills:

- Monologue
- Dialogue
- Group Discussion
- Effective Communication/ Miss- Communication
- Interview
- Public Speech

4. Reading and Understanding

- Close Reading
- Comprehension
- Summary Paraphrasing
- Analysis and Interpretation
- Translation(from Indian language to English and vice-versa)
- Literary/Knowledge Texts

5. Writing Skills

- Documenting
- Report Writing
- Making notes
- Letter writing

Suggested Readings:

1. *Fluency in English* - Part II, Oxford University Press, 2006.
2. *Business English*, Pearson, 2008.
3. *Language, Literature and Creativity*, Orient Blackswan, 2013.
4. *Language through Literature* (forthcoming) ed. Dr.Gauri Mishra, Dr RanjanaKaul, Dr BratiBiswas

Unit 1: Introduction to Java (4 Lectures)

Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods),

Unit 2: Arrays, Strings and I/O (8 Lectures)

Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.

Unit 3: Object-Oriented Programming Overview (4 Lectures)

Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

Unit 4: Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata (14 lectures)

Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

Unit 5: Exception Handling, Threading, Networking and Database Connectivity (15 Lectures)

Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

Unit 6: Applets and Event Handling (15 Lectures)

Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, textfields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Suggested Readings:

1. Ken Arnold, James Gosling, David Homes, "The Java Programming Language", 4th Edition, 2005.
2. James Gosling, Bill Joy, Guy L Steele Jr, Gilad Bracha, Alex Buckley "The Java Language Specification, Java SE 8 Edition (Java Series)", Published by Addison Wesley, 2014.
3. Joshua Bloch, "Effective Java" 2nd Edition, Publisher: Addison-Wesley, 2008.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1 ,9th Edition, Printice Hall.2012
5. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 2 - Advanced Features)", 9th Edition, Printice Hall.2013
6. Bruce Eckel, "Thinking in Java", 3rd Edition, PHI, 2002.
7. E. Balaguruswamy, "Programming with Java", 4th Edition, McGraw Hill.2009.
8. Paul Deitel, Harvey Deitel, "Java: How to Program", 10th Edition, Prentice Hall, 2011.
9. Bert Bates, Kathy Sierra, "Head First Java", Orielly Media Inc. 2nd Edition, 2005.
10. Object Oriented Programming through JAVA, P Radha Krishna, University Press
11. David J. Eck, "Introduction to Programming Using Java", Published by CreateSpace Independent Publishing Platform, 2009.
12. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2nd Edition, 2004.
13. R. Nageswara, Core Java: An Integrated Approach, Dreamtech Press

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Unit 1: Introduction: (15 Lectures)

Sets - finite and Infinite sets, uncountably Infinite Sets; functions, relations, Properties of Binary Relations, Closure, Partial Ordering Relations; counting - Pigeonhole Principle, Permutation and Combination; Mathematical Induction, Principle of Inclusion and Exclusion.

Unit 2: Growth of Functions: (8 Lectures)

Asymptotic Notations, Summation formulas and properties, Bounding Summations, approximation by Integrals

Unit 3: Recurrences: (10 Lectures)

Recurrence Relations, generating functions, Linear Recurrence Relations with constant coefficients and their solution, Substitution Method, Recurrence Trees, Master Theorem

Unit 4: Graph Theory (15 Lectures)

Basic Terminology, Models and Types, multigraphs and weighted graphs, Graph Representation, Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs, Graph Coloring, Trees, Basic Terminology and properties of Trees, Introduction to Spanning Trees

Unit 5: Propositional Logic (12 Lectures)

Logical Connectives, Well-formed Formulas, Tautologies, Equivalences, Inference Theory

Suggested Readings:

1. C.L. Liu , D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition , Tata McGraw Hill, 1985,
2. Kenneth Rosen, Discrete Mathematics and Its Applications, Sixth Edition ,McGraw Hill 2006
3. T.H. Cormen, C.E. Leiserson, R. L. Rivest, Introduction to algorithms, 3rd edition Prentice Hall on India, 2009
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms , John Wiley Publication, 1988
5. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
6. D.J. Hunter, Essentials of Discrete Mathematics, Jones and Bartlett Publishers, 2008
7. Discrete Mathematical Structures with Applications to Combinatorics, V Ramaswamy, University Press
8. Discrete Mathematics: A Concept-based Approach, Basavaraj S Anami, Venkanna S Madalli, University Press

[Top ^](#)**GE 24:Generic Elective-2**

Select another distinct paper from the previously chosen discipline and follow the respective syllabus.

[Top ^](#)**CC 22L: Programming in JAVA Lab****[Credit: 2, Lab Hours: 60]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. To find the sum of any number of integers entered as command line arguments
2. To find the factorial of a given number
3. To learn use of single dimensional array by defining the array dynamically.
4. To learn use of .length in case of a two dimensional array
5. To convert a decimal to binary number
6. To check if a number is prime or not, by taking the number as input from the keyboard
7. To find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument
8. Write a program that show working of different functions of String and StringBuffer classes like setCharAt(), setLength(), append(), insert(), concat() and equals().
9. Write a program to create a —distance class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer

10. Modify the —distance class by creating constructor for assigning values (feet and inches) to the distance object. Create another object and assign second object as reference variable to another object reference variable. Further create a third object which is a clone of the first object.
11. Write a program to show that during function overloading, if no matching argument is found, then java will apply automatic type conversions(from lower to higher data type)
12. Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keyword
13. Write a program to show the use of static functions and to pass variable length arguments in a function.
14. Write a program to demonstrate the concept of boxing and unboxing.
15. Create a multi-file program where in one file a string message is taken as input from the user and the function to display the message on the screen is given in another file (make use of Scanner package in this program).
16. Write a program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate fibonacci series is given in a different file belonging to the same package.
17. Write a program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages
18. Write a program —DivideByZero that takes two numbers a and b as input, computes a/b, and invokes Arithmetic Exception to generate a message when the denominator is zero.
19. Write a program to show the use of nested try statements that emphasizes the sequence of checking for catch handler statements.
20. Write a program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).
21. Write a program to demonstrate priorities among multiple threads.
22. Write a program to demonstrate multithread communication by implementing synchronization among threads (Hint: you can implement a simple producer and consumer problem).
23. Write a program to create URL object, create a URLConnection using the openConnection() method and then use it examine the different components of the URL and content.
24. Write a program to implement a simple datagram client and server in which a message that is typed into the server window is sent to the client side where it is displayed.
25. Write a program that creates a Banner and then creates a thread to scrolls the message in the banner from left to right across the applet's window.
26. Write a program to get the URL/location of code (i.e. java code) and document(i.e. html file).
27. Write a program to demonstrate different mouse handling events like mouseClicked(), mouseEntered(), mouseExited(), mousePressed, mouseReleased() and mouseDragged().
28. Write a program to demonstrate different keyboard handling events.
29. Write a program to generate a window without an applet window using main() function.
30. Write a program to demonstrate the use of push buttons.

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CC 23T:Discrete Structure Tutorial

[Credit: 1, Lecture Hours: 15]

Discrete Structures Tutorial as assigned and advised by teacher(s).

GE 24TL:

[Credit: 2, Lab Hours: 60]

Tutorial or Lab corresponding to the chosen paper for GE 24. Thus follows the syllabus of the chosen discipline.

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----- End of Semester II-----

CC 31: Data Structures**[Credit: 4, Lecture Hours: 60]****Unit 1: Arrays (5 Lectures)**

Single and Multi-dimensional Arrays, Sparse Matrices (Array and Linked Representation)

Unit 2: Stacks (5 Lectures)

Implementing single / multiple stack/s in an Array; Prefix, Infix and Postfix expressions, Utility and conversion of these expressions from one to another; Applications of stack; Limitations of Array representation of stack

Unit 3: Linked Lists (10 Lectures)

Singly, Doubly and Circular Lists (Array and Linked representation); Normal and Circular representation of Stack in Lists; Self Organizing Lists; Skip Lists

Unit 4: Queues (5 Lectures)

Array and Linked representation of Queue, De-queue, Priority Queues

Unit 5: Recursion (5 lectures)

Developing Recursive Definition of Simple Problems and their implementation; Advantages and Limitations of Recursion; Understanding what goes behind Recursion (Internal Stack Implementation)

Unit 6: Trees (20 Lectures)

Introduction to Tree as a data structure; Binary Trees (Insertion, Deletion , Recursive and Iterative Traversals on Binary Search Trees); Threaded Binary Trees (Insertion, Deletion, Traversals); Height-Balanced Trees (Various operations on AVL Trees).

Unit 7: Searching and Sorting (5 Lectures)

Linear Search, Binary Search, Comparison of Linear and Binary Search, Selection Sort, Insertion Sort, Insertion Sort, Shell Sort, Comparison of Sorting Techniques

Unit 8: Hashing (5 Lectures)

Introduction to Hashing, Deleting from Hash Table, Efficiency of Rehash Methods, Hash Table Reordering, Resolving collision by Open Addressing, Coalesced Hashing, Separate Chaining, Dynamic and Extendible Hashing, Choosing a Hash Function, Perfect Hashing Function

Suggested Readings:

1. Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning, 2012.
2. Sartaj Sahni, Data Structures, "Algorithms and applications in C++", Second Edition, Universities Press, 2011.
3. Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, "Data Structures Using C and C++", Second edition, PHI, 2009.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson, 1999.
5. D.S Malik, Data Structure using C++, Second edition, Cengage Learning, 2010.
6. Mark Allen Weiss, "Data Structures and Algorithms Analysis in Java", Pearson Education, 3rd edition, 2011
7. Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, "Data Structures Using Java, 2003.
8. Robert Lafore, "Data Structures and Algorithms in Java, 2/E", Pearson/ Macmillan Computer Pub, 2003
9. John Hubbard, "Data Structures with JAVA", McGraw Hill Education (India) Private Limited; 2 edition, 2009
10. Goodrich, M. and Tamassia, R. "Data Structures and Algorithms Analysis in Java", 4th Edition, Wiley, 2013
11. Herbert Schildt, "Java The Complete Reference (English) 9th Edition Paperback", Tata McGraw Hill, 2014.
12. D. S. Malik, P.S. Nair, "Data Structures Using Java", Course Technology, 2003.

CC 32: Operating Systems**[Credit: 4, Lecture Hours: 60]****Unit 1: Introduction (10 Lectures)**

Basic OS functions, resource abstraction, types of operating systems—multiprogramming systems, batch systems , time sharing systems; operating systems for personal computers & workstations, process control & real time systems.

Unit 2: Operating System Organization (6 Lectures)

Processor and user modes, kernels, system calls and system programs.

Unit 3: Process Management (20 Lectures)

System view of the process and resources, process abstraction, process hierarchy, threads, threading issues, thread libraries; Process Scheduling, non-pre-emptive and pre-emptive scheduling algorithms; concurrent and processes, critical section, semaphores, methods for inter-process communication; deadlocks.

Unit 4: Memory Management (10 Lectures)

Physical and virtual address space; memory allocation strategies -fixed and variable partitions, paging, segmentation, virtual memory

Unit 5: File and I/O Management (10 Lectures)

Directory structure, file operations, file allocation methods, device management.

Unit 6: Protection and Security (4 Lectures)

Policy mechanism, Authentication, Internal access Authorization.

Suggested Readings:

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
3. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997.
4. W. Stallings, Operating Systems, Internals & Design Principles, 5th Edition, Prentice Hall of India. 2008.
5. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.
6. Operating Systems, A K Sharma, University Press

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CC 33: Computer Networks

[Credit: 4, Lecture Hours: 60]

Unit 1: Introduction to Computer Networks (8 Lectures)

Network definition; network topologies; network classifications; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

Unit 2: Data Communication Fundamentals and Techniques (10 Lectures)

Analog and digital signal; data-rate limits; digital to digital line encoding schemes; pulse code modulation; parallel and serial transmission; digital to analog modulation-; multiplexing techniques- FDM, TDM; transmission media.

Unit 3: Networks Switching Techniques and Access mechanisms (10 Lectures)

Circuit switching; packet switching- connectionless datagram switching, connection-oriented virtual circuit switching; dial-up modems; digital subscriber line; cable TV for data transfer.

Unit 4: Data Link Layer Functions and Protocol (10 Lectures)

Error detection and error correction techniques; data-link control- framing and flow control; error recovery protocols- stop and wait ARQ, go-back-n ARQ; Point to Point Protocol on Internet.

Unit 5: Multiple Access Protocol and Networks (5 Lectures)

CSMA/CD protocols; Ethernet LANS; connecting LAN and back-bone networks- repeaters, hubs, switches, bridges, router and gateways;

Unit 6: Networks Layer Functions and Protocols (6 Lectures)

Routing; routing algorithms; network layer protocol of Internet- IP protocol, Internet control protocols

Unit 7: Transport Layer Functions and Protocols (6 Lectures)

Transport services- error and flow control, Connection establishment and release- three way handshaking

Unit 8: Overview of Application layer protocol (5 Lectures)

Overview of DNS protocol; overview of WWW & HTTP protocol

Suggested Readings:

1. B. A. Forouzan: Data Communications and Networking, Fourth edition, THM, 2007.
2. A. S. Tanenbaum: Computer Networks, Fourth edition, PHI, 2002

GE 34: General Elective-3

Select another distinct paper from the previously chosen discipline and follow the respective syllabus.

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CC 31L: Data Structures Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write a program to search an element from a list. Give user the option to perform Linear or Binary search. Use Template functions.
2. WAP using templates to sort a list of elements. Give user the option to perform sorting using Insertion sort, Bubble sort or Selection sort.
3. Implement Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list and concatenate two linked lists (include a function and also overload operator +).
4. Implement Doubly Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
5. Implement Circular Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
6. Perform Stack operations using Linked List implementation.
7. Perform Stack operations using Array implementation. Use Templates.
8. Perform Queues operations using Circular Array implementation. Use Templates.
9. Create and perform different operations on Double-ended Queues using Linked List implementation.
10. WAP to scan a polynomial using linked list and add two polynomial.
11. WAP to calculate factorial and to compute the factors of a given no. (i) using recursion, (ii) using iteration
12. WAP to display fibonacci series (i) using recursion, (ii) using iteration
13. WAP to calculate GCD of 2 number (i) with recursion (ii) without recursion
14. WAP to create a Binary Search Tree and include following operations in tree:
 - (i) Insertion (Recursive and Iterative Implementation)
 - (ii) Deletion by copying
 - (iii) Deletion by Merging
 - (iv) Search a no. in BST
 - (v) Display its preorder, postorder and inorder traversals Recursively
 - (vi) Display its preorder, postorder and inorder traversals Iteratively
 - (vii) Display its level-by-level traversals
 - (viii) Count the non-leaf nodes and leaf nodes
 - (ix) Display height of tree
 - (x) Create a mirror image of tree
 - (xi) Check whether two BSTs are equal or not
15. WAP to convert the Sparse Matrix into non-zero form and vice-versa.
16. WAP to reverse the order of the elements in the stack using additional stack.
17. WAP to reverse the order of the elements in the stack using additional Queue.
18. WAP to implement Diagonal Matrix using one-dimensional array.
19. WAP to implement Lower Triangular Matrix using one-dimensional array.
20. WAP to implement Upper Triangular Matrix using one-dimensional array.
21. WAP to implement Symmetric Matrix using one-dimensional array.
22. WAP to create a Threaded Binary Tree as per inorder traversal, and implement operations like finding the successor / predecessor of an element, insert an element, inorder traversal.
23. WAP to implement various operations on AVL Tree.

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CC 32L: Operating Systems Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

[Implement the following program using C/ C++/Java]

1. WRITE A PROGRAM (using *fork()* and/or *exec()* commands) where parent and child execute:
 - a. same program, same code.
 - b. same program, different code.
 - c. before terminating, the parent waits for the child to finish its task.
2. WRITE A PROGRAM to report behaviour of Linux kernel including kernel version, CPU type and model. (CPU information)
3. WRITE A PROGRAM to report behaviour of Linux kernel including information on configured memory, amount of free and used memory. (memory information)
4. WRITE A PROGRAM to print file details including owner access permissions, file access time, where file name is given as argument.
5. WRITE A PROGRAM to copy files using system calls.
6. Write program to implement FCFS scheduling algorithm.
7. Write program to implement Round Robin scheduling algorithm.
8. Write program to implement SJF scheduling algorithm.
9. Write program to implement non-preemptive priority based scheduling algorithm.
10. Write program to implement preemptive priority based scheduling algorithm.
11. Write program to implement SRJF scheduling algorithm.
12. Write program to calculate sum of n numbers using *thread* library.
13. Write a program to implement first-fit, best-fit and worst-fit allocation strategies.

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CC 33L: Computer Networks Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Simulate Cyclic Redundancy Check (CRC) error detection algorithm for noisy channel.
2. Simulate and implement stop and wait protocol for noisy channel.
3. Simulate and implement go back n sliding window protocol.
4. Simulate and implement selective repeat sliding window protocol.
5. Simulate and implement distance vector routing algorithm
6. Simulate and implement Dijkstra algorithm for shortest path routing.

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GE 34TL:

Tutorial or Lab corresponding to the chosen paper for GE 34. Thus follows the syllabus of the chosen discipline.

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SEC 35TL: Any one from the list (E1-E4)

E1: Digital Electronics and System Maintenance

[15 Lectures +30 Labs]

Unit 1: Boolean Logics (5 Lectures)

Fundamentals of Boolean algebra: Boolean operations, Expressions and Truth-Tables, De Morgan's laws, Minterms and Maxterms, conversion between SOP and POS expressions, Reductions of expressions- algebraic and K-Map methods.

Unit 2: Digital Electronics(5 Lectures)

Basic Logic Gates (NOT, AND, OR), Universal Gates (NAND, NOR), Derived Gates (XOR, XNOR) and truth-tables and applications, Logic Families, Logic Levels, propagation delay; Combinational logic circuits, Half and full adder, parallel binary adder, half and full subtractor; commercially available adders/subtractors, comparator, decoders, encoders, multiplexer, de-multiplexer, Parity generators/ checkers; Flip-Flops: RS, D and JK Flip-Flops, Master-Slave design and edge-triggering; Registers: types and applications; Counters: types and applications.

Unit 3: Desktop/PC HW Maintenance (3 Lectures)

Introduction to computer HW and system SW, basic blocks and their functions, preliminary troubleshooting in each block, identification and preliminary knowledge about popular HW devices- PLA, FPGA, EPROM eraser and programmer, Modem, Microprocessor Kit, I/O devices, Network Devices

Unit 4: OS Installation and System Maintenance (2 Lectures)

Installing different types of OS and utility SW, System Maintenance: OS troubleshooting and system recovery, System Backup, Disk Defragmentation, Disk Management: Creating/removing partitions, Formatting partitions, adding new partitions; Installation and Running of Antivirus SW, Installing and uninstalling application SW packages.

Lab Based on Digital Electronics and System Maintenance:

Digital IC's and implementation of various combinational and sequential circuits based on theory and their practical applications.

Suggested Readings:

1. Gill, Nasib Singh and Dixit J.B., Digital Design and Computer Organisation, University Science Press (Laxmi Publications), New Delhi.
2. Mano, M.M., Digital Logic and Computer Design, Prentice-Hall of India.
3. Mano, M.M., Digital Design, Prentice-Hall of India.
4. Anand Kumar, Fundamentals of Digital Circuits, PHI.
5. Tokheim, Digital Electronics, TMH.
6. S. Rangnekar; Digital Electronics, ISTE/ EXCEL
7. J. Chakravorty, Digital Electronics and Logic Design, Orient Blackswan Pvt Ltd.
8. S K Mandal, Digital Electronics, Tata-Mcgraw Hill

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E2: Website Design with HTML and PHP

[15 Lectures+ 30Labs]

Unit 1: Introduction (1 Lectures)

Introduction to Markup Languages and HTML, need and use; the Head, the Body, Colors, Attributes, Lists, ordered and unordered

Unit 2: Links, Images and Tables (3 Lectures)

Introduction; Relative Links, Absolute Links; Link Attributes; Using the ID Attribute to Link Within a Document; Putting an Image on a Page, Using Images as Links, Putting an Image in the Background, Creating a Table, Table Headers, Captions, Spanning Multiple Columns, Styling Table

Unit 3: Introduction to XML (4 Lectures)

Introduction to XML and its Goals, XML Structure and Syntax, Document classes and Rules, Scripting XML, XML as Data, Linking with XML, XSL –Style Sheet Basics, XSL basics, XSL style sheets. (3L)

Unit 4: Introduction to PHP (3 Lectures)

PHP introduction, inventions and versions, scope, important tools and software requirements (like Web Server, Database, Editors etc.), Basic Syntax, PHP variables and constants, Types of data in PHP, Expressions, scopes of a variable (local, global), PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity

Unit 5: Handling HTML form with PHP (2 Lectures)

Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where to Go from Here Capturing Form Data, GET and POST form methods, Dealing with multi value fields, Redirecting a form after submission

Unit 6: PHP conditional events and Loops (3 Lectures)

PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loops, Goto, Break, Continue and exit

Unit 7: PHP Functions (3 Lectures)

Function, Need of Function, declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference, Scope of Function Global and Local

Unit 8: String Manipulation and Regular Expression (5 Lectures)

Creating and accessing String , Searching & Replacing String; Formatting, joining and splitting String , String Related Library functions; Use and advantage of regular expression over inbuilt function; Use of preg_match(), preg_replace(), preg_split() functions in regular expression

Unit 9: Array (3 Lectures)

Anatomy of an Array ,Creating index based and Associative array ,Accessing array; Looping with Index based array, with associative array using each() and foreach(); Some useful Library function

Suggested Readings:

1. Virginia DeBolt , Integrated HTML and CSS A Smarter, Faster Way to Learn , Wiley / Sybex , 2006
2. Cassidy Williams, Camryn Williams Introduction to HTML and CSS, O'Reilly, 2015
3. XML in action web technology by William J. Pardi
4. Step by Step XML by Michael J. Young
5. Steven Holzner, "PHP: The Complete Reference Paperback", McGraw Hill Education (India), 2007.
6. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India Private Limited, 2008.
7. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5", 3rd Edition Paperback, O'reilly, 2014.
8. Luke Welling, Laura Thompson, PHP and MySQL Web Development", 4th Edition, Addition Paperback, Addison-Wesley Professional,2008.
9. David Sklar, Adam Trachtenberg, "PHP Cookbook: Solutions & Examples for PHP Programmers", 2014.

Software Lab Based on HTML, XML and PHP(Not limited but including the following):

1. Create an HTML document with the different formatting options i.e. Bold, Italics, Underline, Headings (Using H1 to H6 heading styles), Font (Type, Size and Color), Background (Colored background/Image in background), Paragraph, Line Break, Horizontal Rule, Pre tag
2. Create an HTML document which consists of: Ordered List, Unordered List, Nested ordered and/or unordered List and Image
3. Create an HTML document which implements Internal linking as well as External linking Q. No.4.
4. Create a table using HTML demonstrating use of columns and rows, merging multiple rows and/or columns etc.with data and image values and contents with hyperlinking
5. Create a typical student data capture form for the purpose of admission to your college using different types of HTML controls i.e. Text Box, Option/radio buttons, Check boxes, Reset and Submit buttons etc.
6. Create HTML documents having multiple frames in different possible formats/organization
7. Information Structure: In this exercise, student will practice identifying the structure of an information object
8. Deconstructing an XML Document: In this exercise, student will practice identifying the explicit structure within an XML document. In a sense, this is the reverse of what you did in Exercise #7.
9. Creating XML Markup:In this exercise, create some XML markup based on the tree representation from previous exercise and the content from the original sample document.
10. Well-Formedness:This exercise checks your understanding of the constraints for well-formedness based on some sample code document to be provided by the concerned teacher. Are the supplied code document instances well-formed? Explain any NO answers.
11. Create a PHP page using functions for comparing three integers and print the largest number.
12. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
13. WAP to check whether the given number is prime or not.
14. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
15. Write a PHP function that checks if a string is all lower case.
16. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
17. WAP to sort an array.
18. Write a PHP script that removes the whitespaces from a string.
Sample string: 'The quick " " brown fox'
Expected Output :
Thequick""brownfox
19. Write a PHP script that finds out the sum of first n odd numbers.

20. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
21. Write a PHP script that checks if a string contains another string.
22. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
23. Create a script to construct the following pattern, using nested for loop.

```

*
* *
* * *
* * * *

```
24. Write a simple PHP program to check that emails are valid.
25. WAP to print first n even numbers.
26. \$color = array('white', 'green', 'red')
Write a PHP script which will display the colors in the following way
: Output :
white, green, red,
 - green
 - red
 - white
27. Using switch case and dropdown list display a —Hello! message depending on the language selected in drop down list.
28. Write a PHP program to print Fibonacci series using recursion.
29. Write a PHP script to replace the first 'the' of the following string with 'That'.
Sample : 'the quick brown fox jumps over the lazy dog.'
Expected Result : That quick brown fox jumps over the lazy dog.

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E3: Python Programming

[15 Lectures + 30 Labs]

Unit 1: Planning the Computer Program(2 Lectures)

Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation

Unit 2: Techniques of Problem Solving(2 Lectures)

Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

Unit 3: Overview of Programming(3 Lectures)

Structure of a Python Program, Elements of Python

Unit 4: Introduction to Python(4 Lectures)

Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator)

Unit 5: Creating Python Programs(4 Lectures)

Input and Output Statements, Control statements(Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, default arguments.

Suggested Readings:

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Python Tutorial/Documentation www.python.org 2015
3. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012
4. <http://docs.python.org/3/tutorial/index.html>
5. <http://interactivepython.org/courselib/static/pythonds>
6. <http://www.ibiblio.org/g2swap/byteofpython/read/>

Software Lab Based on Python:

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

Section: A (Simple programs)

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :
 - a. Grade A: Percentage ≥ 80
 - b. Grade B: Percentage ≥ 70 and < 80
 - c. Grade C: Percentage ≥ 60 and < 70
 - d. Grade D: Percentage ≥ 40 and < 60
 - e. Grade E: Percentage < 40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$
7. WAP to calculate the sum and product of two compatible matrices.

Section: B (Visual Python):

All the programs should be written using user defined functions, wherever possible.

1. Write a menu-driven program to create mathematical 3D objects
 - a. curve
 - b. sphere
 - c. cone
 - d. arrow
 - e. ring
 - f. cylinder
2. WAP to read n integers and display them as a histogram.
3. WAP to display sine, cosine, polynomial and exponential curves.
4. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.
5. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m=60/(t+2)$, where t is the time in hours. Sketch a graph for t vs. m, where $t \geq 0$.
6. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:
 $P(t) = (15000(1+t))/(15 + e)$
where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
7. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
 - a. velocity wrt time ($v=u+at$)
 - b. distance wrt time ($s=u*t+0.5*a*t*t$)
 - c. distance wrt velocity ($s=(v*v-u*u)/2*a$)
8. WAP to show a ball bouncing between 2 walls.

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----- End of Semester III-----

CC 41: Design and Analysis of Algorithms**[Credit: 4, Lecture Hours: 60]****Unit 1: Introduction (5 Lectures)**

Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm

Unit 2: Algorithm Design Techniques (8 Lectures)

Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy Algorithms

Unit 3: Sorting and Searching Techniques (20 Lectures)

Elementary sorting techniques–Bubble Sort, Insertion Sort, Merge Sort, Advanced Sorting techniques - Heap Sort, Quick Sort, Sorting in Linear Time - Bucket Sort, Radix Sort and Count Sort, Searching Techniques, Medians & Order Statistics, complexity analysis;

Unit 4: Lower Bounding Techniques (5 Lectures)

Decision Trees

Unit 5: Balanced Trees (7 Lectures)

Red-Black Trees

Unit 6: Advanced Analysis Technique (5 Lectures)

Amortized analysis

Unit 7: Graphs (5 Lectures)

Graph Algorithms–Breadth First Search, Depth First Search and its Applications, Minimum Spanning Trees.

Unit 8: String Processing (5 Lectures)

String Matching, KMP Technique

Suggested Readings:

1. T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Introduction to Algorithms, PHI, 3rd Edition 2009
2. Sarabasse & A.V. Gelder Computer Algorithm – Introduction to Design and Analysis, Publisher – Pearson 3rd Edition 1999
3. Rajesh K. Shukla, Analysis and Design of Algorithms: A Beginner's Approach, Wiley

CC 42: Software Engineering**[Credit: 4, Lecture Hours: 60]****Unit 1: Introduction (8 Lectures)**

The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Software Engineering as a Layered Technology, Software Process Framework, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI).

Unit 2: Requirement Analysis (10 Lectures)

Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modeling Techniques, Flow Oriented Modeling, Need for SRS, Characteristics and Components of SRS.

Unit 3: Software Project Management (8 Lectures)

Estimation in Project Planning Process, Project Scheduling

Unit 4: Risk Management (8 Lectures)

Software Risks, Risk Identification, Risk Projection and Risk Refinement, RMMM Plan.

Unit 5: Quality Management (8 Lectures)

Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects.

Unit 6: Design Engineering (10 Lectures)

Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Modeling Component Level Design.

Unit 7: Testing Strategies & Tactics (8 Lectures)

Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing.

Suggested Readings:

1. R.S. Pressman, Software Engineering: A Practitioner's Approach (7th Edition), McGraw-Hill, 2009.
2. P. Jalote, An Integrated Approach to Software Engineering (2nd Edition), Narosa Publishing House, 2003.
3. K.K. Aggarwal and Y. Singh, Software Engineering (2nd Edition), New Age International Publishers, 2008.
4. I. Sommerville, Software Engineering (8th edition), Addison Wesley, 2006.
5. D. Bell, Software Engineering for Students (4th Edition), Addison-Wesley, 2005.
6. R. Mall, Fundamentals of Software Engineering (2nd Edition), Prentice-Hall of India, 2004.

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CC 43: Database Management Systems

[Credit: 4, Lecture Hours: 60]

Unit 1: Introduction (6 Lectures)

Characteristics of database approach, data models, database system architecture and data independence.

Unit 2: Entity Relationship(ER) Modeling (8 Lectures)

Entity types, relationships, constraints.

Unit 3: Relation data model (20 Lectures)

Relational model concepts, relational constraints, relational algebra, SQL queries

Unit 4: Database design (15 Lectures)

Mapping ER/EER model to relational database, functional dependencies, Lossless decomposition, Normal forms (upto BCNF).

Unit 5: Transaction Processing (3 Lectures)

ACID properties, concurrency control

Unit 6: File Structure and Indexing (8 Lectures)

Operations on files, File of Unordered and ordered records, overview of File organizations, Indexing structures for files (Primary index, secondary index, clustering index), Multilevel indexing using B and B+ trees.

Suggested Readings:

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.
2. R. Ramakrishnan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002.
3. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010.
4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and application Programming, 6th Edition, Pearson Education, 2013.
5. Database Book: The Principles and Practices Using MySQL, Narain Gehani, University Press

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GE 44: General Elective-4

Select another distinct paper from the previously chosen discipline and follow the respective syllabus.

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CC 41L: Design and Analysis of Algorithms Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Implement Insertion Sort (The program should report the number of comparisons)
2. Implement Merge Sort (The program should report the number of comparisons)
3. Implement Heap Sort (The program should report the number of comparisons)

4. Implement Randomized Quick sort (The program should report the number of comparisons)
5. Implement Radix Sort
6. Create a Red-Black Tree and perform following operations on it:
 - 6.1. Insert a node
 - 6.2. Delete a node
 - 6.3. Search for a number & also report the color of the node containing this number.
7. Write a program to determine the LCS of two given sequences
8. Implement Breadth-First Search in a graph
9. Implement Depth-First Search in a graph
10. Write a program to determine the minimum spanning tree of a graph
11. For the algorithms at S.No 1 to 3 test run the algorithm on 100 different inputs of sizes varying from 30 to 1000. Count the number of comparisons and draw the graph. Compare it with a graph of $n \log n$.

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CC 42L: Software Engineering Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

S. No.	Practical Title
1	- Problem Statement, - Process Model
2	Requirement Analysis: - Creating a Data Flow - Data Dictionary, Use Cases
3	Project Management: - Computing FP - Effort - Schedule, Risk Table, Timeline chart
4	Design Engineering: - Architectural Design - Data Design, Component Level Design
5	Testing: Basis Path Testing

Sample Projects:

1. **Criminal Record Management:** Implement a criminal record management system for jailers, police officers and CBI officers
2. **DTC Route Information:** Online information about the bus routes and their frequency and fares
3. **Car Pooling:** To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

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CC 43L: Database Management Systems Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

Create and use the following database schema to answer the given queries.

EMPLOYEE Schema

Field	Type	NULL	KEY	DEFAULT
Eno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL
Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	Yes	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES	FK	NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

DEPARTMENT Schema

Field	Type	NULL	KEY	DEFAULT
Dno	Integer	No	PRI	NULL
Dname	Varchar(50)	Yes		NULL
Location	Varchar(50)	Yes		New Delhi

Query List:

- Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
- Query to display unique Jobs from the Employee Table.
- Query to display the Employee Name concatenated by a Job separated by a comma.
- Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
- Query to display the Employee Name and Salary of all the employees earning more than \$2850.
- Query to display Employee Name and Department Number for the Employee No= 7900.
- Query to display Employee Name and Salary for all employees whose salary is not in the range of \$1500 and \$2850.
- Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.
- Query to display Name and Hire Date of every Employee who was hired in 1981.
- Query to display Name and Job of all employees who don't have a current Manager.
- Query to display the Name, Salary and Commission for all the employees who earn commission.
- Sort the data in descending order of Salary and Commission.
- Query to display Name of all the employees where the third letter of their name is _A'.
- Query to display Name of all employees either have two _R's or have two _A's in their name and are either in Dept No = 30 or their Manger's Employee No = 7788.
- Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.
- Query to display the Current Date.
- Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.
- Query to display Name and calculate the number of months between today and the date each employee was hired.
- Query to display the following for each employee <E-Name> earns < Salary> monthly but wants < 3 * Current Salary >. Label the Column as Dream Salary.
- Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with _J', 'A' and _M'.
- Query to display Name, Hire Date and Day of the week on which the employee started.
- Query to display Name, Department Name and Department No for all the employees.
- Query to display Unique Listing of all Jobs that are in Department # 30.
- Query to display Name, Dept Name of all employees who have an _A' in their name.
- Query to display Name, Job, Department No. And Department Name for all the employees working at the Dallas location.
- Query to display Name and Employee no. Along with their Manger's Name and the Manager's employee no; along with the Employees' Name who do not have a Manager.

27. Query to display Name, Dept No. And Salary of any employee whose department No. and salary matches both the department no. And the salary of any employee who earns a commission.
28. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies \$100.
29. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees
30. Query to display the number of employees performing the same Job type functions.
31. Query to display the no. of managers without listing their names.
32. Query to display the Department Name, Location Name, No. of Employees and the average salary for all employees in that department.
33. Query to display Name and Hire Date for all employees in the same dept. as Blake.
34. Query to display the Employee No. And Name for all employees who earn more than the average salary.
35. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a _T'.
36. Query to display the names and salaries of all employees who report to King.
37. Query to display the department no, name and job for all employees in the Sales department.

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GE 44TL:

Tutorial or Lab corresponding to the chosen paper for GE 44. Thus follows the syllabus of the chosen discipline.

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SEC 45TL: Any one from the list (E1-E3)

E1: Android Programming

[15 Lectures +30 Labs]

Unit 1: Introduction (2 Lectures)

History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture.

Unit 2: Overview of object oriented programming using Java (4 Lectures)

OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

Unit 3: Development Tools (5 Lectures)

Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a android project – Hello Word, run on emulator, Deploy it on USB-connected Android device.

Unit 4: User Interface Architecture (2 Lectures)

Application context, intents, Activity life cycle, multiple screen sizes.

Unit 5: User Interface Design (2 Lectures)

Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.

Unit 6: Database (2 Lectures)

Understanding of SQLite database, connecting with the database.

Suggested Readings:

1. Pradeep Kothari, Android Application Development: Black book, Dreamtech Press,
2. James C. Sheusi, Android application development for java programmers, Cengage Learning, 2013.

ONLINE READING / SUPPORTING MATERIAL:

1. <http://www.developer.android.com>
2. <http://developer.android.com/about/versions/index.html>
3. <http://developer.android.com/training/basics/firstapp/index.html>
4. <http://docs.oracle.com/javase/tutorial/index.htm> (Available in the form of free downloadable ebooks also).
5. <http://developer.android.com/guide/components/activities.html>
6. <http://developer.android.com/guide/components/fundamentals.html>
7. <http://developer.android.com/guide/components/intents-filters.html>
8. <http://developer.android.com/training/multiscreen/screensizes.html>

9. <http://developer.android.com/guide/topics/ui/controls.html>
10. <http://developer.android.com/guide/topics/ui/declaring-layout.html>
11. <http://developer.android.com/training/basics/data-storage/databases.html>

Software Lab Based on Android Programming:

1. Create —Hello World! application. That will display —Hello World! in the middle of the screen in the emulator. Also display —Hello World! in the middle of the screen in the Android Phone.
2. Create an application with login module. (Check username and password).
3. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
4. Create a menu with 5 options and selected option should appear in text box.
5. Create a list of all courses in your college and on selecting a particular course teacher-in-charge of that course should appear at the bottom of the screen.
6. Create an application with three option buttons, on selecting a button colour of the screen will change.
7. Create and Login application as above. On successful login, pop up the message.
8. Create an application to Create, Insert, update, Delete and retrieve operation on the database.

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E2: Programming in MATLAB

[15 Lectures + 30 Labs]

Unit 1: Introduction to Programming(2 Lectures)

Components of a computer, working with numbers, Machine code, Software hierarchy.

Unit 2: Programming Environment(3 Lectures)

MATLAB Windows, A First Program, Expressions, Constants, Variables and assignment statement, Arrays.

Unit 3: Graph Plots(2 Lectures)

Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save.

Unit 4: Procedures and Functions(3 Lectures)

Arguments and return values, M-files, Formatted console input-output, String handling.

Unit 5: Control Statements(2 Lectures)

If, Else, Else-if, Repetition statements: While, for loop.

Unit 6: Manipulating Text (2 Lectures)

Writing to a text file, Reading from a text file, Randomising and sorting a list, searching a list.

Unit 7: GUI Interface(2 Lectures)

Attaching buttons to actions, Getting Input, Setting Output.

Suggested Readings:

1. MATLAB: An Introduction with Applications, by Amos Gilat, 2nd edition, Wiley, 2004,
2. C.B. Moler, Numerical Computing with MATLAB, SIAM, 2004.

Software Lab Based on MATLAB:

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write a program to assign the following expressions to a variable A and then to print out the value of A.
 a. $(3+4)/(5+6)$ b. $2\pi^2$ c. $\sqrt{2}$ d. $(0.0000123 + 5.67 \times 10^{-3}) \times 0.4567 \times 10^{-4}$
2. Celsius temperatures can be converted to Fahrenheit by multiplying by 9, dividing by 5, and adding 32. Assign a variable called C the value 37, and implement this formula to assign a variable F the Fahrenheit equivalent of 37 Celsius.
3. Set up a vector called N with five elements having the values: 1, 2, 3, 4, 5. Using N, create assignment statements for a vector X which will result in X having these values:
 - a. 2, 4, 6, 8, 10
 - b. $1/2$, 1, $3/2$, 2, $5/2$
 - c. 1 , $1/2$, $1/3$, $1/4$, $1/5$
 - d. 1 , $1/4$, $1/9$, $1/16$, $1/25$

4. A supermarket conveyor belt holds an array of groceries. The price of each product (in pounds) is [0.6, 1.2, 0.5, 1.3] ; while the numbers of each product are [3, 2, 1, 5]. Use MATLAB to calculate the total bill.
5. The sortrows(x) function will sort a vector or matrix X into increasing row order. Use this function to sort a list of names into alphabetical order.
6. The `—identity` matrix is a square matrix that has ones on the diagonal and zeros elsewhere. You can generate one with the `eye()` function in MATLAB. Use MATLAB to find a matrix B, such that when multiplied by matrix `A=[ 1 2; -1 0 ]` the identity matrix `I=[ 1 0; 0 1 ]` is generated. That is `A*B=I`.
7. Create an array of N numbers. Now find a single MATLAB statement that picks out from that array the 1,4,9,16,...,Nth entries, i.e. those numbers which have indices that are square numbers.
8. Draw a graph that joins the points (0,1), (4,3), (2,0) and (5,-2).
9. The seeds on a sunflower are distributed according to the formula below. Plot a small circle at each of the first 1000 co-ordinates :

$$r_n = \sqrt{n}$$

$$\theta_n = \frac{137.51}{180} \pi n$$

10. Calculate 10 approximate points from the function `y=2x` by using the formulae:
 - a. i. `xn = n`
 - b. ii. `yn = 2n + rand - 0.5`
 Fit a line of best fit to these points using the function `polyfit()` with `degree=1`, and generate co-ordinates from the line of best fit using `polyval()`. Use the on-line help to find out how to use these functions. Plot the raw data and the line of best fit.
11. Calculate and replay 1 second of a sinewave at 500Hz with a sampling rate of 11025Hz. Save the sound to a file called "ex35.wav". Plot the first 100 samples.
12. Calculate and replay a 2 second chirp. That is, a sinusoid that steadily increases in frequency with time, from say 250Hz at the start to 1000Hz at the end.
13. Build a square wave by adding together 10 odd harmonics: 1f, 3f, 5f, etc. The amplitude of the nth harmonic should be 1/n. Display a graph of one cycle of the result superimposed on the individual harmonics.
14. Write a function called `FtoC` (`ftoc.m`) to convert Fahrenheit temperatures into Celsius. Make sure the program has a title comment and a help page. Test from the command window with:
 - a. `FtoC(96)`
 - b. `lookfor Fahrenheit`
 - c. `help FtoC`
15. Write a program to input 2 strings from the user and to print out (i) the concatenation of the two strings with a space between them, (ii) a line of asterisks the same length as the concatenated strings, and (iii) the reversed concatenation. For example:
 - a. Enter string 1: Mark
 - b. Enter string 2: Huckvale
 - c. Mark Huckvale
 - d. *****
 - e. elavkcuHkraM

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E3: VB.NET Programming

[15 Lectures + 30 Labs]

Unit 1: Introduction to .NET Framework (2 Lectures)

Introduction, Characteristics, Web Services; The Framework, Components, Common Language Runtime (CLR), .NET Class Framework vs. A Language - Specific Class Library;

Unit 2: Using .NET Components (3 Lectures)

.NET Windows Forms, Web Forms and Web Services, Console Applications; Microsoft Intermediate Language (MSIL), .NET Compilers, Common Language Runtime, Code reuse, Multiple Language Support in .NET, Cross-Language Interoperability, Garbage Collection, Error Handling; .NET Class Framework, Namespaces, Inheritance: To Use vs. Not To Use, Interface Based Polymorphism vs. Inheritance-Based Polymorphism

Unit 3: Introduction to VB.NET(5 Lectures)

Introduction, Elements, Types, Windows programming, Menus and Dialog Boxes, Using ADO.NET,

Unit 4: Application Development and Deployment using VB.NET (5 Lectures)

Developing Components in Visual Basic .NET; Deploying Applications- Introduction to web services, Assemblies, Deploying Applications

Suggested Readings:

1. Introduction to Visual basic.NET - NIIT PHI, 2005
2. Introducing Microsoft .NET- David S. Platt, Microsoft Press, Saarc Edition, 2001

Software Lab based on VB.NET:

Students are to implement different simple suitable applications based on the VB.NET technologies to be assigned by teachers

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----- End of Semester IV-----

CC 51: Internet Technologies**[Credit: 4, Lecture Hours: 60]****Unit 1:Java (5 Lectures)**

Use of Objects, Array and ArrayList class

Unit 2:JavaScript (15 Lectures)

Data types, operators, functions, control structures, events and event handling.

Unit 3:JDBC (10 Lectures)

JDBC Fundamentals, Establishing Connectivity and working with connection interface, working with statements, Creating and Executing SQL Statements, Working with Result Set Objects.

Unit 4:JSP (20 Lectures)

Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

Unit 5:Java Beans (10 Lectures)

Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB

Recommended Books:

1. DT Editorial Services, Web Technologies, Dreamtech Press
2. Ivan Bayross, Web Enabled Commercial Application Development Using Html, Dhtml, javascript, Perl CGI , BPB Publications, 2009.
3. Cay Horstmann, BIG Java, Wiley Publication, 3rd Edition., 2009
4. Herbert Schildt, Java 7, The Complete Reference, 8th Edition, 2009.
5. Jim Keogh, The Complete Reference J2EE, TMH, 2002.
6. O'Reilly, Java Server Pages, Hans Bergsten, Third Edition, 2003.

CC 52: Theory of Computation**[Credit: 5, Lecture Hours: 60]****Unit 1:Languages (8 Lectures)**

Alphabets, string, language, Basic Operations on language, Concatenation, KleeneStar

Unit 2: Finite Automata and Regular Languages (20 Lectures)

Regular Expressions, Transition Graphs, Deterministics and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma and closure properties of regular languages.

Unit 3: Context free languages (17 Lectures)

Context free grammars, parse trees, ambiguities in grammars and languages, Pushdown automata (Deterministic and Non-deterministic), Pumping Lemma, Properties of context free languages, normal forms.

Unit 4: Turing Macines and Models of Computations (15 Lectures)

RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, Recursively enumerable and recursive languages, unsolvability problems.

Suggested Readings:

1. Daniel I.A.Cohen, Introduction to computer theory, John Wiley,1996
2. Lewis & Papadimitriou, Elements of the theory of computation , PHI 1997.
3. Hoperoft, Aho, Ullman, Introduction to Automata theory, Language & Computation –**3rd** Edition, Pearson Education. 2006
4. P. Linz, An Introduction to Formal Language and Automata 4th edition Publication Jones Bartlett, 2006

DSE 53:DSE [Theory: 60 Lectures]**E1: Microprocessor****[Theory: 60 Lectures]****Unit 1: Microprocessor architecture (20 Lectures)**

Internal architecture, system bus architecture, memory and I/O interfaces

Unit 2: Microprocessor programming (20 Lectures)

Register Organization, instruction formats, assembly language programming

Unit 3: Interfacing (20 Lectures)

Memory address decoding, cache memory and cache controllers, I/O interface, keyboard, display, timer, interrupt controller, DMA controller, video controllers, communication interfaces.

Suggested Readings:

1. Barry B. Brey: The Intel Microprocessors: Architecture, Programming and Interfacing. Pearson Education, Sixth Edition, 2009.
2. Walter A Triebel, Avtar Singh; The 8088 and 8086 Microprocessors Programming, Interfacing, Software, Hardware, and Applications. PHI, Fourth Edition 2005.
3. Ramesh Gaonkar; Microprocessor Architecture, Programming, And Applications With The 8085 5/E, Penram International Publishing(India)
4. B. Ram, Fundamentals of Microprocessors and Microcontrollers, DhanpatRai Publications

E2: Information Security**[Theory: 60 Lectures]****Unit 1: Introduction (5 Lectures)**

Security, Attacks, Computer Criminals, Security Services, Security Mechanisms.

Unit 2: Cryptography (10 Lectures)

Substitution ciphers, Transpositions Cipher, Confusion, diffusion, Symmetric, Asymmetric Encryption. DES Modes of DES, Uses of Encryption, Hash function, key exchange, Digital Signatures, Digital Certificates.

Unit 3: Program Security (10 Lectures)

Secure programs, Non malicious Program errors, Malicious codes virus, Trap doors, Salami attacks, Covert channels, Control against program

Unit 4: Threats (10 Lectures)

Protection in OS: Memory and Address Protection, Access control, File Protection, User Authentication.

Unit 5: Database Security (10 Lectures)

Requirements, Reliability, Integrity, Sensitive data, Inference, Multilevel Security.

Unit 6: Security in Networks (10 Lectures)

Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails

Unit 7: Administating Security(5 Lectures)

Security Planning, Risk Analysis, Organisational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data. Information and law.

Suggested Readings:

1. C. P. Pfleeger, S. L. Pfleeger; Security in Computing, Prentice Hall of India, 2006
2. W. Stallings; Network Security Essentials: Applications and Standards, 4/E, 2010

E3: Modelling and Simulation**[Theory: 60 Lectures]****Unit 1: System models and System studies (5 Lectures)**

Concept of a System, Deterministic and Stochastic Activities, Continuous and Discrete Systems, System Modeling, Types of Models, Principles used in Modeling, Corporate Model, System Design.

Unit 2: What is Simulation? (7 Lectures)

Technique of Simulation, The Monte-Carlo Method, Comparison of Simulation and Analytical Methods, Experimental nature of Simulation, Types of System Simulation, Numerical Computation Techniques for Continuous Models, Numerical Computation Techniques for Discrete Models, Distributed Lag Models, Cobweb Models.

Unit 3: Continuous System Simulation (7 Lectures)

Continuous System Models, Differential Equations & Applications, Feedback Systems, Simulation of an Autopilot, Interactive systems, Real Time Systems.

Unit 4: Concepts in Discrete Event Simulation (7 Lectures)

The Event Scheduling / Time Advance Algorithm, World Views, Manual Simulation using Event Scheduling, List Processing: Lists-Basic properties and operations, Use of arrays for List Processing, Using Dynamic Allocation and Linked Lists.

Unit 5: Queuing Models (9 Lectures)

Characteristics of Queuing Systems, Arrival and Service Patterns, Queue Discipline, Long Run Measures of Performance of Queuing Systems, Time-Average Number in System, Server Utilization, Costs in Queuing Problems, Steady State behavior of Infinite Population Markovian Models, Multiserver Queue: $M/M/C/\infty/\infty$.

Unit 6: Simulation software (7 Lectures)

Comparison of Simulation Packages with Programming Languages, Classification of Simulation Software: General Purpose vs Application Oriented Simulation Packages, Desirable Software Features: General Capabilities, H/w and S/w Requirements, Animation and Dynamic Graphics, Statistical Capabilities, General Purpose Simulation Packages, Object Oriented Simulation, Examples of Application-oriented Simulation packages, Simulation in GPSS.

Unit 7: Random Number, Non-Uniform random variate Generation and Monte-Carlo Method (9 Lectures)

Linear Congruential Generators, Testing Random Number Generators: Empirical and Theoretical tests, Non-Uniform Random Variate Generator: Inverse Transform, Composition. Generating Continuous Random Variates: Uniform, Exponential, Gamma, and Normal. Generating Discrete Random Variates: Bernoulli, Binomial, Poisson. Monte-Carlo Method: Evaluation of Integral-Hit or Miss Method.

Unit 8: Analysis of Simulation Data (5 Lectures)

Identifying the Distribution with Data, Types of Simulations with respect to Output Analysis, Stochastic nature of Output Data, Measures of Performance and their Estimation: Point Estimation, Confidence-Interval Estimation, Output Analysis for Terminating Simulations: Statistical Background, Confidence-Intervals with Specified Precision, Output Analysis for Steady State Simulations, Variance-Reduction Technique-Antithetic variants.

Unit 9: Verification and Validation of Simulation Models (4 Lectures)

Model Building- Verification and Validation, Verification of Simulation Models, Calibration and Validation of Models: Validation of Model Assumptions, Validating Input-output Transformations, Input-Output Validation

Suggested Readings:

1. Raj Jain, Art of Computer Systems Performance Analysis, John Wiley and Sons, Inc, 1991
2. Sheldon M. Ross, Simulation, 4th Ed., Elsevier 2008
3. Averill M. Law and W. David Kelton, Simulation Modeling and Analysis, 3rd Ed., Tata McGraw-Hill, 2003
4. Geofeerey Gordon, System Simulation, 2nd Ed., PHI, 1987
5. Jerry Banks and John S. Carson, Barry L Nelson, Discrete-Event System Simulation, 5th Ed., Prentice Hall, 2010
6. NarsinghDeo, System Simulation with Digital Computers, Prentice Hall of India, 1979

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Unit 1: Introductory Linear Algebra (6 Lectures)

System of linear equations, Matrices, Rank and Determinant of a matrix, Linearly dependent and independent vectors, Basis of a matrix.

Unit 2: Linear programming - I (10 Lectures)

Optimization Problems, Introduction to LP Formulation, Convex sets, Extreme points, Geometry of Linear Programs, Basic feasible solutions (BFS), Neighborhoods, Local and global optima, Profitable Column, Pivoting, Simplex Algorithm with initial BFS, Graphical method

Unit 3: Linear programming - II (10 Lectures)

Degeneracy and Bland's Anticycling rule (Definition), Simplex Algorithm without initial BFS, Artificial variable techniques – two phase method, M-Charnes method, special cases in LPP.

Unit 4: Duality 10 (Lectures)

Definition of the dual problem, primal-dual relationships, economic interpretation of duality, complementary slackness conditions

Unit 5: Transportation Models (6 Lectures)

Transportation Algorithm, Assignment model, Hungarian Method

Unit 6: Introduction to Queuing Models (9 Lectures)

Elements of Queuing Model, Exponential distribution, Poisson Distributions, Poisson Queuing Models, Single Server model, Multiple Server model

Unit 7: Introduction to Markov Chains (9 Lectures)

Introduction to Markov chains, transition probabilities, classification of states, Steady state probabilities, Absorbing states

Suggested Readings:

1. G. Hadley: Linear Programming. Narosa, 2002 (reprint).
2. A. Ravindran, D. T. Phillips and James J. Solberg: Operations Research-Principles and Practice, John Wiley & Sons, 2005.
3. Hamdy A. Taha: Operations Research-An Introduction, Prentice Hall, 8th Edition, 2008. 4. F.S. Hillier. G.J.
4. Lieberman: Introduction to Operations Research- Concepts and Cases, 9th Edition, Tata McGraw Hill. 2010.

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Unit 1: Introduction

Optimization problems, neighbourhoods, local and global optima, convex sets and functions, simplex method, degeneracy; duality and dual simplex algorithm, computational considerations for the simplex and dual simplex algorithms-Dantzig-Wolfe algorithms.

Unit 2: Integer Linear Programming

Cutting plane algorithms, branch and bound technique and approximation algorithms for travelling salesman problem.

Suggested Readings:

1. C.H. Papadimitriou and K. Steiglitz, *Combinatorial Optimization: Algorithms and Complexity*, Prentice-Hall of India, 2006
2. K. Lange, *Optimization*, Springer, 2004.
3. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, *Linear Programming and Network Flows*, John Wiley and Sons, 2004.
4. H.A. Taha, *Operations Research: An Introduction*, 8th Ed., Prentice Hall, 2006.

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Unit 1: Introduction(20 Lectures)

Floating point representation and computer arithmetic, Significant digits, Errors: Round-off error, Local truncation error, Global truncation error, Order of a method, Convergence and terminal conditions, Efficient computations
Bisection method, Secant method, Regula-Falsi method, Newton-Raphson method, Newton's method for solving nonlinear systems, Gauss elimination method (with row pivoting) and Gauss-Jordan method, Gauss Thomas method for tridiagonal systems

Unit 2: Iterative methods(8Lectures)

Jacobi and Gauss-Seidel iterative methods

Unit 3: Interpolation(8Lectures)

Lagrange's form and Newton's form Finite difference operators, Gregory Newton forward and backward differences
Interpolation

Unit 4: Piecewise polynomial interpolation(7Lectures)

Linear interpolation, Cubic spline interpolation (only method), Numerical differentiation: First derivatives and second order derivatives, Richardson extrapolation

Unit 5: Numerical integration(10Lectures)

Trapezoid rule, Simpson's rule (only method), Newton-Cotes open formulas

Unit 6: Extrapolation methods(7Lectures)

Romberg integration, Gaussian quadrature, Ordinary differential equation: Euler's method Modified Euler's methods: Heun method and Mid-point method, Runge-Kutta second methods: Heun method without iteration, Mid-point method and Ralston's method, Classical 4th order Runge-Kutta method, Finite difference method for linear ODE

Suggested Readings:

1. Laurence V. Fausett, Applied Numerical Analysis, Using MATLAB, Pearson, 2/e (2012)
2. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publisher, 6/e (2012)
3. Steven C Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, Tata McGraw Hill, 2/e (2010)

[Top ^](#)**CC 51L: Internet Technologies Lab****[Credit: 2, Lab Hours: 60]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

Create event driven program for following:

1. Print a table of numbers from 5 to 15 and their squares and cubes using alert.
2. Print the largest of three numbers.
3. Find the factorial of a number n.
4. Enter a list of positive numbers terminated by Zero. Find the sum and average of these number s.
5. A person deposits Rs 1000 in a fixed account yielding 5% interest. Compute the amount in the account at the end of each year for n years.
6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.

[Top ^](#)**CC 52T:Theory of Computation Tutorial****[Credit: 1, Lecture Hours: 15]**

Theory of Computation tutorial as assigned and advised by teacher(s).

[Top ^](#)**DSE 53L:DSE Lab [Theory: 60 Lectures]****E1L: Microprocessor Lab****[2Credits; 60 Lectures]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

ASSEMBLY LANGUAGE PROGRAMMING

1. Write a program for 32-bit binary division and multiplication
2. Write a program for 32-bit BCD addition and subtraction
3. Write a program for Linear search and binary search.
4. Write a program to add and subtract two arrays
5. Write a program for binary to ascii conversion
6. Write a program for ascii to binary conversion

E2L: Information Security Lab

[2 Credits, 60 Lectures]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Demonstrate the use of Network tools: ping, ipconfig, ifconfig, tracert, arp, netstat, whois
2. Use of Password cracking tools: John the Ripper, Ophcrack. Verify the strength of passwords using these tools.
3. Perform encryption and decryption of Caesar cipher. Write a script for performing these operations.
4. Perform encryption and decryption of a Rail fence cipher. Write a script for performing these operations.
5. Use nmap/zenmap to analyse a remote machine.
6. Use Burp proxy to capture and modify the message.
7. Demonstrate sending of a protected word document.
8. Demonstrate sending of a digitally signed document.
9. Demonstrate sending of a protected worksheet.
10. Demonstrate use of steganography tools.
11. Demonstrate use of gpg utility for signing and encrypting purposes.

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E3L: Modelling and Simulation Lab

[2 Credits, 60 Lectures]

Practical exercises based on theory.

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DSE 54L: Any one from the following corresponding to paper selected for DSE54

E1L: Operational Research for Computer Science Lab

[2 Credits; 60 Lectures]

Practical based on topics covered in the paper.

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E2L: Combinatorial Optimization Lab

[2 Credits, 60 Lectures]

Practical exercises based on concepts listed in theory.

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E3L: Numerical Methods Lab

[2 Credits, 60 Lectures]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems recommended to be done in any one of Computer Algebra Systems: MATLAB / MATHEMATICA / MAPLE:

1. Find the roots of the equation by bisection method.
2. Find the roots of the equation by secant/Regula-Falsi method.
3. Find the roots of the equation by Newton's method.
4. Find the solution of a system of nonlinear equation using Newton's method.
5. Find the solution of tridiagonal system using Gauss Thomas method.
6. Find the solution of system of equations using Jacobi/Gauss-Seidel method.
7. Find the cubic spline interpolating function.
8. Evaluate the approximate value of finite integrals using Gaussian/Romberg integration.

9. Solve the boundary value problem using finite difference method.

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----- End of Semester V-----

CC 61: Artificial Intelligence**[Credit: 4, Lecture Hours: 60]****Unit 1: Introduction (06 Lectures)**

Introduction to Artificial Intelligence, Background and Applications, Turing Test and Rational Agent approaches to AI, Introduction to Intelligent Agents, their structure, behavior and environment.

Unit 2: Problem Solving and Searching Techniques (20 Lectures)

Problem Characteristics, Production Systems, Control Strategies, Breadth First Search, Depth First Search, Hill climbing and its Variations, Heuristics Search Techniques: Best First Search, A* algorithm, Constraint Satisfaction Problem, Means-End Analysis, Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms.

Unit 3: Knowledge Representation (20 Lectures)

Introduction to First Order Predicate Logic, Resolution Principle, Unification, Semantic Nets, Conceptual Dependencies, Frames, and Scripts, Production Rules, Conceptual Graphs. Programming in Logic (PROLOG)

Unit 4: Dealing with Uncertainty and Inconsistencies (08 Lectures)

Truth Maintenance System, Default Reasoning, Probabilistic Reasoning, Bayesian Probabilistic Inference, Possible World Representations.

Unit 5: Understanding Natural Languages (06 Lectures)

Parsing Techniques, Context-Free and Transformational Grammars, Recursive and Augmented Transition Nets.

Suggested Readings:

1. DAN.W. Patterson, Introduction to A.I and Expert Systems – PHI, 2007.
2. Russell & Norvig, Artificial Intelligence-A Modern Approach, LPE, Pearson Prentice Hall, 2nd edition, 2005.
3. Rich & Knight, Artificial Intelligence – Tata McGraw Hill, 2nd edition, 1991.
4. W.F. Clocksin and Mellish, Programming in PROLOG, Narosa Publishing House, 3rd edition, 2001.
5. Ivan Bratko, Prolog Programming for Artificial Intelligence, Addison-Wesley, Pearson Education, 3rd edition, 2000.

CC 62: Computer Graphics**[Credit: 4, Lecture Hours: 60]****Unit 1: Introduction (5 Lectures)**

Basic elements of Computer graphics, Applications of Computer Graphics.

Unit 2: Graphics Hardware (8 Lectures)

Architecture of Raster and Random scan display devices, input/output devices.

Unit 3: Fundamental Techniques in Graphics (22 Lectures)

Raster scan line, circle and ellipse drawing, thick primitives, Polygon filling, line and polygon clipping algorithms, 2D and 3D Geometric Transformations, 2D and 3D Viewing Transformations (Projections- Parallel and Perspective), Vanishing points.

Unit 4: Geometric Modeling (10 Lectures)

Representing curves & Surfaces.

Unit 5: Visible Surface determination (8 Lectures)

Hidden surface elimination.

Unit 6: Surface rendering (7 Lectures)

Illumination and shading models. Basic color models and Computer Animation.

Suggested Readings:

1. J D Foley, A. Van Dam, Feiner, Hughes Computer Graphics Principles & Practice 2nd edition Publication Addison Wesley 1990.
2. D Hearn, Baker: Computer Graphics, Prentice Hall of India 2008.
3. D F Rogers Procedural Elements for Computer Graphics, McGraw Hill 1997.
4. D F Rogers, Adams Mathematical Elements for Computer Graphics, McGraw Hill 2nd edition 1989.
5. Salini Govil-Pai, Principles of Computer Graphics, University Press

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DSE 63: Any one from the list and the corresponding lab should be chosen for DSE63L

E1: Digital Image Processing

[4 Credits; 60 Lectures]

Unit 1: Introduction (6 Lectures)

Light, Brightness adaption and discrimination, Pixels, coordinate conventions, Imaging Geometry, Perspective Projection, Spatial Domain Filtering, sampling and quantization.

Unit 2: Spatial Domain Filtering (7 Lectures)

Intensity transformations, contrast stretching, histogram equalization, Correlation and convolution, Smoothing filters, sharpening filters, gradient and Laplacian.

Unit 3: Filtering in the Frequency domain (8 Lectures)

Hottelling Transform, Fourier Transforms and properties, FFT (Decimation in Frequency and Decimation in Time Techniques), Convolution, Correlation, 2-D sampling, Discrete Cosine Transform, Frequency domain filtering.

Unit 4: Image Restoration (8 Lectures)

Basic Framework, Interactive Restoration, Image deformation and geometric transformations, image morphing, Restoration techniques, Noise characterization, Noise restoration filters, Adaptive filters, Linear, Position invariant degradations, Estimation of Degradation functions, Restoration from projections.

Unit 5: Image Compression (10 Lectures)

Encoder-Decoder model, Types of redundancies, Lossy and Lossless compression, Entropy of an information source, Shannon's 1st Theorem, Huffman Coding, Arithmetic Coding, Golomb Coding, LZW coding, Transform Coding, Sub-image size selection, blocking artifacts, DCT implementation using FFT, Run length coding, FAX compression (CCITT Group-3 and Group-4), Symbol-based coding, JBIG-2, Bit-plane encoding, Bit-allocation, Zonal Coding, Threshold Coding, JPEG, Lossless predictive coding, Lossy predictive coding, Motion Compensation

Unit 6: Wavelet based Image Compression (5 Lectures)

Expansion of functions, Multi-resolution analysis, Scaling functions, MRA refinement equation, Wavelet series expansion, Discrete Wavelet Transform (DWT), Continuous Wavelet Transform, Fast Wavelet Transform, 2-D wavelet Transform, JPEG-2000 encoding, Digital Image Watermarking.

Unit 7: Morphological Image Processing (7 Lectures)

Basics, SE, Erosion, Dilation, Opening, Closing, Hit-or-Miss Transform, Boundary Detection, Hole filling, Connected components, convex hull, thinning, thickening, skeletons, pruning, Geodesic Dilation, Erosion, Reconstruction by dilation and erosion.

Unit 8: Image Segmentation (9 Lectures)

Boundary detection based techniques, Point, line detection, Edge detection, Edge linking, local processing, regional processing, Hough transform, Thresholding, Iterative thresholding, Otsu's method, Moving averages, Multivariable thresholding, Region-based segmentation, Watershed algorithm, Use of motion in segmentation

Suggested Readings:

1. R C Gonzalez , R E Woods, Digital Image Processing, 3rd Edition, Pearson Education.2008.
2. A K Jain, Fundamentals of Digital image Processing, Prentice Hall of India.1989.
3. K R Castleman, Digital Image Processing, Pearson Education.1996
4. Schalkoff, Digital Image Processing and Computer Vision, John Wiley and Sons.1989.

5. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins,' Digital Image Processing using MATLAB', Pearson Education, Inc., 2004.

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E2: Introduction to Data Sciences

[4 Credits; 60 Lectures]

Unit 1:Data Scientist's Tool Box(10 Lectures)

Turning data into actionable knowledge, introduction to the tools that will be used in building data analysis software: version control, markdown, git, GitHub, R, and RStudio

Unit 2:R Programming Basics(15 Lectures)

Overview of R, R data types and objects, reading and writing data, Control structures, functions, scoping rules, dates and times, Loop functions, debugging tools, Simulation, code profiling

Unit 3:Getting and Cleaning Data(15 Lectures)

Obtaining data from the web, from APIs, from databases and from colleagues in various formats, basics of data cleaning and making data —tidy

Unit 4:Exploratory Data Analysis(10 Lectures)

Essential exploratory techniques for summarizing data, applied before formal modeling commences, eliminating or sharpening potential hypotheses about the world that can be addressed by the data, common multivariate statistical techniques used to visualize high-dimensional data.

Unit 5:Reproducible Research(10 Lectures)

Concepts and tools behind reporting modern data analyses in a reproducible manner, To write a document using R markdown, integrate live R code into a literate statistical program, compile R markdown documents using knitr and related tools, and organize a data analysis so that it is reproducible and accessible to others.

Suggested Readings:

1. D. Cielen, Arno D. B. Meysman, M. Ali, Introducing Data Science, Dreamtech Press
2. Rachel Schutt, Cathy O'Neil, "Doing Data Science: Straight Talk from the Frontline" by Schroff/O'Reilly, 2013.
3. Foster Provost, Tom Fawcett, "Data Science for Business" What You Need to Know About Data Mining and Data-Analytic Thinking" by O'Reilly, 2013.
4. John W. Foreman, "Data Smart: Using data Science to Transform Information into Insight" by John Wiley & Sons, 2013.
5. Ian Ayres, "Super Crunchers: Why Thinking-by-Numbers Is the New Way to Be Smart" Ist Edition by Bantam, 2007.
6. Eric Segel, "Predictive Analytics: The Power to Predict who Will Click, Buy, Lie, or Die", 1st Edition, by Wiley, 2013.
7. Matthew A. Russel, "Mining the Social Web: Data mining Facebook, Twitter, LinkedIn, Goole+, GitHub, and More", Second Edition, by O'Reilly Media, 2013.
8. Michael J. Crawley, The R Book, Wiley

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E3: Data Mining

[4 Credits; 60 Lectures]

Unit 1: Introduction (6 Lectures)

Basic Data Mining Tasks, Data Mining Issues, Data Mining Metrics, Data Mining from a Database Perspective

Unit 2: Data Mining Techniques (10 Lectures)

A Statistical Perspective on Data Mining, Similarity Measures, Decision Trees, Neural Networks, Genetic Algorithms

Unit 3: Classification (15 Lectures)

Statistical-Based Algorithms, Distance-Based Algorithms, Decision Tree-Based Algorithms, Neural Network-Based Algorithms, Rule-Based Algorithms, Combining Techniques.

Unit 4: Clustering (12 Lectures)

Unit 5: Association Rules (12 Lectures)

Basic Algorithms, Parallel and Distributed Algorithms, Incremental Rules, Advanced Association Rule Techniques, Measuring the Quality of Rules.

Unit6: Advanced Techniques (5 Lectures)

Web Mining, Spatial Mining, Temporal Mining.

Suggested Readings:

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education.2005.
2. Richard Roiger, Michael Geatz, Data Mining: A Tutorial Based Primer, Pearson Education 2003.
3. G.K. Gupta, Introduction to Data Mining with Case Studies, PHI,2006.
4. Soman K P, DiwakarShyam, Ajay V Insight Into Data Mining: Theory And Practice, , PHI, 2006
5. Data Mining Techniques, ArunPujari, Fourth Edition, University Press

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CC 61L: Artificial Intelligence Lab

[Credit: 2, Lab Hours: 60]

1. Write a prolog program to calculate the sum of two numbers.
2. Write a prolog program to find the maximum of two numbers.
3. Write a prolog program to calculate the factorial of a given number.
4. Write a prolog program to calculate the nth Fibonacci number.
5. Write a prolog program, insert_nth(item, n, into_list, result) that asserts that result is the list into_list with item inserted as the nth element into every list at all levels.
6. Write a Prolog program to remove the Nth item from a list.
7. Write a Prolog program, remove_nth(Before, After) that asserts the After list is the Before list with the removal of every nth item from every list at all levels.
8. Write a Prolog program to implement append for two lists.
9. Write a Prolog program to implement palindrome(List).
10. Write a Prolog program to implement max(X,Y,Max) so that Max is the greater of two numbers X and Y.
11. Write a Prolog program to implement maxlist(List,Max) so that Max is the greatest number in the list of numbers List.
12. Write a Prolog program to implement sumlist(List,Sum) so that Sum is the sum of a given list of numbers List.
13. Write a Prolog program to implement two predicates evenlength(List) and oddlength(List) so that they are true if their argument is a list of even or odd length respectively.
14. Write a Prolog program to implement reverse(List,ReversedList) that reverses lists.
15. Write a Prolog program to implement maxlist(List,Max) so that Max is the greatest number in the list of numbers List using cut predicate.
16. Write a Prolog program to implement GCD of two numbers.
17. Write a prolog program that implements Semantic Networks/Frame Structures.

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CC 62L: Computer Graphics Lab

[Credit: 2, Lab Hours: 60]

1. Write a program to implement Bresenham's line drawing algorithm.
2. Write a program to implement mid-point circle drawing algorithm.
3. Write a program to clip a line using Cohen and Sutherland line clipping algorithm.
4. Write a program to clip a polygon using Sutherland Hodgeman algorithm.
5. Write a program to apply various 2D transformations on a 2D object (use homogenous coordinates).
6. Write a program to apply various 3D transformations on a 3D object and then apply parallel and perspective projection on it.
7. Write a program to draw Hermite/Bezier curve.

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Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write program to read and display digital image using MATLAB or SCILAB
 - 1.1. Become familiar with SCILAB/MATLAB Basic commands
 - 1.2. Read and display image in SCILAB/MATLAB
 - 1.3. Resize given image
 - 1.4. Convert given color image into gray-scale image
 - 1.5. Convert given color/gray-scale image into black & white image
 - 1.6. Draw image profile
 - 1.7. Separate color image in three R G & B planes
 - 1.8. Create color image using R, G and B three separate planes
 - 1.9. Flow control and LOOP in SCILAB
 - 1.10. Write given 2-D data in image file
2. To write and execute image processing programs using point processing method
 - 2.1. Obtain Negative image
 - 2.2. Obtain Flip image
 - 2.3. Thresholding
 - 2.4. Contrast stretching
3. To write and execute programs for image arithmetic operations
 - 3.1. Addition of two images
 - 3.2. Subtract one image from other image
 - 3.3. Calculate mean value of image
 - 3.4. Different Brightness by changing mean value
4. To write and execute programs for image logical operations
 - 4.1. AND operation between two images
 - 4.2. OR operation between two images
 - 4.3. Calculate intersection of two images
 - 4.4. Water Marking using EX-OR operation
 - 4.5. NOT operation (Negative image)
5. To write a program for histogram calculation and equalization using
 - 5.1. Standard MATLAB function
 - 5.2. Program without using standard MATLAB functions
 - 5.3. C Program
6. To write and execute program for geometric transformation of image
 - 6.1. Translation
 - 6.2. Scaling c. Rotation
 - 6.3. Shrinking
 - 6.4. Zooming
7. To understand various image noise models and to write programs for
 - 7.1. image restoration
 - 7.2. Remove Salt and Pepper Noise
 - 7.3. Minimize Gaussian noise
 - 7.4. Median filter and Weiner filter
8. Write and execute programs to remove noise using spatial filters
 - 8.1. Understand 1-D and 2-D convolution process
 - 8.2. Use 3x3 Mask for low pass filter and high pass filter
9. Write and execute programs for image frequency domain filtering
 - 9.1. Apply FFT on given image
 - 9.2. Perform low pass and high pass filtering in frequency domain
 - 9.3. Apply IFFT to reconstruct image
10. Write a program in C and MATLAB/SCILAB for edge detection using different edge detection mask
11. Write and execute program for image morphological operations erosion and dilation.
12. To write and execute program for wavelet transform on given image and perform inverse wavelet transform to reconstruct image.

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write a program that prints 'Hello World' to the screen.
2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n
3. Write a program that prints a multiplication table for numbers up to 12.
4. Write a function that returns the largest element in a list.
5. Write a function that computes the running total of a list.
6. Write a function that tests whether a string is a palindrome.
7. Implement linear search.
8. Implement binary search.
9. Implement matrices addition, subtraction and Multiplication
10. Fifteen students were enrolled in a course. Their ages were:
20 20 20 20 21 21 21 22 22 22 22 23 23 23
 - a. Find the median age of all students under 22 years
 - b. Find the median age of all students
 - c. Find the mean age of all students
 - d. Find the modal age for all students
 - e. Two more students enter the class. The age of both students is 23. What is now mean, mode and median?
11. Following table gives a frequency distribution of systolic blood pressure. Compute all the measures of dispersion

Midpoint	95.5	105.5	115.5	125.5	135.5	145.5	155.5	165.5	175.5
Number	5	8	22	27	17	9	5	5	2

12. Obtain probability distribution of, where X is number of spots showing when a six-sided symmetric die (i.e. all six faces of the die are equally likely) is rolled. Simulate random samples of sizes 40, 70 and 100 respectively and verify the frequency interpretation of probability.
13. Make visual representations of data using the base, lattice, and ggplot2 plotting systems in R, apply basic principles of data graphics to create rich analytic graphics from available datasets.
14. Use Git / Github software to create Github account. Also, create a repo using Github.

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Practical exercises based on concepts listed in theory.

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DSE 64: Any one from the list and the corresponding lab should be chosen for DSE63L

Unit 1: Introduction (10 Lectures)

Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised vs. Unsupervised Learning, Statistical Learning: Bayesian Method, The Naive Bayes Classifier

Unit 2: Software for Machine Learning and Linear Algebra Overview (10 Lectures)

Plotting of Data, Vectorization, Matrices and Vectors: Addition, Multiplication, Transpose and Inverse using available tool such as MATLAB.

Unit 3: Linear Regression (10 Lectures)

Prediction using Linear Regression, Gradient Descent, Linear Regression with one variable, Linear Regression with multiple variables, Polynomial Regression, Feature Scaling / Selection.

Unit 4: Logistic Regression (10 Lectures)

Classification using Logistic Regression, Logistic Regression vs. Linear Regression, Logistic Regression with one variable and with multiple variables.

Unit 5:Regularization(10 Lectures)

Regularization and its utility: The problem of Overfitting, Application of Regularization in Linear and Logistic Regression, Regularization and Bias/Variance.

Unit 6:Neural Networks(10 Lectures)

Introduction, Model Representation, Gradient Descent vs. Perceptron Training, Stochastic Gradient Descent, Multilayer Perceptrons, Multiclass Representation, Backpropagation Algorithm.

Suggested Readings:

1. EthemAlpaydin, "Introduction to Machine Learning" 2nd Edition, The MIT Press, 2009.
2. Tom M. Mitchell, "Machine Learning", First Edition by Tata McGraw-Hill Education, 2013.
3. Christopher M. Bishop, "Pattern Recognition and Machine Learning" by Springer, 2007.
4. Mevin P. Murphy, "Machine Learning: A Probab
5. Peter Harrington, Machine Learning in Action, Dreamtech Press

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E2: System Programming

[4 Credits; 60 Lectures]

Unit 1:Assemblers & Loaders, Linkers(10 Lectures)

One pass and two pass assembler, design of an assembler, Absolute loader, relocation and linking concepts, relocating loader and Dynamic Linking.

Unit 2:Introduction(5Lectures)

Overview of compilation, Phases of a compiler

Unit 3:Lexical Analysis(10Lectures)

Role of a Lexical analyzer, Specification and recognition of tokens, Symbol table, lex

Unit 4:Parsing(10 Lectures)

Bottom up parsing- LR parser, yacc.

Unit 5:Intermediate representations(10 Lectures)

Three address code generation, syntax directed translation, translation of types, control statements

Unit 6:Storage organization(5 Lectures)

Activation records, stack allocation

Unit 7:Code Generation(10Lectures)

Object code generation

Suggested Readings:

1. SantanuChattopadhyaya, Systems Programming, PHI, 2011.
2. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Compilers: Principles, Techniques, and Tools, 2nd edition, Prentice Hall, 2006.
3. D. M. Dhamdhere, Systems Programming, Tata McGraw Hill, 2011.
4. Leland Beck, D. Manjula, System Software: An Introduction to System Programming, 3rd edition, Pearson Education, 2008.
5. Grune D, Van Reeuwijk . K, Bal H. E, Jacobs C J H, Langendoen K, Modern Compiler Design, 2nd edition, Springer, 2012

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E3: Cloud Computing

[4 Credits; 60 Lectures]

Unit 1: Overview of Computing Paradigm (8 Lectures)

Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing,

Unit 2: Introduction to Cloud Computing (7 Lectures)

Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits and limitations of Cloud Computing

Unit 3: Cloud Computing Architecture (20 Lectures)

Comparison with traditional computing architecture (client/server), Services provided at various levels, Service Models- Infrastructure as a Service(IaaS), Platform as a Service(PaaS), Software as a Service(SaaS), How Cloud Computing Works, Deployment Models- Public cloud, Private cloud, Hybrid cloud, Community cloud, Case study of NIST architecture.

Unit 4: Case Studies (13 Lectures)

Case study of Service model using Google App Engine, Microsoft Azure, Amazon EC2, Eucalyptus.

Unit 5: Service Management in Cloud Computing (7 Lectures)

Service Level Agreements (SLAs), Billing & Accounting, Comparing Scaling Hardware: Traditional vs. Cloud, Economics of scaling.

Unit 6: Cloud Security (5 Lectures)

Infrastructure Security- Network level security, Host level security, Application level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data location, Authentication in cloud computing.

Suggested Readings:

1. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010
2. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wiley, 2011
3. Cloud Computing: Principles, Systems and Applications, Nikos Antonopoulos, Lee Gillam, Springer, 2012
4. Cloud Computing: A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, University Press
5. Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines, Wiley-India, 2010
6. Gautam Shroff, Enterprise Cloud Computing Technology Architecture Applications, Adobe Reader ebooks available from eBooks.com, 2010
7. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, McGraw Hills, 2010.
8. Dimitris N. Chorafas, Cloud Computing Strategies, CRC Press, 2010

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DSE 64L: Any one from the list corresponding to the paper selected for DSE63

E1L: Machine Learning Lab

[4 Credits; 60 Lectures]

For practical Labs for Machine Learning, students may use softwares like MABLAB/Octave or Python. For later exercises, students can create/use their own datasets or utilize datasets from online repositories like UCI Machine Learning Repository (<http://archive.ics.uci.edu/ml/>).

1. Perform elementary mathematical operations in Octave/MATLAB like addition, multiplication, division and exponentiation.
2. Perform elementary logical operations in Octave/MATLAB (like OR, AND, Checking for Equality, NOT, XOR).
3. Create, initialize and display simple variables and simple strings and use simple formatting for variable.
4. Create/Define single dimension / multi-dimension arrays, and arrays with specific values like array of all ones, all zeros, array with random values within a range, or a diagonal matrix.
5. Use command to compute the size of a matrix, size/length of a particular row/column, load data from a text file, store matrix data to a text file, finding out variables and their features in the current scope.
6. Perform basic operations on matrices (like addition, subtraction, multiplication) and display specific rows or columns of the matrix.

7. Perform other matrix operations like converting matrix data to absolute values, taking the negative of matrix values, adding/removing rows/columns from a matrix, finding the maximum or minimum values in a matrix or in a row/column, and finding the sum of some/all elements in a matrix.
8. Create various type of plots/charts like histograms, plot based on sine/cosine function based on data from a matrix. Further label different axes in a plot and data in a plot.
9. Generate different subplots from a given plot and color plot data.
10. Use conditional statements and different type of loops based on simple example/s.
11. Perform vectorized implementation of simple matrix operation like finding the transpose of a matrix, adding, subtracting or multiplying two matrices.
12. Implement Linear Regression problem. For example, based on a dataset comprising of existing set of prices and area/size of the houses, predict the estimated price of a given house.
13. Based on multiple features/variables perform Linear Regression. For example, based on a number of additional features like number of bedrooms, servant room, number of balconies, number of houses of years a house has been built – predict the price of a house.
14. Implement a classification/ logistic regression problem. For example based on different features of students data, classify, whether a student is suitable for a particular activity. Based on the available dataset, a student can also implement another classification problem like checking whether an email is spam or not.
15. Use some function for regularization of dataset based on problem 14.
16. Use some function for neural networks, like Stochastic Gradient Descent or backpropagation - algorithm to predict the value of a variable based on the dataset of problem 14.

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E2L: System Programming Lab

(4 Credits; 60 Lectures)

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. To implement an assembler for a hypothetical language.
2. To get familiar with lex: write a program to recognize numbers, identifiers.
3. To get familiar with yacc: write a desk calculator.

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E3L: Cloud Computing Lab

(4 Credits; 60 Lectures)

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Create virtual machines that access different programs on same platform.
2. Create virtual machines that access different programs on different platforms.
3. Working on tools used in cloud computing online-
 - a) Storage
 - b) Sharing of data
 - c) manage your calendar, to-do lists,
 - d) a document editing tool
4. Exploring Google cloud
5. Exploring microsoft cloud
6. Exploring amazon cloud

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DSE 64P: Project

The students will be allowed to work on any project based on the concepts studied in core / elective or skill based elective courses. The group size should be maximum of three (03) students. Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes. A maximum of Four (04) projects would be assigned to one teacher.

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----- End of Semester VI-----

Proposed Syllabus

For

BCA (Honours)

Submitted

To



ENLIGHTENMENT TO PERFECTION

University of North Bengal

(Accredited by NAAC with grade A)

Under

Choice Based Credit System (CBCS)

[With effect from the Session 2018-19]

Preamble

The University Grants Commission (UGC) has initiated several measures to bring equity, efficiency and excellence in the Higher Education System of country. To enhance academic standards and quality in higher education, several significant measures i.e. innovation and improvements in curriculum, teaching-learning process, and examination and evaluation systems has been taken besides governance and other matters.

To improve the higher education system and maintain minimum standards and quality across the Higher Educational Institutions (HEIs) in India, the UGC has formulated various regulations and guidelines over the times. The academic reforms recommended by the UGC in the recent past have led to overall improvement in the higher education system. Introduction of uniform Choice Based Credit System (CBCS) by the UGC at Under Graduate (UG) level for different subjects recommended to be followed by the HEIs across the country is one of such significant step towards the goal. The HEIs must have the flexibility and freedom in designing the examination and evaluation methods that best fits the curriculum, syllabi and teaching-learning methods, there is a need to devise a sensible system for awarding the grades based on the performance of learners. Presently the performance of the students is reported using the conventional system of marks secured in the examinations or grades or both. The conversion from marks to letter grades and the letter grades used vary widely across the HEIs in the country. This creates difficulty for the academia and the employers to understand and infer the performance of the students graduating from different universities and colleges based on grades.

The grading system is considered to be better than the conventional marks system and hence it has been followed in the top institutions in India and abroad. So it is desirable to introduce uniform grading system. This will facilitate student mobility across institutions within and across countries and also enable potential employers to assess the performance of students. To bring in the desired uniformity, in grading system and method for computing the cumulative grade point average (CGPA) based on the performance of students in the examinations, the UGC has formulated these guidelines.

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CHOICE BASED CREDIT SYSTEM (CBCS):

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core, elective/minor or skill based courses. The courses can be evaluated following the grading system, which is considered to be better than the conventional marks system. Therefore, it is necessary to introduce uniform grading system in the entire higher education in India. This will benefit the students to move across institutions within India to begin with and across countries. The uniform grading system will also enable potential employers in assessing the performance of the candidates. In order to bring uniformity in evaluation system and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations, the UGC has formulated the guidelines to be followed.

Outline of Choice Based Credit System:

1. **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
2. **Elective Course:** Generally a course which can be chosen from a pool of courses and which may be very specific or specialized or advanced or supportive to the discipline/ subject of study or which provides an extended scope or which enables an exposure to some other discipline/subject/domain or nurtures the candidate's proficiency/skill is called an Elective Course.
 - 2.1. **Discipline Specific Elective (DSE) Course:** Elective courses may be offered by the main discipline/subject of study is referred to as Discipline Specific Elective. The University/Institute may also offer discipline related Elective courses of interdisciplinary nature (to be offered by main discipline/subject of study).
 - 2.2. **Project/Dissertation:** An elective course designed to acquire special/advanced knowledge, such as supplement study/support study to a project work. A candidate studies such a course on his own with an advisory support by a teacher/faculty member is called dissertation/project. Project work/Dissertation is considered as a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A Project/Dissertation work would be of 6 credits. A Project/Dissertation work may be given in lieu of a discipline specific elective paper.
 - 2.3. **Generic Elective (GE) Course:** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is called a Generic Elective.
P.S.: A core course offered in a discipline/subject may be treated as an elective by other discipline/subject and vice versa and such electives may also be referred to as Generic Elective.
3. **Ability Enhancement Courses (AE)/ Ability Enhancement Courses Compulsory (AEC)/ Ability Enhancement Courses Elective- Skill Development Courses (SEC):** The Ability Enhancement (AE) Courses may be of two kinds: AE Compulsory Course (AEC) and AE Elective-Skill Based Course (SEC). "AEC" courses are the courses based upon the content that leads to Knowledge enhancement. They ((i) Environmental Science, (ii) English/MIL Communication) are mandatory for all disciplines. AEC courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills, etc.
 - 3.1. **AE Compulsory Course (AEC):** Environmental Science, English Communication/MIL Communication.
 - 3.2. **AE Elective Course- Skill Development (SEC):** These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based instruction.

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Details of courses under BCA (Honors)				
Course Type	Course Category	Theory/Practical/Tutorial	*Credits	
			Theory+ Practical	Theory + Tutorial
1. Core Course (CC)	1.1 Core Course (CC)	CC Theory (14 Papers)	14X4= 56	14X5=70
		CC Practical / Tutorial* (14 Papers)	14X2=28	14X1=14
2. Elective Course	2.1 Discipline Specific Elective(DSE)	DSE Theory(4 Papers)	4X4=16	4X5=20
		DSE Practical / Tutorial*(4 Papers) (Optional Dissertation or project work in place of one Discipline Specific Elective paper (6 credits) in 6 th Semester)	4 X 2=8	4X1=4
	2.2 Generic Elective/ Interdisciplinary (GE)	GE Theory(4 Papers)	4X4=16	4X5=20
		GE Practical / Tutorial*(4 Papers)	4 X 2=8	4X1=4
3. Ability Enhancement Courses (AECC)	3.1 Ability Enhancement Compulsory (AEC)	AEC (2 Papers)	2 X 2=4	2 X 2=4
	3.2 Ability Enhancement Elective - Skill Based (SEC)	SEC (Minimum 2 Papers)	2 X 2=4	2 X 2=4
Total credit			140	140
- Institute should evolve a system/policy about ECA/ General Interest/Hobby/Sports/NCC/NSS/ related courses on its own. *Wherever there is a practical there will be no tutorial and vice-versa				

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PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN BCA (Honours)					
Semester	Core Course (CC) (14 Pairs: Theory and Lab/Tutorial)	Discipline Specific Elective(DSE) (4 Pairs)	Generic Elective/ Interdisciplinary (GE) (4 Pairs)	Ability Enhancement Elective- Skill Based (SEC) (1 Pair)	Ability Enhancement Compulsory (AEC) (1 Pair)
I	Programming in C		GE-1		Environmental Science
	Digital Electronics				
II	Programming in JAVA		GE-2		English/MIL Communication
	Computer System Architecture				
III	Data Structures		GE-3	SEC - 1	
	Operating Systems				
	Discrete Structures				
IV	Computer Networks		GE-4	SEC - 2	
	Software Engineering				
	Database Management Systems				
V	Internet Technologies	DSE – 1			
	Theory of Computation	DSE – 2			
VI	Mobile Computing	DSE – 3			
	Design and Analysis of Algorithms	DSE – 4			

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Proposed paper with examination pattern for BCA (H)							
Semester	Paper Code	Paper Title	Credit	Ins. Hrs/week	Examination Scheme and Marks Distribution		
					T + L	CE + AT	Total
I	AEC 11	Environmental Science	2	2	80	20	100
	CC 12	Programming in C	4	4	40	15	55
	CC 13	Digital Electronics	5	5	60	15	75
	GE 14	Step1: Choose only ONE distinct discipline of interest from the following in consultation with the concerned college authority and faculty members for different semesters: 1. Mathematics 2. Statistics 3. Physics 4. Commerce 5. Economics 6. Management 7. Mass Comm & Journalism 8. Geography 9. Microbiology Step 2: Then, for GE 14 , select one paper from the chosen discipline and follow the respective syllabus.	4/5	4/5	40	15	55
	CC 12L	Programming in C Lab	2	4	20	--	20
	CC 13T	Digital Electronics Tutorials	1	2	--	--	--
	GE 14TL	GE 14TL is the corresponding Lab/Tutorial to the paper selected for GE 14.	2/1	4/2	20	--	20
		End Semester	20				325
II	AEC 21	English/MIL Communication	2	2	35	15	50
	CC 22	Programming in JAVA	4	4	40	15	55
	CC 23	Computer System Architecture	4	4	40	15	55
	GE 24	For GE 24 , select another paper from the same discipline given in the list of Step 1 of GE 14 which is not chosen for GE 14 and follow the respective syllabus.	4/5	4/5	40	15	55
	CC 22L	Programming in JAVA Lab	2	4	20	--	20
	CC 23L	Computer System Architecture Lab	2	4	20	--	20
	GE 24TL	GE 24TL is the corresponding Lab/Tutorial to the paper selected for GE 24.	2/1	4/2	20	--	20
		End Semester	20				275
III	CC 31	Data Structures	4	4	40	15	55
	CC 32	Operating Systems	4	4	40	15	55
	CC 33	Discrete Structures	5	5	60	15	75
	GE 34	For GE 34 , select another paper from a separate discipline given in the list of Step 1 of GE 14 not chosen previously for GE 14 and GE 24 and follow the respective syllabus.	4/5	4/5	40	15	55
	CC 31L	Data StructureLab	2	4	20	--	20
	CC 32L	Operating Systems Lab	2	4	20	--	20
	CC 33T	Discrete Structures Tutorials	1	2	--	--	--
	GE 34TL	GE 34TL is the corresponding Lab/Tutorial to the paper selected for GE 34.	2/1	4/2	20	--	20
	SEC 35TL	Any ONE from the following list: • E1: Arduino Sensors • E2: Website Design with HTML and PHP	2	1T+2 L	60	15	75

		E3: Python Programming					
		End Semester	26				375
IV	CC 41	Computer Networks	5	5	60	15	75
	CC 42	Software Engineering	4	4	40	15	55
	CC 43	Database Management Systems	4	4	40	15	55
	GE 44	For GE 44 , select another paper from the same discipline given in the list of Step 1 of GE 14 not chosen previously for GE 14, GE 24 and GE 34 and follow the respective syllabus.	4/5	4/5	40	15	55
	CC 41T	Computer Networks Tutorials	1	4	--	--	--
	CC 42L	Software EngineeringLab	2	4	20	--	20
	CC 43L	Database Management Systems Lab	2	4	20	--	20
	GE 44TL	GE 44TL is the corresponding Lab/Tutorial to the paper selected for GE 44.	2/1	4/2	20	--	20
	SEC 45TL	Any ONE from the following list: E1: Android Programming E2: Programming in MATLAB E3: VB.NET Programming	2	1T+2 L	60	15	75
		End Semester	26				375
V	CC 51	Internet Technologies	4	4	40	15	55
	CC 52	Theory of Computation	5	5	60	15	75
	DSE 53	For DSE 53 , choose any ONE from the following E1: Microprocessor E2: Information Security E3: Modelling and Simulation	4	4	40	15	55
	DSE 54	For DSE 54 , choose any ONE from the following list: E1: Operational Research E2: Combinatorial Optimization E3: Numerical Methods	4	4	40	15	55
	CC 51L	Internet Technologies Lab	2	4	20	--	20
	CC 52T	Theory of Computation Tutorial	1	2	--	--	--
	DSE53L	Corresponding Lab of the paper chosen for DSE53: E1L: Microprocessor Lab E2L: Information Security Lab E3L: Modelling and SimulationLab	2	4	20	--	20
	DSE 54L	For DSE 54L , choose any ONE Lab from the list corresponding to selected for DSE 54 E1L: Operational Research Lab E2L: Combinatorial Optimization Lab E3L: Numerical Methods Lab	2	4	20	--	20
		End Semester	24				300
VI	CC 61	Mobile Computing	4	4	40	15	55
	CC 62	Design and Analysis of Algorithms	4	4	40	15	55
	DSE 63	For DSE 63 , choose any one from the list E1: Digital Image Processing E2: Introduction to Data Sciences E3: Data Mining	4	4	40	15	55
	CC 61L	Mobile Computing Lab	2	4	20	--	20
	CC 62L	Design and Analysis of Algorithms Lab	2	4	20	--	20
	DSE 63L	For DSE 63L , choose any ONE Lab from the list corresponding to selected for DSE 63 E1L: Digital Image Processing Lab E2L: Introduction to Data Sciences Lab E3L: Data Mining Lab	2	4	20	--	20
	(DSE 64 and DSE 64)	For DSE 64 , choose any one from the list	4	4	40	15	55

	64TL)		• E1: Machine Learning • E2: System Programming • E3: Cloud Computing					
	OR		AND					
	DSE 64P	DSE 64L	For DSE 64L , choose any ONE Lab from the list corresponding to selected for DSE 64 • E1L: Machine Learning Lab • E2L: System Programming Lab • E3L: Cloud Computing Lab	2	4	20	--	20
		OR						
		DSE 64P	Project	6	8	75	--	75
		End Semester		24				300
		Total Course Credit		140				1950

Abbreviations	T: Theory, L: Laboratory, CC: Core Course, DSE: Discipline Specific Elective, GE: Generic Elective, TL: Theory and Lab, AEC: Ability Enhancement Compulsory, SEC: Skill Enhancement Compulsory, PJT: Project CE: Continuous Evaluation, AT: Attendance
Mark Distribution and Nature of Continuous Evaluation	Marks (25) Distribution • 5 Marks shall be allocated for Attendance • 20 Marks Internal Evaluation through • For Theory Papers: Multiple Class Tests • For Lab Papers: Multiple Assignments
Note	• Each Lecture/Lab to be assume of 1 hour duration

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AEC 11: Environmental Science**[Credits: 2, Lectures: 50]****Unit 1: Introduction to environmental studies (2 lectures)**

- Multidisciplinary nature of environmental studies;
- Scope and importance; Concept of sustainability and sustainable development.

Unit 2: Ecosystems (6 Lectures)

- What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems :
 - a) Forest ecosystem
 - b) Grassland ecosystem
 - c) Desert ecosystem
 - d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 3: Natural Resources: Renewable and Non-renewable Resources (8 Lectures)

- Land resources and land use change; Land degradation, soil erosion and desertification.
- Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations.
- Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state).
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Unit 4: Biodiversity and Conservation (8 Lectures)

- Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots
- India as a mega-biodiversity nation; Endangered and endemic species of India
- Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

Unit 5: Environmental Pollution (8 Lectures)

- Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution
- Nuclear hazards and human health risks
- Solid waste management: Control measures of urban and industrial waste.
- Pollution case studies.

Unit 6: Environmental Policies & Practices (7 Lectures)

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture
- Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).
- Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context.

Unit 7: Human Communities and the Environment (6 Lectures)

- Human population growth: Impacts on environment, human health and welfare.
- Resettlement and rehabilitation of project affected persons; case studies.
- Disaster management: floods, earthquake, cyclones and landslides.
- Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan.
- Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi).

Unit 8: Field work (Equivalent to 5 Lectures)

- Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.
- Visit to a local polluted site---Urban/Rural/Industrial/Agricultural.
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems---pond, river, Delhi Ridge, etc.

Suggested Readings:

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36---37.
7. McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 29---64). Zed Books.
8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. Environmental law and policy in India. Tripathi 1992.
14. Sengupta, R. 2003. Ecology and economics: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. Ecology, Environmental Science and Conservation. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
17. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
18. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
19. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
20. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press.

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CC 12: Programming in C

[Credits: 4, Lectures: 60]

Unit 1: Introduction to C (6 Lectures)

History of C, Overview of Procedural Programming, Introduction to Algorithm & Flowcharts.

Unit 2: Understanding Compilation and Execution in C (6 Lectures)

Using main() function Compiling and Executing Simple Programs in C.

Unit 3: Data Types, Variables, Constants, Operators and Basic I/O (7 Lectures)

Declaring, Defining and Initializing Variables, Scope of Variables, Using Named Constants, Keywords, Data Types, Casting of Data Types, Operators (Arithmetic, Logical and Bitwise), Using Comments in programs, Character I/O (getc, getchar, putc, putchar), Formatted and Console I/O (printf(), scanf(), cin, cout), Using Basic Header Files (stdio.h, iostream.h, conio.h).

Unit 4: Expressions, Conditional Statements and Iterative Statements (7 Lectures)

Simple Expressions in C (including Unary Operator Expressions, Binary Operator Expressions), Understanding Operators Precedence in Expressions, Conditional Statements (if construct, switch-case construct), Understanding syntax and utility of Iterative Statements (while, do-while, and for loops), Use of break and continue in Loops, Using Nested Statements (Conditional as well as Iterative)

Unit 5: Understanding Functions (6 Lectures)

Utility of functions, Call by Value, Call by Reference, Functions returning value, Void functions, Inline Functions, Return data type of functions, Functions parameters, Differentiating between Declaration and Definition of Functions, Command Line Arguments/Parameters in Functions, Functions with variable number of Arguments.

Unit 6: Implementation of Arrays and Strings (6 Lectures)

Creating and Using One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, Accessing individual elements in an Array, Manipulating array elements using loops), Use Various types of arrays (integer, float and character arrays / Strings) Two-dimensional Arrays (Declaring, Defining and Initializing Two Dimensional Array, Working with Rows and Columns), Introduction to Multi-dimensional arrays

Unit 7: User-defined Data Types (Structures and Unions) (4 Lectures)

Understanding utility of structures and unions, Declaring, initializing and using simple structures and unions, Manipulating individual members of structures and unions, Array of Structures, Individual data members as structures, Passing and returning structures from functions, Structure with union as members, Union with structures as members.

Unit 8: Pointers and References in C (8 Lectures)

Understanding a Pointer Variable, Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables), Pointers to Pointers, Pointers to structures, Problems with Pointers, Passing pointers as function arguments, Returning a pointer from a function, using arrays as pointers, Passing arrays to functions. Pointers vs. References, Declaring and initializing references, Using references as function arguments and function return values

Unit 9: Memory Allocation in C (3 Lectures)

Differentiating between static and dynamic memory allocation, use of malloc, calloc and free functions, use of new and delete operators, storage of variables in static and dynamic memory allocation

Unit 10: File I/O (4 Lectures)

Opening and closing a file, Reading and writing Text Files, Using put(), get(), read() and write() functions, Random access in files,

Unit 11: Preprocessor Directives (3 Lectures)

Understanding the Preprocessor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef), Macros

Suggested Readings

1. "The C Programming Language ANSI C Version", Kernighan & Ritchie, Prentice Hall Software Series
2. "ANSI C - Made Easy", Herbert Schildt, Osborne McGraw-Hill
3. "Learning to Program in C", N. Kantaris, Babani
4. "C - The Complete Reference", Herbert Schildt, Osborne McGraw-Hill
5. "Programming in C", Reema Thareja, Oxford University Press
6. "A First Course in Programming With C", T. Jeyapoovan, Vikas Publishing House
7. "Let Us C", Yashavant P. Kanetkar, BPB Publications

Unit-1: Fundamentals of Computers (15 Lectures)

Generation of Computers and Computer Languages, Computer Systems, Basic block Diagram, Von- Neumann Architecture, Types of Computers, Hardware, Firmware, I/O Devices, Storage classifications, Language translators.

Unit-2: Logic gates (15 Lectures)

AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR gates, Boolean algebra, Basic Boolean Laws, De-morgan's theorem, Boolean function and their truth tables, MAP simplification, Minimization techniques, K-Map, Sum of Product & Product of Sum, Venn diagram.

Unit-3: Circuits, Adders, Flip Flops, Registers etc. (15 Lectures)

Combinational & Sequential circuits, Half adder & Full adder, BCD adder, Full Subtractor, Flip-flops-RS, D, JK, T & Master-Slave flip-flops, Shift registers, Multiplexer, Encoder, Decoder.

Unit-4: Number Systems & Arithmetic (15 Lectures)

Number System: Positional, Binary, Octal, Decimal, Hexa-Decimal and their Representations. Methods of conversion from one Base to another. Binary Addition, Subtraction, Multiplication. Negative number representation: Sign magnitude, 1's, 2's Complement. Different coding schemes: BCD, EBCDIC, UNICODE, ASCII, GRAY, Excess-3 Codes. Fixed and floating point representation

Suggested Readings

1. Rajaraman V. & Radhakrishnan, An Introduction To Digital Computer Design, PHI.
2. Malvino & Leach, Digital Principles & Applications, TMH
3. S. Salivahanan, S. Arivazhagan, Digital Circuits and Design, Oxford University Press

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GE 14: General Elective - 1

[Theory: 60 Lectures]

Step1: Choose only ONE discipline of interest from the following in consultation with the concerned college authority and faculty members:

1. Mathematics	7. Mass Comm &
2. Statistics	Journalism
3. Physics	8. Geography
4. Commerce	9. Microbiology
5. Economics	
6. Management	

Step 2: Then, for [GE 14](#), select one paper from the chosen discipline and follow the respective syllabus.

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CC 12L: Programming in C Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. WAP to perform input/output of all basic data types.
2. WAP to enter two numbers and find their sum.
3. WAP to reverse a number.
4. WAP to Swap Two Numbers.
5. WAP to Check Whether a Number is Even or Odd
6. WAP to compute the factors of a given number.
7. WAP to enter marks of five subjects and calculate total, average and percentage.
8. WAP to print the sum and product of digits of an integer.
9. WAP to Check Whether a Character is Vowel or Consonant
10. WAP to Find the Largest Number Among Three Numbers
11. WAP to compute the sum of the first n terms of the following series
 $S = 1 - 2 + 3 - 4 + 5 - \dots$
12. WAP to compute the sum of the first n terms of the following series $S = 1 + 1/2 + 1/3 + 1/4 + \dots$

13. WAP to print a triangle of stars as follows (take number of lines from user):

*	1	1	1	*	*	*	*	A	A
***	1	1	2	3	1	2		A B	B A
*****	1	2	1	4	5	6		A B C	C B A
*****	1	3	3	1	7	8	9	A B C D	D C B A
*****	1	4	6	4	1	11	12	A B C D E	E D C B A

14. WAP to perform following actions on an array entered by the user:

- Print the even-valued elements
- Print the odd-valued elements
- Calculate and print the sum and average of the elements of array
- Print the maximum and minimum element of array
- Remove the duplicates from the array
- Print the array in reverse order

The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.

15. WAP that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.

16. Write a program that swaps two numbers using pointers.

17. Write a program in which a function is passed address of two variables and then alter its contents.

18. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.

19. Write a program to find sum of n elements entered by the user. To write this program, allocate memory dynamically using malloc() / calloc() functions or new operator.

20. Write a menu driven program to perform following operations on strings:

21. Show address of each character in string

22. Concatenate two strings without using strcat function.

23. Concatenate two strings using strcat function.

24. Compare two strings

25. Calculate length of the string (use pointers)

26. Convert all lowercase characters to uppercase

27. Convert all uppercase characters to lowercase

28. Calculate number of vowels

29. Reverse the string

30. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.

31. WAP to display Fibonacci series (i)using recursion, (ii) using iteration

32. WAP to calculate Factorial of a number (i)using recursion, (ii) using iteration

33. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.

34. Write a menu-driven program to perform following Matrix operations (2-D array implementation):

- Sum
- Difference
- Product
- Transpose

35. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.

36. Write a program to retrieve the student information from file created in previous question and print it in following format:

Roll No.	Name	Marks

37. Copy the contents of one text file to another file, after removing all whitespaces.

38. WAP to Write a Sentence to a File.

39. WAP to Read a Line From a File and Display it.

40. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void.

41. Write a program that will read 10 integers from user and store them in an array. Implement array using pointers. The program will print the array elements in ascending and descending order.

CC 13T: Digital Electronics Tutorial**[Credit: 1, Lecture Hours: 15]**

Digital Electronics tutorial as assigned and advised by teacher(s).

GE 14TL: General Elective – I Tutorial or Lab

Tutorial or Lab corresponding to the chosen paper for GE 14. Thus follows the syllabus of the chosen discipline.

----- End of Semester I-----

AEC 21: English/MIL Communication**[Credit: 2, Lecture Hours: 50]**

Preamble: The purpose of this course is to introduce students to the theory, fundamentals and tools of communication and to develop in them vital communication skills which should be integral to personal, social and professional interactions. One of the critical links among human beings and an important thread that binds society together is the ability to share thoughts, emotions and ideas through various means of communication: both verbal and non-verbal. In the context of rapid globalization and increasing recognition of social and cultural pluralities, the significance of clear and effective communication has substantially enhanced.

The present course hopes to address some of these aspects through an interactive mode of teaching-learning process and by focusing on various dimensions of communication skills. Some of these are:

Language of communication, various speaking skills such as personal communication, social interactions and communication in professional situations such as interviews, group discussions and office environments, important reading skills as well as writing skills such as report writing, notetaking etc.

While, to an extent, the art of communication is natural to all living beings, in today's world of complexities, it has also acquired some elements of science. It is hoped that after studying this course, students will find a difference in their personal and professional interactions.

The recommended readings given at the end are only suggestive; the students and teachers have the freedom to consult other materials on various units/topics given below. Similarly, the questions in the examination will be aimed towards assessing the skills learnt by the students rather than the textual content of the recommended books.

1. Introduction:

- Theory of Communication,
- Types and modes of Communication

2. Language of Communication:

- Verbal and Non-verbal (Spoken and Written)
- Personal, Social and Business
- Barriers and Strategies
- Intra-personal, Inter-personal and Group communication

3. Speaking Skills:

- Monologue
- Dialogue
- Group Discussion
- Effective Communication/ Mis- Communication
- Interview
- Public Speech

4. Reading and Understanding

- Close Reading
- Comprehension
- Summary Paraphrasing
- Analysis and Interpretation
- Translation(from Indian language to English and vice-versa)
- Literary/Knowledge Texts

5. Writing Skills

- Documenting
- Report Writing
- Making notes
- Letter writing

Suggested Readings:

1. *Fluency in English* - Part II, Oxford University Press, 2006.
2. *Business English*, Pearson, 2008.
3. *Language, Literature and Creativity*, Orient Blackswan, 2013.
4. *Language through Literature* (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas

Unit 1: Introduction to Java (4 Lectures)

Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, Compiling and Executing a Java Program, Variables, Constants, Keywords Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, Java Methods (Defining, Scope, Passing and Returning Arguments, Type Conversion and Type and Checking, Built-in Java Class Methods),

Unit 2: Arrays, Strings and I/O (8 Lectures)

Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.

Unit 3: Object-Oriented Programming Overview (4 Lectures)

Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, Class Constructors, Method Overloading, Class Variables & Methods, Objects as parameters, final classes, Object class, Garbage Collection.

Unit 4: Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata (14 lectures)

Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, Using Standard Java Packages (util, lang, io, net), Wrapper Classes, Autoboxing/Unboxing, Enumerations and Metadata.

Unit 5: Exception Handling, Threading, Networking and Database Connectivity (15 Lectures)

Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions; Multi-threading: The Thread class and Runnable interface, creating single and multiple threads, Thread prioritization, synchronization and communication, suspending/resuming threads. Using java.net package, Overview of TCP/IP and Datagram programming. Accessing and manipulating databases using JDBC.

Unit 6: Applets and Event Handling (15 Lectures)

Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, textfields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. Overview of servlets.

Suggested Readings

1. Ken Arnold, James Gosling, David Homes, "The Java Programming Language", 4th Edition, 2005.
2. James Gosling, Bill Joy, Guy L Steele Jr, Gilad Bracha, Alex Buckley "The Java Language Specification, Java SE 8 Edition (Java Series)", Published by Addison Wesley, 2014.
3. Joshua Bloch, "Effective Java" 2nd Edition, Publisher: Addison-Wesley, 2008.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1 ,9th Edition, Printice Hall.2012
5. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 2 - Advanced Features)", 9th Edition, Printice Hall.2013
6. Bruce Eckel, "Thinking in Java", 3rd Edition, PHI, 2002.
7. E. Balaguruswamy, "Programming with Java", 4th Edition, McGraw Hill.2009.
8. Paul Deitel, Harvey Deitel, "Java: How to Program", 10th Edition, Prentice Hall, 2011.
9. Bert Bates, Kathy Sierra, "Head First Java", Orielly Media Inc. 2nd Edition, 2005.
10. Object Oriented Programming through JAVA, P Radha Krishna, University Press
11. David J. Eck, "Introduction to Programming Using Java", Published by CreateSpace Independent Publishing Platform, 2009.
12. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2nd Edition, 2004.
13. R. Nageswara, Core Java: An Integrated Approach, Dreamtech Press

Unit 1: Introduction (8 lectures)

Logic gates, boolean algebra, combinational circuits, circuit simplification, flip-flops and sequential circuits, decoders, multiplexers, registers, counters and memory units.

Unit 2: Data Representation and Basic Computer Arithmetic (10 lectures)

Number systems, complements, fixed and floating point representation, character representation, addition, subtraction, magnitude comparison, multiplication and division algorithms for integers

Unit 3: Basic Computer Organization and Design (13 lectures)

Computer registers, bus system, instruction set, timing and control, instruction cycle, memory reference, input-output and interrupt, Interconnection Structures, Bus Interconnection design of basic computer.

Unit 4: Central Processing Unit (15 lectures)

Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control. Instruction formats, addressing modes, instruction codes, machine language, assembly language, input output programming, RISC, CISC architectures, pipelining and parallel architecture.

Unit 5: Memory Organization (6 lectures)

Cache memory, Associative memory, mapping.

Unit 6: Input-Output Organization (8 lectures)

Input / Output: External Devices, I/O Modules, Programmed I/O, Interrupt-Driven I/O, Direct Memory Access, I/O Channels.

Suggested Readings

1. M. Mano, Computer System Architecture, Pearson Education 1992
2. A. J. Dos Reis, Assembly Language and Computer Architecture using C++ and JAVA, Course Technology, 2004
3. W. Stallings, Computer Organization and Architecture Designing for Performance, 8th Edition, Prentice Hall of India, 2009
4. M.M. Mano, Digital Design, Pearson Education Asia, 2013
5. Carl Hamacher, Computer Organization, Fifth edition, McGrawHill, 2012.

[Top](#)[^]**GE 24: Generic Elective-2****[Theory: 60 Lectures]**

For [GE 24](#), select another paper from separate discipline given in the list of Step 1 of GE 14 which is not chosen for GE 14 and follow the respective syllabus.

[Top](#)[^]**CC 22L: Programming in JAVA Lab****[Credit: 2, Lab Hours: 60]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. To find the sum of any number of integers entered as command line arguments
2. To find the factorial of a given number
3. To learn use of single dimensional array by defining the array dynamically.
4. To learn use of .length in case of a two dimensional array
5. To convert a decimal to binary number
6. To check if a number is prime or not, by taking the number as input from the keyboard
7. To find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument
8. Write a program that show working of different functions of String and StringBuffer classes like setCharAt(), setLength(), append(), insert(), concat() and equals().

9. Write a program to create a —distance class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer
10. Modify the —distance class by creating constructor for assigning values (feet and inches) to the distance object. Create another object and assign second object as reference variable to another object reference variable. Further create a third object which is a clone of the first object.
11. Write a program to show that during function overloading, if no matching argument is found, then java will apply automatic type conversions(from lower to higher data type)
12. Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keyword
13. Write a program to show the use of static functions and to pass variable length arguments in a function.
14. Write a program to demonstrate the concept of boxing and unboxing.
15. Create a multi-file program where in one file a string message is taken as input from the user and the function to display the message on the screen is given in another file (make use of Scanner package in this program).
16. Write a program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate fibonacci series is given in a different file belonging to the same package.
17. Write a program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages
18. Write a program —DivideByZero that takes two numbers a and b as input, computes a/b, and invokes Arithmetic Exception to generate a message when the denominator is zero.
19. Write a program to show the use of nested try statements that emphasizes the sequence of checking for catch handler statements.
20. Write a program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).
21. Write a program to demonstrate priorities among multiple threads.
22. Write a program to demonstrate multithread communication by implementing synchronization among threads (Hint: you can implement a simple producer and consumer problem).
23. Write a program to create URL object, create a URLConnection using the openConnection() method and then use it examine the different components of the URL and content.
24. Write a program to implement a simple datagram client and server in which a message that is typed into the server window is sent to the client side where it is displayed.
25. Write a program that creates a Banner and then creates a thread to scrolls the message in the banner from left to right across the applet,s window.
26. Write a program to get the URL/location of code (i.e. java code) and document(i.e. html file).
27. Write a program to demonstrate different mouse handling events like mouseClicked(), mouseEntered(), mouseExited(), mousePressed, mouseReleased() and mouseDragged().
28. Write a program to demonstrate different keyboard handling events.
29. Write a program to generate a window without an applet window using main() function.
30. Write a program to demonstrate the use of push buttons.

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Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. General study of Basic & Universal gates

a) AND	b) OR	c) NOT	d) NOR
e) NAND	f) XOR	g) XNOR	
2. Simple Boolean Expression using Basic gates and Universal gates:

$$\overline{A} \cdot (B+A) + \overline{B} \cdot A$$
3. Design Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor Circuit.
4. Parallel Adder (2-bit, 3-bit) Circuit.
5. Implement logic functions in SOP form using Multiplexer.
6. Implement De-multiplexer.
7. Implement 7- Segment Display with Decoder.
8. Implement Parity Generator (Odd & Even)
9. Implement Magnitude Comparator (1-bit, 2-bit, 3-bit)
10. Circuit Design and implementation of Flip-Flops (SR, JK, D) using ICs
11. Circuit design and implementation of Decoder (2x4) and Encoder (4x2) using ICs

Tutorial or Lab corresponding to the chosen paper for GE 24. Thus follows the syllabus of the chosen discipline.

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----- End of Semester II-----

2nd Year: Semester III

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CC 31: Data Structures

[Credit: 4, Lecture Hours: 60]

Unit 1: Arrays (5 Lectures)

Single and Multi-dimensional Arrays, Sparse Matrices (Array and Linked Representation)

Unit 2: Stacks (5 Lectures)

Implementing single / multiple stack/s in an Array; Prefix, Infix and Postfix expressions, Utility and conversion of these expressions from one to another; Applications of stack; Limitations of Array representation of stack

Unit 3: Linked Lists (10 Lectures)

Singly, Doubly and Circular Lists (Array and Linked representation); Normal and Circular representation of Stack in Lists; Self Organizing Lists; Skip Lists

Unit 4: Queues (5 Lectures)

Array and Linked representation of Queue, De-queue, Priority Queues

Unit 5: Recursion (5 lectures)

Developing Recursive Definition of Simple Problems and their implementation; Advantages and Limitations of Recursion; Understanding what goes behind Recursion (Internal Stack Implementation)

Unit 6: Trees (20 Lectures)

Introduction to Tree as a data structure; Binary Trees (Insertion, Deletion, Recursive and Iterative Traversals on Binary Search Trees); Threaded Binary Trees (Insertion, Deletion, Traversals); Height-Balanced Trees (Various operations on AVL Trees).

Unit 7: Searching and Sorting (5 Lectures)

Linear Search, Binary Search, Comparison of Linear and Binary Search, Selection Sort, Insertion Sort, Insertion Sort, Shell Sort, Comparison of Sorting Techniques

Unit 8: Hashing (5 Lectures)

Introduction to Hashing, Deleting from Hash Table, Efficiency of Rehash Methods, Hash Table Reordering, Resolving collision by Open Addressing, Coalesced Hashing, Separate Chaining, Dynamic and Extendible Hashing, Choosing a Hash Function, Perfect Hashing Function

Suggested Readings

1. Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning, 2012.
2. Sartaj Sahni, Data Structures, "Algorithms and applications in C++", Second Edition, Universities Press, 2011.
3. Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, "Data Structures Using C and C++", Second edition, PHI, 2009.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson, 1999.
5. D.S Malik, Data Structure using C++, Second edition, Cengage Learning, 2010.
6. Mark Allen Weiss, "Data Structures and Algorithms Analysis in Java", Pearson Education, 3rd edition, 2011
7. Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, "Data Structures Using Java, 2003.
8. Robert Lafore, "Data Structures and Algorithms in Java, 2/E", Pearson/ Macmillan Computer Pub, 2003
9. John Hubbard, "Data Structures with JAVA", McGraw Hill Education (India) Private Limited; 2 edition, 2009
10. Goodrich, M. and Tamassia, R. "Data Structures and Algorithms Analysis in Java", 4th Edition, Wiley, 2013
11. Herbert Schildt, "Java The Complete Reference (English) 9th Edition Paperback", Tata McGraw Hill, 2014.
12. D. S. Malik, P.S. Nair, "Data Structures Using Java", Course Technology, 2003.

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Unit 1: Introduction (10 Lectures)

Basic OS functions, resource abstraction, types of operating systems—multiprogramming systems, batch systems, time sharing systems; operating systems for personal computers & workstations, process control & real time systems.

Unit 2: Operating System Organization (6 Lectures)

Processor and user modes, kernels, system calls and system programs.

Unit 3: Process Management (20 Lectures)

System view of the process and resources, process abstraction, process hierarchy, threads, threading issues, thread libraries; Process Scheduling, non-preemptive and preemptive scheduling algorithms; concurrent and processes, critical section, semaphores, methods for inter-process communication; deadlocks.

Unit 4: Memory Management (10 Lectures)

Physical and virtual address space; memory allocation strategies -fixed and variable partitions, paging, segmentation, virtual memory

Unit 5: File and I/O Management (10 Lectures)

Directory structure, file operations, file allocation methods, device management.

Unit 6: Protection and Security (4 Lectures)

Policy mechanism, Authentication, Internal access Authorization.

Suggested Readings

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
3. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997.
4. W. Stallings, Operating Systems, Internals & Design Principles, 5th Edition, Prentice Hall of India. 2008.
5. M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill 1992.
6. Operating Systems, A K Sharma, University Press

[Top](#)[^]**Unit 1: Introduction: (15 Lectures)**

Sets - finite and Infinite sets, uncountably Infinite Sets; functions, relations, Properties of Binary Relations, Closure, Partial Ordering Relations; counting - Pigeonhole Principle, Permutation and Combination; Mathematical Induction, Principle of Inclusion and Exclusion.

Unit 2: Growth of Functions: (8 Lectures)

Asymptotic Notations, Summation formulas and properties, Bounding Summations, approximation by Integrals

Unit 3: Recurrences: (10 Lectures)

Recurrence Relations, generating functions, Linear Recurrence Relations with constant coefficients and their solution, Substitution Method, Recurrence Trees, Master Theorem

Unit 4: Graph Theory (15 Lectures)

Basic Terminology, Models and Types, multigraphs and weighted graphs, Graph Representation, Graph Isomorphism, Connectivity, Euler and Hamiltonian Paths and Circuits, Planar Graphs, Graph Coloring, Trees, Basic Terminology and properties of Trees, Introduction to Spanning Trees

Unit 5: Propositional Logic (12 Lectures)

Logical Connectives, Well-formed Formulas, Tautologies, Equivalences, Inference Theory

Suggested Readings

1. C.L. Liu , D.P. Mahopatra, Elements of Discrete mathematics, 2nd Edition , Tata McGraw Hill, 1985,
2. Kenneth Rosen, Discrete Mathematics and Its Applications, Sixth Edition ,McGraw Hill 2006
3. T.H. Cormen, C.E. Leiserson, R. L. Rivest, Introduction to algorithms, 3rd edition Prentice Hall on India, 2009
4. M. O. Albertson and J. P. Hutchinson, Discrete Mathematics with Algorithms , John wiley Publication, 1988
5. J. L. Hein, Discrete Structures, Logic, and Computability, 3rd Edition, Jones and Bartlett Publishers, 2009
6. D.J. Hunter, Essentials of Discrete Mathematics, Jones and Bartlett Publishers, 2008
7. Discrete Mathematical Structures with Applications to Combinatorics, V Ramaswamy, University Press
8. Discrete Mathematics: A Concept-based Approach, Basavaraj S Anami, Venkanna S Madalli, University Press

GE 34: Generic Elective-3

[Theory: 60 Lectures]

For [GE 34](#), select another paper from separate discipline given in the list of Step 1 of GE 14 which is not chosen for GE 14 and GE 24 and follow the respective syllabus.

CC 31L: Data Structures Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write a program to search an element from a list. Give user the option to perform Linear or Binary search. Use Template functions.
2. WAP using templates to sort a list of elements. Give user the option to perform sorting using Insertion sort, Bubble sort or Selection sort.
3. Implement Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list and concatenate two linked lists (include a function and also overload operator +).
4. Implement Doubly Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
5. Implement Circular Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
6. Perform Stack operations using Linked List implementation.
7. Perform Stack operations using Array implementation. Use Templates.
8. Perform Queues operations using Circular Array implementation. Use Templates.
9. Create and perform different operations on Double-ended Queues using Linked List implementation.
10. WAP to scan a polynomial using linked list and add two polynomial.
11. WAP to calculate factorial and to compute the factors of a given no. (i)using recursion, (ii) using iteration
12. WAP to display fibonacci series (i)using recursion, (ii) using iteration
13. WAP to calculate GCD of 2 number (i) with recursion (ii) without recursion
14. WAP to create a Binary Search Tree and include following operations in tree:
 - (i) Insertion (Recursive and Iterative Implementation)
 - (ii) Deletion by copying
 - (iii) Deletion by Merging
 - (iv) Search a no. in BST
 - (v) Display its preorder, postorder and inorder traversals Recursively
 - (vi) Display its preorder, postorder and inorder traversals Iteratively
 - (vii) Display its level-by-level traversals
 - (viii) Count the non-leaf nodes and leaf nodes
 - (ix) Display height of tree
 - (x) Create a mirror image of tree
 - (xi) Check whether two BSTs are equal or not
15. WAP to convert the Sparse Matrix into non-zero form and vice-versa.
16. WAP to reverse the order of the elements in the stack using additional stack.
17. WAP to reverse the order of the elements in the stack using additional Queue.
18. WAP to implement Diagonal Matrix using one-dimensional array.
19. WAP to implement Lower Triangular Matrix using one-dimensional array.
20. WAP to implement Upper Triangular Matrix using one-dimensional array.
21. WAP to implement Symmetric Matrix using one-dimensional array.
22. WAP to create a Threaded Binary Tree as per inorder traversal, and implement operations like finding the successor / predecessor of an element, insert an element, inorder traversal.
23. WAP to implement various operations on AVL Tree.

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems: **[Implement the followings using Bash Shell Script]**

1. Evaluate : $1 * 2^3 + 2 * 4^3 + 3 * 6^3 + \dots$ up to n terms
2. Evaluate : $1^2 + 3^2 + 6^2 + 10^2 + \dots$ up to n terms
3. Evaluate : $1 * 3^2 + 2 * 5^2 + 3 * 7^2 + \dots$ up to n terms
4. Evaluate : $1 - 2 + 3 - 4 + \dots$ up to n terms
5. Print the following:

```

      1           *           5 4 3 2 1
    1 2         * *         4 3 2 1
  1 2 3       * * *       * * *
1 2 3 4     * * * *     * *
1 2 3 4 5 * * * * *     *
                                     2 1
                                     1

```

6. Find the factorial of a number.
7. Find HCF and LCM of 2/3 numbers.
8. Check whether a given year is leap year or not.
9. Find the sum of squares of the digits of a number.
10. Find the Armstrong numbers between 100 & 999.
11. Check whether a given number is prime or not.
12. Print all the prime numbers between 1 & 100.
13. Print the multiplication table of a number.
14. Check whether a number is perfect square or not.
15. Find the first and last digit of any number and find their product.
16. Find the Area of Circle, Rectangle, or Triangle using user-input.
17. Find the prime factors of a number.
18. Convert a decimal number to binary.
19. Convert a binary number to decimal.
20. Check whether a given string is palindrome or not.
21. Abbreviate a name.
22. Reverse a string.
23. Find the largest and smallest numbers from a list of 10 integers.
24. Find the numbers and their sums between 100 to 300 which are divisible by 3 and 7.
25. Calculate nCr using function.

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CC 33T: Discrete Structures Tutorial

[Credit: 1, Lecture Hours: 15]

Discrete structures tutorials as assigned and advised by teacher(s).

GE 34TL:

Tutorial or Lab corresponding to the chosen paper for GE 34. Thus follows the syllabus of the chosen discipline.

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Unit-1: Introduction (3 Lectures)

Arduino Basics, The Arduino platform, Block Diagram, Architecture.

Unit-2: Arduino Basic programming essentials (3 Lectures)

Arduino Control structure, Arduino Functions, Arduino operators, Arduino Sketch Structure

Unit-3: Interfacing (3 Lectures)

LED with Arduino, Working of LED, Sketch for blinking LED using delay function, Sketch Explanation, Interfacing LCD display with Arduino, Interfacing different sensors with Arduino Sensor

Unit-4: IR Sensor (3 Lectures)

Introduction to IR Sensor, Working of IR sensor, Pinouts of IR sensor, Connection of IR sensor with Arduino, Sketch showing working of IR sensor, Sketch explanation Sensor

Unit-5: Ultrasonic Sensor (HC-SR04) (3 Lectures)

Introduction to HC-SR04, Working of HC-SR04, Pinouts of HC-SR04, Connection of HC-SR04 with Arduino, Sketch for water level monitoring using HC-SR04, Sketch explanation Sensor.

Suggested Readings

1. Make: Sensors, Book by KimmoKarvinen, TeroKarvinen, and Ville Valtokari
2. Getting Started with Sensors: Measure the World with Electronics, Arduino and Raspberry Pi by KimmoKarvinen and TeroKarvinen

Arduino Lab:

1. To build a sensor circuit that senses ambient light level and uses its sensor reading to make a decision (Analogue to Digital Conversion ADC).
2. To use Pulse-Width Modulation (PWM) to fade in and out an LED (Digital to Analogue Conversion DAC).
3. To design a circuit that combines the ADC and DAC points above to create a new function.

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Unit 1: Introduction (1 Lectures)

Introduction to Markup Languages and HTML, need and use; the Head, the Body, Colors, Attributes, Lists, ordered and unordered

Unit 2: Links, Images and Tables (3 Lectures)

Introduction; Relative Links, Absolute Links; Link Attributes; Using the ID Attribute to Link Within a Document; Putting an Image on a Page, Using Images as Links, Putting an Image in the Background, Creating a Table, Table Headers, Captions, Spanning Multiple Columns, Styling Table

Unit 3: Introduction to XML (4 Lectures)

Introduction to XML and its Goals, XML Structure and Syntax, Document classes and Rules, Scripting XML, XML as Data, Linking with XML, XSL –Style Sheet Basics, XSL basics, XSL style sheets. (3L)

Unit 4: Introduction to PHP (3 Lectures)

PHP introduction, inventions and versions, scope, important tools and software requirements (like Web Server, Database, Editors etc.), Basic Syntax, PHP variables and constants, Types of data in PHP, Expressions, scopes of a variable (local, global), PHP Operators: Arithmetic, Assignment, Relational, Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity

Unit 5: Handling HTML form with PHP (2 Lectures)

Basic Input and Attributes, Other Kinds of Inputs, Styling forms with CSS, Where to Go from Here Capturing Form Data, GET and POST form methods, Dealing with multi value fields, Redirecting a form after submission

Unit 6: PHP conditional events and Loops (3 Lectures)

PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loops, Goto, Break, Continue and exit

Unit 7: PHP Functions (3 Lectures)

Function, Need of Function, declaration and calling of a function, PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference, Scope of Function Global and Local

Unit 8: String Manipulation and Regular Expression (5 Lectures)

Creating and accessing String, Searching & Replacing String; Formatting, joining and splitting String, String Related Library functions; Use and advantage of regular expression over inbuilt function; Use of preg_match(), preg_replace(), preg_split() functions in regular expression

Unit 9: Array (3 Lectures)

Anatomy of an Array, Creating index based and Associative array, Accessing array; Looping with Index based array, with associative array using each() and foreach(); Some useful Library function

Suggested Readings

1. Virginia DeBolt, Integrated HTML and CSS A Smarter, Faster Way to Learn, Wiley / Sybex, 2006
2. Cassidy Williams, Camryn Williams Introduction to HTML and CSS, O'Reilly, 2015
3. XML in action web technology by William J. Pardi
4. Step by Step XML by Michael J. Young
5. Steven Holzner, "PHP: The Complete Reference Paperback", McGraw Hill Education (India), 2007.
6. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India Private Limited, 2008.
7. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5", 3rd Edition Paperback, O'Reilly, 2014.
8. Luke Welling, Laura Thompson, "PHP and MySQL Web Development", 4th Edition, Addison-Wesley Professional, 2008.
9. David Sklar, Adam Trachtenberg, "PHP Cookbook: Solutions & Examples for PHP Programmers", 2014.

Software Lab Based on HTML, XML and PHP(Not limited but including the following):

1. Create an HTML document with the different formatting options i.e. Bold, Italics, Underline, Headings (Using H1 to H6 heading styles), Font (Type, Size and Color), Background (Colored background/Image in background), Paragraph, Line Break, Horizontal Rule, Pre tag
2. Create an HTML document which consists of: Ordered List, Unordered List, Nested ordered and/or unordered List and Image
3. Create an HTML document which implements Internal linking as well as External linking Q. No.4.
4. Create a table using HTML demonstrating use of columns and rows, merging multiple rows and/or columns etc.with data and image values and contents with hyperlinking
5. Create a typical student data capture form for the purpose of admission to your college using different types of HTML controls i.e. Text Box, Option/radio buttons, Check boxes, Reset and Submit buttons etc.
6. Create HTML documents having multiple frames in different possible formats/organization
7. Information Structure: In this exercise, student will practice identifying the structure of an information object
8. Deconstructing an XML Document: In this exercise, student will practice identifying the explicit structure within an XML document. In a sense, this is the reverse of what you did in Exercise #7.
9. Creating XML Markup:In this exercise, create some XML markup based on the tree representation from previous exercise and the content from the original sample document.
10. Well-Formedness:This exercise checks your understanding of the constraints for well-formedness based on some sample code document to be provided by the concerned teacher. Are the supplied code document instances well-formed? Explain any NO answers.
11. Create a PHP page using functions for comparing three integers and print the largest number.
12. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
13. WAP to check whether the given number is prime or not.
14. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
15. Write a PHP function that checks if a string is all lower case.
16. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
17. WAP to sort an array.
18. Write a PHP script that removes the whitespaces from a string. Sample string: 'The quick " " brown fox'
Expected Output :
Thequick""brownfox
19. Write a PHP script that finds out the sum of first n odd numbers.
20. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
21. Write a PHP script that checks if a string contains another string.
22. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
23. Create a script to construct the following pattern, using nested for loop.
*
* *
* * *
* * * *
24. Write a simple PHP program to check that emails are valid.
25. WAP to print first n even numbers.
26. \$color = array('white', 'green', 'red')

Write a PHP script which will display the colors in the following way

: Output :

white, green, red,

- green
- red
- white

27. Using switch case and dropdown list display a —Hello! message depending on the language selected in dropdown list.
28. Write a PHP program to print Fibonacci series using recursion.
29. Write a PHP script to replace the first 'the' of the following string with 'That'.
Sample : 'the quick brown fox jumps over the lazy dog.'
Expected Result : That quick brown fox jumps over the lazy dog.

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Unit 1: Planning the Computer Program(2 Lectures)

Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation

Unit 2: Techniques of Problem Solving(2 Lectures)

Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

Unit 3: Overview of Programming(3 Lectures)

Structure of a Python Program, Elements of Python

Unit 4: Introduction to Python(4 Lectures)

Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator)

Unit 5: Creating Python Programs(4 Lectures)

Input and Output Statements, Control statements(Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, default arguments.

Suggested Readings

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. Python Tutorial/Documentation www.python.org 2015
3. Allen Downey, Jeffrey Elkner, Chris Meyers , How to think like a computer scientist : learning with Python , Freely available online.2012
4. <http://docs.python.org/3/tutorial/index.html>
5. <http://interactivepython.org/courselib/static/pythonds>
6. <http://www.ibiblio.org/g2swap/byteofpython/read/>

Software Lab Based on Python:

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

Section: A (Simple programs)

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :
 - a. Grade A: Percentage ≥ 80
 - b. Grade B: Percentage ≥ 70 and < 80
 - c. Grade C: Percentage ≥ 60 and < 70
 - d. Grade D: Percentage ≥ 40 and < 60
 - e. Grade E: Percentage < 40
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to implement the use of arrays in Python.
7. WAP to implement String Manipulation in python in Python.
8. WAP to find sum of the following series for n terms: $1 - 2/2! + 3/3! - \dots - n/n!$
9. WAP to calculate the sum and product of two compatible matrices.

Section: B (OOPs using Python):

All the programs should be written using user defined functions, wherever possible.

1. WAP to create Class and Objects in Python.
2. WAP to implement Data Hiding in Python.
3. WAP to implement constructor and destructor for a class in Python.
4. WAP to implement constructor and destructor in Python.
5. WAP to implement different types of inheritance in Python.
6. WAP to implement concept of Overriding in Python.
7. Write programs to create mathematical 3D objects using class.
 - a. curve b. sphere c. cone d. arrow e. ring f. cylinder

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----- End of Semester III-----

CC 41: Computer Networks**[Credit: 5, Lecture Hours: 60]****Unit 1: Introduction to Computer Networks (8 Lectures)**

Network definition; network topologies; network classifications; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

Unit 2: Data Communication Fundamentals and Techniques (10 Lectures)

Analog and digital signal; data-rate limits; digital to digital line encoding schemes; pulse code modulation; parallel and serial transmission; digital to analog modulation-; multiplexing techniques- FDM, TDM; transmission media.

Unit 3: Networks Switching Techniques and Access mechanisms (10 Lectures)

Circuit switching; packet switching- connectionless datagram switching, connection-oriented virtual circuit switching; dial-up modems; digital subscriber line; cable TV for data transfer.

Unit 4: Data Link Layer Functions and Protocol (10 Lectures)

Error detection and error correction techniques; data-link control- framing and flow control; error recovery protocols- stop and wait ARQ, go-back-n ARQ; Point to Point Protocol on Internet.

Unit 5: Multiple Access Protocol and Networks (5 Lectures)

CSMA/CD protocols; Ethernet LANS; connecting LAN and back-bone networks- repeaters, hubs, switches, bridges, router and gateways;

Unit 6: Networks Layer Functions and Protocols (6 Lectures)

Routing; routing algorithms; network layer protocol of Internet- IP protocol, Internet control protocols

Unit 7: Transport Layer Functions and Protocols (6 Lectures)

Transport services- error and flow control, Connection establishment and release- three way handshaking

Unit 8: Overview of Application layer protocol (5 Lectures)

Overview of DNS protocol; overview of WWW & HTTP protocol

Suggested Readings

1. B. A. Forouzan: Data Communications and Networking, Fourth edition, THM, 2007.
2. A. S. Tanenbaum: Computer Networks, Fourth edition, PHI, 2002
3. Dr. Rakesh Kumar Mandal: Computer Networks for Students, First Edition, SPD, 2018

CC 42: Software Engineering**[Credit: 4, Lecture Hours: 60]****Unit 1: Introduction (8 Lectures)**

The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Software Engineering as a Layered Technology, Software Process Framework, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI).

Unit 2: Requirement Analysis (10 Lectures)

Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modeling Techniques, Flow Oriented Modeling, Need for SRS, Characteristics and Components of SRS.

Unit 3: Software Project Management (8 Lectures)

Estimation in Project Planning Process, Project Scheduling

Unit 4: Risk Management (8 Lectures)

Software Risks, Risk Identification, Risk Projection and Risk Refinement, RMMM Plan.

Unit 5: Quality Management (8 Lectures)

Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects.

Unit 6: Design Engineering (10 Lectures)

Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Modeling Component Level Design.

Unit 7: Testing Strategies & Tactics (8 Lectures)

Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing.

Suggested Readings

1. R.S. Pressman, Software Engineering: A Practitioner's Approach (7th Edition), McGraw-Hill, 2009.
2. P. Jalote, An Integrated Approach to Software Engineering (2nd Edition), Narosa Publishing House, 2003.
3. K.K. Aggarwal and Y. Singh, Software Engineering (2nd Edition), New Age International Publishers, 2008.
4. I. Sommerville, Software Engineering (8th edition), Addison Wesley, 2006.
5. D. Bell, Software Engineering for Students (4th Edition), Addison-Wesley, 2005.
6. R. Mall, Fundamentals of Software Engineering (2nd Edition), Prentice-Hall of India, 2004.

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CC 43: Database Management Systems

[Credit: 4, Lecture Hours: 60]

Unit 1: Introduction (6 Lectures)

Characteristics of database approach, data models, database system architecture and data independence.

Unit 2: Entity Relationship(ER) Modeling (8 Lectures)

Entity types, relationships, constraints.

Unit 3: Relation data model (20 Lectures)

Relational model concepts, relational constraints, relational algebra, SQL queries

Unit 4: Database design (15 Lectures)

Mapping ER/EER model to relational database, functional dependencies, Lossless decomposition, Normal Forms (upto BCNF).

Unit 5: Transaction Processing (3 Lectures)

ACID properties, concurrency control

Unit 6: File Structure and Indexing (8 Lectures)

Operations on files, File of Unordered and ordered records, overview of File organizations, Indexing structures for files (Primary index, secondary index, clustering index), Multilevel indexing using B and B+ trees.

Suggested Readings

1. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems 6th Edition, Pearson Education, 2010.
2. R. Ramakrishnan, J. Gehrke, Database Management Systems 3rd Edition, McGraw-Hill, 2002.
3. A. Silberschatz, H.F. Korth, S. Sudarshan, Database System Concepts 6th Edition, McGraw Hill, 2010.
4. R. Elmasri, S.B. Navathe Database Systems Models, Languages, Design and application Programming, 6th Edition, Pearson Education, 2013.
5. Database Book: The Principles and Practices Using MySQL, Narain Gehani, University Press

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GE 44: Generic Elective-4

[Theory: 60 Lectures]

For [GE 44](#), select another paper from separate discipline given in the list of Step 1 of GE 14 which is not chosen for GE 14, GE 24 and GE 34 and follow the respective syllabus.

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Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Simulate Cyclic Redundancy Check (CRC) error detection algorithm for noisy channel.
2. Simulate and implement stop and wait protocol for noisy channel.
3. Simulate and implement go back n sliding window protocol.
4. Simulate and implement selective repeat sliding window protocol.
5. Simulate and implement distance vector routing algorithm
6. Simulate and implement Dijkstra algorithm for shortest path routing.

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Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

S. No.	Practical Title
1	• Problem Statement, • Process Model
2	Requirement Analysis: • Creating a Data Flow • Data Dictionary, Use Cases
3	Project Management: • Computing FP • Effort • Schedule, Risk Table, Timeline chart
4	Design Engineering: • Architectural Design • Data Design, Component Level Design
5	Testing: • Basis Path Testing

Sample Projects:

1. **Criminal Record Management:** Implement a criminal record management system for jailers, police officers and CBI officers
2. **DTC Route Information:** Online information about the bus routes and their frequency and fares
3. **Car Pooling:** To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

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Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

Create and use the following database schema to answer the given queries.

EMPLOYEE Schema

Field	Type	NULL	KEY	DEFAULT
Eno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL
Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	Yes	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES	FK	NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

DEPARTMENT Schema

Field	Type	NULL	KEY	DEFAULT
Dno	Integer	No	PRI	NULL
Dname	Varchar(50)	Yes		NULL
Location	Varchar(50)	Yes		New Delhi

Query List:

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
2. Query to display unique Jobs from the Employee Table.
3. Query to display the Employee Name concatenated by a Job separated by a comma.
4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
5. Query to display the Employee Name and Salary of all the employees earning more than \$2850.
6. Query to display Employee Name and Department Number for the Employee No= 7900.
7. Query to display Employee Name and Salary for all employees whose salary is not in the range of \$1500 and \$2850.
8. Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.
9. Query to display Name and Hire Date of every Employee who was hired in 1981.
10. Query to display Name and Job of all employees who don't have a current Manager.
11. Query to display the Name, Salary and Commission for all the employees who earn commission.
12. Sort the data in descending order of Salary and Commission.
13. Query to display Name of all the employees where the third letter of their name is _A,,.
14. Query to display Name of all employees either have two _R,,s or have two _A,,s in their name and are either in Dept No = 30 or their Manger,,s Employee No = 7788.
15. Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.
16. Query to display the Current Date.
17. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.
18. Query to display Name and calculate the number of months between today and the date each employee was hired.
19. Query to display the following for each employee <E-Name> earns < Salary> monthly but wants < 3 * Current Salary >. Label the Column as Dream Salary.
20. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with _J,,, ,A,, and _M,,.
21. Query to display Name, Hire Date and Day of the week on which the employee started.
22. Query to display Name, Department Name and Department No for all the employees.
23. Query to display Unique Listing of all Jobs that are in Department # 30.
24. Query to display Name, Dept Name of all employees who have an _A,, in their name.
25. Query to display Name, Job, Department No. And Department Name for all the employees working at the Dallas location.
26. Query to display Name and Employee no. Along with their Manger,,s Name and the Manager,,s employee no; along with the Employees,, Name who do not have a Manager.

27. Query to display Name, Dept No. And Salary of any employee whose department No. and salary matches both the department no. And the salary of any employee who earns a commission.
28. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies \$100.
29. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees
30. Query to display the number of employees performing the same Job type functions.
31. Query to display the no. of managers without listing their names.
32. Query to display the Department Name, Location Name, No. of Employees and the average salary for all employees in that department.
33. Query to display Name and Hire Date for all employees in the same dept. as Blake.
34. Query to display the Employee No. And Name for all employees who earn more than the average salary.
35. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a _T,,.
36. Query to display the names and salaries of all employees who report to King.
37. Query to display the department no, name and job for all employees in the Sales department.

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GE 44TL:

Tutorial or Lab corresponding to the chosen paper for GE 44. Thus follows the syllabus of the chosen discipline.

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SEC 45TL: Any one from the list (E1-E3)

E1: Android Programming

[15 Lectures +30 Labs]

Unit 1: Introduction (2 Lectures)

History of Android, Introduction to Android Operating Systems, Android Development Tools, Android Architecture.

Unit 2: Overview of object oriented programming using Java (4 Lectures)

OOPs Concepts: Inheritance, Polymorphism, Interfaces, Abstract class, Threads, Overloading and Overriding, Java Virtual Machine.

Unit 3: Development Tools (5 Lectures)

Installing and using Eclipse with ADT plug-in, Installing Virtual machine for Android sandwich/Jelly bean (Emulator), configuring the installed tools, creating a android project – Hello Word, run on emulator, Deploy it on USB-connected Android device.

Unit 4: User Interface Architecture (2 Lectures)

Application context, intents, Activity life cycle, multiple screen sizes.

Unit 5: User Interface Design (2 Lectures)

Form widgets, Text Fields, Layouts, Button control, toggle buttons, Spinners (Combo boxes), Images, Menu, Dialog.

Unit 6: Database (2 Lectures)

Understanding of SQLite database, connecting with the database.

Suggested Readings

1. Pradeep Kothari, Android Application Development: Black book, Dreamtech Press,
2. James C. Sheusi, Android application development for java programmers, Cengage Learning, 2013.

ONLINE READING / SUPPORTING MATERIAL:

1. <http://www.developer.android.com>
2. <http://developer.android.com/about/versions/index.html>
3. <http://developer.android.com/training/basics/firstapp/index.html>
4. <http://docs.oracle.com/javase/tutorial/index.htm> (Available in the form of free downloadable ebooks also).
5. <http://developer.android.com/guide/components/activities.html>
6. <http://developer.android.com/guide/components/fundamentals.html>
7. <http://developer.android.com/guide/components/intents-filters.html>
8. <http://developer.android.com/training/multiscreen/screensizes.html>

9. <http://developer.android.com/guide/topics/ui/controls.html>
10. <http://developer.android.com/guide/topics/ui/declaring-layout.html>
11. <http://developer.android.com/training/basics/data-storage/databases.html>

Software Lab Based on Android Programming:

1. Create —Hello World application. That will display —Hello World in the middle of the screen in the emulator. Also display —Hello World in the middle of the screen in the Android Phone.
2. Create an application with login module. (Check username and password).
3. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
4. Create a menu with 5 options and selected option should appear in text box.
5. Create a list of all courses in your college and on selecting a particular course teacher-in-charge of that course should appear at the bottom of the screen.
6. Create an application with three option buttons, on selecting a button colour of the screen will change.
7. Create and Login application as above. On successful login, pop up the message.
8. Create an application to Create, Insert, update, Delete and retrieve operation on the database.

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E2: Programming in MATLAB

[15 Lectures + 30 Labs]

Unit 1: Introduction to Programming(2 Lectures)

Components of a computer, working with numbers, Machine code, Software hierarchy.

Unit 2: Programming Environment(3 Lectures)

MATLAB Windows, A First Program, Expressions, Constants, Variables and assignment statement, Arrays.

Unit 3: Graph Plots(2 Lectures)

Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save.

Unit 4: Procedures and Functions(3 Lectures)

Arguments and return values, M-files, Formatted console input-output, String handling.

Unit 5: Control Statements(2 Lectures)

If, Else, Else-if, Repetition statements: While, for loop.

Unit 6: Manipulating Text (2 Lectures)

Writing to a text file, Reading from a text file, Randomising and sorting a list, searching a list.

Unit 7: GUI Interface(2 Lectures)

Attaching buttons to actions, Getting Input, Setting Output.

Recommended Books:

1. MATLAB: An Introduction with Applications, by Amos Gilat, 2nd edition, Wiley, 2004,
2. C.B. Moler, Numerical Computing with MATLAB, SIAM, 2004.

Software Lab Based on MATLAB:

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write a program to assign the following expressions to a variable A and then to print out the value of A.
 - a. $(3+4)/(5+6)$
 - b. $2\pi^2$
 - c. $\sqrt{2}$
 - d. $(0.0000123 + 5.67 \times 10^{-3}) \times 0.4567 \times 10^{-4}$
2. Celsius temperatures can be converted to Fahrenheit by multiplying by 9, dividing by 5, and adding 32. Assign a variable called C the value 37, and implement this formula to assign a variable F the Fahrenheit equivalent of 37 Celsius.
3. Set up a vector called N with five elements having the values: 1, 2, 3, 4, 5. Using N, create assignment statements for a vector X which will result in X having these values:
 - a. 2, 4, 6, 8, 10
 - b. $1/2$, 1 , $3/2$, 2 , $5/2$
 - c. 1 , $1/2$, $1/3$, $1/4$, $1/5$
 - d. 1 , $1/4$, $1/9$, $1/16$, $1/25$

4. A supermarket conveyor belt holds an array of groceries. The price of each product (in pounds) is [0.6, 1.2, 0.5, 1.3] ; while the numbers of each product are [3, 2, 1, 5]. Use MATLAB to calculate the total bill.
5. The sortrows(x) function will sort a vector or matrix X into increasing row order. Use this function to sort a list of names into alphabetical order.
6. The —identity matrix is a square matrix that has ones on the diagonal and zeros elsewhere. You can generate one with the eye() function in MATLAB. Use MATLAB to find a matrix B, such that when multiplied by matrix A=[1 2; -1 0] the identity matrix I=[1 0; 0 1] is generated. That is A*B=I.
7. Create an array of N numbers. Now find a single MATLAB statement that picks out from that array the 1,4,9,16,...,√Nth entries, i.e. those numbers which have indices that are square numbers.
8. Draw a graph that joins the points (0,1), (4,3), (2,0) and (5,-2).
9. The seeds on a sunflower are distributed according to the formula below. Plot a small circle at each of the first 1000 co-ordinates :

$$r_n = \sqrt{n}$$

$$\theta_n = \frac{137.51}{180} \pi n$$

10. Calculate 10 approximate points from the function $y=2x$ by using the formulae:
 - a. i. $x_n = n$
 - b. ii. $y_n = 2n + \text{rand} - 0.5$
 Fit a line of best fit to these points using the function polyfit() with degree=1, and generate co-ordinates from the line of best fit using polyval(). Use the on-line help to find out how to use these functions. Plot the raw data and the line of best fit.
11. Calculate and replay 1 second of a sinewave at 500Hz with a sampling rate of 11025Hz. Save the sound to a file called "ex35.wav". Plot the first 100 samples.
12. Calculate and replay a 2 second chirp. That is, a sinusoid that steadily increases in frequency with time, from say 250Hz at the start to 1000Hz at the end.
13. Build a square wave by adding together 10 odd harmonics: 1f, 3f, 5f, etc. The amplitude of the nth harmonic should be 1/n. Display a graph of one cycle of the result superimposed on the individual harmonics.
14. Write a function called FtoC (ftoc.m) to convert Fahrenheit temperatures into Celsius. Make sure the program has a title comment and a help page. Test from the command window with:
 - a. FtoC(96)
 - b. lookfor Fahrenheit
 - c. help FtoC
15. Write a program to input 2 strings from the user and to print out (i) the concatenation of the two strings with a space between them, (ii) a line of asterisks the same length as the concatenated strings, and (iii) the reversed concatenation. For example:
 - a. Enter string 1: Mark
 - b. Enter string 2: Huckvale
 - c. Mark Huckvale
 - d. *****
 - e. elavkcuH kraM

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E3: VB.NET Programming

[15 Lectures + 30 Labs]

Unit 1: Introduction to .NET Framework (2 Lectures)

Introduction, Characteristics, Web Services; The Framework, Components, Common Language Runtime (CLR), .NET Class Framework vs. A Language - Specific Class Library;

Unit 2: Using .NET Components (3 Lectures)

.NET Windows Forms, Web Forms and Web Services, Console Applications; Microsoft Intermediate Language (MSIL), .NET Compilers, Common Language Runtime, Code reuse, Multiple Language Support in .NET, Cross-Language Interoperability, Garbage Collection, Error Handling; .NET Class Framework, Namespaces, Inheritance: To Use vs. Not To Use, Interface Based Polymorphism vs. Inheritance-Based Polymorphism

Unit 3: Introduction to VB.NET(5 Lectures)

Introduction, Elements, Types, Windows programming, Menus and Dialog Boxes, Using ADO.NET,

Unit 4: Application Development and Deployment using VB.NET (5 Lectures)

Developing Components in Visual Basic .NET; Deploying Applications- Introduction to web services, Assemblies, Deploying Applications

Suggested Readings

1. Introduction to Visual basic.NET - NIIT PHI, 2005
2. Introducing Microsoft .NET- David S. Platt, Microsoft Press, Saarc Edition, 2001

Software Lab based on VB.NET:

Students are to implement different simple suitable applications based on the VB.NET technologies to be assigned by teachers

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----- End of Semester IV-----

CC 51: Internet Technologies**[Credit: 4, Lecture Hours: 60]****Unit 1:Java (5 Lectures)**

Use of Objects, Array and ArrayList class

Unit 2:JavaScript (15 Lectures)

Data types, operators, functions, control structures, events and event handling.

Unit 3:JDBC (10 Lectures)

JDBC Fundamentals, Establishing Connectivity and working with connection interface, working with statements, Creating and Executing SQL Statements, Working with Result Set Objects.

Unit 4:JSP (20 Lectures)

Introduction to Java Server Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

Unit 5:Java Beans (10 Lectures)

Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB

Suggested Readings

1. DT Editorial Services, Web Technologies, Dreamtech Press
2. Ivan Bayross, Web Enabled Commercial Application Development Using Html, Dhtml, javascript, Perl CGI , BPB Publications, 2009.
3. Cay Horstmann, BIG Java, Wiley Publication, 3rd Edition., 2009
4. Herbert Schildt, Java 7, The Complete Reference, 8th Edition, 2009.
5. Jim Keogh, The Complete Reference J2EE, TMH, 2002.
6. O'Reilly, Java Server Pages, Hans Bergsten, Third Edition, 2003.

CC 52: Theory of Computation**[Credit: 5, Lecture Hours: 60]****Unit 1:Languages (8 Lectures)**

Alphabets, string, language, Basic Operations on language, Concatenation, KleeneStar

Unit 2: Finite Automata and Regular Languages (20 Lectures)

Regular Expressions, Transition Graphs, Deterministics and non-deterministic finite automata, NFA to DFA Conversion, Regular languages and their relationship with finite automata, Pumping lemma and closure properties of regular languages.

Unit 3: Context free languages (17 Lectures)

Context free grammars, parse trees, ambiguities in grammars and languages, Pushdown automata (Deterministic and Non-deterministic), Pumping Lemma, Properties of context free languages, normal forms.

Unit 4: Turing Macines and Models of Computations (15 Lectures)

RAM, Turing Machine as a model of computation, Universal Turing Machine, Language acceptability, decidability, halting problem, Recursively enumerable and recursive languages, unsolvability problems.

Suggested Readings

1. Daniel I.A.Cohen, Introduction to computer theory, John Wiley,1996
2. Lewis & Papadimitriou, Elements of the theory of computation , PHI 1997.
3. Hoperoft, Aho, Ullman, Introduction to Automata theory, Language & Computation –**3rd** Edition, Pearson Education. 2006
4. P. Linz, An Introduction to Formal Language and Automata 4th edition Publication Jones Bartlett, 2006

DSE 53:DSE [Theory: 60 Lectures]**E1: Microprocessor****[Theory: 60 Lectures]****Unit 1: Microprocessor architecture (20 Lectures)**

Internal architecture, system bus architecture, memory and I/O interfaces

Unit 2: Microprocessor programming (20 Lectures)

Register Organization, instruction formats, assembly language programming

Unit 3: Interfacing (20 Lectures)

Memory address decoding, cache memory and cache controllers, I/O interface, keyboard, display, timer, interrupt controller, DMA controller, video controllers, communication interfaces.

Suggested Readings

1. Barry B. Brey: The Intel Microprocessors: Architecture, Programming and Interfacing. Pearson Education, Sixth Edition, 2009.
2. Walter A Triebel, Avtar Singh; The 8088 and 8086 Microprocessors Programming, Interfacing, Software, Hardware, and Applications. PHI, Fourth Edition 2005.
3. Ramesh Gaonkar; Microprocessor Architecture, Programming, And Applications With The 8085 5/E, Penram International Publishing(India)
4. B. Ram, Fundamentals of Microprocessors and Microcontrollers, Dhanpat Rai Publications

E2: Information Security**[Theory: 60 Lectures]****Unit 1: Introduction (5 Lectures)**

Security, Attacks, Computer Criminals, Security Services, Security Mechanisms.

Unit 2: Cryptography (10 Lectures)

Substitution ciphers, Transpositions Cipher, Confusion, diffusion, Symmetric, Asymmetric Encryption. DES Modes of DES, Uses of Encryption, Hash function, key exchange, Digital Signatures, Digital Certificates.

Unit 3: Program Security (10 Lectures)

Secure programs, Non malicious Program errors, Malicious codes virus, Trap doors, Salami attacks, Covert channels, Control against program

Unit 4: Threats (10 Lectures)

Protection in OS: Memory and Address Protection, Access control, File Protection, User Authentication.

Unit 5: Database Security (10 Lectures)

Requirements, Reliability, Integrity, Sensitive data, Inference, Multilevel Security.

Unit 6: Security in Networks (10 Lectures)

Threats in Networks, Security Controls, firewalls, Intrusion detection systems, Secure e-mails

Unit 7: Administrating Security(5 Lectures)

Security Planning, Risk Analysis, Organisational Security Policy, Physical Security. Ethical issues in Security: Protecting Programs and data. Information and law.

Suggested Readings

1. C. P. Pfleeger, S. L. Pfleeger; Security in Computing, Prentice Hall of India, 2006
2. W. Stallings; Network Security Essentials: Applications and Standards, 4/E, 2010

Unit 1: System models and System studies (5 Lectures)

Concept of a System, Deterministic and Stochastic Activities, Continuous and Discrete Systems, System Modeling, Types of Models, Principles used in Modeling, Corporate Model, System Design.

Unit 2: What is Simulation? (7 Lectures)

Technique of Simulation, The Monte-Carlo Method, Comparison of Simulation and Analytical Methods, Experimental nature of Simulation, Types of System Simulation, Numerical Computation Techniques for Continuous Models, Numerical Computation Techniques for Discrete Models, Distributed Lag Models, Cobweb Models.

Unit 3: Continuous System Simulation (7 Lectures)

Continuous System Models, Differential Equations & Applications, Feedback Systems, Simulation of an Autopilot, Interactive systems, Real Time Systems.

Unit 4: Concepts in Discrete Event Simulation (7 Lectures)

The Event Scheduling / Time Advance Algorithm, World Views, Manual Simulation using Event Scheduling, List Processing: Lists-Basic properties and operations, Use of arrays for List Processing, Using Dynamic Allocation and Linked Lists.

Unit 5: Queuing Models (9 Lectures)

Characteristics of Queuing Systems, Arrival and Service Patterns, Queue Discipline, Long Run Measures of Performance of Queuing Systems, Time-Average Number in System, Server Utilization, Costs in Queuing Problems, Steady State behavior of Infinite Population Markovian Models, Multiserver Queue: $M/M/C/\infty/\infty$.

Unit 6: Simulation software (7 Lectures)

Comparison of Simulation Packages with Programming Languages, Classification of Simulation Software: General Purpose vs Application Oriented Simulation Packages, Desirable Software Features: General Capabilities, H/w and S/w Requirements, Animation and Dynamic Graphics, Statistical Capabilities, General Purpose Simulation Packages, Object Oriented Simulation, Examples of Application-oriented Simulation packages, Simulation in GPSS.

Unit 7: Random Number, Non-Uniform random variate Generation and Monte-Carlo Method (9 Lectures)

Linear Congruential Generators, Testing Random Number Generators: Empirical and Theoretical tests, Non-Uniform Random Variate Generator: Inverse Transform, Composition. Generating Continuous Random Variates: Uniform, Exponential, Gamma, and Normal. Generating Discrete Random Variates: Bernoulli, Binomial, Poisson. Monte-Carlo Method: Evaluation of Integral-Hit or Miss Method.

Unit 8: Analysis of Simulation Data (5 Lectures)

Identifying the Distribution with Data, Types of Simulations with respect to Output Analysis, Stochastic nature of Output Data, Measures of Performance and their Estimation: Point Estimation, Confidence-Interval Estimation, Output Analysis for Terminating Simulations: Statistical Background, Confidence-Intervals with Specified Precision, Output Analysis for Steady State Simulations, Variance-Reduction Technique-Antithetic variants.

Unit 9: Verification and Validation of Simulation Models (4 Lectures)

Model Building- Verification and Validation, Verification of Simulation Models, Calibration and Validation of Models: Validation of Model Assumptions, Validating Input-output Transformations, Input-Output Validation

Suggested Readings

1. Raj Jain, Art of Computer Systems Performance Analysis, John Wiley and Sons, Inc, 1991
2. Sheldon M. Ross, Simulation, 4th Ed., Elsevier 2008
3. Averill M. Law and W. David Kelton, Simulation Modeling and Analysis, 3rd Ed., Tata McGraw-Hill, 2003
4. Geofeerey Gordon, System Simulation, 2nd Ed., PHI, 1987
5. Jerry Banks and John S. Carson, Barry L Nelson, Discrete-Event System Simulation, 5th Ed., Prentice Hall, 2010
6. Narsingh Deo, System Simulation with Digital Computers, Prentice Hall of India, 1979

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E1: Operational Research

[Theory: 60 Lectures]

Unit 1: Introductory Linear Algebra (8 Lectures)

System of linear equations, Matrices, Rank and Determinant of a matrix, Linearly dependent and independent vectors, Basis of a matrix.

Unit 2: Linear programming - I (12 Lectures)

Optimization Problems, Introduction to LP Formulation, Convex sets, Extreme points, Geometry of Linear Programs, Basic feasible solutions (BFS), Neighborhoods, Local and global optima, Profitable Column, Pivoting, Simplex Algorithm with initial BFS, Graphical method

Unit 3: Linear programming - II (12 Lectures)

Degeneracy and Bland's Anticycling rule (Definition), Simplex Algorithm without initial BFS, Artificial variable techniques – two phase method, M-Charnes method, special cases in LPP.

Unit 4: Transportation Models (8 Lectures)

Transportation Algorithm, Assignment model, Hungarian Method

Unit 6: Network Analysis (10 Lectures)

Shortest Path: Floyd Algorithm; Maximal Flow Problem (Ford-Fulkerson); PERT-CPM : Introduction, Critical Path, Cost Analysis.

Unit 7: Game Theory (10 Lectures)

Introduction; 2-Person Zero-sum Game; Saddle Point; Mini-Max and Maxi-Min Theorems (statement only) and problems; Games without Saddle Point; Principle of Dominance.

Suggested Readings

1. G. Hadley: Linear Programming. Narosa, 2002 (reprint).
2. A. Ravindran, D. T. Phillips and James J. Solberg: Operations Research-Principles and Practice, John Wiley & Sons, 2005.
3. Hamdy A. Taha: Operations Research-An Introduction, Prentice Hall, 8th Edition, 2008.
4. F.S. Hillier. G.J.Lieberman: Introduction to Operations Research- Concepts and Cases, 9th Edition, Tata McGraw Hill. 2010.

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E2: Combinatorial Optimization

[Theory: 60 Lectures]

Unit 1: Introduction

Optimization problems, neighbourhoods, local and global optima, convex sets and functions, simplex method, degeneracy; duality and dual simplex algorithm, computational considerations for the simplex and dual simplex algorithms-Dantzig-Wolfe algorithms.

Unit 2: Integer Linear Programming

Cutting plane algorithms, branch and bound technique and approximation algorithms for travelling salesman problem.

Suggested Readings

1. C.H. Papadimitriou and K. Steiglitz, *Combinatorial Optimization: Algorithms and Complexity*, Prentice-Hall of India, 2006
2. K. Lange, *Optimization*, Springer, 2004.
3. Mokhtar S. Bazaraa, John J. Jarvis and Hanif D. Sherali, *Linear Programming and Network Flows*, John Wiley and Sons, 2004.
4. H.A. Taha, *Operations Research: An Introduction*, 8th Ed., Prentice Hall, 2006.

E3: Numerical Methods**[Theory: 60 Lectures]****Unit 1: Introduction(20 Lectures)**

Floating point representation and computer arithmetic, Significant digits, Errors: Round-off error, Local truncation error, Global truncation error, Absolute error, Relative error, Percentage Error, Rules of rounding off, Convergence and terminal conditions, Efficient computations: Bisection method, Regula-Falsi method, Newton-Raphson method, Gauss elimination method and Gauss-Jordan method, Matrix inversion.

Unit 2: Iterative methods(8 Lectures)

Jacobi and Gauss-Seidel iterative methods

Unit 3: Interpolation(8 Lectures)

Lagrange's Interpolation, Newton forward and backward Interpolation

Unit 4: Numerical integration(10 Lectures)

Trapezoid rule, Simpson's rule (only method)

Unit 5: Extrapolation methods(7 Lectures)

Gaussian quadrature, Ordinary differential equation: Euler's method, Taylor Series Expansion, Runge-Kutta second method, Classical 4th order Runge-Kutta method

Unit 6: Eigen-values & Eigen-vectors(3 Lectures)

Definitions and properties

Unit 7: Fitting(4 Lectures)

Fitting of a straight line, Least square method of curve fitting.

Suggested Readings

1. Laurence V. Fausett, Applied Numerical Analysis, Using MATLAB, Pearson, 2/e (2012)
2. M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publisher, 6/e (2012)
3. Steven C Chapra, Applied Numerical Methods with MATLAB for Engineers and Scientists, Tata McGraw Hill, 2/e (2010)

CC 51L: Internet Technologies Lab**[Credit: 2, Lab Hours: 60]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

Create event driven program for following:

1. Print a table of numbers from 5 to 15 and their squares and cubes using alert.
2. Print the largest of three numbers.
3. Find the factorial of a number n.
4. Enter a list of positive numbers terminated by Zero. Find the sum and average of these number s.
5. A person deposits Rs 1000 in a fixed account yielding 5% interest. Compute the amount in the account at the end of each year for n years.
6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.

CC 52T:Theory of Computation Tutorial**[Credit: 1, Lecture Hours: 15]**

Theory of Computation tutorial as assigned and advised by teacher(s).

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems: ASSEMBLY LANGUAGE PROGRAMMING in 8085

1. Write an assembly language program to check whether a number is even or odd.
2. Write an assembly language program to find the number of ones and the number of zeros in an 8-bit number.
3. Write an assembly language program to find the smaller of two numbers.
4. Write an assembly language program to multiply two 8-bit numbers.
5. Write an assembly language program to find the smallest among 10 integers stored in memory locations starting from 2050H
6. Write an assembly language program to find the largest among 10 integers stored in memory locations starting from 2050H
7. Write an assembly language program to sort 10 numbers using bubble sort.
8. Write an assembly language program to generate the first 10 fibonacci series and store the result at memory location starting from FC50H
9. Write an assembly language program to find the sum of the series $12 + 22 + 32 + 42 + \dots + 102$
10. Write an assembly language program to find the perfect square of any number and if the number is not a perfect square, display FFH
11. Write an assembly language program for linear search.
12. Write an assembly language program to calculate the following expression using a single register: $Y = X^2 + 2X + 3XZ$
13. Write an assembly language program to find the sum of the first 10 even natural numbers.
14. Write an assembly language program to find the sum of the first n odd natural numbers.
15. Write an assembly language program to create an odd parity generator.
16. Write an assembly language program to create an even parity generator.
17. Write an assembly language program to find the sum of five 8-bit numbers.
18. Write an assembly language program to convert decimal to binary.
19. Write an assembly language program to convert octal to binary.
20. Write an assembly language program to convert hexadecimal to binary.
21. Write an assembly language program to convert hexadecimal to decimal.
22. Write an assembly language program to check whether an 8-bit number is palindrome or not.
23. Write an assembly language program to display the truth table for and AND gate.
24. Write an assembly language program to display the truth table for and OR gate.
25. Write an assembly language program to display the truth table for and XOR gate.
26. Write an assembly language program to perform n byte addition of two numbers.
27. Write an assembly language program to implement a simple sub routine call.
28. Write an assembly language program to check whether a number is prime or not.

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

- b. Demonstrate the use of Network tools: ping, ipconfig, ifconfig, tracert, arp, netstat, whois
- c. Use of Password cracking tools: John the Ripper, Ophcrack. Verify the strength of passwords using these tools.
- d. Perform encryption and decryption of Caesar cipher. Write a script for performing these operations.
- e. Perform encryption and decryption of a Rail fence cipher. Write a script for performing these operations.
- f. Use nmap/zenmap to analyse a remote machine.
- g. Use Burp proxy to capture and modify the message.
- h. Demonstrate sending of a protected word document.
- i. Demonstrate sending of a digitally signed document.
- j. Demonstrate sending of a protected worksheet.
- k. Demonstrate use of steganography tools.
- l. Demonstrate use of gpg utility for signing and encrypting purposes.

E3L: Modelling and Simulation Lab**[2 Credits, 60 Lectures]**

Practical exercises based on theory.

[Top](#)[^]**DSE 54L: Any one from the following corresponding to paper selected for DSE54****E1L: Operational Research Lab****[2 Credits; 60 Lectures]**

Practical based on topics covered in the paper.

[Top](#)[^]**E2L: Combinatorial Optimization Lab****[2 Credits, 60 Lectures]**

Practical exercises based on concepts listed in theory.

[Top](#)[^]**E3L: Numerical Methods Lab****[2 Credits, 60 Lectures]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems recommended to be done in any one of Computer Algebra Systems: MATLAB / MATHEMATICA / MAPLE:

1. Find the roots of the equation by bisection method.
2. Find the roots of the equation by secant/Regula-Falsi method.
3. Find the roots of the equation by Newton,,s method.
4. Find the solution of a system of nonlinear equation using Newton,,s method.
5. Find the solution of tridiagonal system using Gauss Thomas method.
6. Find the solution of system of equations using Jacobi/Gauss-Seidel method.
7. Find the cubic spline interpolating function.

8. Evaluate the approximate value of finite integrals using Gaussian/Romberg integration.
9. Solve the boundary value problem using finite difference method.

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----- End of Semester V-----

CC 61: .Mobile Computing**[Credit: 4, Lecture Hours: 60]****Unit – 1: Introduction to Mobile Communications And Computing (6 Lectures)**

Mobile Computing (MC): Introduction to MC, Novel Applications, Limitations, and Architecture. GSM: Mobile Services, System Architecture, Radio Interface, Protocols, Localization and Calling, Handover, Security, and New Data Services.

Unit – 2: (Wireless) Medium Access Control (6 Lectures)

Motivation for a Specialized MAC (Hidden and Exposed Terminals, Near and Far Terminals), SDMA, FDMA, TDMA, CDMA.

Unit – 3: Mobile Network Layer (8 Lectures)

Mobile IP (Goals, Assumptions, Entities and Terminology, Ip Packet Delivery, Agent Advertisement and Discovery, Registration, Tunneling And Encapsulation, Optimizations), Dynamic Host Configuration Protocol (DHCP).

Unit – 4: Mobile Transport Layer (8 Lectures)

Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast Retransmit/Fast Recovery, Transmission /Time-Out Freezing, Selective Retransmission, Transaction Oriented TCP.

Unit – 5: Database Issues (8 Lectures)

Hoarding Techniques, Caching Invalidation Mechanisms, Client Server Computing With Adaptation, Power-Aware And Context-Aware Computing, Transactional Models, Query Processing, Recovery, And Quality Of Service Issues.

Unit – 6: Data Dissemination (8 Lectures)

Communications Asymmetry, Classification of New Data Delivery Mechanisms, Pushbased Mechanisms, Pull-Based Mechanisms, Hybrid Mechanisms, Selective Tuning (Indexing) Techniques.

Unit – 7: Mobile Ad Hoc Networks (MANETS) (8 Lectures)

Overview, Properties of A MANET, Spectrum Of MANET Applications, Routing And Various Routing Algorithms, Security In MANET.

Unit – 8: Protocols and Tools (8 Lectures)

Wireless Application Protocol-WAP. (Introduction, Protocol Architecture, and Treatment Of Protocols Of All Layers), Bluetooth (User Scenarios, Physical Layer, Mac Layer, Networking, Security, Link Management) And J2me.

Suggested Readings

1. Jochen Schiller, "Mobile Communications", Addison-Wesley. second edition, 2004.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing", Wiley, 2002, ISBN 0471419028.
3. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004,
4. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
5. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer, second edition, 2003.
6. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech, 2003.

CC 62: Design and Analysis of Algorithms**[Credit: 4, Lecture Hours: 60]****Unit 1: Introduction (5 Lectures)**

Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm

Unit 2: Algorithm Design Techniques (8 Lectures)

Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy

Algorithms **Unit 3: Sorting and Searching Techniques (20 Lectures)**

Elementary sorting techniques–Bubble Sort, Insertion Sort, Merge Sort, Advanced Sorting techniques - Heap Sort, Quick Sort, Sorting in Linear Time - Bucket Sort, Radix Sort and Count Sort, Searching Techniques, Medians & Order Statistics, complexity analysis;

Unit 4: Lower Bounding Techniques (5 Lectures)

Decision Trees

Unit 5: Balanced Trees (7 Lectures)

Red-Black Trees

Unit 6: Advanced Analysis Technique (5 Lectures)

Amortized analysis

Unit 7: Graphs (5 Lectures)

Graph Algorithms–Breadth First Search, Depth First Search and its Applications, Minimum Spanning Trees.

Unit 8: String Processing (5 Lectures)

String Matching, KMP Technique

Suggested Readings

1. T.H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein Introduction to Algorithms, PHI, 3rd Edition 2009
2. Sarabasse & A.V. Gelder Computer Algorithm – Introduction to Design and Analysis, Publisher – Pearson 3rd Edition 1999
3. Rajesh K. Shukla, Analysis and Design of Algorithms: A Beginner's Approach, Wiley

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DSE 63: Any one from the list and the corresponding lab should be chosen for DSE63L

E1: Digital Image Processing

[4 Credits; 60 Lectures]

Unit 1: Introduction (6 Lectures)

Light, Brightness adaption and discrimination, Pixels, coordinate conventions, Imaging Geometry, Perspective Projection, Spatial Domain Filtering, sampling and quantization.

Unit 2: Spatial Domain Filtering (7 Lectures)

Intensity transformations, contrast stretching, histogram equalization, Correlation and convolution, Smoothing filters, sharpening filters, gradient and Laplacian.

Unit 3: Filtering in the Frequency domain (8 Lectures)

Hotelling Transform, Fourier Transforms and properties, FFT (Decimation in Frequency and Decimation in Time Techniques), Convolution, Correlation, 2-D sampling, Discrete Cosine Transform, Frequency domain filtering.

Unit 4: Image Restoration (8 Lectures)

Basic Framework, Interactive Restoration, Image deformation and geometric transformations, image morphing, Restoration techniques, Noise characterization, Noise restoration filters, Adaptive filters, Linear, Position invariant degradations, Estimation of Degradation functions, Restoration from projections.

Unit 5: Image Compression (10 Lectures)

Encoder-Decoder model, Types of redundancies, Lossy and Lossless compression, Entropy of an information source, Shannon's 1st Theorem, Huffman Coding, Arithmetic Coding, Golomb Coding, LZW coding, Transform Coding, Sub-image size selection, blocking artifacts, DCT implementation using FFT, Run length coding, FAX compression

(CCITT Group-3 and Group-4), Symbol-based coding, JBIG-2, Bit-plane encoding, Bit-allocation, Zonal Coding, Threshold Coding, JPEG, Lossless predictive coding, Lossy predictive coding, Motion Compensation

Unit 6:Wavelet based Image Compression (5 Lectures)

Expansion of functions, Multi-resolution analysis, Scaling functions, MRA refinement equation, Wavelet series expansion, Discrete Wavelet Transform (DWT), Continuous Wavelet Transform, Fast Wavelet Transform, 2-D wavelet Transform, JPEG-2000 encoding, Digital Image Watermarking.

Unit 7:Morphological Image Processing (7 Lectures)

Basics, SE, Erosion, Dilation, Opening, Closing, Hit-or-Miss Transform, Boundary Detection, Hole filling, Connected components, convex hull, thinning, thickening, skeletons, pruning, Geodesic Dilation, Erosion, Reconstruction by dilation and erosion.

Unit 8: Image Segmentation (9 Lectures)

Boundary detection based techniques, Point, line detection, Edge detection, Edge linking, local processing, regional processing, Hough transform, Thresholding, Iterative thresholding, Otsu's method, Moving averages, Multivariable thresholding, Region-based segmentation, Watershed algorithm, Use of motion in segmentation

Suggested Readings

1. R C Gonzalez , R E Woods, Digital Image Processing, 3rd Edition, Pearson Education.2008.
2. A K Jain, Fundamentals of Digital image Processing, Prentice Hall of India.1989.
3. K R Castleman, Digital Image Processing, Pearson Education.1996
4. Schalkoff, Digital Image Processing and Computer Vision, John Wiley and Sons.1989.
5. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins,' Digital Image Processing using MATLAB', Pearson Education, Inc., 2004.

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E2: Introduction to Data Sciences

[4 Credits; 60 Lectures]

Unit 1:Data Scientist's Tool Box(10 Lectures)

Turning data into actionable knowledge, introduction to the tools that will be used in building data analysis software: version control, markdown, git, GitHub, R, and RStudio

Unit 2:R Programming Basics(15 Lectures)

Overview of R, R data types and objects, reading and writing data, Control structures, functions, scoping rules, dates and times, Loop functions, debugging tools, Simulation, code profiling

Unit 3:Getting and Cleaning Data(15 Lectures)

Obtaining data from the web, from APIs, from databases and from colleagues in various formats, basics of data cleaning and making data —tidy

Unit 4:Exploratory Data Analysis(10 Lectures)

Essential exploratory techniques for summarizing data, applied before formal modeling commences, eliminating or sharpening potential hypotheses about the world that can be addressed by the data, common multivariate statistical techniques used to visualize high-dimensional data.

Unit 5:Reproducible Research(10 Lectures)

Concepts and tools behind reporting modern data analyses in a reproducible manner, To write a document using R markdown, integrate live R code into a literate statistical program, compile R markdown documents using knitr and related tools, and organize a data analysis so that it is reproducible and accessible to others.

Suggested Readings

1. D. Cielen, Arno D. B. Meysman, M. Ali, Introducing Data Science, Dreamtech Press
2. Rachel Schutt, Cathy O'Neil, "Doing Data Science: Straight Talk from the Frontline" by Schroff/O'Reilly, 2013.
3. Foster Provost, Tom Fawcett, "Data Science for Business" What You Need to Know About Data Mining and Data-Analytic Thinking" by O'Reilly, 2013.

4. John W. Foreman, "Data Smart: Using data Science to Transform Information into Insight" by John Wiley & Sons, 2013.
5. Ian Ayres, "Super Crunchers: Why Thinking-by-Numbers Is the New Way to Be Smart" Ist Edition by Bantam, 2007.
6. Eric Seigel, "Predictive Analytics: The Power to Predict who Will Click, Buy, Lie, or Die", 1st Edition, by Wiley, 2013.
7. Matthew A. Russel, "Mining the Social Web: Data mining Facebook, Twitter, LinkedIn, Goole+, GitHub, and More", Second Edition, by O'Reilly Media, 2013.
8. Michael J. Crawley, The R Book, Wiley

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E3: Data Mining

[4 Credits; 60 Lectures]

Unit 1: Introduction (6 Lectures)

Basic Data Mining Tasks, Data Mining Issues, Data Mining Metrics, Data Mining from a Database Perspective

Unit 2: Data Mining Techniques (10 Lectures)

A Statistical Perspective on Data Mining, Similarity Measures, Decision Trees, Neural Networks, Genetic Algorithms

Unit 3: Classification (15 Lectures)

Statistical-Based Algorithms, Distance-Based Algorithms, Decision Tree-Based Algorithms, Neural Network-Based Algorithms, Rule-Based Algorithms, Combining Techniques.

Unit 4: Clustering (12 Lectures)

Similarity and Distance Measures, Hierarchical Algorithms, Partitional Algorithms, Clustering Large Databases, Clustering with Categorical Attributes

Unit 5: Association Rules (12 Lectures)

Basic Algorithms, Parallel and Distributed Algorithms, Incremental Rules, Advanced Association Rule Techniques, Measuring the Quality of Rules.

Unit6: Advanced Techniques (5 Lectures)

Web Mining, Spatial Mining, Temporal Mining.

Suggested Readings

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Education.2005.
2. Richard Roiger, Michael Geatz, Data Mining: A Tutorial Based Primer, Pearson Education 2003.
3. G.K. Gupta, Introduction to Data Mining with Case Studies, PHI,2006.
4. Soman K P, Diwakar Shyam, Ajay V Insight Into Data Mining: Theory And Practice, , PHI, 2006
5. Data Mining Techniques, Arun Pujari, Fourth Edition, University Press

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CC 61L: Mobile Computing Lab

[Credit: 2, Lab Hours: 60]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write a WML program to create a card.
2. Write a WML program to create a deck that contain two cards and provide the Functionality of calling two cards from one another.
3. Write a WML program to implement the functionality of Login by username.
4. Write a WML program to display special characters on the screen.
5. Write a WML program to display the image on the screen after 5 seconds.
6. Write a WML program to develop the calculator.
7. Write a WML program to develop a salary calculator.
8. Write a WML program to develop a loan calculator.

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Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Implement Insertion Sort (The program should report the number of comparisons)
2. Implement Merge Sort (The program should report the number of comparisons)
3. Implement Heap Sort (The program should report the number of comparisons)
4. Implement Randomized Quick sort (The program should report the number of comparisons)
5. Implement Radix Sort
6. Create a Red-Black Tree and perform following operations on it:
 - 6.1. Insert a node
 - 6.2. Delete a node
 - 6.3. Search for a number & also report the color of the node containing this number.
7. Write a program to determine the LCS of two given sequences
8. Implement Breadth-First Search in a graph
9. Implement Depth-First Search in a graph
10. Write a program to determine the minimum spanning tree of a graph
11. For the algorithms at S.No 1 to 3 test run the algorithm on 100 different inputs of sizes varying from 30 to 1000. Count the number of comparisons and draw the graph. Compare it with a graph of $n \log n$.

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DSE 63L: Any one from the list corresponding to the paper selected for DSE63**E1L: Digital Image Processing Lab****[2 Credits; 60 Lectures]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write program to read and display digital image using MATLAB or SCILAB 1.1. Become familiar with SCILAB/MATLAB Basic commands
 - 1.2. Read and display image in SCILAB/MATLAB
 - 1.3. Resize given image
 - 1.4. Convert given color image into gray-scale image
 - 1.5. Convert given color/gray-scale image into black & white image
 - 1.6. Draw image profile
 - 1.7. Separate color image in three R G & B planes
 - 1.8. Create color image using R, G and B three separate planes
 - 1.9. Flow control and LOOP in SCILAB
 - 1.10. Write given 2-D data in image file
2. To write and execute image processing programs using point processing method
 - 2.1. Obtain Negative image
 - 2.2. Obtain Flip image
 - 2.3. Thresholding
 - 2.4. Contrast stretching
3. To write and execute programs for image arithmetic operations
 - 3.1. Addition of two images
 - 3.2. Subtract one image from other image
 - 3.3. Calculate mean value of image
 - 3.4. Different Brightness by changing mean value
4. To write and execute programs for image logical operations
 - 4.1. AND operation between two images
 - 4.2. OR operation between two images
 - 4.3. Calculate intersection of two images
 - 4.4. Water Marking using EX-OR operation
 - 4.5. NOT operation (Negative image)
5. To write a program for histogram calculation and equalization
 - 5.1. Standard MATLAB function
 - 5.2. Program without using standard MATLAB functions
 - 5.3. C Program

6. To write and execute program for geometric transformation of image
 - 6.1. Translation
 - 6.2. Scaling c. Rotation
 - 6.3. Shrinking
 - 6.4. Zooming
7. To understand various image noise models and to write programs for
 - 7.1. image restoration
 - 7.2. Remove Salt and Pepper Noise
 - 7.3. Minimize Gaussian noise
 - 7.4. Median filter and Weiner filter
8. Write and execute programs to remove noise using spatial filters
 - 8.1. Understand 1-D and 2-D convolution process
 - 8.2. Use 3x3 Mask for low pass filter and high pass filter
9. Write and execute programs for image frequency domain filtering
 - 9.1. Apply FFT on given image
 - 9.2. Perform low pass and high pass filtering in frequency domain
 - 9.3. Apply IFFT to reconstruct image
10. Write a program in C and MATLAB/SCILAB for edge detection using different edge detection mask
11. Write and execute program for image morphological operations erosion and dilation.
12. To write and execute program for wavelet transform on given image and perform inverse wavelet transform to reconstruct image.

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E2L: Introduction to Data Sciences Lab

[2 Credits; 60 Lectures]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Write a program that prints „Hello World,, to the screen.
2. Write a program that asks the user for a number n and prints the sum of the numbers 1 to n
3. Write a program that prints a multiplication table for numbers up to 12.
4. Write a function that returns the largest element in a list.
5. Write a function that computes the running total of a list.
6. Write a function that tests whether a string is a palindrome.
7. Implement linear search.
8. Implement binary search.
9. Implement matrices addition , subtraction and Multiplication
10. Fifteen students were enrolled in a course. Their ages were:
20 20 20 20 20 21 21 21 22 22 22 22 23 23 23
 - a. Find the median age of all students under 22 years
 - b. Find the median age of all students
 - c. Find the mean age of all students
 - d. Find the modal age for all students
 - e. Two more students enter the class. The age of both students is 23. What is now mean, mode and median?

11. Following table gives a frequency distribution of systolic blood pressure. Compute all the measures of dispersion

Midpoint	95.5	105.5	115.5	125.5	135.5	145.5	155.5	165.5	175.5
Number	5	8	22	27	17	9	5	5	2

12. Obtain probability distribution of, where X is number of spots showing when a six-sided symmetric die (i.e. all six faces of the die are equally likely) is rolled. Simulate random samples of sizes 40, 70 and 100 respectively and verify the frequency interpretation of probability.
13. Make visual representations of data using the base, lattice, and ggplot2 plotting systems in R, apply basic principles of data graphics to create rich analytic graphics from available datasets.
14. Use Git / Github software to create Github account. Also, create a repo using Github.

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Practical exercises based on concepts listed in theory.

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DSE 64: Any one from the list and the corresponding lab should be chosen for DSE63L

E1: Machine Learning**[4 Credits; 60 Lectures]****Unit 1: Introduction (10 Lectures)**

Concept of Machine Learning, Applications of Machine Learning, Key elements of Machine Learning, Supervised vs. Unsupervised Learning, Statistical Learning: Bayesian Method, The Naive Bayes Classifier

Unit 2: Software for Machine Learning and Linear Algebra Overview (10 Lectures)

Plotting of Data, Vectorization, Matrices and Vectors: Addition, Multiplication, Transpose and Inverse using available tool such as MATLAB.

Unit 3: Linear Regression (10 Lectures)

Prediction using Linear Regression, Gradient Descent, Linear Regression with one variable, Linear Regression with multiple variables, Polynomial Regression, Feature Scaling / Selection.

Unit 4: Logistic Regression (10 Lectures)

Classification using Logistic Regression, Logistic Regression vs. Linear Regression, Logistic Regression with one variable and with multiple variables.

Unit 5: Regularization (10 Lectures)

Regularization and its utility: The problem of Overfitting, Application of Regularization in Linear and Logistic Regression, Regularization and Bias/Variance.

Unit 6: Neural Networks (10 Lectures)

Introduction, Model Representation, Gradient Descent vs. Perceptron Training, Stochastic Gradient Descent, Multilayer Perceptrons, Multiclass Representation, Backpropagation Algorithm.

Suggested Readings

1. Ethem Alpaydin, "Introduction to Machine Learning" 2nd Edition, The MIT Press, 2009.
2. Tom M. Mitchell, "Machine Learning", First Edition by Tata McGraw-Hill Education, 2013.
3. Christopher M. Bishop, "Pattern Recognition and Machine Learning" by Springer, 2007.
4. Mevin P. Murphy, "Machine Learning: A Probab
5. Peter Harrington, Machine Learning in Action, Dreamtech Press

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E2: System Programming**[4 Credits; 60 Lectures]****Unit 1: Assemblers & Loaders, Linkers (10 Lectures)**

One pass and two pass assembler, design of an assembler, Absolute loader, relocation and linking concepts, relocating loader and Dynamic Linking.

Unit 2: Introduction (5 Lectures)

Overview of compilation, Phases of a compiler

Unit 3: Lexical Analysis (10 Lectures)

Role of a Lexical analyzer, Specification and recognition of tokens, Symbol table, lex

Unit 4: Parsing (10 Lectures)

Bottom up parsing- LR parser, yacc.

Unit 5:Intermediate representations(10 Lectures)

Three address code generation, syntax directed translation, translation of types, control statements

Unit 6:Storage organization(5 Lectures)

Activation records, stack allocation

Unit 7:Code Generation(10Lectures)

Object code generation

Suggested Readings

1. Santanu Chattopadhyaya, Systems Programming, PHI, 2011.
2. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, Compilers: Principles, Techniques, and Tools, 2nd edition, Prentice Hall, 2006.
3. D. M. Dhamdhare, Systems Programming, Tata McGraw Hill, 2011.
4. Leland Beck, D. Manjula, System Software: An Introduction to System Programming, 3rd edition, Pearson Education, 2008.
5. Grune D, Van Reeuwijk . K, Bal H. E, Jacobs C J H, Langendoen K, Modern Compiler Design, 2nd edition, Springer, 2012

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E3: Cloud Computing

[4 Credits; 60 Lectures]

Unit 1: Overview of Computing Paradigm (8 Lectures)

Recent trends in Computing: Grid Computing, Cluster Computing, Distributed Computing, Utility Computing, Cloud Computing,

Unit 2: Introduction to Cloud Computing (7 Lectures)

Introduction to Cloud Computing, History of Cloud Computing, Cloud service providers, Benefits and limitations of Cloud Computing

Unit 3:Cloud Computing Architecture (20 Lectures)

Comparison with traditional computing architecture (client/server), Services provided at various levels, Service Models- Infrastructure as a Service(IaaS), Platform as a Service(PaaS), Software as a Service(SaaS), How Cloud Computing Works, Deployment Models- Public cloud, Private cloud, Hybrid cloud, Community cloud, Case study of NIST architecture.

Unit 4:Case Studies (13 Lectures)

Case study of Service model using Google App Engine, Microsoft Azure, Amazon EC2, Eucalyptus.

Unit 5: Service Management in Cloud Computing (7 Lectures)

Service Level Agreements (SLAs), Billing & Accounting, Comparing Scaling Hardware:Traditional vs. Cloud, Economics of scaling.

Unit 6: Cloud Security (5 Lectures)

Infrastructure Security- Network level security, Host level security, Application level security, Data security and Storage- Data privacy and security Issues, Jurisdictional issues raised by Data location, Authentication in cloud computing.

Suggested Readings

1. Cloud Computing Bible, Barrie Sosinsky, Wiley-India, 2010
2. Cloud Computing: Principles and Paradigms, Rajkumar Buyya, James Broberg, Andrzej M. Goscinski, Wiley, 2011
3. Cloud Computing: Principles, Systems and Applications, Nikos Antonopoulos, Lee Gillam, Springer, 2012
4. Cloud Computing: A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, University Press
5. Cloud Security: A Comprehensive Guide to Secure Cloud Computing, Ronald L. Krutz, Russell Dean Vines, Wiley-India, 2010
6. Gautam Shroff, Enterprise Cloud Computing Technology Architecture Applications , Adobe Reader ebooks available from eBooks.com,2010

7. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach, McGraw Hills, 2010.
8. Dimitris N. Chorafas, Cloud Computing Strategies ,CRC Press, 2010

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DSE 64L: Any one from the list corresponding to the paper selected for DSE63

E1L: Machine Learning Lab

[4 Credits; 60 Lectures]

For practical Labs for Machine Learning, students may use softwares like MABLAB/Octave or Python. For later exercises, students can create/use their own datasets or utilize datasets from online repositories like UCI Machine Learning Repository (<http://archive.ics.uci.edu/ml/>).

1. Perform elementary mathematical operations in Octave/MATLAB like addition, multiplication, division and exponentiation.
2. Perform elementary logical operations in Octave/MATLAB (like OR, AND, Checking for Equality, NOT, XOR).
3. Create, initialize and display simple variables and simple strings and use simple formatting for variable.
4. Create/Define single dimension / multi-dimension arrays, and arrays with specific values like array of all ones, all zeros, array with random values within a range, or a diagonal matrix.
5. Use command to compute the size of a matrix, size/length of a particular row/column, load data from a text file, store matrix data to a text file, finding out variables and their features in the current scope.
6. Perform basic operations on matrices (like addition, subtraction, multiplication) and display specific rows or columns of the matrix.
7. Perform other matrix operations like converting matrix data to absolute values, taking the negative of matrix values, adding/removing rows/columns from a matrix, finding the maximum or minimum values in a matrix or in a row/column, and finding the sum of some/all elements in a matrix.
8. Create various type of plots/charts like histograms, plot based on sine/cosine function based on data from a matrix. Further label different axes in a plot and data in a plot.
9. Generate different subplots from a given plot and color plot data.
10. Use conditional statements and different type of loops based on simple example/s.
11. Perform vectorized implementation of simple matrix operation like finding the transpose of a matrix, adding, subtracting or multiplying two matrices.
12. Implement Linear Regression problem. For example, based on a dataset comprising of existing set of prices and area/size of the houses, predict the estimated price of a given house.
13. Based on multiple features/variables perform Linear Regression. For example, based on a number of additional features like number of bedrooms, servant room, number of balconies, number of houses of years a house has been built – predict the price of a house.
14. Implement a classification/ logistic regression problem. For example based on different features of students data, classify, whether a student is suitable for a particular activity. Based on the available dataset, a student can also implement another classification problem like checking whether an email is spam or not.
15. Use some function for regularization of dataset based on problem.
16. Use some function for neural networks, like Stochastic Gradient Descent or backpropagation - algorithm to predict the value of a variable based on the dataset of problem 14.

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E2L: System Programming Lab

(4 Credits; 60 Lectures)

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. To implement an assembler for a hypothetical language.
2. To get familiar with lex: write a program to recognize numbers, identifiers.
3. To get familiar with yacc: write a desk calculator.

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E3L: Cloud Computing Lab

(4 Credits; 60 Lectures)

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Create virtual machines that access different programs on same platform.

2. Create virtual machines that access different programs on different platforms.
3. Working on tools used in cloud computing online-
 - a) Storage
 - b) Sharing of data
 - c) manage your calendar, to-do lists,
 - d) a document editing tool
4. Exploring Google cloud
5. Exploring microsoft cloud
6. Exploring amazon cloud

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DSE 64P: Project

The students will be allowed to work on any project based on the concepts studied in core / elective or skill based elective courses. The group size should be maximum of three (03) students. Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes. A maximum of Four (04) projects would be assigned to one teacher.

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----- End of Semester VI-----



SALESIAN COLLEGE (AUTONOMOUS)
SONADA-SILIGURI

Curriculum Structure

For

Bachelor of Computer Science (B. Sc CS)

And

Bachelor of Computer Applications (CSA) Programmes

(Basic and Honours Degree)

As per National Education Policy – 2020 guidelines

Department of Computer Science & Applications

First Revision - 2024

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Vision

Develop young men and women as technocrats, researchers and entrepreneurs in the field of Computer Science and Applications.

Mission

- To conduct and support undergraduate programmes of quality in Computer Science and Applications by means of better teaching-learning methodologies and value-added courses.
- To provide a foundation undergraduate programme which will act as a feeder course for higher studies in the area of Computer Science and Applications.
- To build leadership skills, ethical values and teamwork among the students.
- To provide knowledge and software development skills so students become employable to IT professional and service sectors
- To develop manpower that would provide technical and intellectual leadership to the community.
- To inculcate professional excellence by encouraging projects in industry relevant technologies and through industry interactions.
- To strengthen the collaboration of department and industry through internships, mentorships and professional body activities.
- To foster teaching, research and extension activities for the creation of new knowledge for the development of society.
- To cater to the holistic development of students, following the principles of Don Bosco Institution, so they become intellectually competent, socially sensitive, morally upright and emotionally balanced.

PROGRAM OUTCOMES

Program Outcomes

Degree holders possess knowledge of the relevant field or profession, such that they:	
KNOWLEDGE	PO01: have acquired general understanding and insight into main theories and concepts
	PO02: are aware of the latest knowledge in the relevant field
	PO03: can apply the basic elements of information technology
Degree holders can apply the methods and procedures of the field or profession, such that they:	
SKILLS	PO04: can use the relevant equipment, technology and software
	PO05: can apply critical analytic methods
	PO06: can rationalise their decisions
	PO07: can evaluate critically the methods applied
	PO08: recognise when further data is needed and have the ability to retrieve it, assess its reliability and apply it in an appropriate manner
	PO09: can use reliable data and information resources in the relevant scientific field
	PO10: have acquired an open-minded and innovative way of thinking
Degree holders can apply their knowledge and skills in a practical way in their profession and/or further studies, such that they:	
COMPETENCE	PO11: have developed the competences and independence needed for further studies within the field
	PO12: can work in an independent and organised manner, set goals for their work, devise a work schedule and follow it
	PO13: can participate actively and lead work groups
	PO14: are capable of interpreting and presenting scientific issues and research findings

PROGRAM SPECIFIC OUTCOMES

Program Specific Outcomes

Degree holders possess knowledge of:		PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 01	PO 12	PO 13	PO 14
K N O W L E D G E	PSO01: A number of recurring themes, and a set of general principles that have broad application to the field of computer science	√													
	PSO02: The professional, legal, ethical, security, social and cultural issues and responsibilities inherent in the discipline of computing.	√													
	PSO03: The software systems are used in many different domains. This requires both computing skills and domain knowledge	√	√												
	PSO04: Software development fundamentals, including programming, data structures, algorithms and Complexity	√	√	√											
	PSO05: Systems fundamentals, including architectures and organization, operating systems, networking and communication, parallel and distributed computation, and security	√	√	√											
	PSO06: Mathematics fundamentals, including discrete structures, statistics and calculus	√	√	√											
	PSO07: Software engineering fundamentals, including software analysis and design, evaluation and testing, and software engineering processes	√	√	√											
	PSO08: Application fundamentals, including information management and intelligent applications	√	√	√											
	PSO09: Multiple programming languages, paradigms, and technologies	√	√	√											
Degree holders can apply the methods and procedures as follows:															
S K	PSO10: Know how to apply the knowledge they have gained to solve real issues as they will have the ability to analyse a problem, and identify and define the computing requirements				√			√		√					

PROGRAM SPECIFIC OUTCOMES

[illegible]

PROGRAM SPECIFIC OUTCOMES

[illegible]

Model Programme Structure for Bachelor of Computer Application (Basic/Honours) Programme

Sem.	Maor/Core 100 (Credit-4)	Minor/GE/ DSE 100 (Credit-4)	MD (Credit-3)	AECC		SEC-100 (Credit-3)/ Research Project/ Dissertation (Credit-12)	VOC/ Summer internship/ Apprenticeship-50 (Credit-4)	VAC 100 (Credit-4)	Semester Credit
1 st Year									
I	Paper-1 Paper-2	Paper-I (Elective-1)	Introduction to MS Office (MD1)	English (Cr-2)		SEC-1		Understanding India/ VE	20
II	Paper-3 Paper-4	Paper-I (Elective-2)	Introduction to MS Office (MD2)		Vernacular / Alt English (Cr-2)	SEC-2	VOC/ Summer internship/ Apprenticeship	ENVS	21
<i>Exit option with Undergraduate Certificate in relevant Discipline on completion of 40 credits with 4 credits in work based vocational course offered during summer term or internship/apprenticeship, in addition to 6 credits from skill-based courses earned during first and second semester.</i>									
2 nd Year									
III	Paper-5 Paper-6	Paper-II (Elective-1)	Advanced Excel (MD3)	English (Cr-2)		SEC-3		Desktop Publishing	20
IV	Paper-7 Paper-8 Paper-9	Paper-II (Elective-2)			Vernacular / Alt English (Cr-2)		VOC/ Summer internship/ Apprenticeship		22
<i>Exit option with Undergraduate Diploma in relevant Discipline on completion of 80 credits with 4 credits in skill based vocational course offered during first or second year summer term.</i>									
3 rd Year									
V	Paper-10 Paper-11 Paper-12	Paper-III (Elective-1) & DSE-1					VOC (Soft skills & Personality Development)		22
VI	Paper-13 Paper-14 Paper-15	Paper-III (Elective-2) & DSE-2					VOC/ Summer internship/ Apprenticeship		20
<i>Exit option with Bachelor's degree in relevant discipline on securing 120 credits. 4 credits in vocational course offered during first or second year summer term.</i>									
4 th Year									
VII	Paper-16, Paper-17	Paper-IV (Elective-1), DSE-3, DSE-4 (Mini Project)							20
	Paper-16, Paper-17	Paper-IV (Elective-1I)				Research Methodologies			
VIII	Paper-18, Paper-19, Paper-20	Paper-V (Elective-1), DSE-5 (Project)							20
	Paper-18, Paper-19	Paper-V (Elective-1I)				Research Project/ Dissertation (Major course based)			20
<i>Students will be awarded Undergraduate (Bachelor's) Honours Degree (with/ without Research) in relevant Discipline</i>									

Question pattern for End-Semester Exam

<Department> (Honours / Program)

Pattern for 50 marks question paper:

Group A (10 marks) – 5 out of 8 questions, each of 2 marks

Group B (20 marks) – 4 out of 6 questions, each of 5 marks

Group C (20 marks) – 2 out of 4 questions, each of 10 marks

PAPER CODE /TITLE:

SEMESTER:

YEAR:

FULL MARKS: 50

ASSESSMENT TYPE: End Semester Examination (Summative) **S:** Short (2mks); **M:** Medium (5mks); **L:** Long (10mks)

QUESTION TYPE: Mixed (Subjective & Objective)

WEIGHTAGE: As per MHRD guideline

MODEL PROGRAM STRUCTURE FOR CSA

BLUEPRINT (COGNITIVE DOMAIN)

20%

35%

25%

←----- **20%** -----→

[illegible]

Assessment/ Evaluation scheme for Theory based subjects

Level	Bloom's Taxonomy Level	Continuous Internal Assessment (50% weightage)						Final Examination (50% weightage)	
		CIA-1 (10%)		CIA-2 (15%)		CIA-3 (20%)			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
1	Remember	60%		40%		30%		30%	
	Understand								
2	Apply	40%		40%		40%		40%	
	Analyse								
3	Evaluate			20%		30%		30%	
	Create								
Total		100%		100%		100%		100%	

CIA – 3 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.

Attendance – 5 marks

Assessment/ Evaluation scheme for Practical/ LAB based subjects

Level	Bloom's Taxonomy Level	Continuous Internal Assessment (50% weightage)						Final Examination (50% weightage)	
		CIA-1 (10%)		CIA-2 (15%)		CIA-3 (20%)			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
1	Remember	30%	30%	20%	20%	15%	15%	15%	15%
	Understand								
2	Apply	20%	20%	20%	20%	20%	20%	20%	20%
	Analyse								
3	Evaluate			10%	10%	15%	15%	15%	15%
	Create								
Total		100%		100%		100%		100%	

CIA–3 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.

Attendance – 5 marks

Assessment/ Evaluation Scheme for Lab Examination

Internal		Final Examination	
Assessment Criteria	Marks	Assessment Criteria	Marks
Attendance	5	Flowchart / Algorithm	10
Task completion	35	Program code	15
Practical Record	10	Execution and Formatting	15
		Viva voce	10
Total	50	Total	50

Possible streams after two years

Code	Description
S1	Full Stack Development
S2	Data Science
S3	Artificial Intelligence & Machine Learning
S4	Cyber Security
S5	Physical Computing

SYLLABUS

FIRST YEAR

Semester I

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
AECC-1		English	50	50	100	2			2	2
VAC	Two to be taken up by student	VE	25	25	50	1			1	1
		ENVS	25	25	50				1	1
Core/ Major - 1	23CSAMAJ101	Programming in C	50	50	100	3			3	3
	23CSAMAJ101L	Programming in C Lab	50	50	100			2	1	2
Core/ Major - 2	23CSAMAJ102	Digital Electronics	50	50	100	3	0	0	3	3
		Digital Electronics Lab	50	50	100			2	1	2
GE/ Minor-1	23XXXMIN10X	One from following: - Mathematics - Statistics - Physics - Commerce - Economics - Management - Mass Communications & Journalism - Geography	50	50	100	4	1	0	4	4
Multi-Disciplinary - 1	23CSAMDC101	Introduction to MS Word, Excel and PowerPoint	50	50	100	2	0		2	2
	23CSAMDC101	Introduction to MS Word, Excel and PowerPoint Lab	50	50	100			2	1	2
SEC (Siliguri)	23CSASEC101A	Introduction to Cyber Security	50	50	100	2			2	2
	23CSASEC101AL	Introduction to Cyber Security	50	50	100			2	1	2
SEC (Sonada)	23CSASEC101B	Introduction to Office Tools	50	50	100	2			2	2
	23CSASEC101BL	Introduction to Office Tools Lab	50	50	100			2	1	2
Total									23	26

SYLLABUS

Semester II

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
AECC-2		Vernacular/ Alt English	50	50	100	2			2	2
VAC	Two to be taken up by student	VE	25	25	50	1			1	2
		ENVS	25	25	50	1			1	
VOC		Summer internship/ Apprenticeship on vocational course						4	4	40
Core/ Major - 3	23CSAMAJ103	Object Oriented Programming with Java	50	50	100	3			3	3
	23CSAMAJ103L	Object Oriented Programming with Java Lab	50	50	100			2	1	2
Core/ Major - 4	23CSAMAJ104	Computer Organisation & Architecture	50	50	100	3			3	3
	23CSAMAJ104L	Computer Organisation & Architecture Lab	50	50	100			2	1	2
GE/ Minor-2	23STSMIN10X Or 23MATMIN10X	Paper-I of second minor (Statistics)	50	50	100	4	1	0	4	5
Multi-Disciplinary - 2	23COMOEL101	Accounting and Finance	50	50	100	3	0	0	3	4
SEC	23CSASEC102	Python Programming	50	50	100	2			2	2
	23CSASEC102L	Python Programming Lab	50	50	100			2	1	2
Total									22 (26)	27

SYLLABUS

SECOND YEAR

Semester III

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
AECC-1		English	50	50	100	2			2	2
VAC	Two to be taken by student	NCC/NSS/Sports/Cultural etc	25	25	50				1	?
			25	25	50				1	
Core/ Major – 3	23CSAMAJ201	Data Structures	50	50	100	3			3	3
	23CSAMAJ201L	Data Structures LAB	50	50	100			2	1	2
Core/ Major - 4	23CSAMAJ202	Operating Systems	50	50	100	3			3	3
	23CSAMAJ202L	Operating Systems Lab	50	50	100			2	1	2
GE/ Minor-1	23XXXMIN20X	Paper-II of previously chosen GE-1	50	50	100	4	0	0	4	4
Multi- Disciplinary - 3	23CSAMDC201	Advanced Excel	50	50	100	3	0	0	3	3
SEC-A	23CSASEC201A	Introduction to Web Technology (HTML, JavaScript & PHP)	50	50	100	2			2	2
	23CSASEC201AL	Introduction to Web Technology (HTML, JavaScript & PHP) Lab	50	50	100			2	1	2
SEC-B	23CSASEC201B	Introduction to Web Technology (Java Technology)	50	50	100	2			2	2
	23CSASEC201BL	Introduction to Web Technology (Java Technology) Lab	50	50	100			2	1	2
Total									22	25

SYLLABUS

Semester IV

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
AECC-2		Vernacular/ Alt English	50	50	100	2			2	2
VAC	Two to be taken by student	NCC/NSS/Sports/Cultural etc	25	25	50				1	2
			25	25	50				1	
VOC		Summer internship/ Apprenticeship on vocational course						4	4	
Core/ Major-5	23CSAMAJ203A	Graphics programming using OpenGL	50	50	100	3			3	3
	23CSAMAJ203AL	Graphics programming Lab	50	50	100			2	1	2
	23CSAMAJ203B	Programming with Python and ML libraries	50	50	100	3			3	3
	23CSAMAJ203BL	Programming with Python and ML libraries Lab	50	50	100			2	1	2
Core/ Major-6	23CSAMAJ204	Software Engineering	50	50	100	3			3	3
	23CSAMAJ204L	Software Engineering Lab	50	50	100			2	1	2
Core/ Major-7	23CSAMAJ205	Database Management Systems	50	50	100	3			3	3
	23CSAMAJ205L	Database Management Systems Lab	50	50	100			2	1	2
GE/ Minor-2	23STSMIN30X	Paper-II of previously chosen GE-2	50	50	100	4	1	0	4	5
Total									20 (24)	24

SYLLABUS

SEMESTER - I

Course 23CSAMAJ101

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ101	Programming in C	3		45	2
23CSAMAJ101L	Programming in C Lab		1	30	2

Course Objectives:

This course is designed to give an introduction to programming and provide a comprehensive study of the C programming language.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSAMAJ101_1	Understand the basic concepts in computer programming e.g., procedural language, algorithm, flowchart, compiler, assembler, linker etc.
CO_CSAMAJ101_2	Write, compile and debug programs in C language.
CO_CSAMAJ101_3	Use different data types in a computer program.
CO_CSAMAJ101_4	Design programs involving decision structures, loops and functions.
CO_CSAMAJ101_5	Understand the dynamics of memory by the use of pointers.
CO_CSAMAJ101_6	Use different data structures and create/update basic data files.
CO_CSAMAJ101_7	Explain the difference between call by value and call by reference

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1																										
2																										
3																										
4																										
5																										
6																										
7																										

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to C (a) History of C (b) Overview of Procedural Programming (c) Introduction to Algorithm & Flowcharts	6	CO_CSAMAJ101_1	R, U, A1
Unit-2	Compilation and Execution in C (a) Using Basic Header Files (stdio.h, conio.h, etc) (b) Using main() function (c) Compiling and Executing Simple Programs in C	6	CO_CSAMAJ101_1 CO_CSAMAJ101_2	R, U, A1
Unit-3	Data Types, Variables, Constants, Operators and Basic I/O	7	CO_CSAMAJ101_1 CO_CSAMAJ101_2	R, U, A1

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	(a) Declaring, Defining and Initializing Variables (b) Scope of Variables (c) Using Named Constants, Keywords, Comments (d) Data Types, Casting of Data Types (e) Operators (Arithmetic, Logical and Bitwise) (f) Character I/O (getc, getchar, putc, putchar etc) (g) Formatted and Console I/O (printf(), scanf(), cin, cout)		CO_CSAMAJ101_3	
Unit-4	Expressions, Conditional Statements and Iterative Statements (a) Simple Expressions in C (including Unary Operator Expressions, Binary Operator Expressions) (b) Operators Precedence in Expressions (c) Conditional Statements (if construct, switch-case construct) (d) Syntax and utility of Iterative Statements (while, do-while, and for loops) (e) Use of break and continue statements in loops (f) Nested Statements (Conditional as well as Iterative)	7	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4	R, U, A1, A2
Unit-5	Functions (a) Utility of functions (b) Call by Value (c) Call by Reference (d) Return data type of functions (e) Inline Functions (f) Parameters (g) Differentiating between Declaration and Definition of Functions (h) Command Line Arguments/Parameters in Functions (i) Variable number of Arguments	6	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4 CO_CSAMAJ101_7	R, U, A1, A2
Unit-6	Arrays and Strings (a) One Dimensional Arrays (Declaring and Defining an Array, Initializing an Array, accessing individual elements in an Array, manipulating array elements using loops) (b) Use of various types of arrays (integer, float and character arrays / Strings) (c) Two-dimensional Arrays (Declaring, Defining and Initializing Two-Dimensional Array, Working with Rows and Columns) (d) Introduction to Multi-dimensional arrays	6	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4 CO_CSAMAJ101_7	R, U, A1, A2
Unit-7	User-defined Data Types (Structures and Unions) (a) Understanding utility of structures and unions (b) Declaring, initializing and using simple structures and unions (c) Manipulating individual members of structures and unions (d) Array of Structures, Individual data members as structures (e) Passing and returning structures from functions	4	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4 CO_CSAMAJ101_6 CO_CSAMAJ101_7	R, U, A1, A2, E, C

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	(f) Structure with union as members, Union with structures as members.			
Unit-8	Pointers and References in C (a) Understanding a Pointer Variable (b) Simple use of Pointers (Declaring and Dereferencing Pointers to simple variables) (c) Pointers to Pointers, Pointers to structures (d) Passing pointers as function arguments (e) Returning a pointer from a function (f) Using arrays as pointers, Passing arrays to functions (g) Pointers vs. References (h) Declaring and initializing references (i) Using references as function arguments and function return values	8	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4 CO_CSAMAJ101_5 CO_CSAMAJ101_6 CO_CSAMAJ101_7	R, U, A1, A2, E, C
Unit-9	Memory Allocation in C (a) Differentiating between static and dynamic memory allocation (b) Use of malloc, calloc and free functions (c) Storage of variables in static and dynamic memory allocation	3	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4 CO_CSAMAJ101_5 CO_CSAMAJ101_6 CO_CSAMAJ101_7	R, U, A1, A2, E
Unit-10	File I/O (a) Opening and closing a file (b) Reading and writing Text Files [Using put(), get(), read() and write() functions] (c) Random access files	4	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4 CO_CSAMAJ101_5 CO_CSAMAJ101_6	R, U, A1, A2, E, C
Unit-11	Pre-processor Directives (a) Understanding the Pre-processor Directives (#include, #define, #error, #if, #else, #elif, #endif, #ifdef, #ifndef and #undef) (b) Macros	3	CO_CSAMAJ101_1 CO_CSAMAJ101_2	R, U, A1, C

Suggested Readings

1. "The C Programming Language ANSI C Version", Kernighan & Ritchie, Prentice Hall Software Series.
2. "ANSI C - Made Easy", Herbert Schildt, Osborne McGraw-Hill.
3. "Learning to Program in C", N. Kantaris, Babani.
4. "C - The Complete Reference", Herbert Schildt, Osborne McGraw-Hill.
5. "Programming in C", Reema Thareja, Oxford University Press.

Practical (Laboratory)

CSAMAJ101L: Programming in C Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. WAP to perform input/output of all basic data types.
2. WAP to enter two numbers and find their sum.
3. WAP to reverse a number.
4. WAP to Swap Two Numbers.
5. WAP to Check Whether a Number is Even or Odd
6. WAP to compute the factors of a given number.
7. WAP to enter marks of five subjects and calculate total, average and percentage.
8. WAP to print the sum and product of digits of an integer.
9. WAP to Check Whether a Character is Vowel or Consonant

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10. WAP to Find the Largest Number Among Three Numbers
11. WAP to compute the sum of the first n terms of the following series $S = 1 - 2 + 3 - 4 + 5 - \dots$
12. WAP to compute the sum of the first n terms of the following series $S = 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots$
13. WAP to print figures as follow:

*	1	1	1
**	1 1	2 3	1 2
***	1 2 1	4 5 6	1 2 3
****	1 3 3 1	7 8 9 10	1 2 3 4
*****	1 4 6 4 1	11 12 13 14	1 2 3 4 5
* * * * *	A		A
* *	A B		B A
* *	A B C		C B A
* *	A B C D		D C B A
* *	A B C D E		E D C B A
* * * * *	A B C D E F		F E D C B A

14. WAP to perform following actions on an array entered by the user:
 - a) Print the even-valued elements
 - b) Print the odd-valued elements
 - c) Calculate and print the sum and average of the elements of array
 - d) Print the maximum and minimum element of array
 - e) Remove the duplicates from the array
 - f) Print the array in reverse order
 The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.
15. WAP that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
16. Write a program that swaps two numbers using pointers.
17. Write a program in which a function is passed address of two variables and then alter its contents.
18. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
19. Write a program to find sum of n elements entered by the user. To write this program, allocate memory dynamically using **malloc()** / **calloc()** functions or **new** operator.
20. Write a menu driven program to perform following operations on strings:
21. Show address of each character in string
22. Concatenate two strings without using **strcat** function.
23. Concatenate two strings using **strcat** function.
24. Compare two strings
25. Calculate length of the string (use pointers)
26. Convert all lowercase characters to uppercase
27. Convert all uppercase characters to lowercase
28. Calculate number of vowels
29. Reverse the string
30. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
31. WAP to display Fibonacci series
 - (i) using recursion, (ii) using iteration
32. WAP to calculate Factorial of a number
 - (i) using recursion, (ii) using iteration
33. WAP to calculate GCD of two numbers:
 - (i) with recursion (ii) without recursion.
34. Write a menu-driven program to perform following Matrix operations (2-D array implementation):
 - a) Sum b) Difference c) Product d) Transpose
35. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.
36. Write a program to retrieve the student information from file created in previous question and print it in the following format:
Roll No. Name Marks

SYLLABUS

37. Copy the contents of one text file to another file, after removing all whitespaces.
38. WAP to write a sentence to a file.
39. WAP to read a line from a file and display it.
40. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void.
41. Write a program that will read 10 integers from user and store them in an array. Implement array using pointers. The program will print the array elements in ascending and descending order.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

(College Seal)

SYLLABUS

Course 23CSAMAJ102

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ102	Digital Electronics	3		45	3
23CSAMAJ102L	Digital Electronics Lab		1	30	2

Course Objectives:

To introduce the concepts of digital electronics that is at the core of logical and arithmetic operations in a computer.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSAMAJ102_1	Understand the basic design of a computer, hardware and software components.
CO_CSAMAJ102_2	Understand the need of different number systems, conversion rules, encoding systems.
CO_CSAMAJ102_3	Understand the basics of gates, Boolean functions and their uses
CO_CSAMAJ102_4	Construct basic combinational circuits and verify their functionalities
CO_CSAMAJ102_5	Apply the design procedures to design basic sequential circuits
CO_CSAMAJ102_6	Design and evaluate a solution to a digital design problem

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1																										
2																										
3																										
4																										
5																										
6																										

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Fundamentals of Computers (a) Generation of Computers and Computer Languages, (b) Computer Systems, (c) Basic block Diagram, (d) Von- Neumann Architecture, (e) Types of Computers, (f) Hardware, Firmware, (g) I/O Devices, (h) Storage classifications, (i) Language translators.	15	CO_CSAMAJ102_1	R, U
Unit-2	Number Systems & Arithmetic (a) Number System: Positional, Binary, Octal, Decimal, Hexa-Decimal and their Representations. (b) Methods of conversion from one Base to another. (c) Binary Addition, Subtraction, Multiplication.	15	CO_CSAMAJ102_1 CO_CSAMAJ102_2	R, U, A1

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	(d) Negative number representation: Sign magnitude, 1's, (f) 2's Complement. (e) Different coding schemes: BCD, EBCDIC, UNICODE, ASCII, GRAY, Excess-3 Codes. (f) Fixed and floating-point representation			
Unit-3	Logic gates (a) AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR gates, (b) Boolean algebra: Basic Boolean Laws, De-Morgan's theorem, Boolean function and their truth tables, (c) MAP simplification, Minimization techniques, K-Map, (d) Sum of Product & Product of Sum, (e) Venn diagram.	15	CO_CSAMAJ102_1 CO_CSAMAJ102_2 CO_CSAMAJ102_3 CO_CSAMAJ102_4	R, U, A1, A2, E
Unit-4	Circuits, Adders, Flip Flops, Registers etc. (a) Combinational & Sequential circuits, (b) Half adder & Full adder, (c) BCD adder, (d) Full Subtractor, (e) Multiplexer, De-Multiplexer, Encoder, Decoder. (f) Flip-flops-RS, D, JK, T & Master-Slave flip-flops, (g) Counters, Shift registers	15	CO_CSAMAJ102_1 CO_CSAMAJ102_2 CO_CSAMAJ102_3 CO_CSAMAJ102_4 CO_CSAMAJ102_5 CO_CSAMAJ102_6	R, U, A1, A2, E, C

Suggested Readings

1. Rajaraman V. & Radhakrishnan, "An Introduction to Digital Computer Design", PHI.
2. Malvino & Leach, "Digital Principles & Applications", TMH.
3. S. Salivahanan, S. Arivazhagan, "Digital Circuits and Design", Oxford University Press

Practical (Laboratory)

CSAMAJ102L: Digital Electronics Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Show the basic operations of AND, OR, and NOT gates.
2. Simplify the Boolean expression: $F = A'B + AB' + AB$.
3. Implement the following Boolean function using logic gates: $F = A \cdot B + \bar{C}$.
4. Design a half adder circuit using basic logic gates.
5. Draw the truth table and Karnaugh map for a 3-input XOR gate.
6. Implement a 4-to-1 multiplexer using basic logic gates.
7. Design a 3-bit binary up-counter using flip-flops.
8. Design a 4-bit shift register with serial input and parallel output.
9. Implement a T flip-flop using a D flip-flop.
10. Design a 4-bit binary comparator circuit.
11. Implement a 3-bit magnitude comparator using basic logic gates.
12. Design a 3-to-8 decoder with enable input.
13. Design a 4-to-1 multiplexer using 2-to-1 multiplexers.
14. Implement a 1-to-4 demultiplexer using basic logic gates.

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Course 23CSAMDC101

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMDC101	Introduction to MS-Word, Excel and PowerPoint	2		30	2
23CSAMDC101L	Introduction to MS-Word, Excel and PowerPoint Lab		1	30	2

Course Overview:

This course introduces:

- How to use MS Office applications use in office work such as creating professional-quality documents; store, organize and analyse information.
- How to perform arithmetic operations and functions.
- How to create dynamic slide presentations with animation, narration, images, and writing professional emails.

Course Objectives:

To enable a student to:

- Create digital documents of professional quality.
- Organize numerical and financial data for analysis
- Create dynamic presentations with animations
- Differentiate and decide type of document to be used for a given task.
- Write emails of professional quality.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSAMDC101_1	List the uses and features of MS Word, Excel, PowerPoint
CO_CSAMDC101_2	Understand various text formatting techniques, including fonts, styles, sizes, and alignment.
CO_CSAMDC101_3	Build and manage spreadsheets for data entry, analysis, and organization.
CO_CSAMDC101_4	Apply Formatting techniques, tables, and charts to present data and information effectively.
CO_CSAMDC101_5	Design and create documents for a given event.
CO_CSAMDC101_6	Create documents of professional quality for business and academic purposes.

Units	Content	Lecture Hours	COs	RBT
Unit-1	Introduction to MS Word - Creating, editing, saving and printing text documents - Font and paragraph formatting - Simple character formatting - Inserting tables, smart art, page breaks - Using lists and styles - Working with images - Using Spelling and Grammar check - Understanding document properties - Mail Merge	13	CO1 CO6	R U A1 A2 E C
Unit-2	Introduction to MS Excel - Spreadsheet basics - Creating, editing, saving and printing spreadsheets - Working with functions & formulas	14	CO1 CO3 CO6	R U A1 A2 E

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	c. Modifying worksheets with color & autoformats Graphically representing data: Charts & Graphs			C
Unit-3	Introduction to MS PowerPoint a. Opening, viewing, creating, and printing slides Applying auto layouts b. Adding custom animation c. Using slide transitions d. Graphically representing data: Charts & Graphs Creating Professional Slide for Presentation.	13	CO1 CO4 CO6	R U A1 A2 E C
Unit-4	Internet & e-mails a. What is Internet? b. Receiving Incoming, Messages Sending Outgoing Messages, c. Email addressing, Email attachments d. Browsing, Search engines	5	CO2 CO6	R U E C

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Learning Resources:

Open online resources

1. <https://support.microsoft.com/en-us/office/powerpoint-for-windows-training-40e8c930-cb0b-40d8-82c4-bd53d3398787>
2. <https://support.microsoft.com/en-us/office/excel-video-training-9bc05390-e94c-46af-a5b3-d7c22f6990bb>
3. <https://support.microsoft.com/en-us/office/word-for-windows-training-7bcd85e6-2c3d-4c3c-a2a5-5ed8847eae73>

Practical (Laboratory)

CSAMDC101L: Introduction to MS-Word, Excel and PowerPoint Lab [Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Word	1. Change the font style and size in a Word document 2. Apply bold, italic, and underline formatting to text 3. Create bulleted and numbered lists 4. Set margins and adjust page orientation in Word 5. Insert headers and footers into a document 6. Add page numbers to a document 7. Insert a table into a Word document 8. Merge and split cells in a table 9. Apply borders and shading to table cells 10. Insert images and shapes into a Word document 11. Add hyperlinks to text in a document 12. Embed a spreadsheet or chart into a Word document
Excel	1. Enter data into cells in Excel 2. Perform basic arithmetic operations (addition, subtraction, multiplication, division) in Excel 3. Use autofill to quickly fill a series of cells with data 4. Use the SUM function to add a range of cells 5. Use the IF function to create conditional statements in Excel 6. Apply number formatting (currency, percentage, etc.) to cells in Excel 7. Format cells to display dates and times 8. Apply cell styles and themes to a worksheet 9. Create a chart or graph in Excel 10. Customize the appearance of a chart (titles, axis labels, etc.) 11. Add trendlines or error bars to a chart
PowerPoint	1. Create a new presentation in PowerPoint

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	2. Add slides to a presentation and choose different layouts 3. Rearrange the order of slides in a presentation 4. Apply a theme to a PowerPoint presentation 5. Change the background colour or image of a slide 6. Apply text formatting (font size, colour, etc.) to slide titles and bullet points 7. Insert images or videos into a PowerPoint presentation 8. Add animations and transitions between slides 9. Embed audio files or add narration to a presentation 10. Start a slideshow from the beginning or from the current slide 11. Use presenter view to view presenter notes while presenting 12. Set up slide timings or record a narration for a slideshow
Email	1. Initiate a mail merge in Microsoft Word. 2. Connect a data source, such as an Excel spreadsheet, to a Word document for mail merge. 3. Insert merge fields into a Word document. 4. Format merge fields to display specific data types, such as dates or currency. 5. Preview individual merged documents in Microsoft Word. 6. Edit merge documents to ensure proper formatting and content. 7. Filter and sort data in the mail merge recipient list. 8. Explore options available for completing a mail merge, such as printing or sending emails. 9. Perform the actual merge to generate personalized documents for each recipient. 10. Troubleshoot common issues that may arise during the merge process.

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Course 23CSEC101

Course Outcomes Mapping with Program Specific Outcomes							
Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07
1							
2							
3							
4							
5							
6							
7							

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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to Cyber Security a) Defining Cyberspace and Overview of Computer and Web-technology b) Architecture of cyberspace c) Communication and web technology d) Internet infrastructure for data transfer and governance e) Regulation of cyberspace f) Concept of cyber security g) Issues and challenges of cyber security	6	CO_CSASEC101_1	R, U, A1
Unit-2	Cyber Crime and Cyber Law (a) Classification of cyber crimes (b) Common cyber crimes (c) Cybercriminals modus-operandi (d) Reporting of cyber crimes (e) Remedial and mitigation measures (f) Legal perspective of cyber crime 1. IT Act 2000 and its amendments 2. Cybercrime and offences (g) Organisations dealing with Cybercrime and Cyber security in India	6	CO_CSASEC101_1 CO_CSASEC101_2	R, U, A1
Unit-3	Social media Overview and Security (a) Introduction to Social networks (b) Types of Social media (c) Social media platforms (d) Social media monitoring (e) Hashtag (f) Social media marketing (g) Social media privacy (h) Challenges, opportunities and pitfalls in online social network (i) Security issues related to social media (j) Flagging and reporting of inappropriate content (k) Laws regarding posting of inappropriate content (l) Best practices for the use of Social media	7	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3	R, U, A1
Unit-4	E-Commerce and Digital Payments (a) Definition of E- Commerce (b) Components of E-Commerce (c) Elements of E-Commerce security (d) E-Commerce threats (e) E-Commerce security best practices (f) Introduction to digital payments (g) Components of digital payment and stake holders (h) Modes of digital payments 1. Banking Cards	7	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4	R, U, A1, A2

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	2. Unified Payment Interface (UPI) 3. e-Wallets 4. Unstructured Supplementary Service Data (USSD) 5. Aadhar enabled payments (i) Digital payments related common frauds and preventive measures (j) RBI guidelines on digital payments and customer protection in unauthorised banking transactions (k) Relevant provisions of Payment Settlement Act, 2007			
Unit-5	Digital Devices Security, Tools and Technologies for Cyber Security (a) End Point device and Mobile phone security (b) Password policy (c) Security patch management (d) Data backup (e) Downloading and management of third-party software (f) Device security policy (g) Cyber Security best practices 1. Significance of host firewall and Anti-virus 2. Management of host firewall and Anti-virus 3. Wi-Fi security 4. Configuration of basic security policy and permissions	6	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4 CO_CSAMAJ101_7	R, U, A1, A2

References

1. Cyber Crime Impact in the New Millennium, by R. C Mishra, Author Press. Edition 2010.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
3. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson, 13th November, 2001)
4. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd.
5. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
6. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
7. Fundamentals of Network Security by E. Maiwald, McGraw Hill.

Practical (Laboratory)

CSASEC101AL: Introduction to Cyber Security Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-2	1. Checklist for reporting cybercrime at Cybercrime Police Station. 2. Checklist for reporting cybercrime online. 3. Reporting phishing emails. 4. Demonstration of email phishing attack and preventive measures.
Unit-3	1. Basic checklist, privacy and security settings for popular Social media platforms. 2. Reporting and redressal mechanism for violations and misuse of Social media platforms.
Unit-4	1. Configuring security settings in Mobile Wallets and UPIs. 2. Checklist for secure net banking.

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Unit-5	1. Setting, configuring and managing three password policy in the computer (BIOS, Administrator and Standard User). 2. Setting and configuring two factor authentications in the Mobile phone. 3. Security patch management and updates in Computer and Mobiles. 4. Managing Application permissions in Mobile phone. 5. Installation and configuration of computer Anti-virus. 6. Installation and configuration of Computer Host Firewall. 7. Wi-Fi security management in computer and mobile.

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Name:	Name:	Name:
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SYLLABUS

Course 23CSASEC101B

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSASEC101B	Introduction to Office tools	2		30	2
23CSASEC101BL	Introduction to Office tools Lab		1	30	2

Course Objectives:

In this comprehensive course, participants will develop a solid command over fundamental office tools, enabling them to enhance their productivity, streamline tasks, and communicate effectively in a modern workplace.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSASEC102_1	Develop a strong foundation in using Word for various document creation and formatting tasks. They will be equipped to create professional-looking documents, collaborate effectively, and automate processes using features and tools within Microsoft Word.
CO_CSASEC102_2	Develop the skills needed to create visually stunning, engaging, and effective presentations. They will be equipped to convey information with clarity, captivate audiences through multimedia integration, and confidently deliver impactful presentations for various settings and purposes.
CO_CSASEC102_3	Possess a solid understanding of essential Excel functions and features. They will be able to efficiently manage and format data, perform basic calculations, and create simple charts and tables. Participants will gain the foundational skills necessary to use Microsoft Excel for various personal and professional tasks.
CO_CSASEC102_4	Overall, participants will emerge from this unit with a well-rounded proficiency in Microsoft Excel's data management and calculation capabilities. They will be equipped to create and manage structured data tables, perform various calculations using functions, and organize worksheets effectively for both analysis and presentation purposes.

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Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√		√					√			√	√		√					√							
2	√		√	√				√		√	√	√		√					√					√	√	√
3	√		√	√	√			√		√	√	√	√						√			√		√	√	√
4	√		√	√	√			√		√	√	√	√						√			√		√	√	√

Unit	Contents	Hours	Outcomes	Bloom's Revised Taxonomy Levels
Unit-1	Introduction to Microsoft Word (a) Overview of the Word interface and navigation, Creating and saving documents, Understanding the Ribbon and Quick Access Toolbar, Customizing the Word environment. (b) Text Formatting and Styling: Applying font styles, sizes, and colors, Paragraph formatting (alignment, spacing, indentation), Creating bulleted and numbered lists, Using styles and themes for consistent formatting. (c) Document Layout and Page Setup: Setting page margins, orientation, and size, Headers and footers for document branding, Inserting page breaks and section breaks, Creating and formatting tables for data presentation. (d) Document Organization and Navigation: Inserting and formatting page numbers, Inserting images, shapes, and SmartArt graphics, Wrapping text around objects, Adding and formatting text boxes, Embedding and linking multimedia element. (e) Mail Merge and Automation	9	CO_BCA SEC102_1	R, U, A1
Unit-2	Introduction to Microsoft PowerPoint (a) Overview of the PowerPoint interface and navigation, Creating and saving presentations, Understanding the Slide Master and layout options, Customizing the PowerPoint environment. (b) Slide Design and Layout: Choosing and customizing slide layouts, Applying themes and color schemes, Adding and formatting text boxes and placeholders, Working with shapes and lines for visual impact. (c) Adding Visual Elements: Adding audio and video clips to slides, Adjusting multimedia playback options, Using animations and	8	CO_BCA SEC102_2	R, U, A1, A2

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	transitions for engagement, Creating interactive buttons and hyperlinks. (d) Advanced Slide Techniques: Applying slide transitions and animations, Timing animations and slide transitions, Customizing motion paths for objects, Creating interactive quizzes and surveys (e) Slide Show Customization: Setting up and configuring slide show settings, Applying all learned concepts to create a comprehensive presentation.			
Unit-3	Introduction to Microsoft Excel (a) Overview of Excel interface and workbook navigation, Understanding rows, columns, and cells, Entering and editing data in cells, Formatting cells for text, numbers, and dates. (b) Basic Formulas and Functions: Introduction to basic formulas (addition, subtraction, multiplication, division), Using AutoSum for quick calculations, Applying built-in functions (SUM, AVERAGE, COUNT), Copying and pasting formulas and functions. (c) Cell References and Relative/Absolute Values: Understanding cell references (relative, absolute, mixed), Working with absolute and relative values in formulas, Using cell references in basic calculations, Applying formulas across multiple cells. (d) Data Management and Formatting: Sorting data in ascending and descending order. (e) Introduction to Charts and Graphs: Creating basic charts (column, line, pie), Formatting chart elements (titles, axes, data labels), Customizing chart styles and colors, Adding charts to worksheets and resizing.	8	CO_BCA SEC102_3 CO_BCA SEC102_4	R, U, A1, A2
Unit-4	Working with Microsoft Excel (a) Working with Tables: Creating tables for efficient data management, Sorting and filtering data within tables, Adding and removing rows and columns, Formatting tables for visual appeal. (b) Perform Calculations with Functions: Creating Simple Formulas, Setting up your own formula, Date and Time Functions, Financial Functions, Logical Functions, Functions Mathematical Functions. (c) Worksheet Organization and Printing: Inserting and deleting worksheets, Renaming and color-coding worksheets, Adjusting page setup and print options, Printing worksheets and workbooks.	5	CO_BCA SEC102_3 CO_BCA SEC102_4	R, U, A1, A2

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Suggested Readings

1. Joan Lambert, Curtis Frye. *Microsoft Office 2016 Step by Step*.
2. Nancy Conner, Matthew MacDonald. *Microsoft Office 2016: The Missing Manual*.
3. K. Murali Kumar. *Microsoft Office 2019: A Quick and Easy Guide*.
4. Dr. S. Anbazhagan and S. Paneerselvam. *Microsoft Office 365: A Complete Guide*.

Practical (Laboratory)

CSASEC101BL: Introduction to Office Tools Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Word	1. Change the font style and size in a Word document 2. Apply bold, italic, and underline formatting to text 3. Create bulleted and numbered lists 4. Set margins and adjust page orientation in Word 5. Insert headers and footers into a document 6. Add page numbers to a document 7. Insert a table into a Word document 8. Merge and split cells in a table 9. Apply borders and shading to table cells 10. Insert images and shapes into a Word document 11. Add hyperlinks to text in a document 12. Embed a spreadsheet or chart into a Word document
Excel	1. Enter data into cells in Excel 2. Perform basic arithmetic operations (addition, subtraction, multiplication, division) in Excel 3. Use autofill to quickly fill a series of cells with data 4. Use the SUM function to add a range of cells 5. Use the IF function to create conditional statements in Excel 6. Apply number formatting (currency, percentage, etc.) to cells in Excel 7. Format cells to display dates and times 8. Apply cell styles and themes to a worksheet 9. Create a chart or graph in Excel 10. Customize the appearance of a chart (titles, axis labels, etc.) 11. Add trendlines or error bars to a chart
PowerPoint	1. Create a new presentation in PowerPoint 2. Add slides to a presentation and choose different layouts 3. Rearrange the order of slides in a presentation 4. Apply a theme to a PowerPoint presentation 5. Change the background colour or image of a slide 6. Apply text formatting (font size, colour, etc.) to slide titles and bullet points 7. Insert images or videos into a PowerPoint presentation 8. Add animations and transitions between slides 9. Embed audio files or add narration to a presentation 10. Start a slideshow from the beginning or from the current slide 11. Use presenter view to view presenter notes while presenting 12. Set up slide timings or record a narration for a slideshow

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Course 23CSAVAC101

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAVAC101	Website Designing using WordPress		1	30	2

Course Overview:

This course introduces:

- A comprehensive introduction to WordPress, one of the most popular content management systems (CMS) for website development.
- Students will learn how to create, customize, and manage websites using WordPress.
- Students will be able to build and maintain functional and visually appealing websites for personal blogs, portfolios, small businesses, and more.

Course Objectives:

To enable a student to:

- Understand the basics of WordPress and its role in website development.
- Create and set up a WordPress website from scratch.
- Customize website appearance using themes and templates.
- Add and manage content, including text, images, and multimedia.
- Troubleshoot common issues and perform website maintenance.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSAVAC101_1	Enumerate key features and basics of WordPress
CO_CSAVAC101_2	Understand the structure of a website and the importance of tools.
CO_CSAVAC101_3	Classify plugins and tools for content management and optimization.
CO_CSAVAC101_4	Create a simple website or blog.
CO_CSAVAC101_5	Optimize and enhance website security
CO_CSAVAC101_6	Create and Set Up a WordPress Website

Units	Content	Lecture Hours	COs	RBT
Unit-1	Introduction to WordPress - CMS and its uses - WordPress- Advantages & Disadvantages - Creating a Blog website on wordpress.org, installation on localhost and FTP - Choosing and installing WordPress themes. - Customizing website appearance through theme settings. - Creating custom menus and navigation. - Working with widgets and sidebars. - Creating and formatting posts and pages. - Inserting images, videos, and other media. - Organizing content using categories and tags. - Managing comments and discussions.	15	CO1 CO2 CO3 CO4	R U A1 A2
Unit-2	Optimization, Maintenance & Security - Optimizing content for search engines. - Improving website performance and load times. - Ensuring responsive design for various devices. - Creating user accounts and assigning roles. - Setting up user permissions and access levels.	15	CO4 CO5 CO6	A1 A2 E C

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	f. Implementing basic security measures. g. Identifying and resolving common WordPress issues. h. Backing up and updating the website. i. Regular maintenance tasks for a healthy website. j. Create a 4-page website			

Learning Resources:

Open online resources

1. https://www.tutorialspoint.com/wordpress/wordpress_tutorial.pdf

Practical (Laboratory)

CSAVAC101: Website designing using WordPress

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

1. Install WordPress on a web server.
2. Difference between WordPress.com and WordPress.org.
3. Create a local development environment for WordPress using tools like XAMPP or WAMP.
4. Choose a WordPress theme for a website.
5. Customize a WordPress theme to fit specific design requirements.
6. Create a new page in WordPress.
7. Differentiate between pages and posts in WordPress.
8. Add multimedia content (images, videos) to a page or post.
9. Create and customize navigation menus in WordPress.
10. Explain the concept of parent and child menu items in WordPress.
11. Add custom links to a WordPress menu.
12. Add widgets to the sidebar or footer of a WordPress website.
13. State the purpose of common WordPress widgets like Recent Posts, Categories, and Search.
14. Create custom widgets or modify existing ones.
15. Install and activate plugins in WordPress.
16. Explain the purpose of popular WordPress plugins such as Yoast SEO, Contact Form 7, and WooCommerce.
17. Troubleshoot plugin conflicts in WordPress.
18. Describe the benefits of using page builder plugins like Elementor or Beaver Builder in WordPress.
19. Create custom layouts and designs using a page builder.
20. Integrate custom CSS or JavaScript code into a WordPress website built with a page builder.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
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SYLLABUS

SEMESTER - II

Course 23CSAMAJ103

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ103	Object Oriented Programming with Java	3		45	3
23CSAMAJ103L	Object Oriented Programming with Java Lab		1	30	2

Course Objectives:

- To introduce students to the Java programming language.
- To create Java programs that leverage the object-oriented features of the Java language, such as encapsulation, inheritance and polymorphism; use data types, arrays and other data collections;
- To implement I/O functionality to read from and write to text files.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSAMAJ103_1	Understand the principles and practices of object-oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements.
CO_CSAMAJ103_2	Implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
CO_CSAMAJ103_3	Demonstrate the principles of object-oriented programming.
CO_CSAMAJ103_4	Demonstrate the ability to use simple data structures like arrays in a Java program.
CO_CSAMAJ103_5	Understand the concept of package, interface, multithreading and File handling in java.
CO_CSAMAJ103_6	Ability to make use of members of classes found in the Java API (such as the Math class).

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels

SYLLABUS

Unit-1	Introduction to Java - Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, - Compiling and Executing a Java Program, - Variables, Constants, Keywords, Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, - Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, - Java Methods - Defining, Scope, Passing and Returning Arguments, - Type Conversion and Type and Checking, Built-in Java Class Methods),	6	CO_BCAMAJ103_1 CO_BCAMAJ103_2	R, U
Unit-2	Arrays, Strings and I/O - Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, - Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, - String Buffer Classes. - Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.	8	CO_BCAMAJ103_1 CO_BCAMAJ103_2 CO_BCAMAJ103_4	R, U, A1
Unit-3	Object-Oriented Programming Overview - Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, - Class Constructors, Class Variables & Methods, Method Overloading, Objects as parameters, - final classes, Object class, Garbage Collection.	7	CO_BCAMAJ103_1 CO_BCAMAJ103_2 CO_BCAMAJ103_3	R, U, A1, A2,
Unit-4	Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata - Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), - Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, - Using Standard Java Packages (util, lang, io, net), - Wrapper Classes, Autoboxing/Unboxing, - Enumerations and Metadata.	14	CO_BCAMAJ103_1 CO_BCAMAJ103_2 CO_BCAMAJ103_3 CO_BCAMAJ103_5	R, U, A1, A2, E,
Unit-5	Exception Handling, Threading, Networking and Database Connectivity - Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions - Multithreading: Thread class & Runnable interface, creating single & multiple threads, Thread prioritization, synchronization & communication, suspending/resuming threads. - Using java.net package, Overview of TCP/IP and Datagram programming. - Accessing and manipulating databases using JDBC.	15	CO_BCAMAJ103_1 CO_BCAMAJ103_2 CO_BCAMAJ103_3 CO_BCAMAJ103_5	R, U, A1, A2, E, C

SYLLABUS

Unit-6	Applets and Event Handling - Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. - Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. - The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. - Overview of servlets.	15	CO_BCAMAJ103_1 CO_BCAMAJ103_2 CO_BCAMAJ103_3 CO_BCAMAJ103_6	R, U, A1, A2, E, C

Suggested Readings

1. Ken Arnold, James Gosling, David Homes, "The Java Programming Language", 4/e, 2005.
2. James Gosling, Bill Joy, Guy L Steele Jr, Gilad Bracha, Alex Buckley, "The Java Language Specification, Java SE (Java Series)", 8/e, Addison Wesley, 2014.
3. Joshua Bloch, "Effective Java" 2/e, Addison-Wesley, 2008.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Prentice Hall, 2012
5. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 2 - Advanced Features", 9/e, Prentice Hall, 2013.
6. Bruce Eckel, "Thinking in Java", 3/e, PHI, 2002.
7. E. Balaguruswamy, "Programming with Java", 4/e, McGraw Hill.2009.
8. Paul Deitel, Harvey Deitel, "Java: How to Program", 10/e, Prentice Hall, 2011.
9. Bert Bates, Kathy Sierra, "Head First Java", Orielly Media Inc. 2/e, 2005.
10. "Object Oriented Programming through JAVA", P Radha Krishna, University Press.
11. David J. Eck, "Introduction to Programming Using Java", CreateSpace Independent Publishing Platform, 2009.
12. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
13. R. Nageswara, "Core Java: An Integrated Approach", Dreamtech Press.

Practical (Laboratory)

CSAMAJ103L: Programming in JAVA Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. To find the sum of any number of integers entered as command line arguments
2. To find the factorial of a given number
3. To learn use of single dimensional array by defining the array dynamically.
4. To learn use of **.length** in case of a two dimensional array
5. To convert a decimal to binary number
6. To check if a number is prime or not, by taking the number as input from the keyboard
7. To find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument
8. Write a program that show working of different functions of String and StringBuffer classes like setCharAt(), setLength(), append(), insert(), concat() and equals().
9. Write a program to create a "distance" class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer
10. Modify the "distance" class by creating constructor for assigning values (feet and inches) to the distance object. Create another object and assign second object as reference variable to another object reference variable. Further create a third object which is a clone of the first object.
11. Write a program to show that during function overloading, if no matching argument is found, then java will apply automatic type conversions (from lower to higher data type)

SYLLABUS

12. Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keyword
13. Write a program to show the use of static functions and to pass variable length arguments in a function.
14. Write a program to demonstrate the concept of boxing and unboxing.
15. Create a multi-file program where in one file a string message is taken as input from the user and the function to display the message on the screen is given in another file (make use of Scanner package in this program).
16. Write a program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate Fibonacci series is given in a different file belonging to the same package.
17. Write a program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages
18. Write a program “DivideByZero” that takes two numbers a and b as input, computes a/b, and invokes Arithmetic Exception to generate a message when the denominator is zero.
19. Write a program to show the use of nested try statements that emphasizes the sequence of checking for catch handler statements.
20. Write a program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).
21. Write a program to demonstrate priorities among multiple threads.
22. Write a program to demonstrate multithread communication by implementing synchronization among threads (Hint: you can implement a simple producer and consumer problem).
23. Write a program to create URL object, create a URL Connection using the openConnection() method and then use it examine the different components of the URL and content.
24. Write a program to implement a simple datagram client and server in which a message that is typed into the server window is sent to the client side where it is displayed.
25. Write a program that creates a Banner and then creates a thread to scrolls the message in the banner from left to right across the applet’s window.
26. Write a program to get the URL/location of code (i.e. java code) and document (i.e. html file).
27. Write a program to demonstrate different mouse handling events like mouseClicked(), mouseEntered(), mouseExited(), mousePressed, mouseReleased() and mouseDragged().
28. Write a program to demonstrate different keyboard handling events.
29. Write a program to generate a window without an applet window using main() function.
30. Write a program to demonstrate the use of push buttons

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Signature:	Signature:	Signature:
	(Seal)	(Seal)

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SYLLABUS

Course 23CSAMAJ104

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ104	Computer System Architecture	3		45	3
23CSAMAJ104L	Computer System Architecture LAB		1	30	2

Course Objectives:

The course covers the basic principles of computer organization and architecture.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSAMAJ104_1	Be familiar with the building blocks of modern computers
CO_CSAMAJ104_2	Understand binary, octal and hexadecimal number systems
CO_CSAMAJ104_3	Understand the fundamentals of different instruction set architectures and their relationship to the CPU design.
CO_CSAMAJ104_4	Understand the principles and the implementation of computer arithmetic using digital logic.
CO_CSAMAJ104_5	Understand memory organisation

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy
Unit – I	Data representation - Number Systems & Complements - Fixed-point, floating-point and character representation - Addition, subtraction, magnitude comparison, multiplication and division algorithms for integers.	6	CO_ BCAMJ104_1 CO_ BCAMJ104_2	R, U, A1,
Unit-2	Memory and I/O Unit - Memory hierarchy - Main memory - Cache, Auxiliary and associative memory - Input / Output: External Devices - I/O Modules : Interfaces - Programmed I/O - Interrupt-Driven I/O	6	CO_ BCAMJ104_5, CO_ BCAMJ104_1	R, U

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	○ Direct Memory Access, I/O Channels.			
Unit-3	Overview of register transfer and micro operations - Register Transfer Language, Register transfer. - Bus and Memory transfer - Arithmetic, Logic & Shift Micro-operations. - Arithmetic Logic Shift Unit.	8	CO_ BCAMJ104_3	R, U, A1
Unit-4	Basic Computer Organization and Design - Instruction codes, Computer registers - Computer instructions. - Timing and Control, Instruction cycle. - Register, I/O, Memory-Reference Instructions - Input-output and interrupt. - Design of Basic computer, Design of Accumulator Unit	8	CO_ BCAMJ104_2, CO_ BCAMJ104_1	R, U, A1, A2
Unit-5	Central Processing Unit - Introduction, General Register Organization, Stack Organization - Instruction format. - Addressing Modes - Data transfer and manipulation - Program Control, Reduced Instruction Set Computer (RISC).	6	CO_ BCAMJ104_4	R, U, A1, A2
Unit -6	Pipeline and Parallel Processing - Parallel Processing - Pipelining - Arithmetic Pipeline - Instruction Pipeline - RISC Pipeline	6	CO_ BCAMJ104_4	R, U, A1, A2

Suggested Readings

1. M. Mano, "Computer System Architecture", Pearson Education 1992.
2. A. J. Dos Reis, "Assembly Language and Computer Architecture using C++ and JAVA", Course Technology, 2004.
3. W. Stallings, "Computer Organization and Architecture - Designing for Performance", 8/e, Prentice Hall of India, 2009.
4. M.M. Mano, "Digital Design", Pearson Education Asia, 2013.
5. Carl Hamacher, "Computer Organization", 5/e, McGraw Hill, 2012.

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Practical (Laboratory)

CSAMAJ104L: Computer System Architecture Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. General study of Basic & Universal gates
 - a) AND b) OR c) NOT d) NOR
 - e) NAND f) XOR g) XNOR
2. Simple Boolean Expression using Basic gates and Universal gates:
 $\bar{A}.(B+A) + \bar{B}.A$
3. Design Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor Circuit.
4. Parallel Adder (2-bit, 3-bit) Circuit.
5. Implement logic functions in SOP form using Multiplexer.
6. Implement De-multiplexer.
7. Implement 7- Segment Display with Decoder.
8. Implement Parity Generator (Odd & Even)
9. Implement Magnitude Comparator (1-bit, 2-bit, 3-bit)
10. Circuit Design and implementation of Flip-Flops (SR, JK, D) using ICs
11. Circuit design and implementation of Decoder (2x4) and Encoder (4x2) using ICs

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(College Seal)

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23CSAMIN101

This Course is exactly the same as 23CSAMAJ101.

SYLLABUS

Course 23CSASEC103

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSASEC103	Python Programming	2		30	2
23CSASEC103L	Python Programming Lab		1	30	2

Course Overview:

A core Python programming course typically provides a comprehensive introduction to the Python programming language, catering to both beginners and individuals with prior programming experience. The course aims to teach the fundamental concepts, syntax, and techniques required to write efficient and functional Python code.

Course Objectives:

The objectives of a core Python programming course are to equip students with a strong foundation in the Python programming language.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSASE103_1	Basic Proficiency: - Write, execute, and understand basic Python programs using appropriate syntax and semantics. - Demonstrate a clear understanding of Python's data types, including numbers, strings, lists, tuples, and dictionaries.
CO_CSASE103_2	Control Flow and Looping: - Implement conditional statements (if, elif, else) to control program flow. - Use loops (for and while) to iterate through sequences and perform repetitive tasks.
CO_CSASE103_3	Function Implementation: - Define functions with parameters and return values. - Utilize function abstraction for modular and reusable code.
CO_CSASE103_4	Data Manipulation: - Effectively manipulate strings and perform operations on lists, tuples, and dictionaries. - Utilize list comprehensions for concise data transformations.
CO_CSASE103_5	Preparation for Advanced Learning: Lay a strong foundation for further exploration of advanced Python topics, such as web development, data science, and machine learning.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
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Units	Content	Lecture Hours	COs	RBT
Unit-1	Unit-1: Components, control structures, functions.	20		R, U

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	<i>Components:</i> Python Interpreter/Shell, Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type() function and Is operator, Dynamic and Strongly Typed Language; <i>Control Flow Statements:</i> The if Decision Control Flow Statement, The if...else Decision Control Flow Statement, The if...elif...else Decision Control Statement, Nested if Statement, The while Loop, The for Loop, The continue and break Statements; <i>Functions:</i> Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Life time of Variables, Default Parameters, Command Line Arguments; <i>Strings:</i> Creating and Storing Strings, Basic String operations, Accessing Characters in String by Index Number, String Slicing and Joining, String methods			
Unit-2	<i>Lists:</i> Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, The del Statement, <i>Dictionaries:</i> Creating Dictionary, Accessing and modifying key:value pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary methods, The del Statement. <i>Tuples and Sets:</i> Creating tuples, basic tuple operations, indexing and slicing in tuples, built-in functions used on tuples, relations between tuples and lists, relations between tuples and dictionaries, tuple methods, using zip() function, <i>Sets:</i> Set Methods, Frozen set.	20		R, U, A1
Unit-3	<i>Files:</i> Types of files, creating and reading text data, file methods to read and write data, reading and writing binary files, the Pickle module, reading and writing CSV files, <i>Object-oriented programming:</i> Classes and Objects, Creating Classes in Python, Creating Objects in Python, The constructor method, classes with multiple objects, class attributes versus data attributes; encapsulation, inheritance, polymorphism.	20		U, A1, E

Text Books:

1. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372. [Unit I&II- 2,3,4,5,6,7,8,9 Unit III-11,12].

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2. Eric Matthes, "Python Crash Course- A Hands-On, Project-Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.[Unit III-15, Unit IV-16]
3. Wesley J. Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education, 2016. [Unit IV-2,5].

Reference Books:

1. Kamthane, A. N., & Kamthane, A.A. , "Programming and Problem Solving with Python", McGraw Hill Education, 2017.
2. Mark Lutz, "Learning Python", 5th edition, Orelly Publication, 2013, ISBN 978- 1449355739.
3. Ljubomir Perkovic, "Introduction to Computing Using Python- An Application Development Focus", Wiley,2012.

Practical (Laboratory)

CSASEC103L: Python Programming Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	1. Write a Python script that prints "Hello, World!" to the console. 2. Create a program that takes two numbers as input from the user and prints their sum. 3. Write a program to calculate the area of a rectangle given its length and width. 4. Write a Python script that demonstrates the use of different data types (integers, floats, strings, booleans). 5. Create a program that swaps the values of two variables without using a temporary variable. 6. Write a program that converts temperature from Celsius to Fahrenheit. 7. Write a Python script that checks whether a number is positive, negative, or zero. 8. Create a program that determines if a given year is a leap year or not. 9. Write a program that compares three numbers and prints the largest one. 10. Write a Python script that prints all the even numbers from 1 to 20 using a for loop. 11. Create a program that calculates the factorial of a number using a while loop. 12. Write a program that prompts the user for a number and prints its multiplication table. 13. Create a program that checks if a given word is a palindrome or not. 14. Write a Python function to calculate the area of a circle given its radius. 15. Create a function that checks if a number is prime or not. 16. Write a program that uses a function to calculate the factorial of a number.
Unit-2	1. Write a Python script that demonstrates basic list operations (creation, accessing elements, appending, slicing). 2. Write a program that sorts a list of numbers in ascending order. 3. Create a dictionary representing a person with keys for "name", "age", and "city". Print each key-value pair. 4. Write a program that takes a dictionary as input and prints all keys and their corresponding values. 5. Add a new key-value pair to an existing dictionary. 6. Write a program that removes a key from a dictionary if it exists, and prints the updated dictionary. 7. Iterate over a dictionary and print only the keys. 8. Write a program that updates the values of a dictionary based on user input. 9. Create a tuple containing the days of the week. Print the third day of the week. 10. Write a program that unpacks a tuple into multiple variables and prints them. 11. Concatenate two tuples and print the result. 12. Write a program that converts a tuple into a list. 13. Iterate over a tuple and print each element. 14. Write a program that checks if a given element exists in a tuple. 15. Create two sets of numbers and find their union, intersection, and difference.

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	16. Write a program that checks if a given element exists in a set. 17. Add an element to a set and print the updated set. 18. Remove an element from a set and print the updated set. 19. Iterate over a set and print each element. 20. Write a program that removes duplicate elements from a list and converts it into a set. 21. Write a program that checks if one set is a subset or superset of another set. 22. Write a program that finds the symmetric difference between two sets.
Unit-3	1. Write a Python script that reads a text file and counts the number of lines. 2. Create a program that reads a CSV file and prints its contents. 3. Write a program that writes data to a text file and reads it back. 4. Create a class called Car with attributes make , model , and year . Include a method get_info() that prints the car's information. 5. Create an object of the Car class and call the get_info() method. 6. Modify the Car class to include an __init__() method that initializes the attributes. 7. Create multiple objects of the Car class with different attributes. 8. Add a class variable num_cars to the Car class that keeps track of the number of cars created. 9. Include a class method display_num_cars() that prints the total number of cars. 10. Create a class ElectricCar that inherits from the Car class. Add an additional attribute battery_size . 11. Override the get_info() method in the ElectricCar class to include battery information. 12. Create a class HybridCar that inherits from both the Car and ElectricCar classes. Add an additional attribute gas_tank_size . 13. Override the get_info() method in the HybridCar class to include both battery and gas tank information. 14. Modify the Car class to make the make , model , and year attributes private. 15. Include getter and setter methods to access and modify these private attributes. 16. Create a class Truck that inherits from the Car class. Override the get_info() method to include additional information specific to trucks. 17. Overload the + operator for the Car class to combine two cars into a new object with combined attributes. 18. Create an abstract base class called Vehicle with abstract methods start() and stop() . 19. Implement the Vehicle class in the Car , ElectricCar , and HybridCar classes.

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SYLLABUS

Course 23CSAVAC102

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAVAC102	Graphics Designing		1	30	2

Course Objectives:

The objective of this Graphic Designing (Basic) course is to provide students with a comprehensive introduction to the fundamental principles and techniques of graphic design. Through a balanced blend of theoretical instruction and practical hands-on exercises, students will develop a strong foundation in design concepts, software proficiency, and creative problem-solving skills. By the conclusion of the course, students will be equipped to produce visually appealing and effective designs tailored for both print and digital media. The course aims to enable students to:

- Understand the pivotal role and significance of graphic design in various industries and contexts.
- Comprehend and apply key elements and principles of design, such as line, shape, colour, texture, balance, and contrast, to create visually engaging compositions.
- Familiarize themselves with essential design software, including Adobe Photoshop and Illustrator, to execute design tasks efficiently.
- Demonstrate practical skills through hands-on exercises, culminating in the creation of a basic digital artwork that incorporates fundamental design elements.
- Develop a solid grasp of typography fundamentals, encompassing typefaces, fonts, hierarchy, kerning, and leading, and effectively apply them in layout design.
- Apply principles of effective layout design to craft visually compelling posters, integrating typography and layout techniques learned during the course.
- Gain proficiency in image editing and manipulation, including image resolution, file formats, colour modes, cropping, retouching, and colour adjustments using Photoshop tools.
- Enhance a photograph through practical application of image editing techniques, showcasing an understanding of digital image enhancement.
- Cultivate skills in designing for digital media, producing web graphics and social media posts that communicate effectively in the digital realm.
- Explore the realm of vector graphics and logo design, acquiring a foundational understanding of logo creation.
- Successfully conceive, design, and execute a final project consisting of a simple logo and business card, applying learned design principles and software skills.
- Present and articulate their final design projects, engage in constructive critique, and evaluate design choices effectively.
- By achieving these objectives, students will be well-prepared to embark on their graphic design journey, equipped with a strong foundation that supports further exploration and advancement in the field.

Course Outcomes:

Code	Outcome description
CO_CSAVAC102_1	Upon successful completion of this course, students will have or be able to A comprehensive understanding of the fundamental concepts that underpin the world of graphic design. They will appreciate the pivotal role that graphic design plays in shaping visual communication across various industries and contexts. Students will be adept at identifying and applying essential design elements and principles, including line, shape, colour, texture, balance, and contrast, to create visually captivating compositions. By successfully completing this module, students will have established a strong foundation in graphic design, enabling them to approach design tasks with a critical eye and an informed perspective. They will be equipped to analyze visual compositions, comprehend the interplay of design elements, and initiate their creative journey in the realm of graphic design.
CO_CSAVAC102_2	Developed a comprehensive understanding of the art and science of typography, as well as the principles governing effective layout design. Students will possess the

SYLLABUS

	ability to discern and select appropriate typefaces and fonts based on design objectives, and they will have a keen grasp of establishing visual hierarchy through techniques such as kerning and leading. The students will be adept at applying the principles of effective layout design, employing concepts such as alignment, proximity, contrast, and balance to create visually harmonious and compelling compositions. Through hands-on experience, students will have honed their skills by designing a poster that emphasizes the integration of typography and layout elements.
CO_CSAVAC102_3	Developed a proficient skill set in image editing techniques and manipulation, enabling them to effectively enhance and transform digital images. Students will have gained a solid understanding of key technical aspects, including image resolution, file formats, and colour modes, allowing them to make informed decisions when working with visual content. By successfully completing this module, students will possess the practical skills needed to manipulate digital images with precision and creativity. They will be equipped to make visual improvements to photographs, create visually appealing compositions, and effectively convey desired moods and messages through image manipulation. This proficiency in image editing will serve as a valuable asset in various design projects and provide students with a strong foundation for further exploration in the realm of graphic design.
CO_CSAVAC102_4	Acquired the essential skills to excel in the realm of digital design. They will be adept at crafting impactful visuals tailored for digital media, including web graphics and social media posts, effectively engaging audiences in the digital landscape. The students will have a foundational understanding of vector graphics and logo design principles, empowering them to create distinctive and versatile visual identities. Through hands-on experience, students will have successfully conceptualized, designed, and executed a simple logo and business card, showcasing their ability to apply learned concepts to real-world design projects.

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to Graphics Design (a) Understanding the role and importance of graphic design (b) Elements and principles of design: line, shape, colour, texture, balance, contrast, etc. (c) Introduction to design software (e.g., Adobe Photoshop, Illustrator, InDesign) (d) Hands-on: Creating a simple digital artwork using basic design elements	6	CO_CSAVAC102_1	R, U, A1
Unit-2	Typography and Layout Design (a) Typography fundamentals: typefaces, fonts, hierarchy, kerning, leading (b) Principles of effective layout design (c) Hands-on: Designing a poster with emphasis on typography and layout	8	CO_CSAVAC102_2	R, U, A1
Unit-3	Image Editing and Manipulation (a) Introduction to image resolution, file formats, and colour modes (b) Basic image editing techniques: cropping, retouching, colour adjustments (c) Hands-on: Enhancing a photograph using Photoshop tools	10	CO_CSAVAC102_3	R, U, A1
Unit-4	Digital Design	6	CO_CSAVAC102_4	R, U, A1

SYLLABUS

	(a) Designing for digital media: web graphics, social media posts (b) Introduction to vector graphics and logo design			

Recommended Resources:

1. Ellen Lupton. *Thinking with Type*.
2. Williams, Robin. *The Non-Designer's Design Book*.
3. Dabner, David., Stewart, Sandra. and Vickress, Abbie. *Graphic Design School: The Principles and Practice of Graphic Design*.
4. Adobe Creative Cloud Tutorials and Documentation

Websites and Blogs:

Smashing Magazine: A great resource for design articles, tutorials, and inspiration.

Behance: A platform to showcase and discover creative work, offering inspiration and insights.

YouTube Channels:

The Futur: Offers insightful videos on design principles, typography, and more.

Tutpad: Provides a variety of graphic design tutorials for beginners.

Practical (Laboratory)

CSAVAC102: Graphics Design

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Photoshop	1. Crop an image in Photoshop. 2. Adjust brightness and contrast in Photoshop. 3. Use the clone stamp tool to remove unwanted elements from an image. 4. Use layers in Photoshop. 5. Create a new layer and apply blending modes. 6. Make a selection using the lasso tool in Photoshop. 7. Retouch blemishes in a portrait using the spot healing brush tool. 8. Use the dodge and burn tools to selectively lighten and darken areas of an image.
Illustrator	1. Create a rectangle and a circle in Illustrator. 2. Use the pen tool to draw custom shapes. 3. Apply stroke and fill colours to shapes in Illustrator. 4. Create and format text in Illustrator? 5. Difference between point text and area text. 6. Convert text to outlines in Illustrator. 7. Demonstrate use of artboards in Illustrator. 8. Organize artwork using layers in Illustrator. 9. Create a new layer and rearrange layers in the layer panel.
InDesign	1. How do you create a new document in InDesign? 2. Explain how to set up margins and columns for a document in InDesign. 3. Describe how to add pages to a document in InDesign. 4. How do you import text and images into an InDesign document? 5. Explain how to create text frames and link them together in InDesign. 6. Describe how to adjust image size and position within an InDesign document. 7. How do you create a grid layout for a magazine spread in InDesign? 8. Explain the process of aligning and distributing objects on a page in InDesign. 9. Describe how to apply colours, gradients, and effects to objects in InDesign. 10. How do you export an InDesign document to PDF format?

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	11. Explain how to set up bleeds and crop marks for printing in InDesign. 12. Describe how to package an InDesign document to include all linked images and fonts.

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SEMESTER - III

Course 23CSAMAJ201

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ201	Data Structures	3		45	3
23CSAMAJ201L	Data Structures LAB		1	30	2

Course Objectives:

The objective of this course is to teach students various data structures and to explain them algorithms for performing various operations on these data structures.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSAMAJ201_1	Demonstrate familiarity with major algorithms and data structures.
CO_CSAMAJ201_2	Analyse performance of algorithms and choose the appropriate data structure and algorithm design method for a specified application.
CO_CSAMAJ201_3	Determine which algorithm or data structure to use in different scenarios and be familiar with writing recursive methods.
CO_CSAMAJ201_4	Demonstrate understanding of the abstract properties of various data structures such as stacks, queues, lists, trees and graphs and Use various data structures effectively in application programs.
CO_CSAMAJ201_5	Demonstrate understanding of various sorting algorithms, including bubble sort, insertion sort, selection sort, heap sort and quick sort.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1																										
2																										
3																										
4																										
5																										

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Arrays a) Single and Multi-dimensional Arrays, b) Sparse Matrices (Array and Linked Representation)	5		R, U, A1
Unit-2	Stacks (a) Implementing single / multiple stack/s in an Array (b) Prefix, Infix and Postfix expressions (c) Utility and conversion of these expressions from one to another (d) Applications of stack (e) Limitations of Array representation of stack	5		R, U, A1
Unit-3	Linked Lists	10	CO_CSAMAJ101_1 CO_CSAMAJ101_2	R, U, A1

SYLLABUS

	(a) Singly, Doubly and Circular Lists (Array and Linked representation) (b) Normal and Circular representation of Stack in Lists (c) Self-Organizing Lists (d) Skip Lists		CO_CSAMAJ101_3	
Unit-4	Queues (a) Array and Linked representation of Queue, De-queue, Priority Queues	5	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4	R, U, A1, A2
Unit-5	Recursion (a) Developing Recursive Definition of Simple Problems and their implementation (b) Advantages and Limitations of Recursion (c) Understanding what goes behind Recursion (Internal Stack Implementation)	5	CO_CSAMAJ101_1 CO_CSAMAJ101_2 CO_CSAMAJ101_3 CO_CSAMAJ101_4 CO_CSAMAJ101_7	R, U, A1, A2
Unit-6	Trees (a) Introduction to Tree as a data structure (b) Binary Trees (Insertion, Deletion, Recursive and Iterative Traversals on Binary Search Trees) (c) Threaded Binary Trees (Insertion, Deletion, Traversals) (d) Height-Balanced Trees (Various operations on AVL Trees)	20		
Unit-7	Searching and Sorting (a) Linear Search (b) Binary Search (c) Comparison of Linear and Binary Search (d) Selection Sort (e) Insertion Sort (f) Merge Sort (g) Shell Sort (h) Comparison of Sorting Techniques	5		
Unit-8	Hashing (a) Introduction to Hashing, Deleting from Hash Table, Efficiency of Rehash Methods, Hash Table Reordering (b) Resolving collision by Open Addressing, Coalesced Hashing, Separate Chaining, Dynamic and Extendible Hashing, (c) Choosing a Hash Function, Perfect Hashing Function			

Suggested Readings

1. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
2. Sartaj Sahni, Data Structures, "Algorithms and applications in C++", 2/e, Universities Press, 2011.
3. Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, "Data Structures Using C and C++", 2/e, PHI, 2009.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson, 1999.
5. D.S Malik, "Data Structure using C++", 2/e, Cengage Learning, 2010.
6. Mark Allen Weiss, "Data Structures and Algorithms Analysis in Java", Pearson Education, 3/e, 2011
7. Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, "Data Structures Using Java", 2003.
8. Robert Lafore, "Data Structures and Algorithms in Java", 2/e, Pearson/ Macmillan Computer Pub, 2003.
9. John Hubbard, "Data Structures with JAVA", McGraw Hill Education (India) Private Limited, 2/e, 2009.

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10. Goodrich, M. and Tamassia, R. "Data Structures and Algorithms Analysis in Java", 4/e, Wiley, 2013.
11. Herbert Schildt, "Java The Complete Reference (English) Paperback", 9/e, Tata McGraw Hill, 2014.
12. D. S. Malik, P.S. Nair, "Data Structures Using Java", Course Technology, 2003.

Practical (Laboratory)

CSAMAJ201L: Data Structures Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

1. Write a program to search an element from a list. Give user the option to perform Linear or Binary search. Use Template functions.
2. WAP using templates to sort a list of elements. Give user the option to perform sorting using Insertion sort, Bubble sort or Selection sort.
3. Implement Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list and concatenate two linked lists (include a function and also overload operator +).
4. Implement Doubly Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
5. Implement Circular Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
6. Perform Stack operations using Linked List implementation.
7. Perform Stack operations using Array implementation. Use Templates.
8. Perform Queues operations using Circular Array implementation. Use Templates.
9. Create and perform different operations on Double-ended Queues using Linked List implementation.
10. WAP to scan a polynomial using linked list and add two polynomials.
11. WAP to calculate factorial and to compute the factors of a given no. (i) using recursion, (ii) using iteration
12. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
13. WAP to calculate GCD of 2 numbers
(i) with recursion (ii) without recursion
14. WAP to create a Binary Search Tree and include following operations in tree:
(i) Insertion (Recursive and Iterative Implementation)
(ii) Deletion by copying
(iii) Deletion by Merging
(iv) Search a no. in BST
(v) Display its preorder, postorder and inorder traversals Recursively
(vi) Display its preorder, postorder and inorder traversals Iteratively
(vii) Display its level-by-level traversals
(viii) Count the non-leaf nodes and leaf nodes
(ix) Display height of tree
(x) Create a mirror image of tree
(xi) Check whether two BSTs are equal or not
15. WAP to convert the Sparse Matrix into non-zero form and vice-versa.
16. WAP to reverse the order of the elements in the stack using additional stack.
17. WAP to reverse the order of the elements in the stack using additional Queue.
18. WAP to implement Diagonal Matrix using one-dimensional array.
19. WAP to implement Lower Triangular Matrix using one-dimensional array.
20. WAP to implement Upper Triangular Matrix using one-dimensional array.
21. WAP to implement Symmetric Matrix using one-dimensional array.
22. WAP to create a Threaded Binary Tree as per inorder traversal, and implement operations like finding the successor / predecessor of an element, insert an element, inorder traversal.
23. WAP to implement various operations on AVL Tree.

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Course 23CSAMAJ202

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ202	Operating Systems	3		45	3
23CSAMAJ202L	Operating Systems LAB		1	30	2

Course Objectives:

The objective of the course is to provide basic knowledge of computer operating system structures and functioning.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSAMAJ202_1	Understand the difference between different types of modern operating systems, virtual machines and their structure of implementation and applications.
CO_CSAMAJ202_2	Understand the difference between process & thread, issues of scheduling of user level processes / threads and their issues & use of locks, semaphores, monitors for synchronizing multiprogramming with multithreaded systems and implement them in multithreaded programs.
CO_CSAMAJ202_3	Gain knowledge about the concepts of deadlock in operating systems and how they can be managed / avoided and implement them in multiprogramming system.
CO_CSAMAJ202_4	Demonstrate the design and management concepts along with issues and challenges of main memory, virtual memory and file system.
CO_CSAMAJ202_5	Understand the types of I/O management, disk scheduling, protection and security problems faced by operating systems and how to minimize these problems.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1																										
2																										
3																										
4																										
5																										

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction a) Basic OS functions, resource abstraction, types of operating systems– multiprogramming systems, batch systems, time sharing systems b) Operating systems for personal computers & workstation`s, process control & real time systems	10		R, U, A1
Unit-2	Operating System Organization (a) Processor and user modes, kernels, system calls and system programs.	6		R, U, A1

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Unit-3	Process Management (a) System view of the process and resources, process abstraction, process hierarchy, threads, threading issues, thread libraries (b) Process Scheduling, non-pre-emptive and pre-emptive scheduling algorithms (c) Concurrent and processes, critical section, semaphores, methods for inter-process communication (d) Deadlocks	20		R, U, A1
Unit-4	Memory Management (a) Physical and virtual address space (b) Memory allocation strategies -fixed and variable partitions, paging, segmentation, virtual memory	10		R, U, A1, A2
Unit-5	File and I/O Management (a) Directory structure, file operations, file allocation methods, device management.	10		R, U, A1, A2
Unit-6	Protection and Security (a) Policy mechanism, Authentication, Internal access Authorization.	4		

Suggested Readings

1. A Silberschatz, P.B. Galvin, G. Gagne, "Operating Systems Concepts", 8th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, "Modern Operating Systems", 3/e, Pearson Education 2007.
3. G. Nutt, "Operating Systems: A Modern Perspective", 2/e, Pearson Education 1997.
4. W. Stallings, "Operating Systems, Internals & Design Principles", 5/e, Prentice Hall of India. 2008.
5. M. Milenkovic, "Operating Systems - Concepts and design", Tata McGraw Hill 1992.
6. "Operating Systems", A K Sharma, University Press.

Practical (Laboratory)

CSAMAJ202L: Operating Systems Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities: **[Implement the followings using Bash Shell Script]**

1. Evaluate : $1 * 2^3 + 2 * 4^3 + 3 * 6^3 + \dots$ up to n terms
2. Evaluate : $1^2 + 3^2 + 6^2 + 10^2 + \dots$ up to n terms
3. Evaluate : $1 * 3^2 + 2 * 5^2 + 3 * 7^2 + \dots$ up to n terms
4. Evaluate : $1 - 2 + 3 - 4 + \dots$ up to n terms
5. Print the following:

*	5 4 3 2 1	1	* * * * *
**	4 3 2 1	1 2	*
***	3 2 1	1 2 3	* * * * *
****	2 1	1 2 3 4	* * * *
*****	1	1 2 3 4 5	* * *
			* *
			*

6. Find the factorial of a number.
7. Find HCF and LCM of 2/3 numbers.
8. Check whether a given year is leap year or not.
9. Find the sum of squares of the digits of a numbers.
10. Find the Armstrong numbers between 100 & 999.

SYLLABUS

11. Check whether a given number is prime or not.
12. Print all the prime numbers between 1 & 100.
13. Print the multiplication table of a number.
14. Check whether a number is perfect square or not.
15. Find the first and last digit of any number and find their product.
16. Find the Area of Circle, Rectangle, or Triangle using user-input.
17. Find the prime factors of a number.
18. Convert a decimal number to binary.
19. Convert a binary number to decimal.
20. Check whether a given string is palindrome or not.
21. Abbreviate a name.
22. Reverse a string.
23. Find the largest and smallest numbers from a list of 10 integers.
24. Find the numbers and their sums between 100 to 300 which are divisible by 3 and 7.
25. Calculate ${}^nC_r$ using function.

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Course 23CSE201A

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSASEC201A	Introduction to Web Technology (HTML, JavaScript & PHP)	2		30	3
23CSASEC201AL	Introduction to Web Technology (HTML, JavaScript & PHP) LAB		1	30	2

Course Overview:

This course introduces students to the understanding of web technology fundamentals and gives practical skills in HTML, JavaScript, and PHP programming for web development.

Course Objectives:

To enable a student to:

- Gain a foundational understanding of how the World Wide Web works, including client-server architecture, HTTP protocol, and web standards.
- Learn the basics of HTML and CSS
- Learn the basics of JavaScript as a client-side scripting language for adding interactivity and dynamic behaviour to web pages
- Learn basics of PHP (Hypertext Pre-processor) as a server-side scripting language for building dynamic web applications with its integration with web server.
- Integrate databases such as MySQL/MariaDB for dynamic content generation and data-driven web applications
- Make use of essential tools/ software used for web development

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSASEC201A_1	Explain how the World Wide Web works, including client-server architecture, HTTP protocol, and web standards
CO_CSASEC201A_2	Develop simple web pages/forms using HTML and CSS
CO_CSASEC201A_3	Make the web page/form interactive by the use of JavaScript
CO_CSASEC201A_4	Perform server-side scripting making use of web server
CO_CSASEC201A_5	Perform database integration and make the content data driven
CO_CSASEC201A_6	Use essential tools/ software used in web development (editing, debugging, testing etc)

Course Outcomes mapping with Program Specific Outcomes

Outcomes	1	2	3	4	5	6
PSO1						
PSO2						
PSO3						
PSO4						
PSO5						
PSO6						
PSO7						
PSO8						
PSO9						
PSO10						
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PSO19						
PSO20						
PSO21						
PSO22						
PSO23						
PSO24						
PSO25						
PSO26						

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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Web Basics and Overview Introduction to: a) Internet, World Wide Web, Web Browsers, URL, MIME, HTTP b) Web Programmers Toolbox c) HTML Common tags: List, Tables, images, forms, frames, Cascading Style Sheets (CSS) & its Types. d) Java Script - Declaring variables, functions, Event handlers (onclick, onsubmit, etc.,) and Form Validation.	10		R, U, A1
Unit-2	a) Introduction to XML: - Document type definition - XML Schemas - Presenting XML - XHTML - Using XML Processors: DOM and SAX b) PHP: - Declaring Variables, - Data types, - Operators, - Control structures, - Functions.			
Unit-3	Web Servers: a) Handling Http Request & Responses b) Cookies and Session tracking.			
Unit-4	Database Access: a) Connecting to database in PHP, b) Execution of Simple Queries,			

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNITs 1, 2)

REFERENCE BOOKS:

1. Programming world wide web-Sebesta, Pearson Education,2007.
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/ Pearson Education Asia.
5. An Introduction to WEB Design and Programming –Wang-Thomson
6. PHP: The Complete Reference Steven Holzner TataMcGraw-Hill.

Practical (Laboratory)

CSASEC201AL: Introduction to Web Technology (HTML, JavaScript & PHP) Lab [Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

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1. Create an HTML document with the different formatting options i.e. Bold, Italics, Underline, Headings (Using H1 to H6 heading styles), Font (Type, Size and Colour), Background (Coloured background/Image in background), Paragraph, Line Break, Horizontal Rule, Pre tag
2. Create an HTML document which consists of: Ordered List, Unordered List, Nested ordered and/or unordered List and Image
3. Create an HTML document which implements Internal linking as well as External linking.
4. Create a table using HTML demonstrating use of columns and rows, merging multiple rows and/or columns etc. with data and image values and contents with hyperlinking
5. Create a typical student data capture form for the purpose of admission to your college using different types of HTML controls i.e. Text Box, Option/radio buttons, Check boxes, Reset and Submit buttons etc.
6. Create HTML documents having multiple frames in different possible formats/organization.
7. Information Structure: In this exercise, student will practice identifying the structure of an information object
8. Deconstructing an XML Document: In this exercise, student will practice identifying the explicit structure within an XML document. In a sense, this is the reverse of what you did in Exercise #7.
9. Creating XML Mark-up: In this exercise, create some XML mark-up based on the tree representation from previous exercise and the content from the original sample document.
10. Well-Formedness: This exercise checks your understanding of the constraints for well-formedness based on some sample code document to be provided by the concerned teacher. Are the supplied code document instances well-formed? Explain any NO answers.
11. Create a PHP page using functions for comparing three integers and print the largest number.
12. Write a function to calculate the factorial of a number (non-negative integer). The function accept the number as an argument.
13. WAP to check whether the given number is prime or not.
14. Create a PHP page which accepts string from user. After submission that page displays the reverse of provided string.
15. Write a PHP function that checks if a string is all lower case.
16. Write a PHP script that checks whether a passed string is palindrome or not? (A palindrome is word, phrase, or sequence that reads the same backward as forward, e.g., madam or nurses run)
17. WAP to sort an array.
18. Write a PHP script that removes the whitespaces from a string. Sample string: 'The quick " " brown fox'
Expected Output : Thequick""brownfox
19. Write a PHP script that finds out the sum of first n odd numbers.
20. Create a login page having user name and password. On clicking submit, a welcome message should be displayed if the user is already registered (i.e.name is present in the database) otherwise error message should be displayed.
21. Write a PHP script that checks if a string contains another string.
22. Create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.
23. Create a script to construct the following pattern, using nested for loop.
*
* *
* * *
* * * *
24. Write a simple PHP program to check that emails are valid.
25. WAP to print first n even numbers.
26. \$color = array('white', 'green', 'red')
Write a PHP script which will display the colours in the following way
: Output:
white, green, red,
☐ green
☐ red
☐ white
27. Using switch case and dropdown list display a —Hello! message depending on the language selected in drop down list.
28. Write a PHP program to print Fibonacci series using recursion.
29. Write a PHP script to replace the first 'the' of the following string with 'That'. Sample: 'the quick brown fox jumps over the lazy dog.'

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Expected Result: That quick brown fox jumps over the lazy dog.

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Course 23CSASEC201B

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSASEC201B	Introduction to Web Technology (Java Technology)	2		30	3
23CSASEC201BL	Introduction to Web Technology (Java Technology) LAB		1	30	2

Course Overview:

This course introduces students to the understanding of web technology fundamentals including client-server architecture, HTTP protocol and web standards along the Java technology path.

Course Objectives:

To enable a student to:

- Gain a foundational understanding of how the World Wide Web works, including client-server architecture, HTTP protocol, and web standards.
- Learn the basics of HTML and CSS
- Learn the basics of JavaScript as a client-side scripting language for adding interactivity and dynamic behaviour to web pages
- Learn the basics of Servlets a Java-based technology for creating dynamic web content, including handling HTTP requests and responses, session management, and servlet lifecycle.
- Learn the basics of Java Server Pages (JSP) for creating dynamic web pages
- Integrate Java web applications with databases using JDBC

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSASEC201B_1	Explain how the World Wide Web works, including client-server architecture, HTTP protocol, and web standards
CO_CSASEC201B_2	Develop simple web pages/forms using HTML and CSS
CO_CSASEC201B_3	Make the web page/form interactive by the use of JavaScript
CO_CSASEC201B_4	Develop Servlets for server-side operations
CO_CSASEC201B_5	Develop JSP forms for dynamic data driven web pages.
CO_CSASEC201B_6	Perform database operations, including connecting to databases, executing SQL queries, and handling result sets.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1																										
2																										
3																										
4																										
5																										
6																										

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels

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Unit-1	Web Basics and Overview Introduction to: e) Internet, World Wide Web, Web Browsers, URL, MIME, HTTP f) Web Programmers Toolbox g) HTML Common tags: List, Tables, images, forms, frames, Cascading Style Sheets (CSS) & its Types. h) Java Script - Declaring variables, functions, Event handlers (onclick, onsubmit, etc.,) and Form Validation.	10		R, U, A1
Unit-2	c) Introduction to XML: - Document type definition - XML Schemas - Presenting XML - XHTML - Using XML Processors: DOM and SAX			
Unit-3	Web Servers and Servlets: c) Introduction to Servlets d) Lifecycle of a Servlet e) JSDK f) Deploying Servlet g) The Servlet API h) The javax Servlet Package i) Reading Servlet parameters j) Reading Initialization parameters k) The javax.servlet HTTP package l) Handling Http Request & Responses m) Cookies and Session tracking.			
Unit-4	JSP Application Development: a) The Anatomy of a JSP Page, b) JSP Processing. c) JSP Application Design and JSP environment d) JSP Declarations, Directives, Expressions, Scripting Elements, implicit objects			
Unit-5	Database Access: a) Database Programming using JDBC, JDBC drivers, b) Studying Javax.sql.* package c) Connecting to database in JSP d) Execution of Simple Queries e) Accessing a Database from a Servlet.			

TEXT BOOKS:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNITs 1, 2)
2. Core Servlets and Java Server Pages Volume 1: Core Technologies by Marty Hall and Larry Brown Pearson (Units 3, 4, 5)

REFERENCE BOOKS:

1. Programming world wide web-Sebesta, Pearson Education,2007.
2. Internet and World Wide Web – How to program by Dietel and Nieto PHI/ Pearson Education Asia.
3. Jakarta Struts Cookbook, Bill Siggelkow, SPD O' Reilly for chap8.
4. March's beginning JAVA JDK 5, Murach, SPD
5. An Introduction to WEB Design and Programming –Wang-Thomson

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Practical (Laboratory)

CSASEC201BL: Introduction to Web Technology (Java Technology) Lab [Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	1. Create an HTML document with the different formatting options i.e. Bold, Italics, Underline, Headings (Using H1 to H6 heading styles), Font (Type, Size and Colour), Background (Coloured background/Image in background), Paragraph, Line Break, Horizontal Rule, Pre tag 2. Create an HTML document which consists of: Ordered List, Unordered List, Nested ordered and/or unordered List and Image 3. Create an HTML document which implements Internal linking as well as External linking. 4. Create a table using HTML demonstrating use of columns and rows, merging multiple rows and/or columns etc. with data and image values and contents with hyperlinking 5. Create a typical student data capture form for the purpose of admission to your college using different types of HTML controls i.e. Text Box, Option/radio buttons, Check boxes, Reset and Submit buttons etc. 6. Create HTML documents having multiple frames in different possible formats/organization.
Unit-2	1. Deconstruct an XML Document: In this exercise, student will practice identifying the explicit structure within an XML document. 2. Create XML Mark-up: In this exercise, create some XML mark-up based on the tree representation from previous exercise and the content from the original sample document.
Unit-3	1. What is a servlet and how does it differ from other Java technologies for web development? 2. Describe the lifecycle of a servlet. 3. Create and configure a servlet in a Java web application. 4. Explain the concept of servlet mapping and how it is configured in a web.xml file. 5. Difference between URL patterns like exact match, prefix, and suffix mapping. 6. Map multiple servlets to different URL patterns in a web application. 7. Describe the role of HTTP methods such as GET, POST, PUT, DELETE in servlets. 8. Explain how to handle different types of HTTP requests in a servlet. 9. Retrieve request parameters and headers in a servlet. 10. What is session management in the context of web applications? 11. Describe the different ways to manage sessions in Java web applications. 12. Store and retrieve session attributes in servlets.
Unit-4	1. What is JavaServer Pages (JSP) and how does it relate to servlets? 2. Describe the structure of a JSP page and its lifecycle. 3. Embed Java code and expressions in a JSP page. 4. Print a table of numbers from 5 to 15 and their squares and cubes using alert. 5. Print the largest of three numbers. 6. Find the factorial of a number n. 7. Enter a list of positive numbers terminated by Zero. Find the sum and average of these number s. 8. A person deposits Rs 1000 in a fixed account yielding 5% interest. Compute the amount in the account at the end of each year for n years. 9. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list. 10. Demonstrate use of JSP directives like page, include, and taglib. 11. Demonstrate use of common JSP actions such as forward, include. 12. Include external resources like CSS and JavaScript in a JSP page.
Unit-5	1. Connect to a database using JDBC from a JSP page. 2. Execute SQL queries and handle result sets in a servlet or JSP page.

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SYLLABUS

Course 23CSASEC202

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSASEC202	Introduction to R Programming	2		30	2
23CSASEC202L	Introduction to R Programming LAB		1	30	2

Course Overview:

This course introduces the R programming language, RStudio IDE, basic operations and functions, data import/export, data cleansing and manipulation and data visualization.

Course Objectives:

To enable a student to:

- Have familiarity of the programming language and the Integrated Development Environment.
- Import / export data available in various formats, into and out of the environment
- Perform basic cleansing of data and do basic manipulations of the same
- Perform basic analysis of data.
- Perform visualization of data and/or its analysis.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSASEC202_1	Setup the environment and manage its configuration
CO_CSASEC202_2	Write programs in R language
CO_CSASEC202_3	Import/ load data into the environment; export data out of the environment
CO_CSASEC202_4	Perform basic statistical analysis of data
CO_CSASEC202_5	Perform visualization of the data analysis

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1																										
2																										
3																										
4																										
5																										

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction (a) Understanding R (b) RStudio: Familiarize yourself with the RStudio IDE (Integrated Development Environment) and its features. (c) Simple Program: Learn how to write and execute basic R programs. (d) Variables: Concept of variables in R and how to assign and manipulate values.	10		R, U, A1
Unit-2	Data types and Operators:			

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	(a) Data Types: Different data types in R, including numeric, character, and date. (b) Nchar: to determine the number of characters in a string. (c) Logical Operators: (e.g., AND, OR, NOT) in R. (d) Subset Data, Square Brackets, and Logic Statements (e) Logic Statements and cbind Command: cbind function to combine data frames.			
Unit-3	Control statements: (f) If Statement: for conditional execution of code. (g) If Else Statement: for multiple conditional branches. (h) For Loop: iterative execution of code. (i) While Loop: for repetitive execution of code until a condition is met.			
Unit-4	Vector and Matrices: (a) Vectors: working with vectors in R. (b) Explore advanced vector operations, such as vector indexing and subsetting (c) Getting Specific Items from a Vector (d) Matrix: Concept of a matrix. Create and manipulate matrices in R. (e) Explore advanced matrix operations, such as matrix transposition and multiplication.			
Unit-4	Data Frames, Lists and File Operations: (a) Data Frame: Working with data frames to store tabular data. (b) Additional techniques to manipulate and analyse data frames in R. (c) List: Create and manipulate lists in R. (d) Read CSV files: import data from CSV files into R. (e) Read text files: import data from text files into R.			
Unit-5	Charts and Plots: (a) Charts: Bar charts, pie charts, and scatter plots. (b) Mean, attach /detach, levels, and summary statistics in R. (c) Stacked Bar Charts and Clustered Bar Charts, Categorical data. (d) Scatter Plot, Relationships between two continuous variables.			

References:

Practical (Laboratory)

CSASEC202L: Introduction to R programming Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

1. Install R and RStudio on your system.

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2. Demonstrate the key features of the RStudio interface.
3. Explain the difference between R scripts and R markdown documents.
4. Create a new R script in RStudio.
5. Install and load packages in R.
6. Import data into RStudio from external sources.
7. Perform basic data manipulation tasks such as sub-setting and filtering in R.
8. Demonstrate the concept of vectors and how they are used in R.
9. Create basic plots in R using the base plotting system.
10. What are the advantages of using ggplot2 for data visualization in R?
11. Customize plots using ggplot2 syntax.
12. Export plots created in RStudio to external files.
13. Demonstrate usage of functions in R (By defining and using).
14. Demonstrate the concept of control structures (such as loops and conditional statements) in R programming.
15. Demonstrate handling of missing data in R.
16. Demonstrate some common methods for conducting descriptive statistics in R.
17. Demonstrate basic hypothesis testing in R.
18. Interpret the output of statistical tests conducted in R.
19. Describe some resources or methods for getting help with R programming when encountering difficulties.

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Course 23CSAMDC201

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMDC201	Advanced MS Excel	2		30	2
23CSAMDC201L	Advanced MS Excel Lab		1	30	2

Course Overview:

This course is designed to provide participants with a comprehensive understanding of Microsoft Excel, a powerful spreadsheet application. Participants will learn essential Excel skills, from basic functionalities to more advanced features, enabling them to effectively organize, analyse, and present data.

Course Objectives

This course enables students to:

- 1. Master Advanced Formulas and Functions**
Understand and apply advanced formulas and functions, including nested functions, array formulas, logical functions and lookup and reference functions, to solve complex problems.
- 2. Perform Advanced Statistical Analysis**
Implement advanced statistical functions and analyse data using built-in statistical tools.
- 3. Perform Data Analysis Using PivotTables and PivotChart**
Create, customize, and utilize PivotTables and PivotChart for sophisticated data analysis and reporting.
- 4. Implement Advanced Data Visualization Techniques**
Design and customize advanced chart types, apply conditional formatting and use sparklines & data bars to effectively visualize data trends.
- 5. Import, Export, and Manage Data**
Import data from various sources, export data in different formats and manage data connections & refresh operations for efficient data handling.
- 6. Utilize Conditional Formatting and Data Validation**
Create dynamic, interactive spreadsheets with customized drop-down lists and data entry controls that enhance data accuracy and visual insights.
- 7. Apply Advanced Data Analysis Tools**
Use tools like Solver for optimization, data tables for sensitivity analysis, Scenario Manager for what-if analysis and Goal Seek for target value analysis.
- 8. Protect, Collaborate and Share Excel Files**
Protect worksheets and workbooks with security measures, share and collaborate on Excel files with others and integrate Excel with other Microsoft Office applications for comprehensive workflows.
- 9. Automate Tasks Using Macros and VBA**
Record and edit Macros, write simple VBA scripts and implement automation to streamline repetitive tasks.
- 10. Generate Comprehensive Reports**
Create, customize and automate complex reports using Excel, ensuring clear and effective presentation of data.

Course Outcomes

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Code	Outcome description (Upon successful completion of this course, students will be able to)
CO_23CSAMDC201_1	Utilize advanced formulas and functions to efficiently solve complex data analysis problems.
CO_23CSAMDC201_2	Conduct advanced statistical analysis using built-in statistical functions and tools.
CO_23CSAMDC201_3	Create and customize PivotTables and PivotChart for in-depth data analysis and visualization.
CO_23CSAMDC201_4	Design and implement advanced data visualizations using a variety of chart types, conditional formatting and sparklines.
CO_23CSAMDC201_5	Efficiently import, export, and manage data from multiple sources and formats using Excel.
CO_23CSAMDC201_6	Implement advanced conditional formatting to highlight critical data patterns and trends & apply data validation techniques to ensure data integrity and facilitate efficient data entry.
CO_23CSAMDC201_7	Use advanced data analysis tools such as Solver, data tables, Scenario Manager and Goal Seek to perform complex analyses.
CO_23CSAMDC201_8	Protect workbooks & worksheets to ensure data integrity and security, Collaborate effectively on shared Excel files and integrate Excel workflows with other Microsoft Office applications.
CO_23CSAMDC201_9	Automate repetitive tasks by recording Macros and writing VBA scripts, enhancing productivity.
CO_23CSAMDC201_10	Generate comprehensive and automated reports, presenting data clearly and effectively for decision-making purposes.

Unit	Contents	Hour	Course Outcomes	RBT Levels
1	Advanced Formulas and Functions Overview of advanced Excel capabilities, Logical functions (IF, AND, OR, NOT), Lookup and reference functions (VLOOKUP, HLOOKUP, INDEX, MATCH). Array Formulas and Advanced Functions Introduction to array formulas, Advanced functions (OFFSET, INDIRECT, ROW, COLUMN). Advanced Statistical Functions Overview of advanced statistical functions, Practical applications of statistical analysis.	12	CO1 CO2	R U A1 A2 E C

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Unit	Contents	Hour	Course Outcomes	RBT Levels
2	Data Analysis with PivotTables and PivotChart Creating and customizing PivotTables, Advanced PivotTable techniques (Calculated Fields, Grouping). Advanced Data Visualization Techniques Creating and customizing advanced charts (Waterfall, Funnel, Combo), Using sparklines and data bars.	8	CO3 CO4	R U A1 A2 E C
3	Data Import and Export Techniques Importing data from various sources (CSV, SQL, Web), Exporting data to different formats. Conditional Formatting and Data Validation Advanced conditional formatting rules, Data validation techniques and creating drop-down lists. Scenario Manager and Goal Seek Scenario Manager for what-if analysis, Goal Seek for target value analysis. Advanced Data Analysis Tools Using Solver for optimization problems, Data tables for sensitivity analysis.	16	CO5 CO6 CO7	U A1 A2 C
4	Data Protection and Security Protecting worksheets and workbooks, Password protection and user permissions. Collaboration and Sharing Sharing and collaborating on Excel files, Using Excel with other Office applications.	8	CO8	U A1 E
5	Introduction to Macros Basics of Macros, Recording and running Macros. Advanced Macros and VBA Basic VBA concepts, Writing simple VBA scripts.	8	CO9	U A1 C
6	Advanced Reporting Techniques Creating comprehensive reports using Excel, Customizing and automating reports.	8	CO10	U A1, A2 C

References

- Alexander, Michael, Richard Kusleika, and John Walkenbach. *Microsoft Excel 2019 Bible*. Wiley, 2019.
- Harvey, Greg. *Excel 2019 All-in-One For Dummies. For Dummies*, 2019.
- Alexander, Michael, and Dick Kusleika. *Excel 2019 Power Programming with VBA*. Wiley, 2019.
- Hong, Bryan. *Advanced Excel for Productivity: Learn the Tricks to Maximize Your Data*. CreateSpace Independent Publishing Platform, 2019.
- Harvey, Greg. *Excel 2019 for Dummies. For Dummies*, 2019.
- McFedries, Paul. *Excel Data Analysis For Dummies. For Dummies*, 2018.
- Bluttman, Ken. *Excel Formulas and Functions For Dummies. For Dummies*, 2018.
- Humphrey, M.L. *Excel 2019 Essentials*. M.L. Humphrey, 2019.

SYLLABUS

Course 23CSAVAC201

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAVAC201	Desktop Publishing		1	30	2

Course Objectives:

This course offers students the chance to create a collection of publications suitable for inclusion in their portfolios. Participants will work with industry-standard page layout and graphics software, acquiring a comprehensive understanding of print production technology and processes. This includes learning how to effectively communicate with other print experts, estimate expenses, and manage digital output.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSAVAC201_1	Gain and employ the abilities to craft both fiction and non-fiction pieces, engage in professional editing, generate digital content, formulate print and web-based materials, and oversee the progression of writing and editing projects.
CO_CSAVAC201_2	Utilize theoretical and technical expertise in innovative ways to align with diverse readerships and markets, addressing their unique needs and expectations.

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to DTP (a) Preliminary understanding of DTP-related terms (b) Text and graphics formats (c) Difference between drawings and images (d) Image storage formats such as BMP, GIF, TIFF, and JPG/JPEG	4	CO_CSAVAC201_1	R, U, A1
Unit-2	Adobe PageMaker Basics (a) Workspace overview Preferences, menus, toolbox, palettes, converting documents from other programs, saving and closing documents, document pages, master pages, printing a document. (b) Working with Text Utilizing text in PageMaker, importing text, text frames, story editor, character formatting, paragraph formatting, type utilities, working with styles, editing existing styles, working with tables. (c) Working with objects Rectangles and ellipses, polygons, manipulating objects, filling and stroking objects. (d) Working with colour Colours palette, adding new colours, editing and deleting colours, verifying colour suitability for printing, trapping. (e) Working with images and graphics	12	CO_CSAVAC201_1 CO_CSAVAC201_2	R, U, A1

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	Image/graphic file formats, image resolution, placing images, modifying images and graphics, working with frames, text wrap, image masks. (f) Exporting as HTML and PDF files Options for exporting, exporting pages, exporting PDF files.			
Unit-3	CorelDraw (a) Basics of CorelDraw Menus, expanded menus and dialog boxes, toolbars, property bar, status bar, toolbox, zoom tool (zooming in and out), pan tool, document viewing, desktop power tools, starting or opening documents, saving, importing, and exporting files. (b) Rectangles and Ellipses Paths, Objects, Properties, drawing rectangles, rounding rectangle corners, creating ellipses, transforming ellipses into a pie shape or arc. (c) Select, Move, and Size Selecting and deselecting objects, marquee selection, moving an object, copying and pasting objects, cloning objects, copying/moving an object between documents, handles and scaling, altering object dimensions. (d) Polygons, Stars, and Spirals Creating polygons; drawing stars; creating polygons as stars; Creating symmetrical spirals; drawing logarithmic spirals. (e) Nodes and Paths Adding, deleting, joining, and converting using various types of nodes. (f) Lines and Curves Freehand tool, Bezier tool, knife tool, eraser tool, artistic media tool. (g) Colour and Fills Closing object paths, filling with uniform colour, changing outline colour, eyedropper tool, paint bucket tool, interactive mesh fill tool. (h) Working with Text Adding artistic text and paragraph text, using handles, text formatting, flowing text between paragraph text frames, directing paragraph text onto a path and into an object, making text flow around an object, rotating text, free skew tool, interactive drop shadow tool, vector extrusions.	14	CO_CSAVAC201_1 CO_CSAVAC201_2	R, U, A1

Suggested Readings

1. Roger C. Parker and Kate Shoup. *Desktop Publishing & Design For Dummies*.
2. Deke McClelland and Mark AbdeInour. *CorelDRAW for Dummies*.

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Practical (Laboratory)

CSAVAC201: Desktop publishing

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

PageMaker	1. Create a new document in Adobe PageMaker. 2. Setting up page size and orientation. 3. Specify margins and columns for a document in PageMaker. 4. Insert and format text in Adobe PageMaker. 5. Create text frames and link them together. 6. Apply paragraph and character styles to text. 7. Import images and graphics into a PageMaker document. 8. Resize and crop images within PageMaker. 9. Apply borders and effects to images. 10. Arrange and align objects on a PageMaker page. 11. Create master pages and apply them to document pages. 12. Use layers to organize elements within a PageMaker document.
CorelDraw	1. How do you create basic shapes such as rectangles, circles, and polygons in CorelDRAW? 2. Describe how to manipulate objects using the selection and transformation tools. 3. Explain how to apply fills and outlines to shapes in CorelDRAW. 4. How do you create and format text in CorelDRAW? 5. Describe how to convert text to curves for further manipulation. 6. Explain how to apply text effects such as drop shadows and outlines. 7. How do you import images into a CorelDRAW document? 8. Describe how to crop and resize images within CorelDRAW. 9. Explain how to apply effects and filters to images. 10. Describe the process of arranging and aligning objects on a CorelDRAW page. 11. Explain how to use layers to organize elements within a CorelDRAW document. 12. Describe how to create multiple pages and manage page layouts in CorelDRAW. 13. How do you export a CorelDRAW document to common file formats such as PDF or JPEG? 14. Describe how to set up bleeds and crop marks for printing in CorelDRAW. 15. Explain how to adjust colour settings for accurate printing.

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SEMESTER - IV

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ203A	Graphics programming with OpenGL	3		45	3
23CSAMAJ203AL	Graphics programming Lab		1	30	2

- **Understand Fundamental Concepts**

- **Learn OpenGL Architecture**

- **Develop Proficiency in OpenGL Programming**

- **Explore 2D and 3D Graphics Rendering**

- **Implement Interactive Graphics Applications**

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSAMAJ203A_1	Acquire knowledge about different graphics systems and models, including raster and vector graphics, and understand their underlying principles.
CO_CSAMAJ203A_2	Have knowledge about OpenGL architecture
CO_CSAMAJ203A_3	Develop proficiency in graphics programming using OpenGL, including setting up the development environment and writing basic OpenGL code.
CO_CSAMAJ203A_4	Understand geometrical objects, transformations and viewing in both 2D and 3D spaces, including matrix representations and homogeneous coordinates, perspective and orthographic projections, and explore methods for hidden surface removal; illumination and shading techniques, including the use of light sources, surface detail, and material properties.
CO_CSAMAJ203A_5	Implement interactive Graphics applications

Course Outcomes mapping with Program Specific Outcomes		
	Outcomes	
	PSO01	
	PSO02	
	PSO03	
	PSO04	
	PSO05	
	PSO06	
	PSO07	
	PSO08	
	PSO09	
	PSO10	
	PSO11	
	PSO12	
	PSO13	
	PSO14	
	PSO15	
	PSO16	
	PSO17	
	PSO18	
	PSO19	
	PSO20	
	PSO21	
	PSO22	
	PSO23	
	PSO24	
	PSO25	
	PSO26	

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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction a) Motivation, Uses, History b) Graphics Systems and Models c) Graphics Programming: Getting started with OpenGL d) Input and Interaction in OpenGL.	5		R, U, A1
Unit-2	Transformation, Viewing, Illumination and Shading (a) Geometrical Objects and Transformations in 2D and 3D, homogeneous coordinates, matrix representation (b) windows and viewports (c) Viewing in 3D, projections, hidden surface removal; (d) Light, shading and materials. Illumination and Shading, light sources, (surface detail, ray tracing, radiosity)	7		R, U, A1
Unit-3	Processing, shading (a) From Vertices to Fragments: modelling, geometry processing, rasterization, fragment processing. (b) Clipping, hidden surface removal, antialiasing (c) Discrete techniques: buffers, bit and pixel operations, texture mapping, compositing (d) Programmable shaders: OpenGL shading language, fragment shaders, cub and bump maps.	20		R, U, A1
Unit-4	Modelling and rendering (a) Modelling Techniques, trees, scene graphs; (b) Curve and surface representation (c) Advanced rendering techniques: ray tracing, radiosity, image-based rendering.	15		R, U, A1, A2

Reference Books:

Edward Angel, *Interactive Computer Graphics: A Top-Down Approach with OpenGL*, 4th edition, Addison-Wesley, 2005.

Additional References:

SYLLABUS

1. Edward Angel, OpenGL: A primer, 2nd edition, Addison-Wesley, 2005
2. The OpenGL Programmer's Guide (the Redbook), Addison-Wesley
3. The OpenGL Reference Manual (the Bluebook), Addison-Wesley
4. James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, Computer Graphics : Principles & Practices, Addison Wesley Longman, 2nd edition in C, 1994
5. Donald Hearn, M. Pauline Baker, Computer Graphics, 2nd edition, C version, Prentice Hall, 1996.

Practical (Laboratory)

CSAMAJ203AL: Graphics programming Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

1. Set up an OpenGL development environment on your system.
2. Describe the basic structure of an OpenGL program.
3. Illustrate vertices, edges, and polygons in OpenGL.
4. Explain the OpenGL rendering pipeline and its stages.
5. Specify geometric primitives in OpenGL?
6. Set up and manage a window for OpenGL rendering.
7. Demonstrate use of shaders in OpenGL in the rendering process.
8. Create and compile shaders in an OpenGL program.
9. Transform objects in 3D space using matrices in OpenGL.
10. Demonstrate the concept of camera transformations and how they are implemented in OpenGL.
11. Specify lighting and material properties in an OpenGL scene.
12. Explain the different types of shading models available in OpenGL (e.g., flat shading, Gouraud shading, Phong shading).
13. Describe the process of texture mapping in OpenGL.
14. Load and apply textures to objects in an OpenGL scene.
15. Demonstrate the use of framebuffer objects (FBOs) in advanced rendering techniques.
16. Explain the concept of vertex buffer objects (VBOs) and how they improve rendering performance in OpenGL.
17. Describe some common techniques for optimizing OpenGL rendering performance.
18. Handle user input (e.g., keyboard and mouse events) in an OpenGL application.
19. List some resources or methods for further learning and exploring advanced topics in OpenGL graphics programming.

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Course 23CSAMAJ203B

The course aims to equip students with foundational Python skills, including control flow, data structure manipulation, object-oriented programming, file handling, and exception handling, to prepare them for practical application in various domains, including machine learning.

Code	Outcome description
CO_CSAMAJ203B_1	Understand the foundational knowledge in Python, including understanding its history, basic syntax, data structures, input/output operations, variables, and operators.
CO_CSAMAJ203B_2	Demonstrate proficiency in Python program flow, including indentation, conditional statements, looping, control statements, function implementation, parameter passing, and understanding of scope and namespaces.
CO_CSAMAJ203B_3	Work with various Python data structures including lists, tuples, dictionaries, and sets, as well as mastering string manipulation and list comprehensions for efficient data handling.
CO_CSAMAJ203B_4	Demonstrate mastery in defining and utilizing functions, understanding function arguments, handling global and local variables, and effectively importing and using modules in Python programming.
CO_CSAMAJ203B_5	Exhibit proficiency in object-oriented programming principles, including class and object creation, inheritance, polymorphism, encapsulation, and abstraction, along with familiarity with advanced concepts like decorators and magic methods.
CO_CSAMAJ203B_6	Showcase competence in file handling operations, including opening, reading, writing, and appending files, as well as adeptness in handling exceptions gracefully for writing robust and error-tolerant code.
CO_CSAMAJ203B_7	Understand some of popular Python libraries used in machine learning, enabling them to apply these libraries effectively in real-world data analysis and machine learning projects.

Outcomes	
1	PSO1
2	PSO2
3	PSO3
4	PSO4
5	PSO5
6	PSO6
7	PSO7
	PSO8
	PSO9
	PSO10
	PSO11
	PSO12
	PSO13
	PSO14
	PSO15
	PSO16
	PSO17
	PSO18
	PSO19
	PSO20
	PSO21
	PSO22
	PSO23
	PSO24
	PSO25
	PSO26

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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction (a) History & features (b) Setting up path (c) Basic syntax, python data structures & (d) data types (e) Simple input & output variables & operators in python	6	CO_CSAMAJ203B_1	R, U, A1
Unit-2	Python program flow (a) Indentation (b) Conditional statements (c) Looping & range statement (d) Control statements (e) Function and parameter passing (e) (f) Scope and namespaces	6	CO_CSAMAJ203B_1 CO_CSAMAJ203B_2	R, U, A1
Unit-3	Data structures (a) List: introduction, accessing list, operations, working with lists, function and methods (b) Tuples: introduction, accessing tuples, operations, working, functions and methods (c) Dictionaries: introduction, accessing values in dictionaries, working with dictionaries, (d) String manipulation, sets and their operations, working with sequences, list (e) comprehensions	7	CO_CSAMAJ203B_1 CO_CSAMAJ203B_2 CO_CSAMAJ203B_3	R, U, A1
Unit-4	Functions & Modules (a) Defining a function (b) Calling a function (c) Types of function & function arguments (d) Global and local variable (e) Importing module (f) Math module & random module (g) Packages	7	CO_CSAMAJ203B_1 CO_CSAMAJ203B_2 CO_CSAMAJ203B_3 CO_CSAMAJ203B_4	R, U, A1, A2
Unit-5	Object Oriented Programming (OOP) (a) Class and objects (b) Inheritance and polymorphism (c) Encapsulation and abstraction (d) Advanced OOP concepts (decorators, magic method)	6	CO_CSAMAJ203B_1 CO_CSAMAJ203B_2 CO_CSAMAJ203B_5	R, U, A1, A2
Unit-6	File handling & exceptions handling (a) file handling modes (b) opening & closing files (c) reading & writing files (d) writing & appending to files (e) exception & exception handling (f) except clause, try?, finally clause, user defined exception	6	CO_CSAMAJ203B_1 CO_CSAMAJ203B_3 CO_CSAMAJ203B_5 CO_CSAMAJ203B_6	R, U, A1, A2
Unit-7	Libraries used for machine learning (a) Scikit-learn (b) NumPy (c) Pandas	7	CO_CSAMAJ203_7	R, U, A1, A2

SYLLABUS

	(d) Matplotlib and Seaborn (e) Tensorflow (f) Pytorch (g) Keras (h) Opencv (i) Mediapipe			

Text Books:

1. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372. [Unit I&II- 2,3,4,5,6,7,8,9 Unit III-11,12].
2. Eric Matthes, "Python Crash Course- A Hands-On, Project-Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.[Unit III-15, Unit IV-16]
3. Wesley J. Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education, 2016. [Unit IV- 2,5].

Reference Books:

1. Kamthane, A. N., & Kamthane, A.A. , "Programming and Problem Solving with Python", McGraw Hill Education, 2017.
2. Mark Lutz, "Learning Python", 5th edition, Orelly Publication, 2013, ISBN 978- 1449355739.
3. Ljubomir Perkovic, "Introduction to Computing Using Python- An Application Development Focus", Wiley,2012.

Practical (Laboratory)

CSAMAJ203BL: Programming with Python and ML libraries Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

1. State the key advantages of using Python for machine learning development?
2. Set up a Python development environment for machine learning.
3. Install popular machine learning libraries such as scikit-learn, TensorFlow, and PyTorch?
4. Explain the role of NumPy and Pandas in data pre-processing for machine learning tasks.
5. Load and manipulate datasets using Pandas?
6. Demonstrate data visualization in Python using libraries such as Matplotlib and Seaborn.
7. Illustrate the steps involved in data pre-processing for machine learning tasks.
8. Demonstrate different ways of handling missing values and categorical data during data pre-processing.
9. Explain the concept of feature scaling and its importance in machine learning.
10. Demonstrate different types of feature scaling techniques available in scikit-learn.
11. Demonstrate the process of splitting a dataset into training and testing sets for model evaluation.
12. Demonstrate training of a machine learning model using scikit-learn.
13. State some common algorithms available in scikit-learn for classification and regression tasks.
14. Evaluate the performance of a machine learning model using metrics such as accuracy, precision, recall, and F1-score.
15. Explain the concept of cross-validation and its importance in model evaluation.
16. Describe the process of building and training neural networks using TensorFlow or PyTorch.
17. State some common neural network architectures used in deep learning tasks.
18. Demonstrate handling of overfitting and underfitting in machine learning models.
19. State some resources or methods for further learning and exploring advanced topics in Python programming and machine learning.

SYLLABUS

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

(College Seal)

SYLLABUS

Course 23CSAMAJ204

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ204	Software Engineering	3		45	3
23CSAMAJ204L	Software Engineering LAB		1	30	2

Course Objectives:

The aim of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_ CSAMAJ204_1	Select and implement different software development process models
CO_ CSAMAJ204_2	Extract and analyse software requirements specifications for different projects
CO_ CSAMAJ204_3	Develop some basic level of software architecture/design
CO_ CSAMAJ204_4	Apply standard coding practices
CO_ CSAMAJ204_5	Define the basic concepts and importance of Software project management concepts like cost estimation, scheduling and reviewing the progress.
CO_ CSAMAJ204_6	Identify and implement of the software metrics
CO_ CSAMAJ204_7	Apply different testing and debugging techniques and analysing their effectiveness.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1																										
2																										
3																										
4																										
5																										
6																										
7																										

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction a) The Evolving Role of Software b) Software Characteristics c) Changing Nature of Software d) Software Engineering as a Layered Technology e) Software Process Framework f) Framework and Umbrella Activities g) Process Models h) Capability Maturity Model Integration (CMMI)	8		R, U, A1

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Unit-2	Requirement Analysis (a) Software Requirement Analysis (b) Initiating Requirement Engineering Process (c) Requirement Analysis and Modelling Techniques (d) Flow Oriented Modelling (e) Need for SRS - Characteristics and Components of SRS	10		R, U, A1
Unit-3	Software Project Management (a) Estimation in Project Planning Process (b) Project Scheduling	8		R, U, A1
Unit-4	Risk Management (a) Software Risks (b) Risk Identification (c) Risk Projection and Risk Refinement (d) RMMM Plan	8		R, U, A1, A2
Unit-5	Quality Management (a) Quality Concepts (b) Software Quality Assurance (c) Software Reviews (d) Metrics for Process and Projects.	8		R, U, A1, A2

Suggested Readings

1. R.S. Pressman, "Software Engineering: A Practitioner's Approach", 7/e, McGraw-Hill, 2009.
2. P. Jalote, "An Integrated Approach to Software Engineering", 2/e, Narosa Publishing House, 2003.
3. K.K. Aggarwal and Y. Singh, "Software Engineering", 2/e, New Age International Publishers, 2008.
4. I. Sommerville, "Software Engineering", 8/e, Addison Wesley, 2006.
5. D. Bell, "Software Engineering for Students", 4/e, Addison-Wesley, 2005.
6. R. Mall, "Fundamentals of Software Engineering", 2/e, Prentice-Hall of India, 2004.

Practical (Laboratory)

CSAMAJ204L: Software Engineering Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Srl #.	Practical Title
1	Problem Statement, Process Model
2	Requirement Analysis: • Creating a Data Flow • Data Dictionary, Use Cases
3	Project Management: • Computing FP • Effort • Schedule, Risk Table, Timeline chart
4	Design Engineering: • Architectural Design • Data Design, Component Level Design
5	Testing: • Basis Path Testing

Sample Projects:

1. Criminal Record Management: Implement a criminal record management system for jailers, police officers and CBI officers
2. DTC Route Information: Online information about the bus routes and their frequency and fares

SYLLABUS

3. Car Pooling: To maintain a web-based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

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SYLLABUS

Course 23CSAMAJ205

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMAJ205	Database Management Systems	3		45	3
23CSAMAJ205L	Database Management Systems LAB		1	30	2

Course Objectives:

To educate students with fundamental concepts of Database Management Systems, Data Models, Different Database Languages.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSAMAJ205_1	Analyse Data Base design methodology.
CO_CSAMAJ205_2	Extract and analyse software requirements specifications for different projects with focus on database requirements and design.
CO_CSAMAJ205_3	Analyse the difference between traditional file system and DBMS.
CO_CSAMAJ205_4	Able to handle with different Data Base languages.
CO_CSAMAJ205_5	Draw various data models for Data Base and write SQL queries.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1																										
2																										
3																										
4																										
5																										

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction a) Characteristics of database b) Data models, c) Database system architecture d) Data independence	6		R, U, A1
Unit-2	Entity Relationship (ER) Modelling (a) Entity types (b) Relationships (c) Constraints	8		R, U, A1
Unit-3	Relational Data Model (a) Relational model concepts (b) Relational constraints (c) Relational algebra (d) SQL queries	20		R, U, A1
Unit-4	Database Design (a) Mapping ER/EER model to relational database	15		R, U, A1, A2

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	(b) functional dependencies (c) Lossless decomposition (d) Normal Forms (up to BCNF)			
Unit-5	Transaction Processing (a) ACID properties (b) Concurrency control	3		R, U, A1, A2
Unit-6	File Structure and Indexing (a) Operations on files (b) File of Unordered and ordered records (c) overview of File organizations (d) Indexing structures for files (Primary index, secondary index, clustering index) (e) Multilevel indexing using B and B+ trees	8		

Suggested Readings

1. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", 6/e, Pearson Education, 2010.
2. R. Ramakrishnan, J. Gehrke, "Database Management Systems", 3/e, McGraw-Hill, 2002.
3. A. Silberschatz, H.F. Korth, S. Sudarshan, "Database System Concepts", 6/e, McGraw Hill, 2010.
4. R. Elmasri, S.B. Navathe, "Database Systems Models, Languages, Design and application Programming", 6/e, Pearson Education, 2013.
5. Database Book: "The Principles and Practices Using MySQL", Narain Gehani, University Press.

Practical (Laboratory)

CSAMAJ205L: Database Management Systems Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Create and use the following database schema to answer the given queries

EMPLOYEE Schema

Field	Type	NULL	KEY	DEFAULT
Eno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL
Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	YES	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES		NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

Query List:

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
2. Query to display unique Jobs from the Employee Table.
3. Query to display the Employee Name concatenated by a Job separated by a comma.
4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
5. Query to display the Employee Name and Salary of all the employees earning more than Rs2850.
6. Query to display Employee Name and Department Number for the Employee No= 7900.
7. Query to display Employee Name and Salary for all employees whose salary is not in the range of Rs1500 and Rs2850.
8. Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.

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9. Query to display Name and Hire Date of every Employee who was hired in 1981.
10. Query to display Name and Job of all employees who don't have a current Manager.
11. Query to display the Name, Salary and Commission for all the employees who earn commission.
12. Sort the data in descending order of Salary and Commission.
13. Query to display Name of all the employees where the third letter of their name is 'A'.
14. Query to display Name of all employees either have two 'R's or have two 'A's in their name and are either in Dept No = 30 or their Manger's Employee No = 7788.
15. Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.
16. Query to display the Current Date.
17. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.
18. Query to display Name and calculate the number of months between today and the date each employee was hired.
19. Query to display the following for each employee <E-Name> earns < Salary> monthly but wants < 3 * Current Salary >. Label the Column as Dream Salary.
20. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with 'J', 'A' and 'M'.
21. Query to display Name, Hire Date and Day of the week on which the employee started.
22. Query to display Name, Department Name and Department No for all the employees.
23. Query to display Unique Listing of all Jobs that are in Department # 30.
24. Query to display Name, Dept Name of all employees who have an 'A' in their name.
25. Query to display Name, Job, Department No. And Department Name for all the employees working at the Delhi location.
26. Query to display Name and Employee no. Along with their Manger's Name and the Manager's employee no; along with the Employees,, Name who do not have a Manager.
27. Query to display Name, Dept No. And Salary of any employee whose department No. and salary matches both the department no. And the salary of any employee who earns a commission.
28. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies Rs.100.
29. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees
30. Query to display the number of employees performing the same Job type functions.
31. Query to display the no. of managers without listing their names.
32. Query to display the Department Name, Location Name, No. of Employees and the average salary for all employees in that department.
33. Query to display Name and Hire Date for all employees in the same dept. as Blake.
34. Query to display the Employee No. And Name for all employees who earn more than the average salary.
35. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a 'T'.
36. Query to display the names and salaries of all employees who report to King.
37. Query to display the department no, name and job for all employees in the Sales department.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(Seal)

(Seal)

(College Seal)

SYLLABUS

Course 23CSAMIN201

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAMIN201	Introduction to Web Design	3		45	3
23CSAMIN201L	Introduction to Web Design Lab		1	30	2

Course Overview:

This course is designed to provide participants with a fundamental knowledge and skill for Web Designing using HTML (Hypertext Mark-up Language), CSS (Cascading Style Sheet) and JavaScript.

Course Objectives

This course enables students to:

1. Create simple web pages using HTML
2. Apply CSS to beautify web pages
3. Apply JavaScript to make the web page dynamic

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSAMIN201_1	Develop web pages using basic HTML
CO_CSAMIN201_2	Enhance the layout and the look and feel of web pages using CSS.
CO_CSAMIN201_3	Know, understand and apply the programming fundamentals involved in web page designing.
CO_CSAMIN201_4	Add interactivity to web pages to make them dynamic using JavaScript.

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to Internet- World Wide Web, Internet Addressing, Browser, URL, Web server, website, homepage, Domain Name. Basic concepts. Software for Web Designing- Notepad, Notepad++, Dreamweaver, VS Code, Blue Grifon, Net Beans, Sea Monkey, Word press, Sublime Text. Introduction to HTML: HTML Tags and Attributes, Basic Tags, Formatting Tags, HTML Color Coding, Div and Span Tags for Grouping. Lists: Unordered Lists, Ordered Lists, Definition list. Images: Image and Image Mapping. Hyperlink: URL - Uniform Resource Locator, URL Encoding. Table: <th>, <thead>, <tbody>, <colgroup>, Attributes Using Iframe as the Target Forms: <button>, <label>	15	CO_CSAMIN201_1	R, U, A1

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	Headers: Title, Base, Link, Styles, Script HTML Meta Tag, XHTML, HTML Deprecated Tags & Attributes			
Unit-2	CSS: Introduction, Features and benefits of CSS, CSS Syntax, External Style Sheet using Multiple Style Sheets, Value Lengths and Percentages. Selectors: ID Selectors, Class Selectors, Grouping Selectors, Universal Selector, Descendant / Child Selectors, Attribute Selectors, CSS - Pseudo Classes. Colour Background Cursor: background-image, background-repeat, background-position. CSS Cursor Text Fonts: Colour, background-colour, text-decoration, text-align, vertical-align, text-indent, text-transform, white-space, letter-spacing, word-spacing, line-height, font-family, font-size, font-style, font-variant, font-weight.	15	CO_CSAMIN201_2	R, U, A1
Unit-3	Lists & Tables: list-style-type, list-style-position, list-style-image, list-style, CSS Tables (border. width & height, text-align, vertical-align, padding, color) Box Model: Borders & Outline, Margin & Padding, Height and width, CSS Dimensions. Display Positioning: CSS Visibility, CSS Display, CSS Scrollbars, CSS Positioning (Static Positioning, Fixed Positioning, Relative Positioning, Absolute Positioning), CSS Layers with Z Index. Floats: The float Property, The clear Property, The clearfix Hack.	15	CO_CSAMIN201_1, CO_CSAMIN201_2	R, U, A1
Unit-4	The JavaScript: Nature of JavaScript, Script Writing Basics, Enhancing JavaScript, The Building Blocks. Introduction to JavaScript, JavaScript Engines, Values, Variables and Operators, Variable Mutation, Basic Operators, Operator Precedence, JavaScript Types, Types Definition, Types in JavaScript, Objects, Type Conversion and Coercion, Static vs Dynamic Type Checking. JavaScript Conditionals: Introduction to Conditionals, Conditionals in JavaScript, Ternary Operators and Conditionals. Conditional Ladder & Switch statement.	15	CO_CSAMIN201_4	R, U, A1, A2

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	JavaScript Arrays: Introduction to Arrays, Declaring and Mutating Arrays, Array Methods Methods. Multi-dimensional Arrays.			
Unit-5	JavaScript Loops: Introduction to Loops, Loops in JavaScript. While and Do/While Loops. For Loops, Break and Continue in Loops, Iterating Arrays, Iterating Objects. JavaScript Functions: Introduction to Functions, Functions in JavaScript, Nested Functions in JavaScript, Arrow Functions in JavaScript, Function as an Argument, Function as the Returned Object. JavaScript Scope: Scope Introduction, Scope in JavaScript, Lexical Scope, Module Scope. Method of Adding Interactivity to a Web Page, Creating Dynamic Web Pages; Concept of JavaScripting the Forms. JavaScripting the Forms: Basic Script Construction, talking to the Form Objects, Organizing Objects and Scripts, Field-Level Validation, Check Required Fields like Validating Zip Code, Automated Formatting, Format Phone, Format Money, Automatic Calculation, Calculate Expiration Date, Calculate Amount etc.	15	CO_CSAMIN201_3, CO_CSAMIN201_4	R, U, A1, A2, E

Suggested Readings

1. HTML And CSS: Design and Build Websites, Wiley, Jon Duckett
2. Learning Web Design: A Beginner's Guide To HTML, CSS, JavaScript, and Web Graphics, O'reilly, Jennifer Niederst Robbins.
3. Html, XHTML and CSS Bible, Wiley, Steven M. Schafer.
4. Basics of Web Design: Htm15 & Css3, 5th Edition, Pearson Education, 2019, Felke-Morris.
5. Web Development & Design Foundations with HTML5, 10th Edition, Addison-Wesley, Felke-Morris.
6. Richard York, Beginning CSS: Cascading Style Sheets For Web Design, Wiley India, Ian Pouncey.

Suggestive digital platforms web links:

- <https://www.w3schools.com/>
- <https://spoken-tutorial.org/>

Suggested equivalent online courses:

- <https://nptel.ac.in/courses/106/105/106105084/> (NPTEL Course: Internet Technology — Part of the Course)
- https://onlinecourses.swayam2.ac.in/aic20_spl11/preview (HTML and CSS)
- <https://www.coursera.org/learn/html-css-javascript-for-web-developers#syllabus> (HTML, CSS and JavaScript for Web Developers)
- <https://www.classeentral.com/course/html-css-javascript-for-web-developers-4270> (HTML, CSS and JavaScript for Web Developers)
- <https://www.classcentral.com/course/duke-programming-web-4256>
- <https://imvw.coursera.org/learn/duke-programming-web> (Programming Foundations with JavaScript HTML and CSS)

SYLLABUS

Course 23CSAVAC202

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSAVAC202	PC Maintenance and Troubleshooting		1	30	2

Course Overview:

This course introduces students to the knowledge and process of doing the maintenance and troubleshooting of hardware and software issues of a personal computer.

Course Objectives:

To provide knowledge of:

- Hardware components of a personal computer.
- The process of assembling/ disassembling a computer.
- The process of installing operating systems (Windows/ Linux) – on physical or virtual machine.
- The process of installing device drivers/ application software.
- Troubleshooting common issues of hardware and software.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSAVAC202_1	Increased knowledge of how a computer works
CO_CSAVAC202_2	Identify and describe functions of common hardware parts that make up a computer.
CO_CSAVAC202_3	Assemble Desktop Computer
CO_CSAVAC202_4	Install and configure Window / Linux Operating System
CO_CSAVAC202_5	Install device drivers (e.g., printer, scanner, etc) and application software
CO_CSAVAC202_5	Trouble hardware and software issues

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Assembling/ Disassembling Hardware Component 1. Identify various hardware component 2. Identify front and rear panel port and connector 3. Understand Motherboard and various component on it 4. SMPS & Its connection with motherboard 5. Disassembling PC component 6. Assembling component and building a PC	4	CO_CSAVAC202_1, CO_CSAVAC202_2, CO_CSAVAC202_3	R, U, A1
Unit-2	Virtual Machine 1. Introduction to Virtual Machine 2. Installation of VMWare. 3. Create and Configure Virtual Machine	12	CO_CSAVAC202_5	R, U, A1
Unit-3	Operating System Installation 1. Introduction about OS. 2. BIOS Overview. 3. Booting Process. 4. UEFI Vs Legacy Boot. 5. Various software for making Bootable USB. 6. Make Bootable USB (Single and Dual boot).	14	CO_CSAVAC202_4	R, U, A1

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	7. Difference between Installation and Upgrading Windows 10. 8. Install Windows 10. 9. Install Ubuntu. 10. Create Dual boot System.			
Unit-4	Windows Utilities 1. Hard disk Partitioning. 2. Third Party tools for Hard Disk Partitioning. 3. Disk Clean-up and Disk Defragmentation. 4. Create Windows System Image. 5. Create Restore Point. 6. Installation of third-party Antivirus.		CO_CSAVAC202_5	
Unit-5	Printers & Scanner 1. Types of Printer. 2. Printer Installation and configuration. 3. Scanner Installation and configuration. 4. Troubleshooting common Printer and Scanner problem.		CO_CSAVAC202_5	
Unit-5	Troubleshooting Windows / Linux. 1. Troubleshooting common hardware problems 2. Troubleshooting common software problems		CO_CSAVAC202_5	

Suggested Readings:

1. R. Taxali, "Computer Course", McGraw- Hill, 2010.
2. Prof. S.P.S. Saini, "Troubleshooting and Maintenance of Computers", Vayu Education of India, 2009.
3. B Govindarajalu, IBM PC and Clones – "Hardware, Troubleshooting and Maintenance", Second Edition, Tata McGraw – Hill, 1991.
4. Dan Gookin – "Troubleshooting & Maintaining Your PC All-In-One for Dummies"
5. Ron White – "How Computers Work"
6. Alex Frith – "Look Inside How Computers Work"

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

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(Seal)

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Core/ Major Courses:

Course Code	Title
23CSAMAJ101	Programming in C
23CSAMAJ102	Digital Electronics
23CSAMAJ103	Object Oriented Programming with Java
23CSAMAJ104	Computer Organisation & Architecture
23CSAMAJ201	Data Structures
23CSAMAJ202	Operating Systems
23CSAMAJ203	Graphics programming using OpenGL
23CSAMAJ204	Software Engineering
23CSAMAJ205	Database Management Systems

Skill Enhancement Courses:

Course Code	Title
23CSASEC101	Introduction to Cyber Security
23CSASEC102	Python Programming
23CSASEC201A	Introduction to Web Technology – PHP based
23CSASEC201B	Introduction to Web Technology – JSP based
23CSASEC202	Introduction to R Programming



SALESIAN COLLEGE (AUTONOMOUS)
SONADA-SILIGURI

Curriculum Structure
For

Bachelor of Computer Science (B. Sc CS) – Dual Major

(Basic and Honours Degree)

As per National Education Policy – 2020 guidelines

Department of Computer Science & Applications

First Draft - 2024

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Vision

Develop young men and women as technocrats, researchers and entrepreneurs in the field of Computer Science and Applications.

Mission

- To conduct and support undergraduate programmes of quality in Computer Science and Applications by means of better teaching-learning methodologies and value-added courses.
- To provide a foundation undergraduate programme which will act as a feeder course for higher studies in the area of Computer Science and Applications.
- To build leadership skills, ethical values and teamwork among the students.
- To provide knowledge and software development skills so students become employable to IT professional and service sectors
- To develop manpower that would provide technical and intellectual leadership to the community.
- To inculcate professional excellence by encouraging projects in industry relevant technologies and through industry interactions.
- To strengthen the collaboration of department and industry through internships, mentorships and professional body activities.
- To foster teaching, research and extension activities for the creation of new knowledge for the development of society.
- To cater to the holistic development of students, following the principles of Don Bosco Institution, so they become intellectually competent, socially sensitive, morally upright and emotionally balanced.

PROGRAM OUTCOMES

Program Outcomes

Degree holders possess knowledge of the relevant field or profession, such that they:	
KNOWLEDGE	PO01: have acquired general understanding and insight into main theories and concepts
	PO02: are aware of the latest knowledge in the relevant field
	PO03: can apply the basic elements of information technology
Degree holders can apply the methods and procedures of the field or profession, such that they:	
SKILLS	PO04: can use the relevant equipment, technology and software
	PO05: can apply critical analytic methods
	PO06: can rationalise their decisions
	PO07: can evaluate critically the methods applied
	PO08: recognise when further data is needed and have the ability to retrieve it, assess its reliability and apply it in an appropriate manner
	PO09: can use reliable data and information resources in the relevant scientific field
	PO10: have acquired an open-minded and innovative way of thinking
Degree holders can apply their knowledge and skills in a practical way in their profession and/or further studies, such that they:	
COMPETENCE	PO11: have developed the competences and independence needed for further studies within the field
	PO12: can work in an independent and organised manner, set goals for their work, devise a work schedule and follow it
	PO13: can participate actively and lead work groups
	PO14: are capable of interpreting and presenting scientific issues and research findings

PROGRAM SPECIFIC OUTCOMES

Program Specific Outcomes

Degree holders possess knowledge of:		PO 01	PO 02	PO 03	PO 04	PO 05	PO 06	PO 07	PO 08	PO 09	PO 10	PO 01	PO 12	PO 13	PO 14
K N O W L E D G E	PSO01: A number of recurring themes, and a set of general principles that have broad application to the field of computer science	√													
	PSO02: The professional, legal, ethical, security, social and cultural issues and responsibilities inherent in the discipline of computing.	√													
	PSO03: The software systems are used in many different domains. This requires both computing skills and domain knowledge	√	√												
	PSO04: Software development fundamentals, including programming, data structures, algorithms and Complexity	√	√	√											
	PSO05: Systems fundamentals, including architectures and organization, operating systems, networking and communication, parallel and distributed computation, and security	√	√	√											
	PSO06: Mathematics fundamentals, including discrete structures, statistics and calculus	√	√	√											
	PSO07: Software engineering fundamentals, including software analysis and design, evaluation and testing, and software engineering processes	√	√	√											
	PSO08: Application fundamentals, including information management and intelligent applications	√	√	√											
	PSO09: Multiple programming languages, paradigms, and technologies	√	√	√											
Degree holders can apply the methods and procedures as follows:															
S K	PSO10: Know how to apply the knowledge they have gained to solve real issues as they will have the ability to analyse a problem, and identify and define the computing requirements				√			√		√					

PROGRAM SPECIFIC OUTCOMES

I	[including mathematical] appropriate to its solution.														
L	PSO11: Realize that there are multiple solutions to a given problem and these solutions will have a real impact on people's lives						√								
L	PSO12: Communicate their solution to others, including why and how a solution solves the problem and what assumptions were made						√								
S	PSO13: Successfully apply the knowledge they have gained through project experience as they will have the ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.					√	√	√							
	PSO14: Encompass an appreciation for the structure of computer systems and the processes involved in their construction and analysis						√				√				
	PSO15: Understand individual and collective responsibility and individual limitations as well as the limitations of technical tools						√	√	√		√				
	PSO16: Understand the range of opportunities and limitations of computing										√				
Degree holders can apply their knowledge and skills, as follows:															
	PSO17: Understand the multiple levels of detail and abstraction											√			
C	PSO18: Recognize the context in which a computer system may function, including its interactions with people and the physical world.											√			
O	PSO19: Able to communicate with, and learn from, experts from different domains throughout their careers											√			
M	PSO20: Possess a solid foundation that allows and encourages them to maintain relevant skills as the field evolves											√	√		
P	PSO21: To be able to manage their own career development and advancement											√			√
E	PSO22: Manage their own learning and development,												√		

PROGRAM SPECIFIC OUTCOMES

including managing time, priorities, and progress														
PSO23: Have developed interpersonal communication skills as part of their project experience													√	
PSO24: Work effectively both individually and as members of teams													√	
PSO25: Make effective communication /presentations to a wide range of audiences about technical problems and their solutions													√	√
PSO26: Encompass an appreciation of the interplay between theory and practice														√

MODEL PROGRAM STRUCTURE FOR CSC

Model Programme Structure for Bachelor of Computer Science Programme

Sem.	Maor/Core-A 100 (Credit-4)	Major/Core-B 100 (Credit-4)	MD (Credit-3)	AECC		SEC-100 (Credit-3)/ (Credit-12)	VOC/ Summer internship/ Apprenticeship-50 (Credit-4)	VAC 50 (Credit-2)	Semester Credit
				Lang-50 (Credit-2)	EVS-50 (Credit-2)				
1 st Year									
I	Paper-1 (A)	Paper-I (B)	(MD1)	English/ Vernacular (Cr-2)	EVS (Theory)	SEC-1 (A)		Common	20
II	Paper-2 (A) Paper-3 (A)	Paper-2 (B) Paper-3 (B)	(MD2)			SEC-2 (B)		From A	24
2 nd Year									
III	Paper-4 (A)	Paper-4 (B)	(MD3)	English / Vernacular (Cr-2)	EVS (Field work)	SEC-3 (A)		Common	20
IV	Paper-5 (A) Paper-6 (A)	Paper-5 (B) Paper-6 (B)				SEC-4 (B)		From B	25
Exit option with Undergraduate Diploma in relevant Discipline on completion of 80 credits with 4 credits in skill based vocational course offered during summer term.									
3 rd Year									
V	Paper-7 (A) Paper-8 (A) Paper-9 (A)	Paper-7 (B) Paper-8 (B) Paper-9 (B)					VOC/ Internship/ Apprenticeship		24
VI	Paper-10 (A) Paper-11 (A) Paper-12 (A)	Paper-10 (B) Paper-11 (B) Paper-12 (B)							24
Dual Major									
3 rd Year									
V	Paper-7 (A or B) Paper-8 (A or B) Paper-9 (A or B) Paper-13 (A or B) Paper-14 (A or B)								20
VI	Paper-10 (A or B) Paper-11 (A or B) Paper-12 (A or B) Paper-15 (A or B) Paper-16 (A or B)								20
Single Major									

Question pattern for End-Semester Exam

<Department> (Honours / Program)

Pattern for 50 marks question paper:

Group A (5 marks) – 5 out of 8 questions, each of 2 marks

Group B (15 marks) – 4 out of 6 questions, each of 5 marks

Group C (20 marks) – 2 out of 4 questions, each of 10 marks

PAPER CODE /TITLE:

SEMESTER:

YEAR:

FULL MARKS: 50

ASSESSMENT TYPE: End Semester Examination (Summative) **S:** Very Short (1mk); **M:** Medium (5mks); **L:** Long (10mks)

QUESTION TYPE: Mixed (Subjective & Objective)

WEIGHTAGE: As per MHRD guideline

MODEL PROGRAM STRUCTURE FOR CSC

BLUEPRINT (COGNITIVE DOMAIN)

20%

35%

25%

←----- 20% -----→

Topic	Instructional Objectives	Reference		Remembering			Understanding			Applying			Analyzing			Evaluating			Creating			Total Marks	Actual Percentage
		W %	Marks	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L		
Unit 1:																							
Unit 2:																							
Unit 3:																							
Unit 4:																							
Unit 5:																							
Unit 6:																							
Unit 7:																							
Total marks																							
Actual Percentage																							

Assessment/ Evaluation scheme for Theory based subjects

Level	Bloom's Taxonomy Level	Continuous Internal Assessment (50% weightage)						Final Examination (50% weightage)	
		CIA-1 (10%)		CIA-2 (15%)		CIA-3 (20%)			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
1	Remember	60%		40%		30%		30%	
	Understand								
2	Apply	40%		40%		40%		40%	
	Analyse								
3	Evaluate			20%		30%		30%	
	Create								
Total		100%		100%		100%		100%	

CIA – 3 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.

Attendance – 5 marks

Assessment/ Evaluation scheme for Practical/ LAB based subjects

Level	Bloom's Taxonomy Level	Continuous Internal Assessment (50% weightage)						Final Examination (50% weightage)	
		CIA-1 (10%)		CIA-2 (15%)		CIA-3 (20%)			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
1	Remember	30%	30%	20%	20%	15%	15%	15%	15%
	Understand								
2	Apply	20%	20%	20%	20%	20%	20%	20%	20%
	Analyse								
3	Evaluate			10%	10%	15%	15%	15%	15%
	Create								
Total		100%		100%		100%		100%	

CIA–3 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.

Attendance – 5 marks

Assessment/ Evaluation Scheme for Lab Examination

Internal		Final Examination	
Assessment Criteria	Marks	Assessment Criteria	Marks
Attendance	5	Flowchart / Algorithm	10
Task completion	35	Program code	15
Practical Record	10	Execution and Formatting	15
		Viva voce	10
Total	50	Total	50

SYLLABUS

FIRST YEAR

Semester I

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
AECC-1		English / Vernacular	25	25	50	2			2	2
AECC-2		ENVS	25	25	50	1		1	2	2
VAC	From common pool	NCC/NSS/Sports/Cultural etc	25	25	50	2			2	2
Core A/ Major - 1	24CSCMAJ101	Introduction to Computational Thinking & Programming	50	50	100	3			3	3
	24CSCMAJ101L	Introduction to Computational Thinking & Programming Lab	50	50	100			2	1	2
Core B/ Major - 1			50	50	100	3	1	0	4	4
Multi-Disciplinary – 1 (offered by CSA Department)	24CSCMDC101	Introduction to MS-Word, Excel and PowerPoint	50	50	100	3	0		3	3
	24CSCMDC101L	Introduction to MS-Word, Excel and PowerPoint Lab								
SEC (from A)	24CSCSEC101	Introduction to Cyber Security	50	50	100	2			2	2
	24CSCSEC101L	Introduction to Cyber Security	50	50	100			2	1	2
Total									20	22

SYLLABUS

Semester II

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
VAC	From discipline A		25	25	50	2			2	2
Core A/ Major - 2	24CSCMAJ102	Digital Electronics	50	50	100	3			3	3
	24CSCMAJ102L	Digital Electronics Lab	50	50	100			2	1	2
Core A/ Major - 3	24CSCMAJ103	Python Programming	50	50	100	3			3	3
	24CSCMAJ103L	Python Programming Lab	50	50	100			2	1	2
Core B/ Major - 2			50	50	100	4	1	0	4	5
Core B/ Major - 3			50	50	100	4	1	0	4	5
Multi-Disciplinary – 2 (offered by CSA Department)	24CSCMDC102	Advanced Excel	50	50	100	3	0	0	3	4
SEC (from B)			50	50	100	3			3	3
Total									24 (24)	27

SYLLABUS

SECOND YEAR

Semester III

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
AECC-1		English/ Vernacular	25	25	50	2			2	2
AECC-2		ENVS	25	25	50	1		1	2	2
VAC	From common pool	NCC/NSS/Sports/Cultural etc	25	25	50				2	2
Core A/ Major – 4	24CSCMAJ201	Data Structures	50	50	100	3			3	3
	24CSCMAJ201L	Data Structures LAB	50	50	100			2	1	2
Core B/ Major - 4			50	50	100	4	0	0	4	4
Multi-Disciplinary – 3 (offered by CSA Department)	24CSCMDC201	Prompt Engineering	50	50	100	3	0	0	3	3
SEC (A)	24CSCSEC201	Introduction to Web Technology	50	50	100	2			2	2
	24CSCSEC201L	Introduction to Web Technology Lab	50	50	100			2	1	2
Total									20	22

SYLLABUS

Semester IV

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
VAC	From discipline B		25	25	50				2	2
Core A/ Major-5	24CSCMAJ202	Object Oriented Programming in Java	50	50	100	3			3	3
	24CSCMAJ202L	Object Oriented Programming in Java Lab	50	50	100			2	1	2
Core A/ Major-6	24CSCMAJ203B	Computer Organisation & Architecture	50	50	100	3			3	3
	24CSCMAJ203L	Computer Organisation & Architecture Lab	50	50	100			2	1	2
Core B/ Major- 5			50	50	100	4	1		4	5
Core B/ Major- 6			50	50	100	4	1		4	5
SEC (B)			50	50	100	3			3	3
Total									25	25+160

SYLLABUS

THIRD YEAR

Semester V

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
VOC		Summer internship/ Apprenticeship on vocational course						4	4	40
Core A/ Major – 7	24CSCMAJ301	Operating Systems	50	50	100	3			3	3
	24CSCMAJ301L	Operating Systems Lab	50	50	100			2	1	2
Core/ Major – 8	24CSCMAJ302	Computer Networks	50	50	100	3			3	3
	24CSCMAJ302L	Computer Networks Lab	50	50	100			2	1	2
Core/ Major - 9	24CSCMAJ303	Introduction to Artificial Intelligence	50	50	100	3			3	3
	24CSCMAJ303L	Introduction to Artificial Intelligence Lab	50	50	100			2	1	2
Core B/ Major – 7			50	50	100	4		0	4	4
Core B/ Major – 8			50	50	100	4		0	4	4
Core B/ Major – 9			50	50	100	4		0	4	4
Total									24	27

SYLLABUS

Semester VI

Course Type	Code	Title of Paper	Maximum Marks			Credits Allotted				Weekly Hours
			CIA	ESE	Total	L	T	P	C	
Core A / Major – 10	24CSCMAJ304	Digital Marketing	50	50	100	4	1		4	5
Core A/ Major – 11	24CSCMAJ305	Information Security	50	50	100	3			3	3
	24CSCMAJ305L	Information Security Lab	50	50	100			2	1	2
Core A/ Major - 12	24CSCMAJ306	Design & Analysis of Algorithms	50	50	100	3			3	3
	24CSCMAJ306L	Design & Analysis of Algorithms Lab	50	50	100			2	1	2
Core B / Major – 10			50	50	100	4	1	0	4	5
Core B / Major – 11			50	50	100	4	1	0	4	5
Core B / Major – 12			50	50	100	4	1	0	4	5
Total									24	30

SYLLABUS

SEMESTER - I

Course 24CSCMAJ101

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
23CSCMAJ101	Introduction to Computational Thinking & Programming	3		45	3
23CSCMAJ101L	Introduction to Computational Thinking & Programming Lab		1	30	2

Course Objectives:

Computational thinking (CT) is the process of analysing a problem then designing and expressing its solution in such a way that a computer can effectively carry it out. It includes a number of characteristics, such as breaking a problem into small and repetitive ordered steps, logically ordering and analysing data and creating solutions that can be effectively implemented as programs running on computer.

The aim of this course is hence to take students with no prior experience of thinking in a computational manner to a point where you can derive simple algorithms and code the programs to solve some basic problems in your domain of studies. Student will also learn about basic program construct and simple data structures. In addition, the course will include topics to appreciate the internal operations of a processor.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ101_1	Describe the internal operation of a basic processor, how a program is executed by a computer and computing trends.
CO_CSCMAJ101_2	Analyse a problem then design and express its solution in such a way that a computer can effectively carry it out. (i.e. equip you with CT skills)
CO_CSCMAJ101_3	Implement problem solutions as programs using basic control structures (sequence, conditional, iterative).
CO_CSCMAJ101_4	Implement problem solutions as programs using basic data types and aggregate data types.
CO_CSCMAJ101_5	Apply the CT concepts on case studies/problem-based scenarios through hands-on practice of the CT processes.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√				√																					
2	√									√																
3	√									√			√													
4	√									√			√													
5	√			√														√								

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels

SYLLABUS

Unit-1	Course Overview and Concepts of Computational Thinking Solving complex problem using computer - enables the student to work out exactly what to tell the computer to do. Overview of Programming Languages and Basic Internal Operation of Computer (a) High level programming languages (Python, C, Java) (b) Basic computer organization (Processor, Memory, I/O) (c) How a computer executes a program (Machine instructions).	6	CO_CSCMAJ101_1	R, U
Unit-2	Basic Program Structure: Control Constructs and Data Types (a) Concepts of data types, variables; (b) Pseudo-code and flowcharts; (c) Sequences, Selection (d) (if/else), (e) iteration (for/while loop).	6	CO_CSCMAJ101_1 CO_CSCMAJ101_2	R, U, A1
Unit-3	CT Concepts Abstraction (a) Problem formulation - reducing something to a very simple set of characteristics to only focus on the most relevant to the problem. (b) Concept of functions/libraries and data structure. Decomposition Break a complex problem into smaller and more manageable parts/steps, such that each of these smaller problems can then be looked at individually. Pattern recognition Looking for similarities among and within problems, which also enable re-use knowledge of previous similar problems. Algorithm Reformulating the problem into series of ordered steps through Identifying, analysing, and implementing possible solutions with the goal of achieving the most efficient and effective combination of steps and resources. (Some common/useful examples: Sorting and searching).	17	CO_CSCMAJ101_1 CO_CSCMAJ101_2 CO_CSCMAJ101_3 CO_CSCMAJ101_4	R, U, A1, A2
Unit-4	Basic Programming Constructs in C Language C program structure. Syntax and semantics. Intrinsic data types, declarations, operators, assignments, control flow, and simple input/output; Pre-processing. Functions; Return values, arguments and parameter passing; Scopes of variables; Concept of side effects.	8	CO_CSCMAJ101_1 CO_CSCMAJ101_2 CO_CSCMAJ101_3 CO_CSCMAJ101_4 CO_CSCMAJ101_5	R, U, A1, A2, E, C
Unit-5	Built-in Data Structures	8	CO_CSCMAJ101_1 CO_CSCMAJ101_2	R, U, A1, A2, E, C

SYLLABUS

	Pointers, pointer operations and pass by reference; One-dimensional and multidimensional arrays, and pointers and arrays; Character strings and arrays of strings; Structures, arrays of structures and type definitions.		CO_CSCMAJ101_3 CO_CSCMAJ101_4 CO_CSCMAJ101_5	

Suggested Readings

1. "Computational Thinking", Peter J. Denning and Matti Tedre, The MIT Press.
2. "The C Programming Language ANSI C Version", Kernighan & Ritchie, Prentice Hall Software Series.
3. "ANSI C - Made Easy", Herbert Schildt, Osborne McGraw-Hill.
4. "Learning to Program in C", N. Kantaris, Babani.

Practical (Laboratory)

CSCMAJ101L: Programming in C Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. WAP to perform input/output of all basic data types.
2. WAP to enter two numbers and find their sum.
3. WAP to reverse a number.
4. WAP to Swap Two Numbers.
5. WAP to Check Whether a Number is Even or Odd
6. WAP to compute the factors of a given number.
7. WAP to enter marks of five subjects and calculate total, average and percentage.
8. WAP to print the sum and product of digits of an integer.
9. WAP to Check Whether a Character is Vowel or Consonant
10. WAP to Find the Largest Number Among Three Numbers
11. WAP to compute the sum of the first n terms of the following series $S = 1 - 2 + 3 - 4 + 5 - \dots$
12. WAP to compute the sum of the first n terms of the following series $S = 1 + 1/2 + 1/3 + 1/4 + \dots$
13. WAP to print figures as follow:

*	1	1	1
**	1 1	2 3	1 2
***	1 2 1	4 5 6	1 2 3
****	1 3 3 1	7 8 9 10	1 2 3 4
*****	1 4 6 4 1	11 12 13 14	1 2 3 4 5
* * * * *	A		A
* *	A B		B A
* *	A B C		C B A
* *	A B C D		D C B A
* *	A B C D E		E D C B A
* * * * *	A B C D E F		F E D C B A

14. WAP to perform following actions on an array entered by the user:

- a) Print the even-valued elements
- b) Print the odd-valued elements
- c) Calculate and print the sum and average of the elements of array
- d) Print the maximum and minimum element of array
- e) Remove the duplicates from the array
- f) Print the array in reverse order

The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.

15. WAP that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
16. Write a program that swaps two numbers using pointers.
17. Write a program in which a function is passed address of two variables and then alter its contents.

SYLLABUS

18. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
19. Write a program to find sum of n elements entered by the user. To write this program, allocate memory dynamically using **malloc()** / **calloc()** functions or **new** operator.
20. Write a menu driven program to perform following operations on strings:
21. Show address of each character in string
22. Concatenate two strings without using **strcat** function.
23. Concatenate two strings using **strcat** function.
24. Compare two strings
25. Calculate length of the string (use pointers)
26. Convert all lowercase characters to uppercase
27. Convert all uppercase characters to lowercase
28. Calculate number of vowels
29. Reverse the string
30. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
31. WAP to display Fibonacci series
(i) using recursion, (ii) using iteration
32. WAP to calculate Factorial of a number
(i) using recursion, (ii) using iteration
33. WAP to calculate GCD of two numbers:
(i) with recursion (ii) without recursion.
34. Write a menu-driven program to perform following Matrix operations (2-D array implementation):
a) Sum b) Difference c) Product d) Transpose
35. Write a function that reverses the elements of an array in place. The function must accept only one pointer value and return void.
36. Write a program that will read 10 integers from user and store them in an array. Implement array using pointers. The program will print the array elements in ascending and descending order.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

(Seal)

(Seal)

(College Seal)

SYLLABUS

SEMESTER - II

Course 24CSCMAJ102

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ102	Digital Electronics	3		45	3
24CSCMAJ102L	Digital Electronics Lab		1	30	2

Course Objectives:

To introduce the concepts of digital electronics that is at the core of logical and arithmetic operations in a computer.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSCMAJ102_1	Understand the basic design of a computer, hardware and software components.
CO_CSCMAJ102_2	Understand the need of different number systems, conversion rules, encoding systems.
CO_CSCMAJ102_3	Understand the basics of gates, Boolean functions and their uses
CO_CSCMAJ102_4	Construct basic combinational circuits and verify their functionalities
CO_CSCMAJ102_5	Apply the design procedures to design basic sequential circuits
CO_CSCMAJ102_6	Design and evaluate a solution to a digital design problem

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√				√																					
2	√				√																					
3	√				√																					
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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Fundamentals of Computers (a) Generation of Computers and Computer Languages, (b) Computer Systems, (c) Basic block Diagram, (d) Von- Neumann Architecture, (e) Types of Computers, (f) Hardware, Firmware, (g) I/O Devices, (h) Storage classifications, (i) Language translators.	10	CO_CSCMAJ102_1	R, U
Unit-2	Number Systems & Arithmetic (a) Number System: Positional, Binary, Octal, Decimal, Hexa-Decimal and their Representations. (b) Methods of conversion from one Base to another.	10	CO_CSCMAJ102_1 CO_CSCMAJ102_2	R, U, A1

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	(c) Binary Addition, Subtraction, Multiplication. (d) Negative number representation: Sign magnitude, 1's, (f) 2's Complement. (e) Different coding schemes: BCD, EBCDIC, UNICODE, ASCII, GRAY, Excess-3 Codes. (f) Fixed and floating-point representation			
Unit-3	Logic gates (a) AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR gates, (b) Boolean algebra: Basic Boolean Laws, De-Morgan's theorem, Boolean function and their truth tables, (c) MAP simplification, Minimization techniques, K-Map, (d) Sum of Product & Product of Sum, (e) Venn diagram.	12	CO_CSCMAJ102_1 CO_CSCMAJ102_2 CO_CSCMAJ102_3 CO_CSCMAJ102_4	R, U, A1, A2, E
Unit-4	Circuits, Adders, Flip Flops, Registers etc. (a) Combinational & Sequential circuits, (b) Half adder & Full adder, (c) BCD adder, (d) Full Subtractor, (e) Multiplexer, De-Multiplexer, Encoder, Decoder. (f) Flip-flops-RS, D, JK, T & Master-Slave flip-flops, (g) Counters, Shift registers	13	CO_CSCMAJ102_1 CO_CSCMAJ102_2 CO_CSCMAJ102_3 CO_CSCMAJ102_4 CO_CSCMAJ102_5 CO_CSCMAJ102_6	R, U, A1, A2, E, C

Suggested Readings

1. Rajaraman V. & Radhakrishnan, "An Introduction to Digital Computer Design", PHI.
2. Malvino & Leach, "Digital Principles & Applications", TMH.
3. S. Salivahanan, S. Arivazhagan, "Digital Circuits and Design", Oxford University Press

Practical (Laboratory)

CSCMAJ102L: Digital Electronics Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. Show the basic operations of AND, OR, and NOT gates.
2. Simplify the Boolean expression: $F = A'B + AB' + AB$.
3. Implement the following Boolean function using logic gates: $F = A \cdot B + \bar{C}$.
4. Design a half adder circuit using basic logic gates.
5. Draw the truth table and Karnaugh map for a 3-input XOR gate.
6. Implement a 4-to-1 multiplexer using basic logic gates.
7. Design a 3-bit binary up-counter using flip-flops.
8. Design a 4-bit shift register with serial input and parallel output.
9. Implement a T flip-flop using a D flip-flop.
10. Design a 4-bit binary comparator circuit.
11. Implement a 3-bit magnitude comparator using basic logic gates.
12. Design a 3-to-8 decoder with enable input.
13. Design a 4-to-1 multiplexer using 2-to-1 multiplexers.
14. Implement a 1-to-4 demultiplexer using basic logic gates.

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Name: Signature:	Name: Signature:	Name: Signature:

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Course 24CSCMAJ103

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ103	Python Programming	3		45	3
24CSCMAJ103L	Python Programming Lab		1	30	2

Course Overview:

A core Python programming course typically provides a comprehensive introduction to the Python programming language, catering to both beginners and individuals with prior programming experience. The course aims to teach the fundamental concepts, syntax, and techniques required to write efficient and functional Python code.

Course Objectives:

The objectives of a core Python programming course are to equip students with a strong foundation in the Python programming language.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSCSE103_1	Basic Proficiency: - Write, execute, and understand basic Python programs using appropriate syntax and semantics. - Demonstrate a clear understanding of Python's data types, including numbers, strings, lists, tuples, and dictionaries.
CO_CSCSE103_2	Control Flow and Looping: - Implement conditional statements (if, elif, else) to control program flow. - Use loops (for and while) to iterate through sequences and perform repetitive tasks.
CO_CSCSE103_3	Function Implementation: - Define functions with parameters and return values. - Utilize function abstraction for modular and reusable code.
CO_CSCSE103_4	Data Manipulation: - Effectively manipulate strings and perform operations on lists, tuples, and dictionaries. - Utilize list comprehensions for concise data transformations.
CO_CSCSE103_5	Preparation for Advanced Learning: Lay a strong foundation for further exploration of advanced Python topics, such as web development, data science, and machine learning.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
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2	√			√						√																
3	√			√						√																
4	√			√						√																
5	√			√						√			√							√						

Units	Content	Lecture Hours	COs	RBT
Unit-1	Components, control structures, functions.	20	1, 2, 3	R, U

SYLLABUS

	<i>Components:</i> Python Interpreter/Shell, Identifiers, Keywords, Statements and Expressions, Variables, Operators, Precedence and Associativity, Data types, Indentation, Comments, Reading Input, Print Output, Type Conversions, The type() function and Is operator, Dynamic and Strongly Typed Language; <i>Control Flow Statements:</i> The if Decision Control Flow Statement, The if...else Decision Control Flow Statement, The if...elif...else Decision Control Statement, Nested if Statement, The while Loop, The for Loop, The continue and break Statements; <i>Functions:</i> Built-In Functions, Commonly Used Modules, Function Definition and Calling the Function, The return Statement and void Function, Scope and Life time of Variables, Default Parameters, Command Line Arguments; <i>Strings:</i> Creating and Storing Strings, Basic String operations, Accessing Characters in String by Index Number, String Slicing and Joining, String methods			
Unit-2	Lists, Dictionaries, Sets & Tuples <i>Lists:</i> Creating Lists, Basic List Operations, Indexing and Slicing in Lists, Built-In Functions Used on Lists, List Methods, The del Statement, <i>Dictionaries:</i> Creating Dictionary, Accessing and modifying key:value pairs in Dictionaries, Built-In Functions Used on Dictionaries, Dictionary methods, The del Statement. <i>Tuples and Sets:</i> Creating tuples, basic tuple operations, indexing and slicing in tuples, built-in functions used on tuples, relations between tuples and lists, relations between tuples and dictionaries, tuple methods, using zip() function, <i>Sets:</i> Set Methods, Frozen set.	15	1,2,3,4	R, U, A1
Unit-3	File handling and OOP <i>Files:</i> Types of files, creating and reading text data, file methods to read and write data, reading and writing binary files, the Pickle module, reading and writing CSV files, <i>Object-oriented programming:</i> Classes and Objects, Creating Classes in Python, Creating Objects in Python, The constructor method, classes with multiple objects, class attributes versus data attributes; encapsulation, inheritance, polymorphism.	10	1,2,3,4,5	U, A1, E

SYLLABUS

Text Books:

1. Gowrishankar S, Veena A, "Introduction to Python Programming", 1st Edition, CRC Press/Taylor & Francis, 2018. ISBN-13: 978-0815394372. [Unit I&II- 2,3,4,5,6,7,8,9 Unit III-11,12].
2. Eric Matthes, "Python Crash Course- A Hands-On, Project-Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.[Unit III-15, Unit IV-16]
3. Wesley J. Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education, 2016. [Unit IV-2,5].

Reference Books:

1. Kamthane, A. N., & Kamthane, A.A., "Programming and Problem Solving with Python", McGraw Hill Education, 2017.
2. Mark Lutz, "Learning Python", 5th edition, Orally Publication, 2013, ISBN 978- 1449355739.
3. Ljubomir Perkovic, "Introduction to Computing Using Python- An Application Development Focus", Wiley, 2012.

Practical (Laboratory)

CSCSEC103L: Python Programming Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	1. Write a Python script that prints "Hello, World!" to the console. 2. Create a program that takes two numbers as input from the user and prints their sum. 3. Write a program to calculate the area of a rectangle given its length and width. 4. Write a Python script that demonstrates the use of different data types (integers, floats, strings, booleans). 5. Create a program that swaps the values of two variables without using a temporary variable. 6. Write a program that converts temperature from Celsius to Fahrenheit. 7. Write a Python script that checks whether a number is positive, negative, or zero. 8. Create a program that determines if a given year is a leap year or not. 9. Write a program that compares three numbers and prints the largest one. 10. Write a Python script that prints all the even numbers from 1 to 20 using a for loop. 11. Create a program that calculates the factorial of a number using a while loop. 12. Write a program that prompts the user for a number and prints its multiplication table. 13. Create a program that checks if a given word is a palindrome or not. 14. Write a Python function to calculate the area of a circle given its radius. 15. Create a function that checks if a number is prime or not. 16. Write a program that uses a function to calculate the factorial of a number.
Unit-2	(a) Write a Python script that demonstrates basic list operations (creation, accessing elements, appending, slicing). (b) Write a program that sorts a list of numbers in ascending order. (c) Create a dictionary representing a person with keys for "name", "age", and "city". Print each key-value pair. (d) Write a program that takes a dictionary as input and prints all keys and their corresponding values. (e) Add a new key-value pair to an existing dictionary. (f) Write a program that removes a key from a dictionary if it exists, and prints the updated dictionary. (g) Iterate over a dictionary and print only the keys. (h) Write a program that updates the values of a dictionary based on user input. (i) Create a tuple containing the days of the week. Print the third day of the week. (j) Write a program that unpacks a tuple into multiple variables and prints them. (k) Concatenate two tuples and print the result.

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	(l) Write a program that converts a tuple into a list. (m) Iterate over a tuple and print each element. (n) Write a program that checks if a given element exists in a tuple. (o) Create two sets of numbers and find their union, intersection, and difference. (p) Write a program that checks if a given element exists in a set. (q) Add an element to a set and print the updated set. (r) Remove an element from a set and print the updated set. (s) Iterate over a set and print each element. (t) Write a program that removes duplicate elements from a list and converts it into a set. (u) Write a program that checks if one set is a subset or superset of another set. (v) Write a program that finds the symmetric difference between two sets.
Unit-3	1. Write a Python script that reads a text file and counts the number of lines. 2. Create a program that reads a CSV file and prints its contents. 3. Write a program that writes data to a text file and reads it back. 4. Create a class called Car with attributes make, model, and year. Include a method get_info() that prints the car's information. 5. Create an object of the Car class and call the get_info() method. 6. Modify the Car class to include an __init__() method that initializes the attributes. 7. Create multiple objects of the Car class with different attributes. 8. Add a class variable num_cars to the Car class that keeps track of the number of cars created. 9. Include a class method display_num_cars() that prints the total number of cars. 10. Create a class ElectricCar that inherits from the Car class. Add an additional attribute battery_size. 11. Override the get_info() method in the ElectricCar class to include battery information. 12. Create a class HybridCar that inherits from both the Car and ElectricCar classes. Add an additional attribute gas_tank_size. 13. Override the get_info() method in the HybridCar class to include both battery and gas tank information. 14. Modify the Car class to make the make, model, and year attributes private. 15. Include getter and setter methods to access and modify these private attributes. 16. Create a class Truck that inherits from the Car class. Override the get_info() method to include additional information specific to trucks. 17. Overload the + operator for the Car class to combine two cars into a new object with combined attributes. 18. Create an abstract base class called Vehicle with abstract methods start() and stop(). 19. Implement the Vehicle class in the Car, ElectricCar, and HybridCar classes.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

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SYLLABUS

SEMESTER - III

Course 24CSCMAJ201

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ201	Data Structures	3		45	3
24CSCMAJ201L	Data Structures LAB		1	30	2

Course Objectives:

The objective of this course is to teach students various data structures and to explain them algorithms for performing various operations on these data structures.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ201_1	Demonstrate familiarity with major algorithms and data structures.
CO_CSCMAJ201_2	Analyse performance of algorithms and choose the appropriate data structure and algorithm design method for a specified application.
CO_CSCMAJ201_3	Determine which algorithm or data structure to use in different scenarios and be familiar with writing recursive methods.
CO_CSCMAJ201_4	Demonstrate understanding of the abstract properties of various data structures such as stacks, queues, lists, trees and graphs and Use various data structures effectively in application programs.
CO_CSCMAJ201_5	Demonstrate understanding of various sorting algorithms, including bubble sort, insertion sort, selection sort, heap sort and quick sort.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√			√																						
2	√			√		√																				
3	√			√		√					√															
4	√			√		√					√															
5	√			√		√					√															

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Arrays a) Single and Multi-dimensional Arrays, b) Sparse Matrices (Array and Linked Representation)	5		R, U, A1
Unit-2	Stacks (a) Implementing single / multiple stack/s in an Array (b) Prefix, Infix and Postfix expressions (c) Utility and conversion of these expressions from one to another (d) Applications of stack (e) Limitations of Array representation of stack	5		R, U, A1
Unit-3	Linked Lists	10	CO_CSCMAJ201_1 CO_CSCMAJ201_2	R, U, A1

SYLLABUS

	(a) Singly, Doubly and Circular Lists (Array and Linked representation) (b) Normal and Circular representation of Stack in Lists (c) Self-Organizing Lists (d) Skip Lists		CO_CSCMAJ201_3	
Unit-4	Queues (a) Array and Linked representation of Queue, De-queue, Priority Queues	5	CO_CSCMAJ201_1 CO_CSCMAJ201_2 CO_CSCMAJ201_3 CO_CSCMAJ201_4	R, U, A1, A2
Unit-5	Recursion (a) Developing Recursive Definition of Simple Problems and their implementation (b) Advantages and Limitations of Recursion (c) Understanding what goes behind Recursion (Internal Stack Implementation)	5	CO_CSCMAJ201_1 CO_CSCMAJ201_2 CO_CSCMAJ201_3 CO_CSCMAJ201_4 CO_CSCMAJ201_7	R, U, A1, A2
Unit-6	Trees (a) Introduction to Tree as a data structure (b) Binary Trees (Insertion, Deletion, Recursive and Iterative Traversals on Binary Search Trees) (c) Threaded Binary Trees (Insertion, Deletion, Traversals) (d) Height-Balanced Trees (Various operations on AVL Trees)	20		
Unit-7	Searching and Sorting (a) Linear Search (b) Binary Search (c) Comparison of Linear and Binary Search (d) Selection Sort (e) Insertion Sort (f) Merge Sort (g) Shell Sort (h) Comparison of Sorting Techniques	5		
Unit-8	Hashing (a) Introduction to Hashing, Deleting from Hash Table, Efficiency of Rehash Methods, Hash Table Reordering (b) Resolving collision by Open Addressing, Coalesced Hashing, Separate Chaining, Dynamic and Extendible Hashing, (c) Choosing a Hash Function, Perfect Hashing Function			

Suggested Readings

1. Adam Drozdek, "Data Structures and algorithm in C++", 3/e, Cengage Learning, 2012.
2. Sartaj Sahni, Data Structures, "Algorithms and applications in C++", 2/e, Universities Press, 2011.
3. Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, "Data Structures Using C and C++", 2/e, PHI, 2009.
4. Robert L. Kruse, "Data Structures and Program Design in C++", Pearson, 1999.
5. D.S Malik, "Data Structure using C++", 2/e, Cengage Learning, 2010.
6. Mark Allen Weiss, "Data Structures and Algorithms Analysis in Java", Pearson Education, 3/e, 2011
7. Aaron M. Tenenbaum, Moshe J. Augenstein, Yedidyah Langsam, "Data Structures Using Java", 2003.
8. Robert Lafore, "Data Structures and Algorithms in Java", 2/e, Pearson/ Macmillan Computer Pub, 2003.
9. John Hubbard, "Data Structures with JAVA", McGraw Hill Education (India) Private Limited, 2/e, 2009.

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10. Goodrich, M. and Tamassia, R. "Data Structures and Algorithms Analysis in Java", 4/e, Wiley, 2013.
11. Herbert Schildt, "Java The Complete Reference (English) Paperback", 9/e, Tata McGraw Hill, 2014.
12. D. S. Malik, P.S. Nair, "Data Structures Using Java", Course Technology, 2003.

Practical (Laboratory)

CSCMAJ201L: Data Structures Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

1. Write a program to search an element from a list. Give user the option to perform Linear or Binary search. Use Template functions.
2. WAP using templates to sort a list of elements. Give user the option to perform sorting using Insertion sort, Bubble sort or Selection sort.
3. Implement Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list and concatenate two linked lists (include a function and also overload operator +).
4. Implement Doubly Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
5. Implement Circular Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
6. Perform Stack operations using Linked List implementation.
7. Perform Stack operations using Array implementation. Use Templates.
8. Perform Queues operations using Circular Array implementation. Use Templates.
9. Create and perform different operations on Double-ended Queues using Linked List implementation.
10. WAP to scan a polynomial using linked list and add two polynomials.
11. WAP to calculate factorial and to compute the factors of a given no. (i) using recursion, (ii) using iteration
12. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
13. WAP to calculate GCD of 2 numbers
(i) with recursion (ii) without recursion
14. WAP to create a Binary Search Tree and include following operations in tree:
(i) Insertion (Recursive and Iterative Implementation)
(ii) Deletion by copying
(iii) Deletion by Merging
(iv) Search a no. in BST
(v) Display its preorder, postorder and inorder traversals Recursively
(vi) Display its preorder, postorder and inorder traversals Iteratively
(vii) Display its level-by-level traversals
(viii) Count the non-leaf nodes and leaf nodes
(ix) Display height of tree
(x) Create a mirror image of tree
(xi) Check whether two BSTs are equal or not
15. WAP to convert the Sparse Matrix into non-zero form and vice-versa.
16. WAP to reverse the order of the elements in the stack using additional stack.
17. WAP to reverse the order of the elements in the stack using additional Queue.
18. WAP to implement Diagonal Matrix using one-dimensional array.
19. WAP to implement Lower Triangular Matrix using one-dimensional array.
20. WAP to implement Upper Triangular Matrix using one-dimensional array.
21. WAP to implement Symmetric Matrix using one-dimensional array.
22. WAP to create a Threaded Binary Tree as per inorder traversal, and implement operations like finding the successor / predecessor of an element, insert an element, inorder traversal.
23. WAP to implement various operations on AVL Tree.

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Name: Signature:	Name: Signature:	Name: Signature:

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SYLLABUS

SEMESTER - IV

Course 24CSCMAJ202

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ202	Object Oriented Programming with Java	3		45	3
24CSCMAJ202L	Object Oriented Programming with Java Lab		1	30	2

Course Objectives:

- To introduce students to the Java programming language.
- To create Java programs that leverage the object-oriented features of the Java language, such as encapsulation, inheritance and polymorphism; use data types, arrays and other data collections;
- To implement I/O functionality to read from and write to text files.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ202_1	Understand the principles and practices of object-oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements.
CO_CSCMAJ202_2	Implement, compile, test and run Java programs comprising more than one class, to address a particular software problem.
CO_CSCMAJ202_3	Demonstrate the principles of object-oriented programming.
CO_CSCMAJ202_4	Demonstrate the ability to use simple data structures like arrays in a Java program.
CO_CSCMAJ202_5	Understand the concept of package, interface, multithreading and File handling in java.
CO_CSCMAJ202_6	Ability to make use of members of classes found in the Java API (such as the Math class).

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√			√			√																			
2	√			√			√																			
3	√			√			√			√																
4	√			√			√			√																
5	√			√			√																			
6	√			√			√			√																

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels

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Unit-1	Introduction to Java - Java Architecture and Features, Understanding the semantic and syntax differences between C++ and Java, - Compiling and Executing a Java Program, - Variables, Constants, Keywords, Data Types, Operators (Arithmetic, Logical and Bitwise) and Expressions, Comments, - Doing Basic Program Output, Decision Making Constructs (conditional statements and loops) and Nesting, - Java Methods - Defining, Scope, Passing and Returning Arguments, - Type Conversion and Type and Checking, Built-in Java Class Methods),	6	CO_CSCMAJ202_1 CO_CSCMAJ202_2	R, U
Unit-2	Arrays, Strings and I/O - Creating & Using Arrays (One Dimension and Multi-dimensional), Referencing Arrays Dynamically, - Java Strings: The Java String class, Creating & Using String Objects, Manipulating Strings, String Immutability & Equality, Passing Strings To & From Methods, - String Buffer Classes. - Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files.	8	CO_CSCMAJ202_1 CO_CSCMAJ202_2 CO_CSCMAJ202_4	R, U, A1
Unit-3	Object-Oriented Programming Overview - Principles of Object-Oriented Programming, Defining & Using Classes, Controlling Access to Class Members, - Class Constructors, Class Variables & Methods, Method Overloading, Objects as parameters, - final classes, Object class, Garbage Collection.	7	CO_CSCMAJ202_1 CO_CSCMAJ202_2 CO_CSCMAJ202_3	R, U, A1, A2,
Unit-4	Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata - Inheritance: (Single Level and Multilevel, Method Overriding, Dynamic Method Dispatch, Abstract Classes), - Interfaces and Packages, Extending interfaces and packages, Package and Class Visibility, - Using Standard Java Packages (util, lang, io, net), - Wrapper Classes, Autoboxing/Unboxing, - Enumerations and Metadata.	14	CO_CSCMAJ202_1 CO_CSCMAJ202_2 CO_CSCMAJ202_3 CO_CSCMAJ202_5	R, U, A1, A2, E,
Unit-5	Exception Handling, Threading, Networking and Database Connectivity - Exception types, uncaught exceptions, throw, built-in exceptions, Creating your own exceptions - Multithreading: Thread class & Runnable interface, creating single & multiple threads, Thread prioritization, synchronization & communication, suspending/resuming threads. - Using java.net package, Overview of TCP/IP and Datagram programming. - Accessing and manipulating databases using JDBC.	15	CO_CSCMAJ202_1 CO_CSCMAJ202_2 CO_CSCMAJ202_3 CO_CSCMAJ202_5	R, U, A1, A2, E, C

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Unit-6	Applets and Event Handling - Java Applets: Introduction to Applets, Writing Java Applets, Working with Graphics, Incorporating Images & Sounds. - Event Handling Mechanisms, Listener Interfaces, Adapter and Inner Classes. - The design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners; Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts. - Overview of servlets.	15	CO_CSCMAJ202_1 CO_CSCMAJ202_2 CO_CSCMAJ202_3 CO_CSCMAJ202_6	R, U, A1, A2, E, C

Suggested Readings

1. Ken Arnold, James Gosling, David Homes, "The Java Programming Language", 4/e, 2005.
2. James Gosling, Bill Joy, Guy L Steele Jr, Gilad Bracha, Alex Buckley, "The Java Language Specification, Java SE (Java Series)", 8/e, Addison Wesley, 2014.
3. Joshua Bloch, "Effective Java" 2/e, Addison-Wesley, 2008.
4. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 1", 9/e, Prentice Hall, 2012
5. Cay S. Horstmann, Gary Cornell, "Core Java 2 Volume 2 - Advanced Features", 9/e, Prentice Hall, 2013.
6. Bruce Eckel, "Thinking in Java", 3/e, PHI, 2002.
7. E. Balaguruswamy, "Programming with Java", 4/e, McGraw Hill.2009.
8. Paul Deitel, Harvey Deitel, "Java: How to Program", 10/e, Prentice Hall, 2011.
9. Bert Bates, Kathy Sierra, "Head First Java", Orielly Media Inc. 2/e, 2005.
10. "Object Oriented Programming through JAVA", P Radha Krishna, University Press.
11. David J. Eck, "Introduction to Programming Using Java", CreateSpace Independent Publishing Platform, 2009.
12. John R. Hubbard, "Programming with JAVA", Schaum's Series, 2/e, 2004.
13. R. Nageswara, "Core Java: An Integrated Approach", Dreamtech Press.

Practical (Laboratory)

CSCMAJ202L: Programming in JAVA Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. To find the sum of any number of integers entered as command line arguments
2. To find the factorial of a given number
3. To learn use of single dimensional array by defining the array dynamically.
4. To learn use of **.length** in case of a two dimensional array
5. To convert a decimal to binary number
6. To check if a number is prime or not, by taking the number as input from the keyboard
7. To find the sum of any number of integers interactively, i.e., entering every number from the keyboard, whereas the total number of integers is given as a command line argument
8. Write a program that show working of different functions of String and StringBuffer classes like setCharAt(), setLength(), append(), insert(), concat() and equals().
9. Write a program to create a "distance" class with methods where distance is computed in terms of feet and inches, how to create objects of a class and to see the use of this pointer
10. Modify the "distance" class by creating constructor for assigning values (feet and inches) to the distance object. Create another object and assign second object as reference variable to another object reference variable. Further create a third object which is a clone of the first object.
11. Write a program to show that during function overloading, if no matching argument is found, then java will apply automatic type conversions (from lower to higher data type)

SYLLABUS

12. Write a program to show the difference between public and private access specifiers. The program should also show that primitive data types are passed by value and objects are passed by reference and to learn use of final keyword
13. Write a program to show the use of static functions and to pass variable length arguments in a function.
14. Write a program to demonstrate the concept of boxing and unboxing.
15. Create a multi-file program where in one file a string message is taken as input from the user and the function to display the message on the screen is given in another file (make use of Scanner package in this program).
16. Write a program to create a multilevel package and also creates a reusable class to generate Fibonacci series, where the function to generate Fibonacci series is given in a different file belonging to the same package.
17. Write a program that creates illustrates different levels of protection in classes/subclasses belonging to same package or different packages
18. Write a program “DivideByZero” that takes two numbers a and b as input, computes a/b, and invokes Arithmetic Exception to generate a message when the denominator is zero.
19. Write a program to show the use of nested try statements that emphasizes the sequence of checking for catch handler statements.
20. Write a program to create your own exception types to handle situation specific to your application (Hint: Define a subclass of Exception which itself is a subclass of Throwable).
21. Write a program to demonstrate priorities among multiple threads.
22. Write a program to demonstrate multithread communication by implementing synchronization among threads (Hint: you can implement a simple producer and consumer problem).
23. Write a program to create URL object, create a URL Connection using the openConnection() method and then use it examine the different components of the URL and content.
24. Write a program to implement a simple datagram client and server in which a message that is typed into the server window is sent to the client side where it is displayed.
25. Write a program that creates a Banner and then creates a thread to scrolls the message in the banner from left to right across the applet’s window.
26. Write a program to get the URL/location of code (i.e. java code) and document (i.e. html file).
27. Write a program to demonstrate different mouse handling events like mouseClicked(), mouseEntered(), mouseExited(), mousePressed, mouseReleased() and mouseDragged().
28. Write a program to demonstrate different keyboard handling events.
29. Write a program to generate a window without an applet window using main() function.
30. Write a program to demonstrate the use of push buttons

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SYLLABUS

Course 24CSCMAJ203

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ203	Computer Organisation & Architecture	3		45	3
24CSCMAJ203L	Computer Organisation & Architecture LAB		1	30	2

Course Objectives:

The course covers the basic principles of computer organization and architecture.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ203_1	Be familiar with the building blocks of modern computers
CO_CSCMAJ203_2	Understand binary, octal and hexadecimal number systems
CO_CSCMAJ203_3	Understand the fundamentals of different instruction set architectures and their relationship to the CPU design.
CO_CSCMAJ203_4	Understand the principles and the implementation of computer arithmetic using digital logic.
CO_CSCMAJ203_5	Understand memory organisation

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√				√																					
2	√				√																					
3	√				√																					
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5	√				√																					

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy
Unit – I	Data representation - Number Systems & Complements - Fixed-point, floating-point and character representation - Addition, subtraction, magnitude comparison, multiplication and division algorithms for integers.	6	CO_CSCMJ104_1 CO_CSCMJ104_2	R, U, A1,
Unit-2	Memory and I/O Unit - Memory hierarchy - Main memory - Cache, Auxiliary and associative memory - Input / Output: External Devices - I/O Modules : Interfaces - Programmed I/O - Interrupt-Driven I/O	6	CO_CSCMJ104_5, CO_CSCMJ104_1	R, U

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	○ Direct Memory Access, I/O Channels.			
Unit-3	Overview of register transfer and micro operations - Register Transfer Language, Register transfer. - Bus and Memory transfer - Arithmetic, Logic & Shift Micro-operations. - Arithmetic Logic Shift Unit.	8	CO_ CSCMJ104_3	R, U, A1
Unit-4	Basic Computer Organization and Design - Instruction codes, Computer registers - Computer instructions. - Timing and Control, Instruction cycle. - Register, I/O, Memory-Reference Instructions - Input-output and interrupt. - Design of Basic computer, Design of Accumulator Unit	8	CO_ CSCMJ104_2, CO_ CSCMJ104_1	R, U, A1, A2
Unit-5	Central Processing Unit - Introduction, General Register Organization, Stack Organization - Instruction format. - Addressing Modes - Data transfer and manipulation - Program Control, Reduced Instruction Set Computer (RISC).	6	CO_ CSCMJ104_4	R, U, A1, A2
Unit -6	Pipeline and Parallel Processing - Parallel Processing - Pipelining - Arithmetic Pipeline - Instruction Pipeline - RISC Pipeline	6	CO_ CSCMJ104_4	R, U, A1, A2

Suggested Readings

1. M. Mano, "Computer System Architecture", Pearson Education 1992.
2. A. J. Dos Reis, "Assembly Language and Computer Architecture using C++ and JAVA", Course Technology, 2004.
3. W. Stallings, "Computer Organization and Architecture - Designing for Performance", 8/e, Prentice Hall of India, 2009.
4. M.M. Mano, "Digital Design", Pearson Education Asia, 2013.
5. Carl Hamacher, "Computer Organization", 5/e, McGraw Hill, 2012.

SYLLABUS

Practical (Laboratory)

CSCMAJ203L: Computer Organisation & Architecture Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of problems:

1. General study of Basic & Universal gates
 - a) AND b) OR c) NOT d) NOR
 - e) NAND f) XOR g) XNOR
2. Simple Boolean Expression using Basic gates and Universal gates:
 $\bar{A}.(B+A) + \bar{B}.A$
3. Design Half-Adder, Full-Adder, Half-Subtractor, Full-Subtractor Circuit.
4. Parallel Adder (2-bit, 3-bit) Circuit.
5. Implement logic functions in SOP form using Multiplexer.
6. Implement De-multiplexer.
7. Implement 7- Segment Display with Decoder.
8. Implement Parity Generator (Odd & Even)
9. Implement Magnitude Comparator (1-bit, 2-bit, 3-bit)
10. Circuit Design and implementation of Flip-Flops (SR, JK, D) using ICs
11. Circuit design and implementation of Decoder (2x4) and Encoder (4x2) using ICs

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SEMESTER – V

Course 24CSCMAJ301

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ301	Operating Systems	3		45	3
24CSCMAJ301L	Operating Systems LAB		1	30	2

Course Objectives:

The objective of the course is to provide basic knowledge of computer operating system structures and functioning.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ301_1	Understand the difference between different types of modern operating systems, virtual machines and their structure of implementation and applications.
CO_CSCMAJ301_2	Understand the difference between process & thread, issues of scheduling of user level processes / threads and their issues & use of locks, semaphores, monitors for synchronizing multiprogramming with multithreaded systems and implement them in multithreaded programs.
CO_CSCMAJ301_3	Gain knowledge about the concepts of deadlock in operating systems and how they can be managed / avoided and implement them in multiprogramming system.
CO_CSCMAJ301_4	Demonstrate the design and management concepts along with issues and challenges of main memory, virtual memory and file system.
CO_CSCMAJ301_5	Understand the types of I/O management, disk scheduling, protection and security problems faced by operating systems and how to minimize these problems.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction a) Basic OS functions, resource abstraction, types of operating systems– multiprogramming systems, batch systems, time sharing systems b) Operating systems for personal computers & workstation`s, process control & real time systems Operating System Organization	8	CO_CSCMAJ301_1	R, U, A1

SYLLABUS

	System Components, Operating-System Services, System Calls, System Programs, System Structure, Virtual Machines.			
Unit-2	Process Management (a) System view of the process and resources, process abstraction, process hierarchy, threads, threading issues, thread libraries (b) Process Scheduling, non-pre-emptive and pre-emptive scheduling algorithms (c) Inter-process communication	8	CO_CSCMAJ301_2, CO_CSCMAJ301_3	R, U, A1
Unit-3	Process Synchronization (a) Background, The Critical-Section Problem (b) Synchronization Hardware, Semaphores, Classic Problems of Synchronization. Deadlocks (c) System Model, Deadlock Characterization (d) Methods for Handling Deadlocks – Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.	10		
Unit-4	CPU Scheduling CPU Scheduling concepts; Scheduling criteria; Scheduling algorithms; Overview of thread scheduling	6		
Unit-4	Memory Management (a) Physical and virtual address space (b) Memory allocation strategies -fixed and variable partitions, paging, segmentation, virtual memory	8	CO_CSCMAJ301_4	R, U, A1, A2
Unit-5	Linux File and I/O Management (a) Directory structure, file operations, file allocation methods, device management (b) Basic shell programming	5	CO_CSCMAJ301_5	R, U, A1, A2

Suggested Readings

1. A Silberschatz, P.B. Galvin, G. Gagne, “Operating Systems Concepts”, 8th Edition, John Wiley Publications 2008.
2. A.S. Tanenbaum, “Modern Operating Systems”, 3/e, Pearson Education 2007.
3. G. Nutt, “Operating Systems: A Modern Perspective”, 2/e, Pearson Education 1997.
4. W. Stallings, “Operating Systems, Internals & Design Principles”, 5/e, Prentice Hall of India. 2008.
5. M. Milenkovic, “Operating Systems - Concepts and design”, Tata McGraw Hill 1992.
6. “Operating Systems”, A K Sharma, University Press.

Practical (Laboratory)

CSCMAJ301L: Operating Systems Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

[Core concepts using C programming]

1. Simulate the following CPU scheduling algorithms.
(a) FCFS b) SJF c) Round Robin d) Priority.
2. Simulate Bankers Algorithm for Dead Lock Avoidance
3. Write a program to implement kill(), raise() and sleep() functions.
4. Write a program to implement alarm(), pause() and abort() functions
5. Write a program that illustrates communication between two process using named pipes or FIFO.

SYLLABUS

6. Write a program that receives a message from message queue and display them.
7. Write a program that illustrates two processes communicating using Shared memory.
8. Simulate all page replacement algorithms a) FIFO b) LRU c) OPTIMAL
9. Write a program to create child process and allow parent process to display “parent” and the child to display “child” on the screen
10. Write a program to simulate disk scheduling algorithms. a) FCFS b) SCAN c) C-SCAN

[Linux OS - Implement the followings using Bash Shell Script]

1. Evaluate : $1 * 2^3 + 2 * 4^3 + 3 * 6^3 + \dots$ up to n terms
2. Evaluate : $1^2 + 3^2 + 6^2 + 10^2 + \dots$ up to n terms
3. Evaluate : $1 * 3^2 + 2 * 5^2 + 3 * 7^2 + \dots$ up to n terms
4. Evaluate : $1 - 2 + 3 - 4 + \dots$ up to n terms
5. Print the following:

*	5 4 3 2 1	1	* * * * *
**	4 3 2 1	1 2	*
***	3 2 1	1 2 3	* * * * *
****	2 1	1 2 3 4	* * * *
*****	1	1 2 3 4 5	* * *
			* *
			*

6. Find the factorial of a number.
7. Find HCF and LCM of 2/3 numbers.
8. Check whether a given year is leap year or not.
9. Find the sum of squares of the digits of a number.
10. Find the Armstrong numbers between 100 & 999.
11. Check whether a given number is prime or not.
12. Print all the prime numbers between 1 & 100.
13. Print the multiplication table of a number.
14. Check whether a number is perfect square or not.
15. Find the first and last digit of any number and find their product.
16. Find the Area of Circle, Rectangle, or Triangle using user-input.
17. Find the prime factors of a number.
18. Convert a decimal number to binary.
19. Convert a binary number to decimal.
20. Check whether a given string is palindrome or not.
21. Abbreviate a name.
22. Reverse a string.
23. Find the largest and smallest numbers from a list of 10 integers.
24. Find the numbers and their sums between 100 to 300 which are divisible by 3 and 7.
25. Calculate ${}^nC_r$ using function.

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SYLLABUS

Course 24CSCMAJ302

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ302	Computer Networks	3		45	3
24CSCMAJ302L	Computer Networks LAB		1	30	2

Course Objectives:

The objective of this course is to introduce students to the fundamental principles and concepts of computer networks. By the end of this course, students should have a solid understanding of network architectures, protocols, and technologies. They will also gain practical knowledge of data communication, switching techniques, data link layer functions, network layer functions, and transport layer functions.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ302_1	Understand the basic principles of computer networks, network topologies, and classifications
CO_CSCMAJ302_2	Explain the functioning and structure of network protocols
CO_CSCMAJ302_3	Describe the layered network architecture and the OSI reference model
CO_CSCMAJ302_4	Analyse and compare different switching techniques and access mechanisms
CO_CSCMAJ302_5	Demonstrate knowledge of data link layer functions and protocols
CO_CSCMAJ302_6	Understand the concept and implementation of multiple access protocols in network environments
CO_CSCMAJ302_7	Explain the functions and protocols of network and transport layers
CO_CSCMAJ302_8	Identify and discuss various application layer protocols and their significance in network communications

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
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8										√			√													

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to Computer Networks (a) Definition and importance of computer networks (b) Network topologies and classifications (c) Overview of network protocols (d) Layered network architecture (e) Introduction to the OSI reference model (f) Overview of the TCP/IP protocol suite	8	CO_CSCMAJ302_?	R, U, A1

SYLLABUS

Unit-2	Data Communication Fundamentals and Techniques (a) Analog and digital signals (b) Digital-to-digital line encoding schemes (c) Pulse code modulation (d) Parallel and serial transmission techniques (e) Digital-to-analog modulation (f) Multiplexing techniques (FDM, TDM) (g) Transmission media	10	CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1
Unit-3	Networks Switching Techniques and Access Mechanisms (a) Circuit switching and its characteristics (b) Packet switching: connectionless datagram switching and connection-oriented virtual circuit switching (c) Introduction to dial-up modems and digital subscriber line (DSL) technology	10		
Unit-4	Data Link Layer Functions and Protocol (a) Error detection and error correction techniques (b) Data-link control: framing and flow control (c) Error recovery protocols: stop and wait ARQ, go-back-n ARQ (d) Point-to-Point Protocol (PPP) on the Internet	10		
Unit-5	Multiple Access Protocol and Networks (a) CSMA/CD and CSMA/CA protocols (b) Ethernet LANs (c) Connecting LAN and backbone networks: repeaters, hubs, switches, bridges, routers, and gateways	5		
Unit-6	Network Layer Functions and Protocols (a) Routing principles and algorithms (b) Overview of the Internet Protocol (IP) (c) Introduction to Internet control protocols	6		
Unit-7	Transport Layer Functions and Protocols (a) Transport services: error control and flow control (b) Connection establishment and release: three-way handshaking	6		
Unit-8	Overview of Application Layer Protocols (a) Introduction to DNS protocol (b) Overview of the World Wide Web (WWW) and HTTP protocol	5		

Suggested Readings

1. B. A. Forouzan: "Data Communications and Networking", 4/e, THM, 2007.
2. A. S. Tanenbaum: "Computer Networks", 4/e, PHI, 2002.
3. Dr. Rakesh Kumar Mandal: "Computer Networks for Students", 1/e, SPD, 2018.

Practical (Laboratory)

CSCMAJ302L: Computer Networks Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

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Unit-1	1. Simulate setting up a small network with two computers and a switch. Configure network settings (IP address, subnet mask, default gateway) for communication. 2. Practice using basic network utilities like ping, traceroute, and ipconfig (Windows) or ifconfig (Linux) to diagnose connectivity and identify routes.
Unit-2	1. Explore different data representation methods like ASCII and binary. Convert between them and understand how data is packaged for transmission. 2. Implement simple error detection techniques like checksum. Simulate data transmission with errors and use checksums to verify data integrity.
Unit-3	1. Identify a hub, a switch, and a router in a network. 2. Compare and contrast packet switching and circuit switching by simulating data transfer scenarios for each. 3. Differentiate between hubs and switches by observing their behaviour in a simulated network setup.
Unit-4	1. Analyse the structure of an Ethernet frame, identifying fields like source and destination MAC addresses, data type, and error checking mechanisms. 2. Simulate ARP functionality by observing how MAC addresses are resolved for given IP addresses.
Unit-5	1. Simulate a network using CSMA/CD and observe how collisions are handled during data transmission. 2. Explore different Wi-Fi standards like 802.11g or 802.11n and their impact on network performance.
Unit-6	1. Practice creating subnets from a larger network address block. Configure IP addresses and subnet masks for devices on a simulated network. 2. Simulate basic routing using static routes. Explore the concept of hop count and how routers make forwarding decisions.
Unit-7	1. Compare TCP and UDP in terms of reliability, connection establishment, and suitability for different applications. 2. Identify and explain the role of well-known port numbers used by common applications (e.g., port 80 for HTTP).
Unit-8	1. Simulate a simple web client to understand how HTTP requests and responses work. 2. Explore how DNS translates domain names to IP addresses and simulate resolving a website address using a command-line tool.

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SYLLABUS

Course 24CSCMAJ303

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ303	Introduction to Artificial Intelligence	3		45	3
24CSCMAJ303L	Introduction to Artificial Intelligence LAB		1	30	2

Course Objectives:

The objective of this course is to explore the foundational skills on AI techniques acquired in theory in solving problems and using sample data sets and various tools prepare themselves for careers in AI industry.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ303_1	Explain what constitutes "Artificial" Intelligence and how to identify systems with Artificial Intelligence.
CO_CSCMAJ303_2	Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem
CO_CSCMAJ303_3	Formalise a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem, etc.)
CO_CSCMAJ303_4	Implement basic AI algorithms (e.g., standard search or constraint propagation algorithms).
CO_CSCMAJ303_5	Explain the limitations of current Artificial Intelligence techniques.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√																									
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3	√			√						√																
4	√			√						√																
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Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction a) Introduction to Artificial Intelligence b) Background and Applications c) Turing Test and Rational Agent approaches to AI d) Introduction to Intelligent Agents, their structure, behaviour and environment	6		R, U, A1
Unit-2	Problem Solving and Searching Techniques (a) Problem Characteristics, (b) Production Systems, (c) Control Strategies,	20		R, U, A1

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	(d) Breadth First Search, (e) Depth First Search, (f) Hill climbing and its Variations, (g) Heuristics Search Techniques: Best First Search, A* algorithm, (h) Constraint Satisfaction Problem, (i) Means-End Analysis, (j) Introduction to Game Playing, Min-Max and Alpha-Beta pruning algorithms			
Unit-3	Knowledge Representation (a) Introduction to First Order Predicate Logic (b) Resolution Principle (c) Unification (d) Semantic Nets (e) Conceptual Dependencies (f) Frames, and Scripts (g) Production Rules (h) Conceptual Graphs (i) Programming in Logic (PROLOG)	20		R, U, A1
Unit-4	Dealing with Uncertainty and Inconsistencies (a) Truth Maintenance System (b) Default Reasoning (c) Probabilistic Reasoning (d) Bayesian Probabilistic Inference (e) Possible World Representations	8		R, U, A1, A2
Unit-5	Understanding Natural Languages (a) Parsing Techniques (b) Context-Free and Transformational Grammars (c) Recursive and Augmented Transition Nets	8		R, U, A1, A2

Suggested Readings:

1. DAN.W. Patterson, Introduction to A.I and Expert Systems – PHI, 2007.
2. Russell & Norvig, Artificial Intelligence-A Modern Approach, LPE, Pearson Prentice Hall, 2nd edition, 2005.
3. Rich & Knight, Artificial Intelligence – Tata McGraw Hill, 2nd edition, 1991.
4. W.F. Clocksin and Mellish, Programming in PROLOG, Narosa Publishing House, 3rd edition, 2001.
5. Ivan Bratko, Prolog Programming for Artificial Intelligence, Addison-Wesley, Pearson Education, 3rd edition, 2000.

Practical (Laboratory)

CSCMAJ303L: Artificial Intelligence Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	1. Explore the concept of a rational agent. Provide examples of rational and non-rational behaviours in different scenarios. 2. Design a simple reflex agent in Python to navigate a grid-based environment. Test the agent with different initial configurations and obstacles. 3. Implement a model-based reflex agent capable of maintaining an internal state. Use this agent to solve a more complex navigation problem with dynamic obstacles.
Unit-2	1. Develop a Python program to solve the Tower of Hanoi puzzle using a recursive algorithm. Analyse the time complexity of the algorithm for different numbers of disks. 2. Implement iterative deepening depth-first search (IDDFS) in Python and compare its performance with depth-first search and breadth-first search on various search problems. 3. Apply a genetic algorithm in Python to solve the traveling salesman problem. Experiment with different mutation and crossover operators to optimize the solution.

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Unit-3	1. Design a knowledge base using propositional logic to represent facts about a smart home environment. Use logical operators to encode rules for automated actions. 2. Develop an ontology using Protégé or a similar tool to represent concepts and relationships in a specific domain (e.g., transportation, healthcare). Populate the ontology with instances and define axioms. 3. Implement a semantic parser in Python to extract structured information from unstructured text data. Use regular expressions and syntactic analysis techniques to identify entities and relationships.
Unit-4	1. Construct a Bayesian network in Python to model the relationship between symptoms and diseases in a medical diagnosis scenario. Use Bayesian inference to update beliefs based on observed evidence. 2. Develop a fuzzy logic system in Python to control a simple robotic arm. Define fuzzy sets for input variables (e.g., distance, angle) and rules for motor control. 3. Experiment with inconsistency handling in a knowledge base using truth maintenance systems (TMS). Implement a TMS algorithm in Python and apply it to resolve conflicts in a set of logical assertions.
Unit-5	1. Build a sentiment analysis system in Python using machine learning techniques (e.g., Naive Bayes, SVM) and a dataset of customer reviews. Evaluate the performance of the classifier using cross-validation. 2. Implement a simple chatbot in Python using rule-based and retrieval-based techniques. Train the chatbot on a corpus of conversational data and test its ability to generate appropriate responses.

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SYLLABUS

SEMESTER - VI

Course 24CSCMAJ305

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ305	Digital Marketing	4		60	4

Course Objectives:

The aim of the Digital Marketing Course is to provide students with the knowledge about business advantages of the digital marketing and its importance for marketing success; to develop a digital marketing plan; to make SWOT analysis; to define a target group; to get introduced to various digital channels, their advantages and ways of integration; how to integrate different digital media and create marketing content; how to optimize a Website and SEO optimization; how to create Google AdWords campaigns; social media planning; to get basic knowledge of Google Analytics for measuring effects of digital marketing and getting insight of future trends that will affect the future development of the digital marketing. The application of the gained knowledge, skills and competences will help future managers in forming digital marketing plan in order to manage a digital marketing performance efficiently.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_ CSCMAJ305_1	Identify the importance of the digital marketing for marketing success
CO_ CSCMAJ305_2	Manage customer relationships across all digital channels and build better customer relationships
CO_ CSCMAJ305_3	Create a digital marketing plan, starting from the SWOT analysis and defining a target group, then identifying digital channels, their advantages and limitations, to perceiving ways of their integration taking into consideration the available budget

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√							√																		
2	√							√		√	√	√							√		√	√				
3	√							√		√	√	√							√		√	√				

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	- Introduction to the Course and Work plan - Introduction of the digital marketing - Digital vs. Real Marketing - Digital Marketing Channels	3	CO_CSCMAJ305_?	R, U, A1
Unit-2	- Creating initial digital marketing plan - Content management - SWOT analysis - Target group analysis - EXERCISE: Define a target group (working in groups)	3	CO_CSCMAJ305_? CO_CSCMAJ305_?	R, U, A1
Unit-3	- Web design - Optimization of Web sites - MS Expression Web	3	CO_CSCMAJ305_? CO_CSCMAJ305_? CO_CSCMAJ305_?	R, U, A1

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	EXERCISE: Creating web sites, MS Expression (working in groups)			
Unit-4	- SEO Optimization - Writing the SEO content - Exercise: Writing the SEO content (working in groups)	3	CO_CSCMAJ305_? CO_CSCMAJ305_? CO_CSCMAJ305_?	R, U, A1, A2
Unit-5	- Google AdWords- creating accounts - Google AdWords- types - Exercise: Google AdWords (working in groups)	3	CO_CSCMAJ305_? CO_CSCMAJ305_? CO_CSCMAJ305_?	R, U, A1, A2
Unit-6	- Introduction to CRM - CRM platform - CRM models - Exercise: CRM strategy (working in groups)	3	CO_CSCMAJ305_? CO_CSCMAJ305_? CO_CSCMAJ305_?	R, U, A1, A2
Unit-7	- Introduction to Web analytics - Web analytics – levels - Introduction of Social Media Marketing - Exercise: Social Media Marketing plan (working in groups)	3	CO_CSCMAJ305_? CO_CSCMAJ305_? CO_CSCMAJ305_?	R, U, A1, A2, E, C
Unit-8	- Creating a Facebook page - Visual identity of a Facebook page - Types of publications - Exercise: Making a Facebook page (working in groups)	3		
Unit-9	- Business opportunities and Instagram options - Optimization of Instagram profiles - Integrating Instagram with a Web Site and other social networks - Keeping up with posts	3		
Unit-10	- Business tools on LinkedIn - Creating campaigns on LinkedIn - Analysing visitation on LinkedIn	3		
Unit-11	- Creating business accounts on YouTube - YouTube Advertising - YouTube Analytics	3		
Unit-12	- Facebook Ads - Creating Facebook Ads - Ads Visibility	3		
Unit-13	- E-mail marketing - E-mail marketing plan - E-mail marketing campaign analysis - Keeping up with conversions	3		
Unit-14	Digital Marketing Budgeting - resource planning - cost estimating - cost budgeting - cost control	3		
Unit-15	Recapitulation: - lessons learned - student satisfaction survey - closing	3		

Suggested Readings

1. Ryan, D: “Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation”, Kogan Page Limited, 2014.
2. Pulizzi, J: “The Beginner's Guide to Digital Marketing”, Epic Content Marketing, 2015.
3. Pulizzi, J: “Digital Marketer”, Mcgraw Hill Education, 2014.

SYLLABUS

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name: Signature:	Name: Signature:	Name: Signature:

(Seal)

(Seal)

(College Seal)

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Course 24CSCMAJ305

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ305	Information Security	3		45	3
24CSCMAJ305L	Information Security LAB		1	30	2

Course Objectives:

- To know why security and its management are important for any modern organization
- To select appropriate techniques to tackle and solve problems in the discipline of information security management;

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_ CSCMAJ305_1	Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
CO_ CSCMAJ305_2	Gain familiarity with prevalent network and distributed system attacks, defences against them, and forensics to investigate the aftermath.
CO_ CSCMAJ305_3	Develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
CO_ CSCMAJ305_4	Develop an understanding of security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√	√						√							√			√								
2	√	√						√							√			√								
3	√	√						√							√			√								
4	√	√						√							√			√								

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction (a) Security (b) Attacks (c) Computer criminals (d) Security services (e) Security mechanisms	5	CO_CSCMAJ306_?	R, U, A1
Unit-2	Cryptography (a) Substitution cipher (b) Transposition cipher (c) Confusion and Diffusion (d) Symmetric and asymmetric encryption (e) Data Encryption Standard (DES) and modes of DES (f) Hash function	10	CO_CSCMAJ306_? CO_CSCMAJ306_?	R, U, A1

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	(g) Key exchange (h) Digital signatures (i) Digital certificates			
Unit-3	Program Security (a) Secure programs (b) Non-malicious program errors (c) Malicious code viruses (d) Trap doors (e) Salami attacks (f) Covert channels (g) Control mechanisms	10	CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_?	R, U, A1
Unit-4	Threats (a) Protection in OS (b) Memory and address protection (c) Access control (d) File protection (e) User authentication	10	CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_?	R, U, A1, A2
Unit-5	Database Security (a) Requirements (b) Reliability (c) Integrity (d) Sensitive data (e) Inference (f) Multi-level security	10	CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_?	R, U, A1, A2
Unit-6	Network Security (a) Network threats (b) Security controls (c) Firewalls (d) Intrusion detection systems (e) Secure emails	10	CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_?	R, U, A1, A2
Unit-7	Security Administration (a) Security planning (b) Risk analysis (c) Organisational security policy (d) Physical security (e) Ethical issues in security (f) Program and data protection (g) Information and Law	5	CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_? CO_CSCMAJ306_?	R, U, A1, A2, E, C

Suggested Readings

1. C. P. Pfleeger, S. L. Pfleeger: "Security in Computing", Prentice Hall of India, 2006.
2. W. Stallings: "Network Security Essentials: Applications and Standards", 4/e, 2010.

Practical (Laboratory)

CSCMAJ305L: Information Security LAB

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	Security Concepts: <i>Prepare a presentation on the following, segregated by topics</i> • Information security and its importance in modern computing. • Discuss the CIA Triad and its relevance in information security. • Explain the difference between confidentiality, integrity, and availability in the context of information security. Attacks: • Describe common types of cyber-attacks, such as phishing, malware, and DDoS attacks.

	• Provide examples of social engineering attacks and their potential impact on organizations. • Explain the difference between active and passive attacks in the context of network security. Computer Criminals: • Discuss the motivations behind cybercrime. • Identify different categories of cybercriminals, such as hackers, crackers, and script kiddies. • Analyse recent cybercrime incidents and their implications for information security. Security Services: • Define authentication, authorization, and accounting (AAA) services. • Explain how encryption provides confidentiality in data communication. • Discuss the role of access control mechanisms in ensuring security within an organization. Security Mechanisms: • Compare and contrast symmetric and asymmetric encryption algorithms. • Explain how digital signatures provide integrity and non-repudiation in electronic transactions. • Describe the use of firewalls and intrusion detection systems (IDS) in network security.
Unit-2	Substitution Cipher: • Implement a simple substitution cipher algorithm in C/C++/Python and encrypt a given message. • Decrypt a message encrypted with a substitution cipher without knowing the key. • Discuss the weaknesses of the simple substitution cipher and how they can be exploited. Transposition Cipher: • Implement a transposition cipher algorithm in a programming language of your choice. • Encrypt a message using a transposition cipher and a given key. • Decrypt a message encrypted with a transposition cipher without knowing the key. Confusion and Diffusion: • Explain the concepts of confusion and diffusion in cryptography. • Discuss how substitution and transposition ciphers provide confusion and diffusion, respectively. • Provide examples of modern cryptographic algorithms that employ confusion and diffusion techniques. Symmetric and Asymmetric Encryption: • Compare and contrast symmetric and asymmetric encryption algorithms. • Implement symmetric encryption using a library like PyCryptodome in Python. • Generate a key pair and demonstrate asymmetric encryption and decryption using RSA or ElGamal algorithm. Data Encryption Standard (DES) and Modes of DES: • Implement the Data Encryption Standard (DES) algorithm in C/C++/Python. • Demonstrate different modes of DES, such as Electronic Codebook (ECB) and Cipher Block Chaining (CBC), and compare their strengths and weaknesses. • Discuss the limitations of DES and the need for more secure encryption algorithms. Hash Function: • Implement a hash function such as MD5 or SHA-256 in C/C++/Python. • Calculate the hash value of a given message and verify its integrity by comparing hashes. • Discuss collision resistance and how it impacts the security of hash functions. Key Exchange: • Explain the need for key exchange protocols in secure communication. • Implement the Diffie-Hellman key exchange algorithm in C/C++/Python. • Exchange keys securely between two parties and demonstrate how they can be used for symmetric encryption. Digital Signatures: • Implement a digital signature algorithm such as RSA or DSA in C/C++/Python. • Sign a message using a private key and verify the signature using the corresponding public key. • Discuss the importance of digital signatures in ensuring message integrity and authenticity. Digital Certificates: • Explain the purpose of digital certificates in public key infrastructure (PKI). • Obtain a digital certificate from a trusted certificate authority (CA) or generate a self-signed certificate. • Use the certificate to establish secure communication between two parties using SSL/TLS protocol.

Unit-3	Secure Programs: - Implement a simple program that demonstrates secure coding practices, such as input validation and output sanitization, to prevent common vulnerabilities like buffer overflows and injection attacks. - Create a program that securely handles sensitive information, such as passwords, using encryption and secure storage techniques. Non-Malicious Program Errors: - Develop a program with intentional non-malicious errors, such as null pointer dereferences or division by zero, and demonstrate how to identify and fix them using debugging tools like GDB or Valgrind. - Write a program that handles exceptions gracefully and provides informative error messages to users without exposing sensitive information. Viruses: - Create a simple virus program that infects other executable files within a simulated file system. - Implement a program that detects and removes viruses using signature-based or behaviour-based detection techniques. Trap Doors: - Develop a program with a hidden backdoor or trap door that allows unauthorized access to certain functionalities or data. - Implement a mechanism to detect and mitigate trap doors in existing software systems. Salami Attacks: - Simulate a salami attack by writing a program that systematically steals small amounts of resources, such as processing power or network bandwidth, without triggering detection mechanisms. - Design and implement a defence mechanism to detect and prevent salami attacks in a network or system. Covert Channels: - Create a covert channel within a network communication program that allows covert communication between two parties without raising suspicion. - Develop a program that detects and monitors covert channels by analysing network traffic patterns and anomalies. Control Mechanisms: - Implement access control mechanisms, such as role-based access control (RBAC) or discretionary access control (DAC), in a multi-user operating system environment. - Develop a program that enforces security policies, such as mandatory access control (MAC) or integrity verification, to prevent unauthorized access or tampering with system resources.
Unit-4	Protection in Operating Systems: <i>Prepare a presentation on the following</i> - Explain the concept of protection in operating systems and its importance in ensuring system security. - Compare and contrast the approaches to protection in different operating systems, such as Unix/Linux and Windows. - Discuss the principles of least privilege and separation of privileges in the context of protection. Memory and Address Protection: - Implement a program in C/C++ that demonstrates buffer overflow vulnerability and its potential impact on system security. - Utilize memory protection mechanisms, such as Address Space Layout Randomization (ASLR) and Data Execution Prevention (DEP), to mitigate buffer overflow attacks. - Explain how virtual memory and memory segmentation contribute to memory protection in modern operating systems. Access Control: - Set up a multi-user environment on a Unix/Linux system and implement access control lists (ACLs) to restrict file access permissions for different users and groups. - Compare discretionary access control (DAC) and mandatory access control (MAC) models and their suitability for different security requirements. - Discuss the role of access control matrices in defining and enforcing access rights in operating systems. File Protection:

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	- Adopt a file system with multiple files and directories, and implement file protection mechanisms, such as file permissions and encryption, to control access to sensitive data. - Implement file integrity checking mechanisms, such as cryptographic hash functions, to detect unauthorized modifications to files. - Discuss the challenges of file protection in distributed file systems and cloud computing environments. User Authentication: - Implement a simple user authentication system using username/password credentials stored securely in a password file. - Explore alternative authentication methods, such as biometric authentication or two-factor authentication (2FA), and compare their strengths and weaknesses. - Enlist the importance of password policies, such as password complexity requirements and expiration periods, in ensuring robust user authentication.
Unit-5	Security Requirements: - Define the security requirements for a database system, considering factors such as confidentiality, integrity, availability, and accountability. - Discuss the importance of enforcing access controls, auditing mechanisms, and encryption techniques to meet security requirements. Reliability and Integrity: - Implement a database schema with integrity constraints, such as primary keys, foreign keys, and check constraints, to ensure data reliability and integrity. - Design and execute SQL queries to validate data integrity and identify any violations of integrity constraints. - Discuss the role of transaction management and concurrency control mechanisms in maintaining data consistency and reliability. Sensitive Data Protection: - Identify sensitive data elements within a database, such as personally identifiable information (PII), financial records, or proprietary information. - Implement data masking and encryption techniques to protect sensitive data at rest and in transit. - Design and implement access controls to restrict access to sensitive data based on user roles and privileges. Inference Control: - Explore the concept of inference control and its importance in preventing unauthorized disclosure of sensitive information through indirect means. - Analyse a database schema and query patterns to identify potential inference vulnerabilities. - Implement inference control mechanisms, such as view-level security and aggregation restrictions, to mitigate inference risks. Multi-level Security: - Explore multi-level security (MLS) model for a database system that supports different security clearance levels for users and data objects. - Demonstrate how MLS policies enforce information flow control and prevent unauthorized access to classified information. - Discuss the challenges of implementing and maintaining MLS in a dynamic and heterogeneous computing environment.
Unit-6	Network Threats: - Explain and differentiate between internal and external network threats. - Identify common types of network threats such as malware, phishing, DDoS attacks, and man-in-the-middle attacks. - Explain how network vulnerabilities can be exploited by attackers. Security Controls: - Describe the role of access control mechanisms in network security. - Discuss the importance of encryption in securing data transmission over networks. - Explain the concept of network segmentation and its role in reducing the attack surface. - Compare and contrast the effectiveness of different authentication methods such as passwords, biometrics, and multi-factor authentication. Firewalls: - Explain how a firewall functions to protect a network. - Discuss the differences between stateful and stateless firewalls. - Explore the concepts of packet filtering, proxy firewalls, and application layer firewalls.

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	• Set up a basic firewall configuration using software such as iptables or Windows Firewall. Intrusion Detection Systems (IDS): • How does an intrusion detection system (IDS) differ from a firewall. • Explain the difference between host-based and network-based IDS. • Discuss the advantages and limitations of signature-based and anomaly-based IDS. • Set up and configure a simple IDS using open-source software like Snort. Secure Emails: • Describe the vulnerabilities associated with traditional email communication. • Explain how end-to-end encryption works to secure email communication. • Discuss the role of digital signatures in email authentication and integrity verification. • Set up and configure an email client (e.g., Thunderbird) to use secure email protocols such as S/MIME or PGP/GPG.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

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(College Seal)

SYLLABUS

Course 24CSCMAJ306

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ306	Design & Analysis of Algorithms	3		45	3
24CSCMAJ306L	Design & Analysis of Algorithms LAB		1	30	2

Course Objectives:

- To reinforce basic design concepts (e.g., pseudocode, specifications, top-down design)
- To impart knowledge of algorithm design strategies
- To inculcate familiarity with an assortment of important algorithms
- To inculcate ability to analyse time and space complexities

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have / be able to
CO_ CSCMAJ306_1	Apply design principles and concepts to algorithm design
CO_ CSCMAJ306_2	The mathematical foundation in analysis of algorithms
CO_ CSCMAJ306_3	Understand different algorithmic design strategies
CO_ CSCMAJ306_4	Knowledge of various sorting & searching algorithms using linear and non-linear data structures.
CO_ CSCMAJ306_5	Analyse the efficiency of algorithms using time and space complexity theory

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√			√		√				√																
2	√			√		√				√																
3	√			√		√				√																
4	√			√		√				√																
5	√			√		√				√																

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction (a) Basic design and analysis techniques of algorithms (b) Correctness of Algorithm	5	CO_CSCMAJ307_?	R, U, A1
Unit-2	Algorithm Design Techniques (a) Iterative techniques (b) Divide and Conquer (c) Dynamic Programming (d) Greedy Algorithms	8	CO_CSCMAJ307_? CO_CSCMAJ307_?	R, U, A1
Unit-3	Sorting and Searching Techniques (a) Searching Techniques (b) Elementary sorting techniques–Bubble Sort, Insertion Sort, Merge Sort	20	CO_CSCMAJ307_? CO_CSCMAJ307_? CO_CSCMAJ307_?	R, U, A1

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	(c) Advanced Sorting techniques - Heap Sort, Quick Sort, Sorting in Linear Time - Bucket Sort, Radix Sort and Count Sort (d) Medians & Order Statistics (e) Complexity analysis			
Unit-4	Lower Bounding Techniques (a) Decision Trees	5	CO_CSCMAJ307_? CO_CSCMAJ307_?	R, U, A1, A2
Unit-5	Balanced Trees (a) Red-Black Trees	7	CO_CSCMAJ307_? CO_CSCMAJ307_?	R, U, A1, A2
Unit-6	Advanced Analysis Technique (a) Amortized analysis	5	CO_CSCMAJ307_? CO_CSCMAJ307_?	R, U, A1, A2
Unit-7	Graph Algorithms (a) Breadth First Search (b) Depth First Search (c) Minimum Spanning Trees	5	CO_CSCMAJ307_? CO_CSCMAJ307_? CO_CSCMAJ307_?	R, U, A1, A2, E, C
Unit-8	String Processing (a) String Matching (d) KMP Technique	5	CO_CSCMAJ307_? CO_CSCMAJ307_?	

Suggested Readings

1. T. H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein "Introduction to Algorithms", PHI, 3/e, 2009.
2. Sara Basse & A.V. Gelder, "Computer Algorithm – Introduction to Design and Analysis", Pearson, 3/e, 1999.
3. Rajesh K. Shukla, "Analysis and Design of Algorithms: A Beginner's Approach", Wiley.

Practical (Laboratory)

CSCMAJ306L: DAA LAB

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	1. Discuss the importance of algorithm correctness. What are some common methods for proving the correctness of an algorithm? Provide examples for each method. 2. Explain the concept of "loop invariant" in algorithm correctness proofs. Provide an example algorithm and demonstrate how a loop invariant can be used to prove its correctness. 3. Discuss the role of induction in proving algorithm correctness. Provide an example of an algorithm and demonstrate how mathematical induction can be used to prove its correctness. 4. Compare and contrast the "top-down" and "bottom-up" approaches in dynamic programming. Provide examples of problems where each approach would be more suitable. 5. Explain the concept of "recurrence relation" in algorithm analysis. Provide an example problem and derive its recurrence relation. 6. Discuss the importance of choosing appropriate data structures in algorithm design. Give examples of problems where the choice of data structure significantly impacts the efficiency of the algorithm.
Unit-2	1. Iterative Techniques: a. Discuss iterative techniques in algorithm design. Provide examples of problems where iterative approaches are more suitable than recursive ones. b. Compare and contrast iterative and recursive approaches in algorithm design. Give examples of problems where each approach shines. 2. Divide and Conquer: a. Explain the divide and conquer strategy in algorithm design. Provide an example problem and describe how it can be solved using divide and conquer. b. Discuss the time complexity analysis of divide and conquer algorithms. Provide examples of problems and analyse their time complexity using recurrence relations. 3. Dynamic Programming: a. Define dynamic programming and its key principles in algorithm design. Give an example problem and demonstrate how dynamic programming can be applied to solve it.

SYLLABUS

	b. Discuss the concept of memoization in dynamic programming. Provide examples of problems where memoization can improve the efficiency of the algorithm. 4. Greedy Algorithms: a. Explain the greedy algorithmic paradigm. Provide an example problem and describe how a greedy algorithm can be used to solve it. b. Discuss the characteristics of problems that are suitable for greedy algorithms. Provide examples of such problems and explain why greedy algorithms work for them.
Unit-3	1. Searching Techniques: a. Describe the linear search algorithm and its time complexity. Provide an example illustrating how linear search works. b. Explain binary search and its time complexity. Provide an example of a sorted array and demonstrate how binary search finds an element. 2. Sorting Techniques: a. Explain the bubble sort algorithm. Provide an example and step-by-step illustration of how bubble sort works. Analyse its time complexity. b. Describe the insertion sort algorithm. Provide an example and demonstrate how insertion sort sorts an array. Analyse its time complexity. 3. Advanced Sorting Techniques: a. Explain the merge sort algorithm. Provide a step-by-step explanation of the merge sort process and analyse its time complexity. b. Describe the heap sort algorithm. Provide an example of building a heap and performing heap sort. Analyse its time complexity. 4. Quick Sort and its Variants: a. Explain the quick sort algorithm. Provide a step-by-step explanation of the partitioning process and analyse its time complexity. b. Discuss any variants or optimizations of quick sort. Compare their performance with the basic quick sort algorithm. 5. Bucket Sort, Radix Sort, and Count Sort: a. Describe the bucket sort algorithm. Provide an example and explain how bucket sort works. Analyse its time complexity. b. Explain radix sort and count sort algorithms. Discuss their similarities and differences. Analyse their time complexities and identify scenarios where each algorithm excels. 6. Medians & Order Statistics: a. Define the concepts of median and order statistics. Explain algorithms to find the median and kth smallest/largest element in an array. b. Analyse the time complexity of median and order statistics algorithms. Discuss their practical applications. 7. Complexity Analysis: a. Discuss the importance of analysing the time and space complexity of algorithms. b. Provide examples of algorithms and analyse their time complexity using Big O notation. Discuss how the choice of algorithm affects performance.
Unit-4	1. Decision Trees: a. Discuss the concept of a decision tree in the context of algorithm analysis. b. Explain how decision trees can be used to analyse the lower bound of comparison-based sorting algorithms. 2. Lower Bounding Techniques: a. Discuss the importance of lower bounding techniques in algorithm analysis. b. Explain the relationship between decision trees and lower bounds in sorting algorithms. 3. Comparison-Based Sorting Algorithms: a. Provide a brief overview of comparison-based sorting algorithms such as bubble sort, insertion sort, merge sort, heap sort, and quick sort. b. Discuss why these sorting algorithms are called "comparison-based." 4. Constructing Decision Trees: a. Describe the process of constructing a decision tree for a given sorting problem. b. Provide an example of constructing a decision tree for a small set of elements to illustrate the process. 5. Analysis Using Decision Trees: a. Explain how decision trees can be used to analyse the lower bound of comparison-based sorting algorithms in terms of key comparisons. b. Provide an example of using a decision tree to determine the lower bound for a specific sorting problem. 6. Optimality of Decision Trees:

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	a. Discuss the optimality of decision trees in determining lower bounds for comparison-based sorting algorithms. b. Explain why decision trees provide accurate lower bounds for such algorithms. 7. Limitations of Decision Trees: a. Discuss any limitations or assumptions associated with using decision trees for lower bounding analysis. b. Explore alternative approaches or techniques used when decision trees are not applicable. 8. Practical Applications: a. Identify real-world applications where decision trees and lower bounding techniques are used in algorithm analysis. b. Discuss how understanding lower bounds helps in designing efficient algorithms for practical problems.
Unit-5	1. Introduction to Red-Black Trees: a. Explain the concept of balanced binary search trees and their importance in maintaining efficient search, insert, and delete operations. b. Introduce Red-Black Trees as a type of balanced binary search tree. Describe their properties that ensure balance. 2. Properties of Red-Black Trees: a. Describe the key properties of Red-Black Trees, including colour properties and the rules for maintaining balance. b. Explain how Red-Black Trees ensure a balanced height, and why this is crucial for efficient operations. 3. Insertion Operation: a. Provide a step-by-step explanation of the insertion operation in Red-Black Trees, including how to maintain balance during insertion. b. Illustrate the insertion process with diagrams or pseudocode for better understanding. 4. Deletion Operation: a. Explain the deletion operation in Red-Black Trees, focusing on how to maintain balance after a node is deleted. b. Discuss any special cases that may arise during deletion and how they are handled. 5. Time Complexity Analysis: a. Analyse the time complexity of insertion and deletion operations in Red-Black Trees. Compare it with unbalanced binary search trees. b. Discuss how the balance properties of Red-Black Trees contribute to their overall efficiency in terms of time complexity. 6. Applications of Red-Black Trees: a. Identify real-world applications where Red-Black Trees are commonly used. b. Discuss why Red-Black Trees are preferred over other types of balanced trees in these applications. 7. Practical Exercise: a. Implement basic operations (insertion, deletion, search) for Red-Black Trees in a programming language of your choice. b. Test the implementation with various input scenarios and analyse its performance.
Unit-6	1. Introduction to Amortized Analysis: a. Explain the concept of amortized analysis and its significance in analysing the time complexity of data structures and algorithms. b. Discuss why traditional worst-case analysis may not accurately reflect the actual performance of certain operations. 2. Amortized Cost and Potential Method: a. Define amortized cost and potential method as key concepts in amortized analysis. b. Provide a high-level overview of how the potential method is used to analyse the amortized cost of operations. 3. Examples of Amortized Analysis: a. Choose a data structure or algorithm (e.g., dynamic arrays, binary counters) and demonstrate how amortized analysis can be applied to analyse its time complexity. b. Illustrate the process with step-by-step calculations of amortized cost for specific operations. 4. Types of Amortized Analysis: a. Discuss different types of amortized analysis techniques, such as aggregate analysis, accounting method, and potential method. b. Compare and contrast these techniques, highlighting their strengths and weaknesses. 5. Real-World Applications:

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	a. Identify real-world scenarios where amortized analysis is commonly used to analyse the performance of algorithms or data structures. b. Discuss how understanding amortized analysis can lead to more efficient designs in practical applications. 6. Time Complexity Analysis: a. Analyse the time complexity of a specific algorithm or data structure using amortized analysis. b. Compare the results with traditional worst-case analysis and discuss any discrepancies. 7. Practical Exercise: a. Implement a data structure or algorithm that benefits from amortized analysis, such as a dynamic array with resizing. b. Analyse its performance using both worst-case and amortized analysis approaches.
Unit-7	Breadth-First Search (BFS): Introduction to BFS: a. Explain the basic principles of Breadth-First Search (BFS) and its applications in graph traversal. b. Discuss the main components of BFS, such as the queue data structure and visited set. BFS Implementation: a. Implement BFS in a programming language of your choice. b. Test your implementation with various input graphs and analyse its performance. Applications of BFS: a. Identify real-world scenarios where BFS can be applied, such as shortest path finding or network traversal. b. Discuss how BFS can be adapted to solve specific problems in these scenarios. Depth-First Search (DFS): Introduction to DFS: a. Explain the basic principles of Depth-First Search (DFS) and its differences from BFS. b. Discuss the main components of DFS, such as the stack data structure and visited set. DFS Implementation: a. Implement DFS in a programming language of your choice. b. Test your implementation with various input graphs and analyse its performance. Applications of DFS: a. Identify real-world scenarios where DFS can be applied, such as cycle detection or maze solving. b. Discuss how DFS can be adapted to solve specific problems in these scenarios. Minimum Spanning Trees (MST): Introduction to Minimum Spanning Trees: a. Define the concept of Minimum Spanning Trees (MSTs) and their significance in graph theory. b. Discuss algorithms commonly used to find MSTs, such as Kruskal's algorithm and Prim's algorithm. MST Algorithms Implementation: a. Implement Kruskal's algorithm and Prim's algorithm for finding MSTs in a programming language of your choice. b. Test your implementations with various input graphs and analyse their performance. Applications of MSTs: a. Identify real-world scenarios where MSTs can be applied, such as network design or clustering. b. Discuss how MSTs can be used to solve specific optimization problems in these scenarios. Comparative Analysis: a. Compare the time complexity and performance of BFS and DFS for different types of graphs and search tasks. b. Compare the time complexity and performance of Kruskal's and Prim's algorithms for finding MSTs in different types of graphs.
Unit-8	String Matching: Introduction to String Matching: a. Explain the importance of string matching algorithms in computer science and various applications. b. Discuss the challenges associated with efficiently finding occurrences of a pattern within a text.

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	Brute-Force String Matching: - Describe the brute-force string matching algorithm and its basic principles. - Implement the brute-force algorithm for string matching in a programming language of your choice. - Analyse the time complexity of the brute-force algorithm and discuss its efficiency. Rabin-Karp Algorithm: - Explain the Rabin-Karp algorithm for string matching and its underlying principles, including hashing. - Discuss the advantages and limitations of the Rabin-Karp algorithm compared to brute-force string matching. Knuth-Morris-Pratt (KMP) Algorithm: Introduction to the KMP Algorithm: - Describe the Knuth-Morris-Pratt (KMP) algorithm for string matching and its significance. - Explain the key idea behind the KMP algorithm, such as the "failure function" or "prefix function." KMP Algorithm Implementation: - Implement the Knuth-Morris-Pratt (KMP) algorithm for string matching in a programming language of your choice. - Test your implementation with various input texts and patterns, including worst-case scenarios. - Analyse the time complexity of the KMP algorithm and discuss its efficiency compared to other string-matching algorithms. Applications of the KMP Algorithm: - Identify real-world applications where the KMP algorithm can be applied, such as text processing or bioinformatics. - Discuss how the KMP algorithm can be adapted to solve specific problems in these applications.

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Name:	Name:	Name:
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SYLLABUS

Course 24CSCMAJ307

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ307	Software Engineering	3		45	3
24CSCMAJ307L	Software Engineering LAB		1	30	2

Course Objectives:

The aim of the course is to assist the student in understanding the basic theory of software engineering, and to apply these basic theoretical principles to a group software development project.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_ CSCMAJ307_1	Select and implement different software development process models
CO_ CSCMAJ307_2	Extract and analyse software requirements specifications for different projects
CO_ CSCMAJ307_3	Develop some basic level of software architecture/design
CO_ CSCMAJ307_4	Apply standard coding practices
CO_ CSCMAJ307_5	Define the basic concepts and importance of Software project management concepts like cost estimation, scheduling and reviewing the progress.
CO_ CSCMAJ307_6	Identify and implement of the software metrics
CO_ CSCMAJ307_7	Apply different testing and debugging techniques and analysing their effectiveness.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√						√	√		√																
2	√						√	√		√																
3	√						√	√		√																
4	√						√	√		√																
5	√						√	√		√																
6	√						√	√		√																
7	√						√	√		√																

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction a) The Evolving Role of Software b) Software Characteristics c) Changing Nature of Software d) Software Engineering as a Layered Technology e) Software Process Framework f) Framework and Umbrella Activities g) Process Models h) Capability Maturity Model Integration (CMMI)	8		R, U, A1

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Unit-2	Requirement Analysis (a) Software Requirement Analysis (b) Initiating Requirement Engineering Process (c) Requirement Analysis and Modelling Techniques (d) Flow Oriented Modelling (e) Need for SRS - Characteristics and Components of SRS	10		R, U, A1
Unit-3	Software Project Management (a) Estimation in Project Planning Process (b) Project Scheduling	8		R, U, A1
Unit-4	Risk Management (a) Software Risks (b) Risk Identification (c) Risk Projection and Risk Refinement (d) RMMM Plan	8		R, U, A1, A2
Unit-5	Quality Management (a) Quality Concepts (b) Software Quality Assurance (c) Software Reviews (d) Metrics for Process and Projects.	8		R, U, A1, A2

Suggested Readings

1. R.S. Pressman, "Software Engineering: A Practitioner's Approach", 7/e, McGraw-Hill, 2009.
2. P. Jalote, "An Integrated Approach to Software Engineering", 2/e, Narosa Publishing House, 2003.
3. K.K. Aggarwal and Y. Singh, "Software Engineering", 2/e, New Age International Publishers, 2008.
4. I. Sommerville, "Software Engineering", 8/e, Addison Wesley, 2006.
5. D. Bell, "Software Engineering for Students", 4/e, Addison-Wesley, 2005.
6. R. Mall, "Fundamentals of Software Engineering", 2/e, Prentice-Hall of India, 2004.

Practical (Laboratory)

CSCMAJ307L: Software Engineering Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Srl #.	Practical Title
1	Problem Statement, Process Model
2	Requirement Analysis: • Creating a Data Flow • Data Dictionary, Use Cases
3	Project Management: • Computing FP • Effort • Schedule, Risk Table, Timeline chart
4	Design Engineering: • Architectural Design • Data Design, Component Level Design
5	Testing: • Basis Path Testing

Sample Projects:

1. Criminal Record Management: Implement a criminal record management system for jailers, police officers and CBI officers
2. DTC Route Information: Online information about the bus routes and their frequency and fares

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3. Car Pooling: To maintain a web-based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

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SYLLABUS

Course 24CSCMAJ308

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ308	Database Management Systems	3		45	3
24CSCMAJ308L	Database Management Systems LAB		1	30	2

Course Objectives:

To educate students with fundamental concepts of Database Management Systems, Data Models, Different Database Languages.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ308_1	Analyse Data Base design methodology.
CO_CSCMAJ308_2	Extract and analyse software requirements specifications for different projects with focus on database requirements and design.
CO_CSCMAJ308_3	Analyse the difference between traditional file system and DBMS.
CO_CSCMAJ308_4	Able to handle with different Data Base languages.
CO_CSCMAJ308_5	Draw various data models for Data Base and write SQL queries.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√						√	√		√																
2	√						√	√		√																
3	√						√	√		√																
4	√						√	√		√																
5	√						√	√		√																

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction a) Characteristics of database b) Data models, c) Database system architecture d) Data independence	6		R, U, A1
Unit-2	Entity Relationship (ER) Modelling (a) Entity types (b) Relationships (c) Constraints	8		R, U, A1
Unit-3	Relational Data Model (a) Relational model concepts (b) Relational constraints (c) Relational algebra (d) SQL queries	20		R, U, A1
Unit-4	Database Design (a) Mapping ER/EER model to relational database (b) functional dependencies	15		R, U, A1, A2

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	(c) Lossless decomposition (d) Normal Forms (up to BCNF)			
Unit-5	Transaction Processing (a) ACID properties (b) Concurrency control	3		R, U, A1, A2
Unit-6	File Structure and Indexing (a) Operations on files (b) File of Unordered and ordered records (c) overview of File organizations (d) Indexing structures for files (Primary index, secondary index, clustering index) (e) Multilevel indexing using B and B+ trees	8		

Suggested Readings

1. R. Elmasri, S.B. Navathe, "Fundamentals of Database Systems", 6/e, Pearson Education, 2010.
2. R. Ramakrishnan, J. Gehrke, "Database Management Systems", 3/e, McGraw-Hill, 2002.
3. A. Silberschatz, H.F. Korth, S. Sudarshan, "Database System Concepts", 6/e, McGraw Hill, 2010.
4. R. Elmasri, S.B. Navathe, "Database Systems Models, Languages, Design and application Programming", 6/e, Pearson Education, 2013.
5. Database Book: "The Principles and Practices Using MySQL", Narain Gehani, University Press.

Practical (Laboratory)

CSCMAJ308L: Database Management Systems Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Create and use the following database schema to answer the given queries

EMPLOYEE Schema

Field	Type	NULL	KEY	DEFAULT
Eno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL
Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	YES	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES		NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

Query List:

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
2. Query to display unique Jobs from the Employee Table.
3. Query to display the Employee Name concatenated by a Job separated by a comma.
4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
5. Query to display the Employee Name and Salary of all the employees earning more than Rs2850.
6. Query to display Employee Name and Department Number for the Employee No= 7900.
7. Query to display Employee Name and Salary for all employees whose salary is not in the range of Rs1500 and Rs2850.
8. Query to display Employee Name and Department No. of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.
9. Query to display Name and Hire Date of every Employee who was hired in 1981.

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10. Query to display Name and Job of all employees who don't have a current Manager.
11. Query to display the Name, Salary and Commission for all the employees who earn commission.
12. Sort the data in descending order of Salary and Commission.
13. Query to display Name of all the employees where the third letter of their name is 'A'.
14. Query to display Name of all employees either have two 'R's or have two 'A's in their name and are either in Dept No = 30 or their Manager's Employee No = 7788.
15. Query to display Name, Salary and Commission for all employees whose Commission Amount is 14 greater than their Salary increased by 5%.
16. Query to display the Current Date.
17. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.
18. Query to display Name and calculate the number of months between today and the date each employee was hired.
19. Query to display the following for each employee <E-Name> earns < Salary> monthly but wants < 3 * Current Salary >. Label the Column as Dream Salary.
20. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with 'J', 'A' and 'M'.
21. Query to display Name, Hire Date and Day of the week on which the employee started.
22. Query to display Name, Department Name and Department No for all the employees.
23. Query to display Unique Listing of all Jobs that are in Department # 30.
24. Query to display Name, Dept Name of all employees who have an 'A' in their name.
25. Query to display Name, Job, Department No. And Department Name for all the employees working at the Delhi location.
26. Query to display Name and Employee no. Along with their Manager's Name and the Manager's employee no; along with the Employees,, Name who do not have a Manager.
27. Query to display Name, Dept No. And Salary of any employee whose department No. and salary matches both the department no. And the salary of any employee who earns a commission.
28. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies Rs.100.
29. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees
30. Query to display the number of employees performing the same Job type functions.
31. Query to display the no. of managers without listing their names.
32. Query to display the Department Name, Location Name, No. of Employees and the average salary for all employees in that department.
33. Query to display Name and Hire Date for all employees in the same dept. as Blake.
34. Query to display the Employee No. And Name for all employees who earn more than the average salary.
35. Query to display Employee Number and Name for all employees who work in a department with any employee whose name contains a 'T'.
36. Query to display the names and salaries of all employees who report to King.
37. Query to display the department no, name and job for all employees in the Sales department.

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SYLLABUS

Course 24CSCMAJ309

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ309	Data analysis using Spreadsheet	3		45	3
24CSCMAJ309L	Data analysis using Spreadsheet LAB		1	30	2

Course Objectives:

The course covers.

- Familiarization of Excel basic concepts and interfaces
- Organization of data in worksheets/ workbooks, and customization of their settings.
- Management of data using basic operations and formulas.
- Introduction to various types of charts available in Excel and their creation and customizations.
- Introduction to Excel's built-in data analysis tools, such as sorting, filtering, and conditional formatting and basic data analysis tasks, such as calculating summary statistics and identifying trends in data.
- Introduction to pivot tables to summarize and analyse large datasets.
- Introduction to macros and automation in Excel.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ309_1	Demonstrate basic knowledge of Excel spreadsheet and its features
CO_CSCMAJ309_2	Demonstrate organisation and management of data in worksheets/ workbooks.
CO_CSCMAJ309_3	Perform basic operations on data and do the analysis.
CO_CSCMAJ309_4	Draw different charts based on the data or its analysis.
CO_CSCMAJ309_5	Make use of pivot table to summarize and analyse large data sets.
CO_CSCMAJ309_6	Perform automation of tasks using macros

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√					√		√								√				√						
2	√					√		√								√				√						
3	√					√		√								√				√						
4	√					√		√								√				√						
5	√					√		√								√				√						

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to Excel (a) About Excel & Microsoft and uses of Excel (b) Excel software i. Spreadsheet window pane ii. Title Bar iii. Menu Bar iv. Standard Toolbar	3	CO_CSCMAJ302_?	R, U, A1

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	v. Formatting Toolbar vi. The Ribbon vii. File Tab and Backstage View viii. Formula Bar ix. Workbook Window x. Status Bar xi. Task Pane xii. Workbook & sheets xiii. Columns & Rows			
Unit-2	Columns and Rows (a) Selecting columns and rows (b) Changing Column Width & Row Height (c) Autofitting Columns & Rows (d) Hiding/Unhiding Columns & Rows (e) Inserting & Deleting Columns & Rows (f) Cell, Address of a cell (g) Components of a cell – Format, value, formula (h) Use of paste and paste special	2	CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1
Unit-3	Functionality Using Ranges (a) Using Ranges (b) Selecting Ranges (c) Entering Information into a Range (d) Using AutoFill	3	CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1
Unit-4	Creating Formulas (a) Using Formulas (b) Formula Functions i. Sum ii. Average iii. If iv. Count v. Max vi. Min vii. Proper viii. Upper ix. Lower (c) AutoSum	4	CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1, A2
Unit-5	Advance Formulas (a) Concatenation (b) Vlookup (c) Hlookup (d) Match (e) Countif (f) Text (g) Trim	3	CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1, A2
Unit-6	Spreadsheet Charts (a) Creating charts (b) Types of charts (c) Formatting Chart objects (d) Changing the Chart type (e) Showing and Hiding the Legend (f) Showing and Hiding the Data Table	4	CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1, A2
Unit-7	Data Analysis (a) Sorting (b) Filter (c) Text to Column (d) Data Validation	3	CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1, A2, E, C

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	(e) Passing and returning structures from functions (f) Structure with union as members, Union with structures as members.		CO_CSCMAJ302_?	
Unit-8	Pivot Tables (a) Creating PivotTables (b) Manipulating a PivotTable (c) Using the PivotTable Toolbar (d) Changing Data Field (e) Properties (f) Displaying a PivotChart (g) Setting PivotTable Options (h) Adding Subtotals to PivotTables	3	CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1, A2, E, C
Unit-9	Spreadsheet Tools (a) Moving between Spreadsheets (b) Selecting Multiple Spreadsheets (c) Inserting and Deleting Spreadsheets (d) Renaming Spreadsheets (e) Splitting the Screen (f) Freezing Panes (g) Copying and Pasting Data between Spreadsheets (h) Hiding & Protecting worksheets	3	CO_CSCMAJ302_1 CO_CSCMAJ302_2 CO_CSCMAJ302_3	R, U, A1, A2, E
Unit-10	Making Macros (a) Recording Macros (b) Running Macros (c) Deleting Macros	2	CO_CSCMAJ302_? CO_CSCMAJ302_?	R, U, A1, A2, E, C

References:

Practical (Laboratory)

CSCMAJ309L: Data Analysis using spreadsheet Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

1. Open Microsoft Excel and create a new spreadsheet. Familiarize yourself with the Excel interface, including the ribbon, cells, rows, columns, and worksheet tabs.
2. Enter sample data into the spreadsheet, including numerical values, text, and dates. Experiment with different data formats (e.g., currency, percentage).
3. Explore basic formatting options in Excel, such as changing font styles, cell colours, and alignment settings.
4. Save the spreadsheet to your computer and practice opening, saving, and closing Excel files.
5. Use Excel formulas to perform basic arithmetic operations (e.g., addition, subtraction, multiplication, division) on numerical data.
6. Experiment with built-in functions such as SUM, AVERAGE, MAX, and MIN to calculate summary statistics for a range of data.
7. Practice using relative and absolute cell references in formulas to perform calculations across different cells.
8. Create a formula to concatenate text strings from multiple cells into a single cell.
9. Select a range of data in Excel and create a bar chart to visualize the data. Customize the chart's appearance (e.g., colours, axis labels).
10. Experiment with different chart types, including line charts, pie charts, and scatter plots, to represent different types of data.

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11. Add trendlines and data labels to your charts to provide additional insights into the data.
12. Create a dashboard by combining multiple charts on a single worksheet to present a comprehensive view of the data.
13. Use Excel's built-in sorting and filtering tools to organize and analyse data in a spreadsheet.
14. Apply conditional formatting to highlight specific data points based on user-defined criteria (e.g., colour scales, data bars).
15. Explore Excel's data validation feature to create dropdown lists and restrict input options for cells.
16. Practice using the Goal Seek tool to find the input value required to achieve a specific output value in a formula.
17. Create a pivot table to summarize and analyse large datasets in Excel. Experiment with different row and column configurations to explore the data from different perspectives.
18. Use slicers and timelines to interactively filter and analyse data in a pivot table.
19. Record a simple macro in Excel to automate repetitive tasks, such as formatting data or generating reports.
20. Modify the recorded macro code to add additional functionality or customize the behaviour according to specific requirements.

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SYLLABUS

Course 24CSCMAJ311

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ311	Introduction to Data Science	3		45	3
24CSCMAJ311L	Introduction to Data Science LAB		1	30	2

Course Objectives:

Organizations these days use their data a decision supporting tool and to build data-intensive products and services. The collection of skills required by organizations to support these functions has been grouped under the term “Data Sciences”. This course will cover the basic concepts of big data, methodologies for analysing structured and unstructured data with emphasis on the relationship between the Data Scientist and the business needs.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ311_1	Knowledge about Data Science
CO_CSCMAJ311_2	Knowledge of data analysis tools
CO_CSCMAJ311_3	Knowledge about the process of collecting data, organising data for analysis, and exploratory data analysis using statistical tools and programming.
CO_CSCMAJ311_4	Knowledge about hypotheses testing, visualization and presentation / reporting of analysis results
CO_CSCMAJ311_5	Expertise in R programming or Python programming - for Data Science

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√					√		√								√				√						
2	√					√		√								√				√						
3	√					√		√								√				√						
4	√					√		√								√				√						
5	√					√		√								√				√						

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Data Scientist's Tool Box - Turning data into actionable knowledge - Introduction to the tools that will be used in building data analysis software: version control, markdown, git, GitHub, R, and RStudio	10	CO_CSCDSE302_?	R, U, A1
Unit-2	R Programming Basics (a) Overview of R (b) R data types and objects (c) reading and writing data (d) Control structures	15		

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	(e) Functions (f) scoping rules (g) dates and times (h) Loop functions (i) debugging tools (j) Simulation (k) Code profiling			
Unit-3	Getting and Cleaning Data (a) Obtaining data from the web (b) Obtaining data using APIs (c) Obtaining data from databases (d) Obtaining data from other sources (e) Basics of data cleaning	15		
Unit-4	Exploratory Data Analysis (a) Essential exploratory techniques for summarizing data, applied before formal modelling commences, (b) eliminating or sharpening potential hypotheses about the world that can be addressed by the data (c) common multivariate statistical techniques used to visualize high-dimensional data	10		
Unit-5	Reproducible Research (a) Concepts and tools behind reporting modern data analyses in a reproducible manner (b) Writing a document using R markdown (c) Integration of live R code into a literate statistical program (d) Compilation of R markdown documents using knitr and related tools (e) Organisation of data analysis so that it is reproducible and accessible to others	10		

Suggested Readings

1. D. Cielen, Arno D. B. Meysman, M. Ali, "Introducing Data Science", Dreamtech Press.
2. Rachel Schutt, Cathy O'Neil, "Doing Data Science: Straight Talk from the Frontline", Schroff/O'Reilly, 2013.
3. Foster Provost, Tom Fawcett, "Data Science for Business - What You Need to Know About Data Mining and Data-Analytic Thinking" by O'Reilly, 2013.

Practical (Laboratory)

CSCMAJ311L: Introduction to Data Science LAB

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	1. List three essential skills for a data scientist. 2. What are some popular programming languages used in data science? Briefly explain why they are preferred. (e.g., Python, R) 3. Describe two common data analysis libraries used in R. 4. What is the role of version control systems (e.g., Git) in data science projects? 5. Explore the RStudio interface. Briefly describe the functionalities of the following elements: a. Console b. Editor c. Environment

SYLLABUS

	d. Plots 6. How can you comment lines of code in R? What is the purpose of commenting code? 7. Load a built-in dataset (e.g., iris) in RStudio. How can you view the structure and first few rows of the data?
Unit-2	1. Open R Studio and write commands to perform the following: - Assign the value 10 to a variable named "age". - Print the square root of 16. - Create a vector containing your name, city, and favourite food. - Check the data type of a variable. 2. Write an R expression to calculate the area of a circle with a radius of 5. (Use pi as 3.14) 3. What are the different operators used for arithmetic operations (addition, subtraction, etc.) and logical comparisons (equal to, greater than, etc.) in R?
Unit-3	1. Describe two common ways to import data into R (e.g., CSV files, web scraping). 2. Simulate a messy dataset by introducing missing values and inconsistencies. How can you identify and handle missing values in R (e.g., removing rows, imputation)? 3. What are some strategies for dealing with outliers in a dataset?
Unit-4	1. Load a dataset of your choice (from a public repository or provided for the lab). 2. Perform basic EDA techniques in R, including: - Summarizing the data (mean, median, standard deviation) - Exploring data distribution (histograms, boxplots) - Identifying categorical variable frequencies (counts, tables) 3. Create a visualization (e.g., scatter plot, bar chart) to explore a potential relationship between two variables in your chosen dataset.
Unit-5	1. Explain the importance of reproducible research in data science. 2. How can you document your code and analysis steps to ensure reproducibility? 3. Describe the benefits of using R Markdown for creating reproducible reports.

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SYLLABUS

Course 24CSCMAJ313

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ313	Programming with Java Script	3		45	3
24CSCMAJ313L	Programming with Java Script LAB		1	30	2

Course Objectives:

Organizations these days use their data a decision supporting tool and to build data-intensive products and services. The collection of skills required by organizations to support these functions has been grouped under the term “Data Sciences”. This course will cover the basic concepts of big data, methodologies for analysing structured and unstructured data with emphasis on the relationship between the Data Scientist and the business needs.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ313_1	Understand JavaScript Syntax and Grammar
CO_CSCMAJ313_2	Comprehend Core JavaScript Concepts
CO_CSCMAJ313_3	Write and Debug JavaScript Code
CO_CSCMAJ313_4	Work with the Document Object Model (DOM)
CO_CSCMAJ313_5	Understand Event Handling

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√			√						√																
2	√			√						√																
3	√			√						√																
4	√			√						√																
5	√			√						√																

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction (a) What is JavaScript? (b) What Is AJAX? Developer Essentials (c) The development workflow (d) Selecting the right tools for the job (e) Just enough HTML and CSS (f) Understanding objects (g) Understanding variables (h) Making comparisons (i) Understanding events	3	CO_CSCDSE301_?	R, U, A1
Unit-2	Starting to Code (a) Writing your first script (b) Internal vs. external scripts	2		

SYLLABUS

	(c) Using comments in scripts (d) Using the NoScript tag in HTML			
Unit-3	Interacting with Users (a) Creating alert dialogs (b) Understanding conditional statements (c) Getting confirmations from users (d) Creating prompts for users (e) Understanding functions (f) Making links smarter (g) Using switch/case statements (h) Handling errors	5		
Unit-4	JavaScript Language Essentials (a) Getting started (b) Creating loops (c) Passing values to functions (d) Detecting objects (e) Reading arrays (f) Returning values from functions (g) Writing arrays (h) Building do and while loops (i) Re-using functions	5		
Unit-5	Creating Rollovers and More (a) Creating a basic image rollover (b) How to write a better rollover (c) Creating a three-state rollover (d) Making rollovers accessible and 508 compliant (e) Making disjointed rollovers (f) Creating slideshows (g) Displaying random images	5		
Unit-6	Building Smarter Forms (a) Getting started (b) Creating jump menus (c) Creating dynamic menus (d) Requiring fields (e) Cross-checking fields (f) Displaying more informative errors (g) Verifying radio button selections (h) Setting one field with another field (i) Verifying email addresses	5		
Unit-7	Handling Events (a) Responding to window events (b) Responding to mouse movements (c) Responding to mouse clicks (d) Responding to onBlur form events (e) Responding to onFocus form events (f) Responding to keyboard events	5		
Unit-8	Working with Cookies (a) Demystifying cookies (b) Writing a cookie (c) Reading a cookie (d) Displaying a cookie (e) Counting with cookies (f) Deleting cookies (g) Handling multiple cookies (h) Cookies in action	5		
Unit-9	The DOM, Nodes, and Objects	5		

SYLLABUS

	(a) Understanding the DOM (b) Adding nodes to the DOM (c) Deleting nodes from the DOM (d) Deleting specific nodes (e) Inserting nodes into the DOM (f) Replacing nodes in the DOM			
Unit-10	Working with Dates and Times (a) Displaying dates (b) Displaying times (c) Creating a countdown	2		
Unit-11	Real-World Applications of JavaScript (a) Creating sliding menus (b) Creating pop-up menus (c) Creating slideshows with captions (d) Creating a stylesheet switcher	3		

Suggested Readings

1. Laurence Lars Svekis, Maaik van Putten, Rob Percival, “JavaScript from Beginner to Professional”, Packt Publishing, 2021.
2. Eric Sarrion, “JavaScript from Frontend to Backend”, Packt Publishing, 2022.
3. Chris Minnick, “JavaScript® All-in-One for Dummies®”, John Wiley & Sons, 2023.

Practical (Laboratory)

CSCDSE313L: Programming with Java Script LAB

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	1. Install a code editor or IDE of your choice and configure it for JavaScript development. 2. Practice using the browser developer console to write and execute simple JavaScript code.
Unit-2	1. Declare variables with different data types (string, number, boolean) and practice basic operations like assignment, arithmetic, and concatenation. 2. Implement conditional statements (if/else) and loops (for, while) to control the flow of your program.
Unit-3	1. Use alert() and prompt() functions to interact with the user and display messages or get input. 2. Change the content of an HTML element using methods like getElementById() and innerHTML().
Unit-4	1. Define simple functions that take arguments and perform specific tasks. 2. Create arrays to store collections of data and practice manipulating them (accessing elements, adding/removing items).
Unit-5	1. Use the onmouseover and onmouseout events to change the appearance of an element on hover. 2. Write code to display a sequence of images using JavaScript with a set interval, simulating a slideshow. 3. Generate random numbers using Math.random() and use them to display a random image from a set.
Unit-6	1. Write code to validate user input in a form before submission (e.g., checking if a field is empty). 2. Use JavaScript to add or remove form elements based on user interaction.
Unit-7	1. Capture the click event on a button and execute a specific function when clicked. 2. Respond to keyboard presses (e.g., key down) to trigger actions in your program.
Unit-8	1. Store and retrieve simple data using cookies (limited scope recommended for learning purposes).

SYLLABUS

Unit-9	1. Use methods like <code>querySelector()</code> and <code>querySelectorAll()</code> to access specific elements in the HTML document. 2. Change the style properties (e.g., color, background) of an element using JavaScript.
Unit-10	1. Use built-in functions like <code>Date()</code> and its methods (e.g., <code>getDay()</code>, <code>getTime()</code>) to manipulate dates and times in your program. 2. Set up timers and intervals using <code>setTimeout()</code> and <code>setInterval()</code> to execute code after a delay or repeatedly at specific intervals.
Unit-11	1. Create a simple to-do list application where users can add, remove, and mark tasks as complete. 2. Design a quiz with questions and multiple-choice answers using JavaScript to check user responses and provide feedback.

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SYLLABUS

Course 24CSCMAJ314

Paper Code	Title	Credits		Total Classes (15 weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMAJ314	Introduction to Machine Learning	3		45	3
24CSCMAJ314L	Introduction to Machine Learning LAB		1	30	2

Course Objectives:

The course is an introduction to the foundations of learning and making predictions from data. It deals with basic concepts such as trading goodness of fit and model complexity, important machine learning algorithms used in practice, and some hands-on experience.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will be able to
CO_CSCMAJ314_1	Basic knowledge about the key algorithms and theory that form the foundation of machine learning and computational intelligence.
CO_CSCMAJ314_2	Understand the principles, advantages, limitations and possible applications of machine learning.
CO_CSCMAJ314_3	Evaluate the strengths and limitations of learning procedures/ algorithms and select an appropriate one for a given problem.
CO_CSCMAJ314_4	The ability to implement some basic machine learning algorithms to particular target problems and evaluate and report the results appropriately.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√		√			√		√		√																
2	√		√			√		√		√																
3	√		√			√		√		√																
4	√		√			√		√		√																
5	√		√			√		√		√																

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction (a) Concept of Machine Learning (b) Applications of Machine Learning (c) Key elements of Machine Learning (d) Supervised vs. Unsupervised Learning (e) Statistical Learning: • Bayesian Method • The Naive Bayes Classifier	10	CO_CSCDSE303_?	R, U, A1
Unit-2	Software for Machine Learning and Linear Algebra Overview (a) Plotting of Data (b) Vectorization	10		

SYLLABUS

	(c) Matrices and Vectors: Addition, Multiplication, Transpose and Inverse using available tool such as MATLAB.			
Unit-3	Linear Regression (a) Prediction using Linear Regression (b) Gradient Descent (c) Linear Regression with one variable (d) Linear Regression with multiple variables (e) Polynomial Regression (f) Feature Scaling /Selection	10		
Unit-4	Logistic Regression (a) Classification using Logistic Regression (b) Logistic Regression vs. Linear Regression (c) Logistic Regression with one variable and with multiple variables	10		
Unit-5	Regularization (a) Regularization and its utility: The problem of Overfitting (b) Application of Regularization in Linear and Logistic Regression (c) Regularization and Bias/Variance	10		
Unit-6	Neural Networks (a) Introduction (b) Model Representation (c) Gradient Descent vs. Perceptron Training (d) Stochastic Gradient Descent (e) Multilayer Perceptrons (f) Multiclass Representation (g) Backpropagation Algorithm	10		

Suggested Readings

1. Ethem Alpaydin, "Introduction to Machine Learning", 2/e, the MIT Press, 2009.
2. Tom M. Mitchell, "Machine Learning", 1/e, Tata McGraw-Hill Education, 2013.
3. Christopher M. Bishop, "Pattern Recognition and Machine Learning" by Springer, 2007.
4. Mevin P. Murphy and Francis Bach, "Machine Learning: A Probabilistic perspective, 2012.
5. Peter Harrington, "Machine Learning in Action", Dreamtech Press.

Practical (Laboratory)

CSCMAJ314L: Introduction to Machine Learning LAB

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-1	Concept of Machine Learning: • Define machine learning and explain its significance in today's technological landscape. • Discuss the difference between traditional programming and machine learning. Applications of Machine Learning: • Provide examples of real-world applications where machine learning is used. • Describe how machine learning is employed in fields such as healthcare, finance, and marketing. Key Elements of Machine Learning: • Explain the concepts of features, labels, and models in machine learning. • Discuss the importance of data pre-processing and feature engineering in the machine learning pipeline. Supervised vs. Unsupervised Learning: • Define supervised learning and unsupervised learning.

SYLLABUS

	• Provide examples of tasks that fall under each category. • Discuss the differences in the training process and the types of problems addressed by each approach. Bayesian Method: • Explain the Bayesian method and its philosophical underpinnings. • Discuss how the Bayesian method differs from frequentist statistics. • Provide an example of applying the Bayesian method to solve a real-world problem. The Naive Bayes Classifier: • Introduce the Naive Bayes classifier and its assumptions. • Discuss the advantages and limitations of the Naive Bayes classifier. • Provide a step-by-step explanation of how the Naive Bayes classifier works in a text classification problem.
Unit-2	Software for Machine Learning: • Install Python and necessary libraries such as NumPy, pandas, and scikit-learn. • Write a Python script to load a dataset, perform basic data exploration, and visualize the data using matplotlib or seaborn. Using scikit-learn for Supervised Learning: • Implement a simple linear regression model using scikit-learn to predict housing prices based on features like square footage and number of bedrooms. • Evaluate the performance of the model using metrics like mean squared error and R-squared. Exploring TensorFlow for Deep Learning: • Install TensorFlow and Keras. • Build a simple neural network using Keras to classify images from the MNIST dataset. • Train the neural network and evaluate its performance on a test set. Utilizing Jupyter Notebooks for Data Analysis: • Set up a Jupyter Notebook environment. • Import a dataset and perform data cleaning and pre-processing tasks. • Create visualizations using libraries like matplotlib and seaborn to gain insights into the data. Linear Algebra Overview: Basic Operations in NumPy: • Import NumPy and create arrays representing vectors and matrices. • Perform basic operations such as addition, subtraction, multiplication, and division on arrays. • Use NumPy functions to compute dot products and matrix inverses. Matrix Manipulation for Machine Learning: • Implement matrix operations such as transposition and element-wise multiplication using NumPy. • Perform matrix multiplication to compute the output of a simple neural network layer. Eigenvalues and Eigenvectors: • Define eigenvalues and eigenvectors and their significance in linear algebra. • Compute the eigenvalues and eigenvectors of a square matrix using NumPy. • Discuss how eigenvalues and eigenvectors are used in machine learning algorithms like principal component analysis (PCA). Solving Linear Systems: • Introduce systems of linear equations and their representation using matrices. • Solve a system of linear equations using NumPy's linear algebra module. • Discuss the importance of solving linear systems in machine learning tasks such as linear regression.
Unit-3	Prediction using Linear Regression: • Choose a dataset suitable for linear regression (e.g., housing prices, student grades). • Split the dataset into training and testing sets. • Implement linear regression using scikit-learn. • Train the model on the training set and make predictions on the testing set. • Evaluate the model's performance using metrics such as mean squared error and R-squared. Gradient Descent: • Explain the concept of gradient descent and its role in optimizing linear regression models. • Implement gradient descent from scratch to minimize the cost function for linear regression.

SYLLABUS

	- Compare the results of gradient descent with those obtained using scikit-learn's linear regression implementation. Linear Regression with One Variable: - Load a dataset containing one independent variable and one dependent variable. - Implement linear regression using both scikit-learn and ordinary least squares (OLS) method. - Visualize the dataset and the linear regression line. Linear Regression with Multiple Variables: - Choose a dataset with multiple independent variables and one dependent variable. - Perform feature engineering and pre-processing steps such as handling missing values and encoding categorical variables. - Implement linear regression with multiple variables using scikit-learn. - Evaluate the model's performance and interpret the coefficients of the regression equation. Polynomial Regression: - Generate synthetic data with a non-linear relationship between the independent and dependent variables. - Implement polynomial regression using scikit-learn with different polynomial degrees. - Visualize the dataset and the polynomial regression curves for various degrees. - Compare the performance of polynomial regression models with linear regression. Feature Scaling/Selection: - Discuss the importance of feature scaling and selection in linear regression. - Implement feature scaling techniques such as standardization and normalization on a dataset. - Use feature selection methods like correlation analysis or forward/backward selection to choose relevant features for linear regression. - Train and evaluate linear regression models with and without feature scaling/selection.
Unit-4	Classification using Logistic Regression: - Choose a dataset suitable for binary classification (e.g., spam detection, churn prediction). - Split the dataset into training and testing sets. - Implement logistic regression using scikit-learn. - Train the model on the training set and make predictions on the testing set. - Evaluate the model's performance using metrics such as accuracy, precision, recall, and F1-score. Logistic Regression vs. Linear Regression: - Discuss the differences between logistic regression and linear regression. - Explain why logistic regression is suitable for classification tasks while linear regression is not. - Provide examples of scenarios where logistic regression is more appropriate than linear regression. Logistic Regression with One Variable: - Load a dataset containing one independent variable and a binary target variable. - Implement logistic regression using scikit-learn. - Visualize the dataset and the logistic regression curve. - Interpret the coefficients of the logistic regression equation. Logistic Regression with Multiple Variables: - Choose a dataset with multiple independent variables and a binary target variable. - Perform feature engineering and pre-processing steps such as handling missing values and encoding categorical variables. - Implement logistic regression with multiple variables using scikit-learn. - Evaluate the model's performance and interpret the coefficients of the logistic regression equation.
Unit-5	Introduction to Neural Networks: - Define neural networks and their significance in machine learning. - Discuss the biological inspiration behind artificial neural networks. - Explain the basic architecture of a neural network, including input layer, hidden layers, and output layer. Model Representation in Neural Networks: - Illustrate the mathematical representation of a neural network. - Discuss the role of activation functions in neural networks. - Provide examples of commonly used activation functions and their properties. Gradient Descent vs. Perceptron Training: - Explain the difference between gradient descent and perceptron training algorithms.

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	- Implement the perceptron training algorithm for a binary classification problem. - Compare the convergence behaviour of gradient descent and perceptron training on a simple dataset.
	Stochastic Gradient Descent (SGD):
	- Introduce stochastic gradient descent and its advantages over batch gradient descent. - Implement stochastic gradient descent for training a neural network model. - Discuss how mini-batch gradient descent combines the benefits of batch and stochastic gradient descent.
	Multilayer Perceptrons (MLPs):
	- Explain the concept of multilayer perceptrons (MLPs) and their ability to learn complex functions. - Implement a feedforward neural network with multiple hidden layers using a deep learning framework like TensorFlow or PyTorch. - Train the MLP on a dataset and evaluate its performance on a validation set.
	Multiclass Representation:
	- Discuss techniques for representing multiclass classification problems in neural networks. - Implement one-hot encoding to represent categorical labels in a multiclass classification task. - Modify the output layer of a neural network to accommodate multiclass classification.
	Backpropagation Algorithm:
	- Introduce the backpropagation algorithm and its role in training neural networks. - Derive the equations for computing gradients using the chain rule in backpropagation. - Implement backpropagation to train a neural network model from scratch.

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SKILL ENHANCEMENT COURSES

Course 24CSCSEC101

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCSEC101	Introduction to Cyber Security	2		30	2
24CSCSEC101L	Introduction to Cyber Security Lab		1	30	2

Course Objectives:

- Learn the foundations of Cyber security and threat landscape.
- To equip students with the technical knowledge and skills needed to protect and defend against cyber threats.
- To develop skills in students that can help them plan, implement, and monitor cyber security mechanisms to ensure the protection of information technology assets.
- To expose students to governance, regulatory, legal, economic, environmental, social and ethical contexts of cyber security.
- To expose students to responsible use of online social media networks.
- To systematically educate the necessity to understand the impact of cybercrimes and threats with solutions in a global and societal context.
- To select suitable ethical principles and commit to professional responsibilities and human values and contribute value and wealth for the benefit of the society.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSCSEC101_1	Understand the cyber security threat landscape.
CO_CSCSEC101_2	Develop a deeper understanding and familiarity with various types of cyber-attacks, cybercrimes, vulnerabilities and remedies thereto.
CO_CSCSEC101_3	Analyse and evaluate existing legal framework and laws on cyber security.
CO_CSCSEC101_4	Analyse and evaluate the digital payment system security and remedial measures against digital payment frauds.
CO_CSCSEC101_5	Analyse and evaluate the importance of personal data its privacy and security.
CO_CSCSEC101_6	Analyse and evaluate the security aspects of social media platforms and ethical aspects associated with use of social media.
CO_CSCSEC101_7	Analyse and evaluate the cyber security risks.
CO_CSCSEC101_8	Evaluate and communicate the human role in security systems with an emphasis on ethics, social engineering vulnerabilities and training.
CO_CSCSEC101_9	Increase awareness about cyber-attack vectors and safety against cyber-frauds.
CO_CSCSEC101_10	Take measures for self-cyber-protection as well as societal cyber-protection.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√	√													√			√		√						
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5	√	√													√			√		√						
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7	√	√													√			√		√								
8	√	√													√			√		√								
9	√	√													√			√		√								
10	√	√													√			√		√								

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to Cyber Security a) Defining Cyberspace and Overview of Computer and Web-technology b) Architecture of cyberspace c) Communication and web technology d) Internet infrastructure for data transfer and governance e) Regulation of cyberspace f) Concept of cyber security g) Issues and challenges of cyber security	6	CO_CSCSEC101_1	R, U, A1
Unit-2	Cyber Crime and Cyber Law (a) Classification of cyber crimes (b) Common cyber crimes (c) Cybercriminals modus-operandi (d) Reporting of cyber crimes (e) Remedial and mitigation measures (f) Legal perspective of cyber crime 1. IT Act 2000 and its amendments 2. Cybercrime and offences (g) Organisations dealing with Cybercrime and Cyber security in India	6	CO_CSCSEC101_1 CO_CSCSEC101_2	R, U, A1
Unit-3	Social media Overview and Security (a) Introduction to Social networks (b) Types of Social media (c) Social media platforms (d) Social media monitoring (e) Hashtag (f) Social media marketing (g) Social media privacy (h) Challenges, opportunities and pitfalls in online social network (i) Security issues related to social media (j) Flagging and reporting of inappropriate content (k) Laws regarding posting of inappropriate content (l) Best practices for the use of Social media	7	CO_CSCMAJ101_1 CO_CSCMAJ101_2 CO_CSCMAJ101_3	R, U, A1
Unit-4	E-Commerce and Digital Payments (a) Definition of E- Commerce (b) Components of E-Commerce (c) Elements of E-Commerce security (d) E-Commerce threats (e) E-Commerce security best practices (f) Introduction to digital payments (g) Components of digital payment and stake holders (h) Modes of digital payments	7	CO_CSCMAJ101_1 CO_CSCMAJ101_2 CO_CSCMAJ101_3 CO_CSCMAJ101_4	R, U, A1, A2

SYLLABUS

	1. Banking Cards 2. Unified Payment Interface (UPI) 3. e-Wallets 4. Unstructured Supplementary Service Data (USSD) 5. Aadhar enabled payments (i) Digital payments related common frauds and preventive measures (j) RBI guidelines on digital payments and customer protection in unauthorised banking transactions (k) Relevant provisions of Payment Settlement Act, 2007			
Unit-5	Digital Devices Security, Tools and Technologies for Cyber Security (a) End Point device and Mobile phone security (b) Password policy (c) Security patch management (d) Data backup (e) Downloading and management of third-party software (f) Device security policy (g) Cyber Security best practices 1. Significance of host firewall and Anti-virus 2. Management of host firewall and Anti-virus 3. Wi-Fi security 4. Configuration of basic security policy and permissions	6	CO_CSCMAJ101_1 CO_CSCMAJ101_2 CO_CSCMAJ101_3 CO_CSCMAJ101_4 CO_CSCMAJ101_7	R, U, A1, A2

References

1. Cyber Crime Impact in the New Millennium, by R. C Mishra, Author Press. Edition 2010.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
3. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson, 13th November, 2001)
4. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd.
5. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
6. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.
7. Fundamentals of Network Security by E. Maiwald, McGraw Hill.

Practical (Laboratory)

CSCSEC101L: Introduction to Cyber Security Lab

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Unit-2	1. Checklist for reporting cybercrime at Cybercrime Police Station. 2. Checklist for reporting cybercrime online. 3. Reporting phishing emails. 4. Demonstration of email phishing attack and preventive measures.
Unit-3	1. Basic checklist, privacy and security settings for popular Social media platforms. 2. Reporting and redressal mechanism for violations and misuse of Social media platforms.
Unit-4	1. Configuring security settings in Mobile Wallets and UPIs.

SYLLABUS

	2. Checklist for secure net banking.
Unit-5	1. Setting, configuring and managing three password policy in the computer (BIOS, Administrator and Standard User). 2. Setting and configuring two factor authentications in the Mobile phone. 3. Security patch management and updates in Computer and Mobiles. 4. Managing Application permissions in Mobile phone. 5. Installation and configuration of computer Anti-virus. 6. Installation and configuration of Computer Host Firewall. 7. Wi-Fi security management in computer and mobile.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

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(Seal)

(College Seal)

VALUE ADDED COURSES

Course 24CSCVAC101

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCVAC101	Graphics Designing		1	30	2

Course Objectives:

The objective of this Graphic Designing (Basic) course is to provide students with a comprehensive introduction to the fundamental principles and techniques of graphic design. Through a balanced blend of theoretical instruction and practical hands-on exercises, students will develop a strong foundation in design concepts, software proficiency, and creative problem-solving skills. By the conclusion of the course, students will be equipped to produce visually appealing and effective designs tailored for both print and digital media. The course aims to enable students to:

- Understand the pivotal role and significance of graphic design in various industries and contexts.
- Comprehend and apply key elements and principles of design, such as line, shape, colour, texture, balance, and contrast, to create visually engaging compositions.
- Familiarize themselves with essential design software, including Adobe Photoshop and Illustrator, to execute design tasks efficiently.
- Demonstrate practical skills through hands-on exercises, culminating in the creation of a basic digital artwork that incorporates fundamental design elements.
- Develop a solid grasp of typography fundamentals, encompassing typefaces, fonts, hierarchy, kerning, and leading, and effectively apply them in layout design.
- Apply principles of effective layout design to craft visually compelling posters, integrating typography and layout techniques learned during the course.
- Gain proficiency in image editing and manipulation, including image resolution, file formats, colour modes, cropping, retouching, and colour adjustments using Photoshop tools.
- Enhance a photograph through practical application of image editing techniques, showcasing an understanding of digital image enhancement.
- Cultivate skills in designing for digital media, producing web graphics and social media posts that communicate effectively in the digital realm.
- Explore the realm of vector graphics and logo design, acquiring a foundational understanding of logo creation.
- Successfully conceive, design, and execute a final project consisting of a simple logo and business card, applying learned design principles and software skills.
- Present and articulate their final design projects, engage in constructive critique, and evaluate design choices effectively.
- By achieving these objectives, students will be well-prepared to embark on their graphic design journey, equipped with a strong foundation that supports further exploration and advancement in the field.

Course Outcomes:

Code	Outcome description
CO_CSCVAC101_1	Upon successful completion of this course, students will have or be able to A comprehensive understanding of the fundamental concepts that underpin the world of graphic design. They will appreciate the pivotal role that graphic design plays in shaping visual communication across various industries and contexts. Students will be adept at identifying and applying essential design elements and principles, including line, shape, colour, texture, balance, and contrast, to create visually captivating compositions. By successfully completing this module, students will have established a strong foundation in graphic design, enabling them to approach design tasks with a critical eye and an informed perspective. They will be equipped to analyze visual compositions, comprehend the interplay of design elements, and initiate their creative journey in the realm of graphic design.

SYLLABUS

CO_CSCVAC101_2	Developed a comprehensive understanding of the art and science of typography, as well as the principles governing effective layout design. Students will possess the ability to discern and select appropriate typefaces and fonts based on design objectives, and they will have a keen grasp of establishing visual hierarchy through techniques such as kerning and leading. The students will be adept at applying the principles of effective layout design, employing concepts such as alignment, proximity, contrast, and balance to create visually harmonious and compelling compositions. Through hands-on experience, students will have honed their skills by designing a poster that emphasizes the integration of typography and layout elements.
CO_CSCVAC101_3	Developed a proficient skill set in image editing techniques and manipulation, enabling them to effectively enhance and transform digital images. Students will have gained a solid understanding of key technical aspects, including image resolution, file formats, and colour modes, allowing them to make informed decisions when working with visual content. By successfully completing this module, students will possess the practical skills needed to manipulate digital images with precision and creativity. They will be equipped to make visual improvements to photographs, create visually appealing compositions, and effectively convey desired moods and messages through image manipulation. This proficiency in image editing will serve as a valuable asset in various design projects and provide students with a strong foundation for further exploration in the realm of graphic design.
CO_CSCVAC101_4	Acquired the essential skills to excel in the realm of digital design. They will be adept at crafting impactful visuals tailored for digital media, including web graphics and social media posts, effectively engaging audiences in the digital landscape. The students will have a foundational understanding of vector graphics and logo design principles, empowering them to create distinctive and versatile visual identities. Through hands-on experience, students will have successfully conceptualized, designed, and executed a simple logo and business card, showcasing their ability to apply learned concepts to real-world design projects.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√							√		√										√						
2	√							√		√										√						
3	√							√		√										√						
4	√							√		√										√						

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to Graphics Design (a) Understanding the role and importance of graphic design (b) Elements and principles of design: line, shape, colour, texture, balance, contrast, etc. (c) Introduction to design software (e.g., Adobe Photoshop, Illustrator, InDesign) (d) Hands-on: Creating a simple digital artwork using basic design elements	6	CO_CSCVAC102_1	R, U, A1
Unit-2	Typography and Layout Design (a) Typography fundamentals: typefaces, fonts, hierarchy, kerning, leading (b) Principles of effective layout design	8	CO_CSCVAC102_2	R, U, A1

SYLLABUS

	(c) Hands-on: Designing a poster with emphasis on typography and layout			
Unit-3	Image Editing and Manipulation (a) Introduction to image resolution, file formats, and colour modes (b) Basic image editing techniques: cropping, retouching, colour adjustments (c) Hands-on: Enhancing a photograph using Photoshop tools	10	CO_CSCVAC102_3	R, U, A1
Unit-4	Digital Design (a) Designing for digital media: web graphics, social media posts (b) Introduction to vector graphics and logo design	6	CO_CSCVAC102_4	R, U, A1

Recommended Resources:

1. Ellen Lupton. *Thinking with Type*.
2. Williams, Robin. *The Non-Designer's Design Book*.
3. Dabner, David., Stewart, Sandra. and Vickress, Abbie. *Graphic Design School: The Principles and Practice of Graphic Design*.
4. Adobe Creative Cloud Tutorials and Documentation

Websites and Blogs:

Smashing Magazine: A great resource for design articles, tutorials, and inspiration.

Behance: A platform to showcase and discover creative work, offering inspiration and insights.

YouTube Channels:

The Futur: Offers insightful videos on design principles, typography, and more.

Tutpad: Provides a variety of graphic design tutorials for beginners.

Practical (Laboratory)

CSCVAC101: Graphics Design

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Photoshop	1. Crop an image in Photoshop. 2. Adjust brightness and contrast in Photoshop. 3. Use the clone stamp tool to remove unwanted elements from an image. 4. Use layers in Photoshop. 5. Create a new layer and apply blending modes. 6. Make a selection using the lasso tool in Photoshop. 7. Retouch blemishes in a portrait using the spot healing brush tool. 8. Use the dodge and burn tools to selectively lighten and darken areas of an image.
Illustrator	1. Create a rectangle and a circle in Illustrator. 2. Use the pen tool to draw custom shapes. 3. Apply stroke and fill colours to shapes in Illustrator. 4. Create and format text in Illustrator? 5. Difference between point text and area text. 6. Convert text to outlines in Illustrator. 7. Demonstrate use of artboards in Illustrator. 8. Organize artwork using layers in Illustrator.

SYLLABUS

	9. Create a new layer and rearrange layers in the layer panel.
InDesign	1. How do you create a new document in InDesign? 2. Explain how to set up margins and columns for a document in InDesign. 3. Describe how to add pages to a document in InDesign. 4. How do you import text and images into an InDesign document? 5. Explain how to create text frames and link them together in InDesign. 6. Describe how to adjust image size and position within an InDesign document. 7. How do you create a grid layout for a magazine spread in InDesign? 8. Explain the process of aligning and distributing objects on a page in InDesign. 9. Describe how to apply colours, gradients, and effects to objects in InDesign. 10. How do you export an InDesign document to PDF format? 11. Explain how to set up bleeds and crop marks for printing in InDesign. 12. Describe how to package an InDesign document to include all linked images and fonts.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

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SYLLABUS

Course 24CSCVAC102

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCVAC102	Desktop Publishing		1	30	2

Course Objectives:

This course offers students the chance to create a collection of publications suitable for inclusion in their portfolios. Participants will work with industry-standard page layout and graphics software, acquiring a comprehensive understanding of print production technology and processes. This includes learning how to effectively communicate with other print experts, estimate expenses, and manage digital output.

Course Outcomes:

Code	Outcome description
CO_CSCVAC102_1	Upon successful completion of this course, students will have or be able to Gain and employ the abilities to craft both fiction and non-fiction pieces, engage in professional editing, generate digital content, formulate print and web-based materials, and oversee the progression of writing and editing projects.
CO_CSCVAC102_2	Utilize theoretical and technical expertise in innovative ways to align with diverse readerships and markets, addressing their unique needs and expectations.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√							√		√										√						
2	√							√		√										√						

Unit	Contents	Hours	Outcomes	Revised Bloom's Taxonomy Levels
Unit-1	Introduction to DTP (a) Preliminary understanding of DTP-related terms (b) Text and graphics formats (c) Difference between drawings and images (d) Image storage formats such as BMP, GIF, TIFF, and JPG/JPEG	4	CO_CSCVAC104_1	R, U, A1
Unit-2	Adobe PageMaker Basics (a) Workspace overview Preferences, menus, toolbox, palettes, converting documents from other programs, saving and closing documents, document pages, master pages, printing a document. (b) Working with Text Utilizing text in PageMaker, importing text, text frames, story editor, character formatting, paragraph formatting, type utilities, working with styles, editing existing styles, working with tables. (c) Working with objects	12	CO_CSCVAC104_1 CO_CSCVAC104_2	R, U, A1

SYLLABUS

	Rectangles and ellipses, polygons, manipulating objects, filling and stroking objects. (d) Working with colour Colours palette, adding new colours, editing and deleting colours, verifying colour suitability for printing, trapping. (e) Working with images and graphics Image/graphic file formats, image resolution, placing images, modifying images and graphics, working with frames, text wrap, image masks. (f) Exporting as HTML and PDF files Options for exporting, exporting pages, exporting PDF files.			
Unit-3	CorelDraw (a) Basics of CorelDraw Menus, expanded menus and dialog boxes, toolbars, property bar, status bar, toolbox, zoom tool (zooming in and out), pan tool, document viewing, desktop power tools, starting or opening documents, saving, importing, and exporting files. (b) Rectangles and Ellipses Paths, Objects, Properties, drawing rectangles, rounding rectangle corners, creating ellipses, transforming ellipses into a pie shape or arc. (c) Select, Move, and Size Selecting and deselecting objects, marquee selection, moving an object, copying and pasting objects, cloning objects, copying/moving an object between documents, handles and scaling, altering object dimensions. (d) Polygons, Stars, and Spirals Creating polygons; drawing stars; creating polygons as stars; Creating symmetrical spirals; drawing logarithmic spirals. (e) Nodes and Paths Adding, deleting, joining, and converting using various types of nodes. (f) Lines and Curves Freehand tool, Bezier tool, knife tool, eraser tool, artistic media tool. (g) Colour and Fills Closing object paths, filling with uniform colour, changing outline colour, eyedropper tool, paint bucket tool, interactive mesh fill tool. (h) Working with Text Adding artistic text and paragraph text, using handles, text formatting, flowing text between paragraph text frames, directing paragraph text onto a path and into an object, making text flow around an object, rotating text, free	14	CO_CSCVAC104_1 CO_CSCVAC104_2	R, U, A1

SYLLABUS

	skew tool, interactive drop shadow tool, vector extrusions.			

Suggested Readings

1. Roger C. Parker and Kate Shoup. *Desktop Publishing & Design For Dummies*.
2. Deke McClelland and Mark AbdeInour. *CorelDRAW for Dummies*.

Practical (Laboratory)

CSCVAC102: Desktop publishing

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

PageMaker	1. Create a new document in Adobe PageMaker. 2. Setting up page size and orientation. 3. Specify margins and columns for a document in PageMaker. 4. Insert and format text in Adobe PageMaker. 5. Create text frames and link them together. 6. Apply paragraph and character styles to text. 7. Import images and graphics into a PageMaker document. 8. Resize and crop images within PageMaker. 9. Apply borders and effects to images. 10. Arrange and align objects on a PageMaker page. 11. Create master pages and apply them to document pages. 12. Use layers to organize elements within a PageMaker document.
CorelDraw	1. How do you create basic shapes such as rectangles, circles, and polygons in CorelDRAW? 2. Describe how to manipulate objects using the selection and transformation tools. 3. Explain how to apply fills and outlines to shapes in CorelDRAW. 4. How do you create and format text in CorelDRAW? 5. Describe how to convert text to curves for further manipulation. 6. Explain how to apply text effects such as drop shadows and outlines. 7. How do you import images into a CorelDRAW document? 8. Describe how to crop and resize images within CorelDRAW. 9. Explain how to apply effects and filters to images. 10. Describe the process of arranging and aligning objects on a CorelDRAW page. 11. Explain how to use layers to organize elements within a CorelDRAW document. 12. Describe how to create multiple pages and manage page layouts in CorelDRAW. 13. How do you export a CorelDRAW document to common file formats such as PDF or JPEG? 14. Describe how to set up bleeds and crop marks for printing in CorelDRAW. 15. Explain how to adjust colour settings for accurate printing.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

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(College Seal)

SYLLABUS

Course 24CSCVAC103

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCVAC103	Website Designing using WordPress		1	30	2

Course Overview:

This course introduces:

- A comprehensive introduction to WordPress, one of the most popular content management systems (CMS) for website development.
- Students will learn how to create, customize, and manage websites using WordPress.
- Students will be able to build and maintain functional and visually appealing websites for personal blogs, portfolios, small businesses, and more.

Course Objectives:

To enable a student to:

- Understand the basics of WordPress and its role in website development.
- Create and set up a WordPress website from scratch.
- Customize website appearance using themes and templates.
- Add and manage content, including text, images, and multimedia.
- Troubleshoot common issues and perform website maintenance.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSCVAC103_1	Enumerate key features and basics of WordPress
CO_CSCVAC103_2	Understand the structure of a website and the importance of tools.
CO_CSCVAC103_3	Classify plugins and tools for content management and optimization.
CO_CSCVAC103_4	Create a simple website or blog.
CO_CSCVAC103_5	Optimize and enhance website security
CO_CSCVAC103_6	Create and Set Up a WordPress Website

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√							√		√										√						
2	√							√		√										√						
3	√							√		√										√						
4	√							√		√										√						
5	√							√		√										√						

Units	Content	Lecture Hours	COs	RBT
Unit-1	Introduction to WordPress - CMS and its uses - WordPress- Advantages & Disadvantages - Creating a Blog website on wordpress.org, installation on localhost and FTP - Choosing and installing WordPress themes.	15	CO1 CO2 CO3 CO4	R U A1 A2

SYLLABUS

	e. Customizing website appearance through theme settings. f. Creating custom menus and navigation. g. Working with widgets and sidebars. h. Creating and formatting posts and pages. i. Inserting images, videos, and other media. j. Organizing content using categories and tags. k. Managing comments and discussions.			
Unit-2	Optimization, Maintenance & Security a. Optimizing content for search engines. b. Improving website performance and load times. c. Ensuring responsive design for various devices. d. Creating user accounts and assigning roles. e. Setting up user permissions and access levels. f. Implementing basic security measures. g. Identifying and resolving common WordPress issues. h. Backing up and updating the website. i. Regular maintenance tasks for a healthy website. j. Create a 4-page website	15	CO4 CO5 CO6	A1 A2 E C

Learning Resources:

Open online resources

1. https://www.tutorialspoint.com/wordpress/wordpress_tutorial.pdf

Practical (Laboratory)

CSCVAC103: Website designing using WordPress

[Credit: 1, Lab Hours: 30]

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

1. Install WordPress on a web server.
2. Difference between WordPress.com and WordPress.org.
3. Create a local development environment for WordPress using tools like XAMPP or WAMP.
4. Choose a WordPress theme for a website.
5. Customize a WordPress theme to fit specific design requirements.
6. Create a new page in WordPress.
7. Differentiate between pages and posts in WordPress.
8. Add multimedia content (images, videos) to a page or post.
9. Create and customize navigation menus in WordPress.
10. Explain the concept of parent and child menu items in WordPress.
11. Add custom links to a WordPress menu.
12. Add widgets to the sidebar or footer of a WordPress website.
13. State the purpose of common WordPress widgets like Recent Posts, Categories, and Search.
14. Create custom widgets or modify existing ones.
15. Install and activate plugins in WordPress.
16. Explain the purpose of popular WordPress plugins such as Yoast SEO, Contact Form 7, and WooCommerce.
17. Troubleshoot plugin conflicts in WordPress.
18. Describe the benefits of using page builder plugins like Elementor or Beaver Builder in WordPress.
19. Create custom layouts and designs using a page builder.
20. Integrate custom CSS or JavaScript code into a WordPress website built with a page builder.

Course Faculty	Head of the Department	Director

SYLLABUS

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Name: Signature:	Name: Signature:	Name: Signature:

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MULTI DISCIPLINARY COURSES

Course 24CSCMDC101

Paper Code	Title	Credits		Total Classes (15 Weeks)	Hours / Week
		Theory	Practical / Tutorial		
24CSCMDC101	Introduction to MS-Word, Excel and PowerPoint	2		30	2
24CSCMDC101L	Introduction to MS-Word, Excel and PowerPoint Lab		1	30	2

Course Overview:

This course introduces:

- How to use MS Office applications use in office work such as creating professional-quality documents; store, organize and analyse information.
- How to perform arithmetic operations and functions.
- How to create dynamic slide presentations with animation, narration, images, and writing professional emails.

Course Objectives:

To enable a student to:

- Create digital documents of professional quality.
- Organize numerical and financial data for analysis
- Create dynamic presentations with animations
- Differentiate and decide type of document to be used for a given task.
- Write emails of professional quality.

Course Outcomes:

Code	Outcome description
	Upon successful completion of this course, students will have or be able to
CO_CSCMDC101_1	List the uses and features of MS Word, Excel, PowerPoint
CO_CSCMDC101_2	Understand various text formatting techniques, including fonts, styles, sizes, and alignment.
CO_CSCMDC101_3	Build and manage spreadsheets for data entry, analysis, and organization.
CO_CSCMDC101_4	Apply Formatting techniques, tables, and charts to present data and information effectively.
CO_CSCMDC101_5	Design and create documents for a given event.
CO_CSCMDC101_6	Create documents of professional quality for business and academic purposes.

Course Outcomes mapping with Program Specific Outcomes

Outcomes	PSO01	PSO02	PSO03	PSO04	PSO05	PSO06	PSO07	PSO08	PSO09	PSO10	PSO11	PSO12	PSO13	PSO14	PSO15	PSO16	PSO17	PSO18	PSO19	PSO20	PSO21	PSO22	PSO23	PSO24	PSO25	PSO26
1	√							√		√										√						
2	√							√		√										√						
3	√							√		√										√						
4	√							√		√										√						
5	√							√		√										√						
6	√							√		√										√						

Units	Content	Lecture Hours	COs	RBT
Unit-1	Introduction to MS Word a. Creating, editing, saving and printing text documents	13	CO1 CO6	R U

SYLLABUS

	b. Font and paragraph formatting c. Simple character formatting d. Inserting tables, smart art, page breaks e. Using lists and styles f. Working with images g. Using Spelling and Grammar check h. Understanding document properties i. Mail Merge			A1 A2 E C
Unit-2	Introduction to MS Excel a. Spreadsheet basics b. Creating, editing, saving and printing spreadsheets Working with functions & formulas c. Modifying worksheets with color & autoformats Graphically representing data: Charts & Graphs	14	CO1 CO3 CO6	R U A1 A2 E C
Unit-3	Introduction to MS PowerPoint a. Opening, viewing, creating, and printing slides Applying auto layouts b. Adding custom animation c. Using slide transitions d. Graphically representing data: Charts & Graphs Creating Professional Slide for Presentation.	13	CO1 CO4 CO6	R U A1 A2 E C
Unit-4	Internet & e-mails a. What is Internet? b. Receiving Incoming, Messages Sending Outgoing Messages, c. Email addressing, Email attachments d. Browsing, Search engines	5	CO2 CO6	R U E C

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Learning Resources:

Open online resources

1. <https://support.microsoft.com/en-us/office/powerpoint-for-windows-training-40e8c930-cb0b-40d8-82c4-bd53d3398787>
2. <https://support.microsoft.com/en-us/office/excel-video-training-9bc05390-e94c-46af-a5b3-d7c22f6990bb>
3. <https://support.microsoft.com/en-us/office/word-for-windows-training-7bcd85e6-2c3d-4c3c-a2a5-5ed8847eae73>

Practical (Laboratory)

CSCMDC101L: Introduction to MS-Word, Excel and PowerPoint Lab **[Credit: 1, Lab Hours: 30]**

Students are advised to do laboratory/practical practice not limited to, but including the following types of activities:

Word	1. Change the font style and size in a Word document 2. Apply bold, italic, and underline formatting to text 3. Create bulleted and numbered lists 4. Set margins and adjust page orientation in Word 5. Insert headers and footers into a document 6. Add page numbers to a document 7. Insert a table into a Word document 8. Merge and split cells in a table 9. Apply borders and shading to table cells 10. Insert images and shapes into a Word document 11. Add hyperlinks to text in a document 12. Embed a spreadsheet or chart into a Word document
Excel	1. Enter data into cells in Excel

SYLLABUS

	2. Perform basic arithmetic operations (addition, subtraction, multiplication, division) in Excel 3. Use autofill to quickly fill a series of cells with data 4. Use the SUM function to add a range of cells 5. Use the IF function to create conditional statements in Excel 6. Apply number formatting (currency, percentage, etc.) to cells in Excel 7. Format cells to display dates and times 8. Apply cell styles and themes to a worksheet 9. Create a chart or graph in Excel 10. Customize the appearance of a chart (titles, axis labels, etc.) 11. Add trendlines or error bars to a chart
PowerPoint	1. Create a new presentation in PowerPoint 2. Add slides to a presentation and choose different layouts 3. Rearrange the order of slides in a presentation 4. Apply a theme to a PowerPoint presentation 5. Change the background colour or image of a slide 6. Apply text formatting (font size, colour, etc.) to slide titles and bullet points 7. Insert images or videos into a PowerPoint presentation 8. Add animations and transitions between slides 9. Embed audio files or add narration to a presentation 10. Start a slideshow from the beginning or from the current slide 11. Use presenter view to view presenter notes while presenting 12. Set up slide timings or record a narration for a slideshow
Email	1. Initiate a mail merge in Microsoft Word. 2. Connect a data source, such as an Excel spreadsheet, to a Word document for mail merge. 3. Insert merge fields into a Word document. 4. Format merge fields to display specific data types, such as dates or currency. 5. Preview individual merged documents in Microsoft Word. 6. Edit merge documents to ensure proper formatting and content. 7. Filter and sort data in the mail merge recipient list. 8. Explore options available for completing a mail merge, such as printing or sending emails. 9. Perform the actual merge to generate personalized documents for each recipient. 10. Troubleshoot common issues that may arise during the merge process.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Director (Approved by)
Name:	Name:	Name:
Signature:	Signature:	Signature:

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Core/ Major Courses:

Course Code	Title
24CSCMAJ101	Introduction to Computational Thinking & Programming
24CSCMAJ102	Digital Electronics
24CSCMAJ103	Python Programming
24CSCMAJ201	Data Structures
24CSCMAJ202	Object Oriented Programming with Java
24CSCMAJ203	Computer Organisation & Architecture
24CSCMAJ301	Operating Systems
24CSCMAJ302	Computer Networks
24CSCMAJ303	Introduction to Artificial Intelligence
24CSCMAJ304	Digital Marketing
24CSCMAJ305	Information Security
24CSCMAJ306	Design & Analysis of Algorithms
24CSCMAJ307	Software Engineering
24CSCMAJ308	Database Management Systems
24CSCMAJ309	Data analysis using spreadsheet
24CSCMAJ310	Cloud Computing
24CSCMAJ311	Introduction to Data Science
24CSCMAJ312	Software Testing
24CSCMAJ313	Programming with Java Script
24CSCMAJ314	Introduction to Machine Learning
24CSCMAJ315	Theory of Computation
24CSCMAJ316	Software Project Management

Skill Enhancement Courses:

Course Code	Title
24CSCSEC101	Introduction to Cyber Security
24CSCSEC102	Introduction to Web Technology – PHP based

Multi-Disciplinary Courses:

Course Code	Title
24CSCMDC101	Introduction to MS-Word, Excel and PowerPoint

SYLLABUS

Course Code	23 GEOMDC101			
Course Title	Basics of GIS and Remote Sensing			
Credits	3			
Total Hours	45			
Category	MDC			
Intended Level	Certificate			
Issue(s) Addressed				
Course offered to	Others			
Semester	1			
Regulation	2023			
Course Overview:				
This Course –				
1. Covers the basics of remote sensing, its different types and different satellites with sensors				
2. Explains the concepts of geographic information system, its different data types				
3. Covers the hands on activity of GIS software to produce maps				
Prerequisites: Basic knowledge of light, satellites, object identification and basics of computer handling				
Course Objectives:				
The objectives of the course are-				
1. To understand the basics of remote sensing, its working principle and different types of satellites and sensors				
2. To explain the basic of geographic information system and its different data types and also its application in selected field				
3. To make different types of maps by using GIS software				
Course outcomes are based on RBT and Cognitive Level Mapping				
At the end of the course, the students will be able to:				
COs	Statements		Cognitive	Level Mapping
CO1	Understand the basics of remote sensing and also know the different types of satellite and sensors		U, R	
CO2	Understand the basics of GIS and can define and make difference between different data types		U, R, C	
CO3	Apply and analyze the theoretical knowledge of GIS in practically for making maps		A1, A2	
COURSE CONTENT				
UNITS	CONTENT	HOURS	COs	REVISED BLOOM'S TAXONOMY
Unit I	Remote Sensing: Definition and Development, Platforms and Types, Principles of Remote Sensing, Satellites (Landsat and IRS), Sensors, Visual Satellite Image Interpretation	10	CO1	U R
Unit II	Geographical Information System (GIS): Definition and Components, GIS Data Structures, Types (Spatial and Non-Spatial), Raster and Vector Data Structure, Application of Remote Sensing and GIS in Land Use and Land Cover mapping, Urban Sprawl Analysis	10	CO2	U R C
Unit III	Geo-referencing, Editing and Output (Using any software from the following, Mapinfo / Global Mapper / QGIS / ArcMap)	25	CO3	A1 A2
Reading List				
1. Bhatta B. (2008): Remote Sensing and GIS, Oxford University Press, New Delhi.				
2. Lillesand T. M., Kiefer R.W. and Chapman J.W. (2004): Remote Sensing and Image Interpretation, Wiley. (Wiley Student Edition)				
3. Mukherjee, S. (2004): Textbook of Environmental Remote Sensing, Macmillan, Delhi.				
4. Nag, P. and Kudra, M. (1998): Digital Remote Sensing, Concept, New Delhi.				

5. Sarkar, A. (2015): Practical Geography: A systematic approach, Orient Black Swan Private Limited, New Delhi.

ASSESSMENT SCHEME

Formative Assessment

50 marks as per the Assessment & Evaluation Framework Document of Salesian College

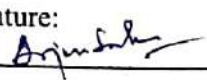
- 10 (CIA I) +25 (Mid-term) +10 (CIA 2) +5 (Attendance)

Summative assessment

1. Theory paper of 50 marks scaled down to 25 marks.

Rubrics:

- g. Six questions of 5 marks each, out of ten questions. Remembering and Understanding levels of RBT. $6 \times 5 = 30$
- h. Two questions of 10 marks each, out of four questions. Analysis, and Applying levels of RBT. $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: ARJUN SANA Signature: 	Name: Dr. BIPUL CHHETRI Signature: 	Name: Signature: 

Course Code	23GEOMDC201-TH
Course Title	Geographical Data Representation
Credits	3
Lecture Hours	45
Category	Multi-Disciplinary Course
Semester	III
Intended Level	Diploma
Issue(s) Addressed	
Courses Offered to	Geography
Regulation	2023

Course Overview:

This Course –

- Covers the basic concept of geographical data, its types and uses.
- Presents different types of graphs to represent geographical data.
- Covers different methods for thematic mapping.

Course Objectives:

This Course –

1. To understand different types of symbols that are used to present geographical data
2. To gain knowledge about the use of different symbols
3. To get an idea about different types of cartograms
4. To understand different types of graphs to represent geographical data
5. To acquire knowledge about the use of different graphs with different types of data
6. To understand the knowledge about different techniques of thematic mapping

Course Outcomes based on RBT and Cognitive Level Mapping

At the end of the course, the students will be able to:

COs	Statements	Cognitive Level Mapping
CO1	understand different types of symbols that use to present geographical data	U, R
CO2	gain knowledge about the use of different symbols	R, A1, A2, E, C
CO3	get the idea about different types of cartograms	U, R, A1
CO4	understand different types of graphs to represent geographical data	U, R, A1
CO5	acquire knowledge about the use of different graphs with different types of data	R, A1, A2, E, C
CO6	understand the knowledge about different techniques of thematic mapping	U, R, A1

Syllabus

UNITS	CONTENT	HOURS	COs	RBT
UNIT I	General Concept of Geographical Data a. Symbolization of Geographical Data (Point Symbol, Line Symbol and Area Symbol) b. Concept and Types of Cartograms.	8	CO1 CO2 CO3	U R A1 A2 E C
UNIT II	Diagrammatic Representation of Data a. Properties, Uses, and Limitations b. Line Graph (Simple) c. Bar graph (Simple) d. Circles (Proportional Circle, and Pie Graph)	19	CO4 CO5	U R A1 A2 E C
UNIT III	Thematic Mapping Techniques	18	CO5	U

	a. Properties, Uses, and Limitations b. Proportional Cube, and Sphere.		CO6	R A1 A2 E C

Reading List:

1. Monkhouse, F.J. & Wilkinson, F.J. (1985). Maps and Diagrams. Methuen, London
2. Robinson, Arthur H. et al. (2010): Elements of Cartography, 6th edition, Wiley India, New Delhi
3. Saha, Pijush Kanti and Basu, Partha (2014): Advanced Practical Geography, Books and Allied (P) Ltd., Kolkata
4. Sarkar, Ashis (2015): Practical Geography –A Systematic Approach, Orient Black Swan, New Delhi.
5. Singh, R. L. & Singh, Rana PB (1993). Elements of Practical Geography, Kalyani Publishers, New Delhi

Formative Assessment (MDC)

50 marks as per the Assessment & Evaluation Framework Document of Salesian College

- 10 (CIA 1) + 25 (Mid-term) + 10 (CIA 2) + 5 (Attendance)

Summative assessment

1. Theory paper of 50 marks scaled down to 25 marks.

Rubrics:

- Six questions of 5 marks each, out of ten questions. Remembering and Understanding levels of RBT. $6 \times 5 = 30$
- Two questions of 10 marks each, out of four questions. Analysis, and Applying levels of RBT.
 $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: <i>Arjun Saha</i> Signature: <i>Saha</i> <i>28/02/24</i>	Name: <i>Dr. Bipul Kumar</i> Signature: <i>Bipul Kumar</i> <i>28.02.24</i>	Name: Signature: <i>[Signature]</i> <i>28/02/24</i>

VICE CHAIRPERSON
Board of Studies
Department of Geography
Salesian College (Autonomous)
Sonada & Siliguri

CHAIRPERSON
Board of Studies
Department of Geography
Salesian College (Autonomous)
Sonada & Siliguri

Course Code 23	23 GEOSEC101 -Th
Course Title	Laboratory Techniques in Physical Geography
Credits	2
Total Hours	30
Category	SEC
Semester	Certificate
Intended Level	
Issue(s) Addressed	Geography
Course Offered to	I
Regulation	2023

Course Overview:

This Course –

- Covers the presentation of Geographical data.
- Helps students recognise the materials and techniques used in Geographical data representation.
- Explains the importance and uses of different maps and diagrams in physical geography.

Prerequisites: Basic knowledge of physical geography and statistical diagrams.

Course Objectives:

The objective of the course is –

1. To understand the fundamental of Geographical Data Presentation.
2. To discuss the importance and forms of graphical data presentation.
3. To inculcate the ability to objectively use the different methods and techniques used in the lab.
4. To identify and create appropriate maps and diagrams in studies related to physical geography.

Course Outcomes based on RBT and Cognitive Level Mapping

At the end of the course, the students will be able to:

COs	Statements	Cognitive Level Mapping
CO1	Understand the fundamental of Geographical Data Presentation.	U, A1, A2, R
CO2	Discuss the importance and forms of graphical data presentation.	U, R, A1, A2, C, R
CO3	Inculcate the ability to objectively use the different methods and techniques used in the lab.	U, A1, C, R
CO4	Identify and create appropriate maps and diagrams in studies related to physical geography.	U, R, A1, A2, C, R

Course Content

UNITS	CONTENT	HOURS	COs	RBT
UNIT I	Presentation of Geographical data 1. Importance 2. Forms of Graphical Data Representation	5	CO1 CO2	R U A1 A2
UNIT II	Materials and Techniques 1. Drawing Instruments Pencils; Scribers; Inks and Colours; Drawing Media. 2. Map Compilation 3. Scales and Scale lines; Frames and panel Margins 4. Shading and stipples; Colour; Lettering. 1. Map Reduction and Enlargement, Duplication and reproduction, Map Generalisation	15	CO3	R U A1 A2 E C
UNIT III	Relief Maps and Diagrams 1. Depiction of Relief: Different types of height; Layer shading and tinting; Hachures; Physiographic division map. 2. Gradient and slope 3. Landscape drawing and Field sketching from topographical maps.	10	CO3 CO4	R U A1 A2 E

PRACTIAL

Course Overview:

This Course will –

- Cover the concept of stream ordering
- Explain the different morphometric and fluviometric indices.
- Help to construct altimetric frequency curve and hypsometric curve of a particular place.
- Identify the soil texture of a particular geographical area.

Course Objective-

The objective of the course is –

1. To understand the different order of streams, present in a particular area.
2. To attain the ability of explaining the geometric properties of the land surface and drainage.
3. To acquire detailed usage of altimetric frequency curve and hypsometric curve.
4. To gain knowledge on the soil textures in different location.

At the end of the course, the students will be able to:

COs	Statements	Cognitive Level Mapping
CO1	understand the different order of streams present in a particular area.	
CO2	attain the ability of explaining the geometric properties of the land surface and drainage.	
CO3	acquire detailed usage of altimetric frequency curve and hypsometric curve.	
CO4	To gain knowledge on the soil textures in different location.	

Course Content

Preparation of Lab note Book with the following:

- 1) Stream Ordering (Horton and Strahler)
- 2) Morphometric Indices: Dissection Index, Ruggedness Index
- 3) Hypsometric Curve and Altimetric Curve
- 4) Fluviometric Indices: Drainage Density and Drainage Texture
- 5) Ternary Graph/ Diagram (Soil Textural Triangle)

Suggested Readings

1. Kale V. S. and Gupta A., 2001: Introduction to Geomorphology, Orient Longman, Hyderabad.
2. Knighton A. D., 1984: Fluvial Forms and Processes, Edward Arnold Publishers, London
3. Richards K. S., 1982: Rivers: Form and Processes in Alluvial Channels, Methuen, London.
4. Selby, M.J., (2005), Earth's Changing Surface, Indian Edition, OUP
5. Monkhouse F. J. and Wilkinson H. R., 1973: Maps and Diagrams, Methuen, London.
6. Gupta K.K. and Tyagi, V. C., 1992: Working with Map, Survey of India, DST, New Delhi.
7. Sarkar, A. (2015) Practical Geography: A Systematic Approach. Orient Black Swan Private Ltd., New Delhi

ASSESSMENT SCHEME**Formative Assessment**

50 marks as per the Assessment & Evaluation Framework Document of Salesian College

- 10 (CIA I) +25 (Mid-term) +10 (CIA 2) +5 (Attendance)

Summative assessment

Combined theory and practical papers:

1. *Theory paper* of 50 marks scaled down to 25 marks.

Rubrics:

- i. Six questions of 5 marks each, out of ten questions. Remembering and Understanding levels of RBT. $6 \times 5 = 30$
- j. Two questions of 10 marks each, out of four questions. Analysis, and Applying levels of RBT.

10 X 2 = 20

2. *Practical paper* of 50 marks, scaled down to 25 marks. Marks distribution as follows:

- x. Lab report: 10 marks
- xi. Viva- voce: 10 marks
- xii. Practical Exam: 30 marks

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: SRASHTA CHOWDHURY Signature: 	Name: Dr. BIPUL CHHETRI Signature: 	Name: Signature: 

Course Code	23GEOSEC201-TH
Course Title	Basics of Computer Application
Credits	2
Lecture Hours	45
Category	Skill Enhancement Course - Theory
Semester	III
Intended Level	Diploma
Issue(s) Addressed	
Courses Offered to Regulation	Geography 2023

Course Overview:

This Course –

- Aim at providing exposure to students in skill development towards basic office applications.

Course Objectives:

This Course enables –

1. To demonstrate a basic understanding of computer hardware and software.
2. To apply skills and concepts for the basic use of a computer.
3. To identify appropriate tools of MS Office to prepare basic documents, charts, spreadsheets and presentations.

Prerequisite: Basic knowledge of what is a computer.

At the end of the course, the students will be able to:

COs	Statements	Cognitive Level Mapping
CO1	Demonstrate a basic understanding of computer hardware and software.	U
CO2	Apply skills and concepts for basic use of a computer.	R, A1, A2
CO3	Identify appropriate tool of MS office to prepare basic documents, charts, spreadsheet and presentations.	U, R, A1, E, C, A2

Syllabus

UNITS	CONTENT	HOURS	COs	RBT
UNIT I	1. Basics of Computers a. Characteristics of computers, Application of computers. b. I/O devices, hardware, software c. Memories: Primary, Auxiliary and Cache Memory. 2. MS Windows	7	CO1 CO2	R U A1 A2 C
UNIT II	1. MS – Word a. Features of MS Word b. MS Word Window Component: Creating, Editing, Formatting and Printing Documents; Headers and Footers; Insert/ Draw Tables, Table Auto Format; Page Border, Page number and Shading; Inserting Symbols, Shapes, Word Art, Page Numbers, Mail Merge	15	CO1 CO2	R U A1 A2 E C
UNIT III	1. MS – Excel a. Overview of Excel Features: Creating New Worksheet; Selecting Cells; Entering and editing Text, Numbers. b. Inserting Rows/ Columns; Changing column width and row heights. c. Formulae; Referencing cells; Changing font	15	CO3 CO4	R U A1 A2 E C

	sizes and colours; Insertion of charts; Auto fill; Sort.			
NIT IV	1. MS – Power point a. Features of Powerpoint: Creating a presentation; b. Inserting and Deleting Slides in Presentation c. Adding Clip Art/ Pictures; Inserting other objects, audio, video d. Resizing and scaling of an Object; Slide Transition; Custom Animation.	8	CO4	R, U, A1, A2, E, C
PRACTICAL 23GEOS201-PR Credit: 1				
Course Overview: This Course – Aims at providing exposure to students in skill development towards basic office applications.				
Course Objectives: This Course enables – - To demonstrate basic understanding of computer hardware and software. - To create personal, academic, and professional documents using MS – Office. - To create spreadsheets and charts. - To create power point presentation.				
At the end of the course, the students will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Demonstrate basic understanding of computer hardware and software.			
CO2	Create personal, academic, and professional documents using MS – Office.			
CO3	Create spreadsheets and charts.			
CO4	Create power point presentation.			
Syllabus				
UNITS	CONTENT	HOURS	COs	RBT
UNIT I	Preparation of Lab note Book with the following: - The different parts of a computer; types of computer; different hardwares and softwares (images) - Academic, professional and personal documents created by students using MS Word. - Spreadsheets and charts created by students using MS Excel. - Presentation created by student using MS Powerpoint	10	CO1 CO2 CO3 CO4	
Suggested Readings - Ron Mansfield Working on Microsoft Office. TMh Publications. - Saxena Sanjay MS Office 2007 in a Nutshell. Vikas Publishing House - Price Michael Excel 2020 in easy steps. TMH publications				

Formative Assessment (SEC)

50 marks as per the Assessment & Evaluation Framework Document of Salesian College
10 (CIA I) + 25 (Mid-term) + 10 (CIA 2) + 5 (Attendance)

Summative assessment

Combined theory and practical papers:

1. Theory paper of 50 marks scaled down to 25 marks.

Rubrics:

- a. Six questions of 5 marks each, out of ten questions. Remembering and Understanding levels of RBT. $6 \times 5 = 30$
b. Two questions of 10 marks each, out of four questions. Analysis, and Applying levels of RBT.
 $10 \times 2 = 20$

2. Practical paper of 50 marks, scaled down to 25 marks. Marks distribution as follows:

- i. Lab report: 5 marks
ii. Viva- voce: 5 marks
iii. Practical Exam: 40 marks

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: DR. SRASHTA CHOWDHURY Signature: <i>[Signature]</i> 23.02.24	Name: <i>[Signature]</i> Signature: <i>[Signature]</i> 23.02.24 VICE CHAIRPERSON	Name: Signature: <i>[Signature]</i>

Board of Studies
Department of Geography
Salesian College (Autonomous)
Sonada & Siliguri

CHAIRPERSON
Board of Studies
Department of Geography
Salesian College
Sonada & Siliguri

Course Code	24GEOMDC102
Course Title	Understanding Climatic Data Analysis
Credits	3
Total Hours	45
Category	MDC
Intended Level	Certificate
Issue(s) Addressed	
Course offered to	Others
Semester	II
Regulation	2023

Course Overview:

This Course –

- Covers the different types of data that are used in the climatic field
- Covers the hands-on use of different climatic instruments
- Explains the different techniques of presenting data and analyzing real weather data of India

Prerequisites: Basic knowledge of temperature, rainfall, cloud, wind and humidity

Course Objectives:

The objectives of the course are-

1. To compare and describe the different types of data and mapping of different data
2. To understand and develop ideas of different minor weather instruments and analyze different data collected by them
3. To apply the knowledge of weather data in real weather map of India and analyze them

Course outcomes are based on RBT and Cognitive Level Mapping

At the end of the course, the students will be able to:

COs	Statements	Cognitive Level Mapping
CO1	Compare and describe the different types of data and mapping of different data	U, R
CO2	Understand and develop ideas for different minor weather instruments and analyze different data collected by them	U, C, A1
CO3	Apply the knowledge of weather data in real weather map of India and analyze them	A1, A2

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOM'S TAXONOMY
Unit I	Climatic Data: Temperature, Rainfall, Wind, Cloud, Humidity. Isopleth mapping: Isotherm, and Isobar	10	CO1	UR
Unit II	Recording of maximum and minimum thermometer, Hygrometer, Fortin's Barometer. Diagrammatic data presentation: Climograph (after Griffith Taylor), Hythergraph (after Griffith Taylor)	10	CO2	U C A1
Unit III	Interpretation of Indian daily weather reports	25	CO3	A1A2

Reading List

4. Sarkar, A. (2015): Practical Geography: A systematic approach, Orient Black Swan Private Limited, New Delhi.
5. Monkhouse, F.J. and Wilkinson, H.R. (1971): Maps and Diagrams, Their Compilation and Construction, Alphanumeric, Kolkata.
6. Basu, P. (2021): Advanced Practical Geography, Books & Allied Pvt. Ltd. Kolkata.

ASSESSMENT SCHEME

Formative Assessment

50 marks as per the Assessment & Evaluation Framework Document of Salesian College

- 20 (FA 1) + 50 (FA2) + 20 (FA3) + 10 (Attendance) = 100 marks scaled down to 50

• (Attendance) Summative assessment

1. Theory paper of 50 marks.

Rubrics:

- a. Five questions of 2 marks each, out of eight questions. Remembering and Understanding Levels of RBT. $2 \times 5 = 10$
- b. Four questions of 5 marks each, out of six questions. Remembering and Understanding levels of RBT. $4 \times 5 = 20$
- c. Two questions of 10 marks each, out of four questions. Analysis, and Applying levels of RBT.

$10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: ~~ARJUN JANA~~ Signature: <i>Arjun Jana</i> 04/06/24	Name: SRITANA SINHA Signature: <i>Sritana Sinha</i> HEAD 06/2024	Name: Signature: <i>[Signature]</i>

Department of Geography
Salesian College (Autonomous)
Siliguri

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Arts & Humanities
Salesian College (Autonomous)
Sonada & Siliguri

Course Code	24GEOSSEC101 -Th
Course Title	Basics of Computer Application
Credits	2
Total Hours	30
Category	SEC
Semester	Certificate
Intended Level	
Issue(s) Addressed	Geography
Course Offered to	1
Regulation	2024

Course Overview:

This Course –

- Aims at providing exposure to students in skill development towards basic office applications.

Prerequisites: Basic knowledge of computers and handling a computer.

Course Objectives:

The course enables –

- To demonstrate a basic understanding of computer hardware and software.
- To apply skills and concepts for basic use of a computer.
- To identify appropriate tools of MS Office to prepare basic documents, charts, spreadsheets and presentations.

Course Outcomes based on RBT and Cognitive Level Mapping

At the end of the course, the students will be able to:

COs	Statements	Cognitive Level
CO1	Demonstrate a basic understanding of computer hardware and software.	U, A1, A2, R
CO2	Apply skills and concepts for the basic use of a computer.	U, R, A1, A2, C, R
CO3	Identify appropriate tools of MS Office to prepare basic documents, charts, spreadsheets, and presentations.	U, A1, C, R

Course Content

UNITS	CONTENT	HOURS	COs	RBT
UNIT I	1. Basics of Computers a. Characteristics of computers, Application of computers. b. I/O devices, hardware, software c. Memories: Primary, Auxiliary, and Cache Memory. 2. MS Windows	5	CO1	R U A1 A2
UNIT II	MS – Word a. Features of MS Word b. MS Word Window Component: Creating, Editing, Formatting, and Printing Documents; Headers and Footers; Insert/ Draw Tables, Table Auto Format; Page Border, Page number and Shading; Inserting Symbols, Shapes, Word Art, Page Numbers, Mail Merge	15	CO2	R U A1 A2 E C
UNIT III	MS – Excel and MS - PowerPoint a. Overview of Excel Features: Creating New Worksheet; Selecting Cells; Entering and editing Text and Numbers. b. Inserting Rows/ Columns; Changing column width and row heights c. Creating a presentation.	10	CO3 CO4	R U A1 A2 E

PRACTICAL			
Paper Code: 24GE0SEC101		Credit: 1	
Course Overview: This Course – Aims at providing exposure to students in skill development towards basic office applications.			
Prerequisites: Basic knowledge of computers and handling a computer.			
Course Objectives: The objective of the course is – - To demonstrate a basic understanding of computer hardware and software. - To create personal, academic, and professional documents using MS – Office. - To create spreadsheets and charts.			
Course Outcomes based on RBT and Cognitive Level Mapping			
At the end of the course, the students will be able to:			
COs	Statements	Cognitive Level	
CO1	Demonstrate a basic understanding of computer hardware and software.		
CO2	Create personal, academic, and professional documents using MS – Office.		
CO3	Create spreadsheets and charts.		
Syllabus			
Course Content	Hours	COs	RBT
Preparation of Lab note Book with the following:			
1) The different parts of a computer; types of computer; different hardware and software (images)	10	CO1	
2) The different components of MS – Word.	5	CO2	
3) Overview of Excel and PowerPoint Features	15	CO3	
Suggested Readings			
1. Ron Mansfield () Working on Microsoft Office. TMh Publications.			
2. Saxena Sanjay () MS Office 2007 in a Nutshell. Vikas Publishing House			
3. Price Michael () Excel 2020 in easy steps. TMH publications			

ASSESSMENT SCHEME

Formative Assessment

50 marks as per the Assessment & Evaluation Framework Document of Salesian College

- 20 (FA 1) + 50 (FA2) + 20 (FA3) + 10 (Attendance) = 100 marks scaled down to 50

Summative assessment

Combined theory and practical papers:

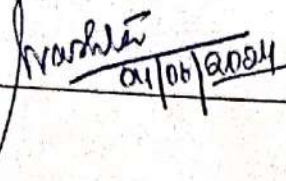
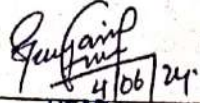
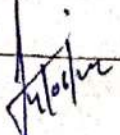
- Theory paper of 50 marks scaled down to 25 marks.

Rubrics:

- Five questions of 2 marks each, out of eight questions. Remembering and Understanding Levels of RBT.
2X5=10
- Four questions of 5 marks each, out of six questions. Remembering and Understanding levels of RBT.
4X 5 = 20
- Two questions of 10 marks each, out of four questions. Analysis, and Applying levels of RBT.
10X 2 = 20

- Practical paper of 50 marks, scaled down to 25 marks. Marks distribution as follows:

- Lab report: 5marks
- Viva- voce: 5 marks
- Practical Exam: 40 marks

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: DR. SRASHTA CHOWDHURY	Name: SRITANA SINHA	Name:
Signature:  01/06/2024	Signature:  04/06/24	Signature: 

HEAD
Department of Geography
Salesian College (Autonomous)
Siliguri

DEAN
Arts & Humanities
Salesian College (Autonomous)
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Course Code	24GEOMDC103-TH
Course Title	Geographical Data Representation
Credits	3
Lecture Hours	45
Category	Multi-Disciplinary Course
Semester	III
Intended Level	Certificate
Issue(s) Addressed	
Courses Offered to	Geography
Regulation	2024

Course Overview:

This Course –

1. Covers the basic concept of geographical data, its types and uses.
2. Presents different types of graphs to represent geographical data.
3. Covers different methods for thematic mapping.

Prerequisites: Basic knowledge and properties of symbols, line, bar, and circle

Course Objectives:

The objectives of the course are-

1. To understand different types of symbols that use to present geographical data.
2. To gain knowledge about the use of different symbols.
3. To get the idea about different types of cartograms.
4. To understand different types of graphs to represent geographical data.
5. To acquire knowledge about the use of different graphs with different types of data.
6. To understand the knowledge about different techniques of thematic mapping.

Course outcomes are based on RBT and Cognitive Level Mapping

At the end of the course, the students will be able to:

COs	Statements	Cognitive Level
CO1	understand different types of symbols that use to present geographical data	U, R
CO2	gain knowledge about the use of different symbols	R, A1, A2, E, C
CO3	get the idea about different types of cartograms	U, R, A1
CO4	understand different types of graphs to represent geographical data	U, R, A1
CO5	acquire knowledge about the use of different graphs with different types of data	R, A1, A2, E, C
CO6	understand the knowledge about different techniques of thematic mapping	U, R, A1

COURSE CONTENT

UNITS	CONTENT	HOURS	COs	REVISED BLOOM'S TAXONOMY
UNIT I	General Concept of Geographical Data a. Symbolization of Geographical Data (Point Symbol, Line Symbol and Area Symbol) b. Use and Choice of Symbols, Concept and Types of Cartograms,	8	CO1 CO2 CO3	U R A1 A2 E C
UNIT II	Diagrammatic Representation of Data a. Properties, Uses, and Limitations b. Line Graph (Simple, and Multiple) c. Bar graph (Simple, Compound and Composite) Circles (Proportional Circle, and Pie Graph)	19	CO4 CO5	U R A1 A2 E C

UNIT III	Thematic Mapping Techniques a. Properties, Uses, and Limitations b. Proportional Cubes, Dot and Sphere Choropleth, and Chorochromatic	18	CO5 CO6	U R A1 A2 E C

Suggested Readings

1. Monkhouse, F.J. & Wilkinson, F.J. (1985). Maps and Diagrams. Methuen, London
2. Robinson, Arthur H. et al. (2010): Elements of Cartography, 6th edition, Wiley India, New Delhi
3. Saha, Pijush Kanti and Basu, Partha (2014): Advanced Practical Geography, Books and Allied (P) Ltd., Kolkata
4. Sarkar, Ashis (2015): Practical Geography – A Systematic Approach, Orient Black Swan, New Delhi.
5. Singh, R. L. & Singh, Rana PB (1993). Elements of Practical Geography, Kalyani Publishers, New Delhi

ASSESSMENT SCHEME

Formative Assessment

50 marks as per the Assessment & Evaluation Framework Document of Salesian College

- 20 (FA 1) + 50 (FA2) + 20 (FA3) + 10 (Attendance) = 100 marks scaled down to 50

Summative assessment

1. Theory paper of 50 marks.

Rubrics:

- a. Five questions of 2 marks each, out of eight questions. Remembering and Understanding Levels of RBT. $2 \times 5 = 10$
- b. Four questions of 5 marks each, out of six questions. Remembering and Understanding levels of RBT. $4 \times 5 = 20$
- c. Two questions of 10 marks each, out of four questions. Analysis, and Applying levels of RBT. $10 \times 2 = 20$

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: ARJUN SAHA	Name: SRITANA SINHA	Name:
Signature: <i>Arjun Saha</i> 4/12/24	Signature: <i>Sritana Sinha</i> 4/12/24	Signature:

HEAD
Department of Geography
Salesian College (Autonomous)
Siliguri

DEAN
Arts & Humanities
Salesian College (Autonomous)
Sonada & Siliguri



Salesian College
(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Commerce

Department of Commerce

Curriculum Document

2023 – 2024

Vision

The Vision of the Department is to create a strong foundation for its students for their career and overall growth which directly contributes to the well-being of a nation and to inspire the youth to show attachment and devotion in a fearless pursuit of truth by being true to the motto of the Salesian college.

Mission

Empower students to become proactive, globally-minded management professionals through experiential learning and holistic personality development.

1. Programme Overview:

Bachelor of Commerce is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs):

After completion of the programme, a student will be able to:	
KNOWLEDGE	PO01: The program helps aspirants to acquire knowledge in the field of accounting, taxation, auditing, risk management, financial management, managerial economics, business, law, and business communications
	PO02: The program is designed to provide knowledge about the derivative market, equity market, portfolio management etc. which helps the learners to play key roles as Investment Banker, Portfolio Manager, Asset Manager or corporate finance.
	PO03: The Program enables learners to enhance theoretical and practical knowledge of real corporate environment.
	PO04: The specially designed Program creates knowledgeable professionals who can handle various financial activities associated with banking and insurance sectors.
SKILL	PO05: The program aims to develop professional skills among students and build a strong foundation in accounting, Finance and Taxation which will benefit themselves as well as the society.
	PO06: The Program enables to develop communication skills in learners and build confidence to face the challenges of the real corporate world.
	PO07: The program develops the critical and analytical thinking skill to make effective managerial decisions.
	PO08: The Program develops entrepreneurial skills amongst learners.
COMPETENCE	PO09: The Program enhances the capability of decision making at personal and professional levels.
	PO10: The Program makes students industry ready and develops various managerial and accounting skills for better professional opportunities.
	PO11: The Program caters to a rapidly growing and changing work environment with regard to innovation, technological advancements, and market relevance.
	PO12: The Program aims at ensuring, learners are able to tackle complex tasks while working effectively.

3. Programme Specific Objectives & Outcomes (PSOs):

Knowledge	PSO1: A student develops a clear idea about the fundamental principles and concepts of accounting.
	PSO2: A student gathers knowledge about mathematical concepts, techniques and economics.
	PSO3: A student develops knowledge about the application of economics in the real world.
	PSO4: A student develops the understanding of the importance of entrepreneurship and creative behavior.
Skills	PSO1: Students will demonstrate ability to interpret and analyze Financial Statements

	PSO2: Student will be able to apply critical thinking in preparing financial reports using the relevant Global reporting standards.
	PSO3: A student will develop understanding of various ethical and social concerns of commercial activities.
	PSO4: A student will develop an understanding of educational technology, ICT and e-learning.
Competence	PSO1: Student will gain through systematic and subject skills within various disciplines of finance, auditing and taxation, accounting, management, communication, computer
	PSO2: Student can also get the practical skills to work as accountant, audit assistant, tax consultant and computer operator.
	PSO3: Student will learn relevant Advanced accounting career skills, applying quantitative and qualitative knowledge to their future careers in business.
	PSO4: Students will be able to do their higher education and can make research in the field of finance and commerce

1. Programme Matrix

Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Honors	Total Marks
I	23COMMAJ101	Major	Financial Accounting	4	3+1+0	60	100
	23COMMAJ102	Major	Business Mathematics	4	3+1+0	60	100
	23COMMINS101	Minor	Microeconomics	4	3+1+0	60	100
	23COMMDC101	MDC	Basics of Accounting and Finance	3	2+1+0	45	100
	23AECE101	AEC	Compulsory English	2	2+0+0		50
	23COMSEC101	SEC	Entrepreneurship	3	2+0+1	45	100
	23COMVED101	VAC1	Value Education	1			50
	23COMVAC101	VAC2	Social Media Marketing/NCC/Sports/Music/ Introduction to Assistant Beauty Therapist	1			50
	Total						
II	23COMMAJ103	Major	Corporate Accounting	4	3+1+0	60	100
	23COMMAJ104	Major	Business Law	4	3+1+0	60	100
	23COMMINS102	Minor	Business Statistics	4	3+1+0	60	100
	23COMMDC102	MDC	Principles of Management	3	2+1+0	45	100
	23AEAE102	AEC	ALT Eng	2	2+0+0		50
	23COMSEC102	SEC	Computer Applications in Business	3	2+0+1	45	100
	23COMVED102	VAC3	Value Education	1			50
	23COMVAC102	VAC4	NCC/Sports/Music/ Basic Depilation Services	1			50
	Total						

COURSE CONTENT TEMPLATE

1. Course description

Course Code	23COMMAJ101
Course Title	Financial Accounting
Credits	4
Total Hours	60
Hours per Week	5
Course Type	Major
Semester	I
Intended Level	Certificate
Issue(s)Addressed	
Course Offered to	B. Com
Regulation	2023
Course Overview	This course: a. Provides students with a comprehensive understanding of the fundamental principles and concepts of accounting. b. Covers the essential aspects of financial accounting, including the preparation of financial statements. The course also introduces students to accounting standards, international financial reporting standards, and the basics of accounting non-profit organizations and incomplete records. c. Through theoretical knowledge and practical applications, students will develop the skills necessary to analyse, interpret, and communicate financial information effectively.
Prerequisite	A foundational understanding of basic accounting principles and concepts.

Course Objectives	I. Understand the principles of Financial Accounting and the Conceptual Framework to accurately prepare and present financial information for external users. II. Master the techniques for Accounting for Depreciation, Reserves, and Provisions to ensure proper recognition and allocation of financial resources. III. Learn the step-by-step Accounting Process and creation of Final Accounts for Trading Concerns, enabling comprehensive analysis of business performance. IV. Acquire proficiency in preparing Final Accounts for Non-Profit Organizations and dealing with Incomplete Records, facilitating accurate financial reporting in diverse contexts. V. Gain expertise in Self-Balancing and Sectional Balancing Ledger methods, ensuring meticulous organization and presentation of financial data for effective decision-making.

Course Outcomes Based on RBT and Cognitive Level Mapping

At the end of this course, a student will be able to:

COs	Statements	Cognitive Level Mapping
CO1	Recall and explain the fundamental principles of financial accounting, including accrual accounting, double-entry accounting, and Revenue recognition.	R

CO2	Understand the Conceptual Framework of financial accounting and its role in guiding the preparation of accurate and transparent. Financial statements.	U
CO3	Apply depreciation methods and calculate the depreciation expense for various types of assets, ensuring accurate representation of them. Decreasing value overtime.	A1
CO4	Analyse financial transactions and prepare the final accounts of trading concerns, incorporating concepts of reserves, provisions, And adjustments.	A2
CO5	Evaluate the financial performance and position of nonprofit organizations by interpreting and preparing their final accounts, considering. unique accounting principles applicable to such entities.	E

Course Content

Units	Content	Lecture re Hour s	COs	RBT

Unit I	Introduction to Financial Accounting and Conceptual Framework a. Accounting as an information system; Users of accounting information; Qualitative characteristics of accounting; Cash basis and accrual basis of accounting; Capital and revenue receipts and expenditure. b. Accounting Concepts and Conventions c. Accounting standards: Concept, benefits, procedure for issuing accounting standards in India. Salient features of First-Time Adoption of Indian Accounting Standard (Ind-AS) 101. Features and objectives of AS-1, AS-2, AS-9, AS-10. International Financial Reporting Standards (IFRS)- Need and procedures	08	CO-1	R UA 1A 2E C
Unit II	Accounting for Depreciation, Reserves and Provisions	10	CO-2	R U A1 A2 E

	a. Depreciation: Meaning, Nature, Factors, Different methods of charging depreciation; Fixed Instalment method, written down value method, Units of production method, Disposal of depreciable assets, Change in the method of depreciation, Provision for depreciation. b. Reserve and Provision: Meaning, Objective, Types, accounting treatment.			C
Unit III	Accounting Process and Final Accounts of Trading Concern a. Accounting process: recording of transactions, preparation of trial balance including adjusting, transfer, and closing entries. b. Final Account: Preparation of Financial statements of sole proprietorship and partnership business – Manufacturing Account, Trading and Profit & Loss Account, and Balance Sheet	20	CO-3	R UA 1A 2E C

Unit IV	Final Account of Non-Profit Organizations and from Incomplete Records. a. Preparation of Receipts & Payment Account, Income & Expenditure Account, and Balance Sheet. b. Preparation of Financial Statements from incomplete records (Single entry)	12	CO-4	R UA 1A 2E C
Unit V	Self-Balancing and Sectional Balancing Ledger a. Self-Balancing: Concept of Self Balancing Ledger, Advantages, Recording Process, and Preparation of Adjustment Accounts. b. Sectional Balancing: Concept of sectional Balancing, Preparation of Control Accounts.	12	CO-5	R UA 1A 2E C
Learning Resources: Suggested Readings: 1. M.C. Shukla, T.S. Grewaland S.C.Gupta. Advanced Accounts. Vol.-I.S.Chand&Co.,NewDelhi.				

2. S.N. Maheshwari, and. S.K. Maheshwari. Financial Accounting. Vikas Publishing House, New Delhi.
3. Deepak Sehgal. Financial Accounting. Vikas Publishing House, New Delhi.
4. Bhushan Kumar Goyal and H N Tiwari, Financial Accounting, International Book House
5. Tulsian, P.C. Financial Accounting, Pearson Education.
6. M.Haniff & A. Mukherjee, Financial Accounting, McGraw-Hill Education.
7. Basu & Das, Financial Accounting, Rabindra Library
8. SP Jain & K. L. Narang, Financial Accounting, Kalyani Publisher

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. ASSESSMENT

- i. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment:* 50 marks
 - Five Very Short Questions to be answered out of seven given from lower order of RBT – (2 Marks each)
 - Three Short to be answered out of five set from higher order of RBT – (5 Marks each).
 - One Long Question to be answered out of two from higher order of RBT – (10 marks)
 - One case study/Financial Interpretation to be answered from Creating level – (15 marks)
 - Summative Assessment Time: 2 Hours for pen and paper test

Course Code	23COMMAJ102
Course Title	Business Mathematics
Credits	4
Total Hours	60
Hours per Week	5
Course Type	Major
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Commerce
Regulation	2023
Course Overview	This course: - Is designed to provide students with a strong foundation in mathematical concepts and techniques applicable to business and economics. - Focuses on developing mathematical skills essential for decision-making, problem-solving, and quantitative analysis in various business contexts. - Helps students to learn and apply mathematical tools and methods to analyse data, make financial calculations, optimize business processes, and understand fundamental mathematical principles relevant to the business world.
Prerequisite	An understanding of basic knowledge of algebra and arithmetic.
Course Objectives	A student will be able to - Comprehend the concept of systematic processing and interpreting the information in quantitative terms to arrive at an optimum solution to business problems. - Develop proficiency in using different mathematical tools. (Matrices, calculus, linear programming, and mathematics of finance) in solving d. Daily life problems. - Acquire competence to use computer for mathematical computations. - Obtain critical thinking and problem-solving aptitude. v. Evaluate the role played by mathematics in the world of business and economy.

Course Outcomes based on RBT and Cognitive Level Mapping

At the end of this course, a student will be able to:

Cos	Statements	Cognitive Level Mapping
CO1	Define the concept of matrices, determinants and functions	R
CO2	Discuss the basics of mathematics	U
CO3	Apply differentiation techniques to find the maximum and minimum values of functions and utilize them in real-world applications such as marginal analysis in business and economics.	A1
CO4	Calculate the inverse of a square matrix and utilize it to solve systems of linear equations, both analytically and numerically.	A2

CO5	Differentiate between various types of annuities, including ordinary, due, deferred, continuous, and perpetual annuities, and calculate their future and present values.	E		
CO6	Generate critical thinking skills by analyzing financial data, making informed financial decisions based on time value of principles, and effectively communicating mathematical solutions using financial terminology.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
UNIT-I	Basics of mathematics a) Algebraic operation b) Indices c) Logarithm d) Theory of Quadratic Equation: Middle term factorization, Sri dharacharya formula	12	CO1 CO2	R UA 1A 2E C
UNIT-II	Matrices and Determinants a) Definition and types b) Algebra of matrices, Inverse of a matrix, Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion Method and Cramer's Rule	16	CO1 CO2	R UA 1A 2E C
UNIT-III	Calculus b) Concept of limit and continuity c) Concept, rules and methods of differentiation and its calculation up to second order derivatives (excluding trigonometric functions). c) Maxima and Minima of a function and its application (Marginal Analysis). d) Integration: Standard forms. Methods of integration – by substitution and parts. Definite Integrals.	18	CO3 CO4	R UA 1A 2E C
UNIT-IV	Mathematics of Finance a) Compounding and discounting of a sum using different types of rates. b) Types of Annuities: ordinary, due, deferred, continuous, perpetual, and their future and present values using different types	14	CO5 CO6	R UA 1A 2E C

Learning Resources:

- 1) N.G. Das & J.K Das, Business Mathematics & Statistics 2) Thukral, J.K., Mathematics for Business Studies.
- 3) Vohra, N.D., Quantitative Techniques in Management. McGraw Hill Education.
- 4) Soni, R.S., Business Mathematics. Ane Books, New Delhi.
- 5) Singh J. K., Business Mathematics. Himalaya Publishing House.
- 6) S.K. Nag, Business Mathematics & Statistics, Kalyani Publisher.
- 7) **S.N. Dey, Business Mathematics, Chhaya Prakashani.**

R:

Remembering, U: Understanding, A1: Applying, A2: Analysing, E:Evaluating, C:Creating

2. ASSESSMENT

1. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

2. *Summative Assessment*: 50 marks

- Five Very Short Questions to be answered out of seven given from lower order of RBT – (2 Marks each)
- Three Short to be answered out of five set from higher order of RBT – (5 Marks each).
- One Long Question to be answered out of two from higher order of RBT – (10 marks)
- One case study/Financial Interpretation to be answered from Creating level – (15 marks)
- Summative Assessment Time: 2 Hours for pen and paper test

Course Code	23COMMIN101
Course Title	MICROECONOMICS
Credits	04
Total Hours	60
Hours per Week	04
Course Type	Minor

Semester	1
Intended Level	Certificate
Issue(s)Addressed	Market Disequilibrium and free rider problem
Course Offered to	Commerce
Regulation	2023

Course Overview	This course: d. Introduces the students to the concepts of economics also providing them insights to apply these concepts in the real world. e. Enhances the critical thinking abilities of the students in order to supplement the other subjects offered in the program.	
Prerequisite	Basic knowledge of Economics and General working of the markets.	
Course Objectives	This course – a. Provides a conceptual understanding of Choice, Scarcity and the subject matter of Microeconomics. b. Makes the students aware of the Behaviour of the Households (Consumers) and of the Firms (Producers) c. Provides understanding about the difference between Behaviour of Firms in Product Markets that are Perfect and Imperfect d. Creates critical thinking to optimization path and establish Equilibrium. e. Creates understanding about nature of public goods	
Course Outcomes Based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify Choice, Scarcity, and the subject matter of Microeconomics	U
CO2	Understand Behaviour of the Households (Consumers) and of the Firms (Producers)	A1
CO3	Identify Behaviour of Markets that are Perfect and Imperfect	A2
CO4	Develop optimization path and establish Equilibrium	A1
CO5	Understand the nature of public goods and associated issues	A2

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Demand, Supply & Consumer Behaviour • Concept of scarcity and choice, Opportunity cost, Three basic economic questions • Cardinal (concept and condition) and Ordinal Utility Approach; Indifference curve analysis of consumer behaviour; Consumer's equilibrium (necessary and sufficient conditions) • Demand Function and its determinants. Determinants of elasticity of demand.	16	CO1 CO2	A1

Unit II	Production and Cost • Production function with special reference to cobb Douglas. • Law of variable proportions • Stages of production cycle • Production Isoquants • Iso-Cost Lines • Production optimization (Graphical) with Expansion Path • Different concepts of short run and long run cost, private vs. social cost and sunk cost (with examples) • Analysis of short run and long run costs: Relation between AC & MC.	14	CO2	A1
Unit III	Forms of Market and their functioning Perfect Competition • Structural characteristics of Perfect Competition • SR equilibrium of a firm • Demand-Supply Analysis including welfare effects of Price Control, Price Support, taxes and subsidy • Welfare gain and loss Monopoly • Features of Monopoly • Sources & determinants of market power of monopoly power • Degrees of Price Discrimination • Short-run equilibrium • Inefficiency under Monopoly and Welfare gain and Loss.	24	CO3 CO4	A1 A2

	Monopolistic Competition • Features of Monopolistic Competition • Short-Run Equilibrium Oligopoly • Features of Oligopoly • Oligopolistic Interdependence (Cournot and kinked demand model)			
Unit IV	Externalities, Public Goods • Features of Public Goods • Free Rider Problem with examples • Concept of Externalities with examples • Common Resources - Tragedy of Commons	06	CO5	A1

Learning Resources:

Suggested Readings:

1. Pindyck, R.S., D. L. Rubinfeld and P. L. Mehta; Microeconomics, Pearson Education
2. N. Gregory Mankiw, Principles of Micro Economics, Cengage Learning
3. Maddala G.S. and E. Miller; Microeconomics: Theory and Applications, McGraw- Hill Education
4. Salvatore, D. Schaum's Outline: Microeconomic Theory, McGraw-Hill, Education
5. Case and Fair, Principles of Micro Economics, Pearson Education
6. Koutsiyannis, Modern Micro Economic Theory.
7. C Snyder, Microeconomic Theory: Basic Principles and Extensions, Cengage Learning
8. Bilas, Richard A., Microeconomics Theory: A Graphical Analysis, McGraw-Hill Education
9. Paul A Samuelson, William D Nordhaus, Microeconomics, McGraw-Hill Education
10. Ghosh. A., Bhattacharya M. Managerial Microeconomics, Platinum Publishers

R: Remembering,U:Understanding,A1:Applying,A2:Analyzing,E:Evaluating,C:Creating

2. ASSESSMENT

1. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College

2. *Summative Assessment:* 50 marks

- Five Very Short Questions to be answered out of seven given from lower order of RBT – (2 Marks each)
- Three Short to be answered out of five set from higher order of RBT – (5 Marks each).
- One Long Question to be answered out of two from higher order of RBT – (10 marks)
- One case study/Financial Interpretation to be answered from Creating level – (15 marks)
- Summative Assessment Time: 2 Hours for pen and paper test

Course Code	23COMMDC101
Course Title	Basics of Accounting and Financial Theory
Credits	3
Total Hours	45
Hours per Week	3
Course Type	Multi-disciplinary courses
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Education
Regulation	2023

Course Overview	This course: The course in accounting and finance is designed to provide students with a strong foundation of accounting and finance with essential principles encompassing both accounting and finance domains. Moreover, it empowers students to Overview of investment instruments, including stocks, bonds, mutual funds, commodities, crypto currencies, and real estate. The core objective of this course is to enhance students' capacity for critical thinking, thereby fostering critical thinking to enrich overall curriculum comprehension.

Prerequisite	Basic knowledge of finance, accounting, investment avenues, budgeting etc.

Course Objectives (total 5)	A student will be able to: - Provide a conceptual comprehension of accounting and finance, key terminology such as accounts, assets, liability, capital, income, revenue, gain, profit, surplus, loss, deficit, debit, and credit. Highlight the importance of recording transactions. - Creates the understanding of the disparities among Personal accounts, Real accounts, and Nominal accounts. Explores the approach to recording transactions. - Facilitate the aim, students will be introduced to financial planning and budgeting, with a focus on understanding the procedure involved in preparing a budget. - Familiarize students with different investment alternatives and the decision-making process, the instruction will provide an overview of various investment options and their evaluation and process involved in investment decision process.

Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		

COs	Statements	Cognitive Level Mapping
CO1	Describe and discuss the key terminology, concepts tools and techniques used in accounting ang Finance.	R

CO2	Contrast the Impact of the Financial System on Economic Development.	U
CO3	Comparing Personal Accounts, Real Accounts, and Nominal Accounts, alongside Journalizing Transaction Procedures for a comprehensive understanding.	A1
CO4	Illustrate Different Investment Avenues and Judging the Factors that Influence Investment Decisions.	A2
CO5	Develop the process involved in investment decision process.	E

Course Content				
Units	Content	Lecture Hours	COs	RBT

Unit I	Introduction Accounting: Meaning, importance and need. Some basic term accounts, assets, liability, capital, income, revenue, gain, profit, surplus, loss, deficit, debit and credit. Introduction to finance and its features, function, types and sources. Financial system and components; Role of financial system in economic development.	12		A2
Unit II	Recording of Transactions Personal account, Real account and Nominal account. Rules for debit and credit; double entry system, journalizing transaction; preparations of ledger, trial balance and financial statements.	10		A2
Unit III	Financial Planning and Budgeting Financial planning: Meaning, Importance and need. Steps in the financial planning process. Budget, types of budgets: Personal Budget, Family budget etc. Procedure for preparing budget.	10		A1
Unit IV	Investment Principles and Strategies Overview of investment instruments, including stocks, bonds, mutual funds, commodities, crypto currencies, and real estate. Investment: meaning, features and objectives. The investment decision process. Factors affecting the investment decision process.	13		A1 A2

Learning Resources:

- i. Cornett Adair Nofsinger "**Finance application & Theory**".
- ii. E.Gordon and K.Natarajan "**Financial Markets and institutions**" Himalaya publishing house. iii. Prasanna Chandra "**Investment analysis and portfolio management**" McGraw - Hill Education.
- iv. LM Bhole and Jitendra Mahakud "**Financial institution and markets structure, growth and innovation**".
- v. Dr. Vinod Kumar, Atul Gupta and Manmeet Kaur "**Financial markets institutions and financial services**" Taxmann's.
- vi. Dr. Vanita Tripathi "**Fundamentals of investment**" Taxmann's.
- vii. S.N. Maheshwari, Suneel.K. Maheshwari and S.K. Maheshwari "**An Introduction of Accountancy**".
- viii. Prof. Amitabha Basu "**Financial Accounting**" Tee Dee Publications.
- ix. M. Hanif and A. Mukherjee "**Financial Accounting**" Mc Graw Hill education.
- x. S. Chand and S.C. Gupta "**Financial Accounting**" Shukla & Grewal's.
- xi. Basu and Das "**Financial Accounting**" Rabindra library.

2. ASSESSMENT

1. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College

2. *Summative Assessment:* 50 marks

- Five Very Short Questions to be answered out of seven given from lower order of RBT – (2 Marks each)
- Three Short to be answered out of five set from higher order of RBT – (5 Marks each).
- One Long Question to be answered out of two from higher order of RBT – (10 marks)
- One case study/Financial Interpretation to be answered from Creating level – (15 marks)
- Summative Assessment Time: 2 Hours for pen and paper test

Course Code	23COMSEC101
Course Title	Entrepreneurship
Credits	03
Total Hours	30
Hours per week	3
Course Type	Skill Enhancement Course
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course offered to	Commerce
Regulation	2023
Course Overview:	This Course is framed to: a. Discuss the skill enhancement course of Entrepreneurship introduces the students to the concepts and importance of Entrepreneurship in the real world and helps them to grasp the culture of start -ups and initiative undertaken by Government of India.
Prerequisites	Basic knowledge of Entrepreneurial Skills, Women Empowerment, Angel Investors, Government Schemes etc.
Course Objectives:	A Student will be able to: ● Understand the fundamental concepts and importance of entrepreneurship and creative behavior. ● Apply entrepreneurial ideas and opportunities in the market. ● Analyze and evaluate the initiatives and programs, such as Skill India, Start-up India, and Make in India, that support entrepreneurship. ● Create various business strategies and projects related to start-up and explore ways to overcome the challenges

Course Outcomes based on RBT and Cognitive Level Mapping

At the end of this course, a student will be able to:

COs	STATEMENTS	Revised BLOM's Taxonomy
CO1	Understand the fundamental concepts and importance of entrepreneurship and creative behaviour.	U
CO2	Identify the Factors that influence Entrepreneurship.	R
CO3	Explanation of the concept, importance, and steps involved in preparing a business plan.	U

C04	Discuss different Government schemes available for promoting Entrepreneurs in India	R
C05	Explore the initiatives and programs, such as Skill India, Start-up India, and Make in India, that support entrepreneurship.	A

Content	Course

UNITS	CONTENT	Lecture Hours	COs	CLs
UNIT-I	Introduction to Entrepreneurship a) Meaning, elements, determinants and importance of entrepreneurship and creative behaviour. b) Entrepreneurship and creative response to the society' problems and at work. c) Dimensions of entrepreneurship: intrapreneurship, technopreneurship, cultural entrepreneurship, entrepreneurship, Ecopreneurship, and social entrepreneurship, d) Role of Entrepreneurship in Economic Development.	10	CO1 CO3	U

Suggested Readings:

- (i) K .Ramachandran: Entrepreneurship Development, Mc Graw-Hill Education(India) Pvt .Limited.
- (ii) Robert J. Calvin: Entrepreneurial Management, McGraw-Hill
- (iii) Dr.R.C.Bhatia: Entrepreneurship–Business and Management,Sultan Chand & Sons
- (iv) Robert Hisrich, Michael Peters, Dean Shepherd, Entrepreneurship, McGraw-Hill Education
- (v) Desai, Vasant. Dynamics of Entrepreneurial Development and Management. Mumbai, Himalaya Publishing House.
- (vi) Jack M. Kaplan, Jack McGourty: Patterns of Entrepreneurship Management, John Wiley & Sons, Inc.
- (vii) Mathur, Abhay: Entrepreneurship, Taxmann’s Publications(P)Ltd.

2. ASSESSMENT

1. Formative Assessment: Evaluation Framework Document of Salesian College

2. Summative Assessment:

Evaluation Framework Document of Salesian College

Course Code	23COMVAC101
Course Title	Social Media Marketing
Credits	1
Practical hours	30
Hours/Week	2
Category	Value Added Course (VAC)
Semester	I

Regulation	2023			
Course Overview: This course – Aims to provide students with the basic knowledge of marketing and give them a brief knowledge about social media and various platforms used in social media marketing.				
Course Objectives: The students will be able to – • Know the importance of marketing in the present scenario. • Know the importance of various platforms used in social media marketing. • Get practical knowledge about the impact of social media marketing on consumer behavior by conducting a minor research.				
Prerequisites: Basic knowledge of tools and techniques used in conducting research.				
Syllabus				
UNITS	CONTENT	HOURS	COs	CLs
UNIT – I	Introduction to Marketing, Marketing Concepts- Marketing process, Marketing mix. Market segmentation and targeting and positioning. Consumer Behaviour	6	CO1	U
UNIT – II	Fundamentals of Social Media Marketing and its significance, Necessity of Social media Marketing. Facebook Marketing, LinkedIn Marketing and Twitter Marketing	6	CO2	U
UNIT – III	Data Collection, Sources of data- Primary and secondary data, Sampling Methods, Data tabulation.	6	CO3	A2

Practical Component	1. Students need to prepare questionnaires to understand the impact of social media marketing on consumer behavior. 2. Conduct a survey and collect data from the respondents 3. Data tabulation 4. Final presentation by the students on the research conducted by them.	12		

Learning Resources:

1. Digital Marketing –Kamat and Kamat-Himalaya
2. Marketing Strategies for Engaging the Digital Generation, D. Ryan,
3. Digital Marketing, V. Ahuja, Oxford University Press
4. Kothari CR, Research Methodology-Methods and Techniques, New Wiley Eastern Ltd., Delhi, 2009
5. Digital Marketing, S.Gupta, McGraw-Hill

Course Outcomes (Cos) and Cognitive Level Mapping

At the end of this course, the students will be able to

COs	STATEMENTS	REVISED BLOOM's LEVEL
CO1	Understanding the basic concepts related to marketing	U
CO2	Understanding the importance of social media marketing and the various platforms used in social media marketing.	U
CO3	Conducting a minor research to understand the impact of social media marketing on consumer behavior	A2

Course Code	23COMMAJ103
Course Title	Corporate Accounting
Credits	4
Total Hours	60
Hours per Week	5
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	B.com
Regulation	2023
Course Overview:	This course is framed to: □ Provide the regulatory environment in which the companies are formed and operate. □ Acquaint with comprehensive understanding of the advanced issues in accounting for assets, liabilities and owner's equity □ Make competent in drafting Company Final Accounts as per Indian Companies Act, 2013 in practical manner with notes to accounts. □ Understand provisions regarding Issue, forfeiture and reissue of forfeited shares; Redemption of preference shares; Issue and Redemption of Debentures as per Companies Act, 2013 and applying practically to solve practical problems. □ Explain the concept, types of amalgamation i.e. absorption, merger, meaning and applicability of internal reconstructions. □ Explain the concept, accounting provisions related to Holding Company and Consolidated Balance Sheet. □ Understand meaning and types of liquidation and legal provisions therein and Liquidators Final Statement of Accounts.
Prerequisites:	Basic knowledge of Financial Accounting and critical thinking

Course Objectives:	After completion of this course, learners will be able to: □ Identify appropriate accounting techniques, as prescribed by the relevant accounting standards, and perform the accounting treatment for each type of inter-entity relationship including preparing consolidated financial statements □ Construct the financial statements of the company with reference to provisions regarding Issue, forfeiture and reissue of forfeited shares, redemption of preference shares, issue and redemption of debenture and buyback of shares as per Companies Act, 2013. □ Differentiate various methods of valuation of goodwill & shares □ Compute the value of goodwill as well as shares. □ Apply the formats of Company Final Accounts as per Indian Companies Act, 2013 with notes to accounts □ Apply the provisions of accounting for amalgamation, Absorption and Internal reconstruction of companies. □ Explain the concept, accounting provisions related to Holding Company and Consolidated Balance Sheet. □ Apply the provisions in solving practical problems related to Holding Company. □ Record entries in books of accounts in case of liquidation of joint stock companies.

Course Outcomes (COs) and Cognitive Level Mapping: At the end of this course, Students will be able to-		
Cos	STATEMENTS	Revised BLOOMS's Level
CO1	Identify appropriate accounting techniques, as prescribed by the relevant accounting standards, and perform the accounting treatment for Issue, forfeiture and reissue of forfeited shares: Issue of right and bonus shares.	R
CO2	Construct the financial statements of the company with reference to provisions regarding Issue, forfeiture and reissue of forfeited shares, redemption of preference shares, issue and redemption of debenture and buyback of shares as per Companies Act, 2013.	C
CO3	Apply the formats of Company Final Accounts as per Indian Companies Act, 2013 with notes to accounts	C
CO4	Differentiate various methods of valuation of goodwill & shares and also compute the value of goodwill as well as shares.	C
CO5	Explain the accounting concept for amalgamation, Absorption and Internal reconstruction of companies and also able to apply the provisions in solving practical problems.	C
CO6	Explain the concept, accounting provisions related to Holding Company and Consolidated Balance Sheet and also able to apply the provisions in solving practical problems.	C
CO7	Record entries in the books of accounts in case of liquidation of joint stock companies.	C
Course Content		

Unit	Content	Lecture Hours	COs	CLs
Unit I	Accounting for Share Capital & Debentures : Issue, forfeiture and reissue of forfeited shares; Issue of right and bonus shares; Buy back of shares; Redemption of preference shares: Provision of the Companies Act for redemption of Preference Shares (Sec 55 of the Companies Act, 2013); Issue and Redemption of Debentures	12	CO1 CO2	R U A1 A2 E C
Unit II	Company Final Accounts : Company Final Accounts – Forms and Contents – Preparation of financial statement as per schedule – III of company act 2013.	8	CO1 CO3	R U A1 A2 E C
Unit III	Valuation of Goodwill and Shares : Concepts, methods and calculation.	8	CO1 CO4	R,U, A1 A2, E, C
Unit IV	Amalgamation of Companies : Concepts and accounting treatment as per Accounting Standard: 14 (ICAI). Internal reconstruction: concepts, Alteration of Share Capital and accounting treatment excluding scheme of reconstruction.	12	CO1 CO5	R U A1 A2 E C
Unit V	Accounts of Holding Companies/Parent Companies : Preparation of consolidated balance sheet with one subsidiary company; Relevant provisions of	12	CO1 CO6	R U A1 A2
	Accounting Standard: 21 (ICAI)			E C
Unit VI	Liquidation of Companies: Introduction – Concepts, Kinds of Winding up and accounting treatment as per Accounting Standard; Liquidators Final Statement of Accounts	8	CO1 CO7	R U A1 A2 E C

Suggested Readings:

- J.R. Monga, *Fundamentals of Corporate Accounting*. Mayur Course Backs, New Delhi.
- M.C. Shukla, T.S. Grewal, and S.C. Gupta. *Advanced Accounts*. Vol.-II. S. Chand & Co., New Delhi.
- S.N. Maheshwari and S. K. Maheshwari. *Corporate Accounting*. Vikas Publishing House, New Delhi.
- Ashok Sehgal, *Fundamentals of Corporate Accounting*. Taxman Publication, New Delhi.
- V.K. Goyal and Ruchi Goyal, *Corporate Accounting*. PHI Learning.
- Jain, S.P. and K.L. Narang. *Corporate Accounting*. Kalyani Publishers, New Delhi.
- Bhushan Kumar Goyal, *Fundamentals of Corporate Accounting*, International Book House
- Basu & Das, *Corporate Accounting*, Rabindra Library
- Amitabha Mukherjee, Mohammed Hanif, *Corporate Accounting*, McGraw Hill Education
- Jain & Narang, *Corporate Accounting*, Kalyani Publishers **Note: Latest edition of text books may be used.**

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. ASSESSMENT

1. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

2. Summative Assessment: 50 marks

- Five Very Short Questions to be answered out of seven given from lower order of RBT – (2 Marks each)
- Three Short to be answered out of five set from higher order of RBT – (5 Marks each).
- One Long Question to be answered out of two from higher order of RBT – (10 marks)
- One case study/Financial Interpretation to be answered from Creating level – (15 marks)
- Summative Assessment Time: 2 Hours for pen and paper test

Course Code	23COMMAJ104
Course Title	Business Law
Credits	04
Lecture Practical Hours/ week	60
Category	Core Course
Semester	II

Regulation	2023
Prerequisites: Understanding of day to day commerce and basic knowledge of type of transaction taking place in the organizations with Legal aptitude to comprehend the various business activities.	
Course Overview: The Business Law course is designed to provide students with a comprehensive understanding of the legal framework that governs business transactions and operations. The course aims to familiarize students with various laws and regulations related to business, contracts, sales, partnerships, and corporate governance. It also aims to develop students' analytical and problem-solving skills in the context of legal issues faced by businesses.	
Course Objectives: The students will be able to– By the end of this course, students will be able to: 1. Understand the fundamental concepts and principles of business law and their application in the business environment. 2. Familiarize students with the legal framework governing business transactions and operations in India. 3. Develop an awareness of the rights, obligations, and legal implications associated with business contracts, sales, partnerships, and corporate governance. 4. Enhance students' analytical and problem-solving skills by critically examining legal issues and applying legal principles to practical business situations. 5. Cultivate an understanding of the ethical and professional responsibilities of businesses in relation to legal compliance and consumer protection. 6. Develop effective communication and presentation skills through case analysis and legal reasoning exercises. 7. Encourage active class participation and engagement to foster a deeper understanding of legal concepts and their real-world implications. 8. Provide a solid foundation in business law for further studies in commerce, law, or related disciplines.	
Course Outcome: After completing the course, learners will be able to: □ Describe the provisions of business law (Contract Act, Partnership Act, and Sale of Goods Act). □ Develop the understanding of the Consumer Rights and the Redressal Mechanism available to them. □ Know the different types of Negotiable Instruments and the consequences of its dishonor. □ Relate day-to-day business activities that are guided by the specific provisions in the law. □ Develop decision making skills regarding the legal aspects of business activities.	

Prerequisites: The student should have understanding of day today Commerce and basic knowledge of commercial / business organizations with Legal aptitude to comprehend the various business activities				
Syllabus				
UNITS	CONTENT	Lecture Hours	COs	CLs

UNIT-I	The Indian Contract Act, 1872 i. Contract – meaning, characteristics and kinds, Essentials of a valid contract ii. Offer and acceptance (Definition, Rules, Communication and Revocation of offer and acceptance) iii. Consideration (Definition, Elements, Types, Rules), “No Consideration No Contract” and its exceptions; Capacity to Parties (Definition and Types) iv. Consent, Free consent, Coercion, Undue Influence, Fraud, Misrepresentation, Mistake v. Legality of objects and Consideration vi. Void and Voidable agreements – Definition, Types and Distinction - Discharge of a contract – Modes of discharge, Breach and Remedies against breach of contract vii. Specific Contracts Meaning - Contingent contracts, Quasi, Contract of Indemnity, Guarantee, Bailment, Pledges	23	CO1 CO2	U A1
UNIT-II	The Sale of Goods Act, 1930 i. Contract of sale, meaning and difference between sale and agreement to sell ii. Conditions and Warranties iii. Transfer of ownership in goods including sale by a non-owner iv. Unpaid seller – meaning, rights of an unpaid seller against the goods and the buyer	12	CO2	A1

UNIT–III	Consumers Protection Act, 1986 i. Consumer Protection Act, 2019 ii. Rights and responsibilities of consumers iii. Redressal mechanisms for consumer grievances	8	CO3	A2
UNIT–IV	The Negotiable Instruments Act 1881 i. Definition, Features, Types, Parties of Negotiable Instruments: Promissory Note, bill of exchange, Cheque (Definition and Types) ii. Endorsement: Meaning and Types of Endorsement iii. Dishonor of Negotiable Instruments: Modes, Consequences, Notice of Dishonor; Noting and Protesting	8	CO4	A2
UNIT -V	The Limited Liability Partnership Act, 2008 i. Salient Features of LLP ii. Differences between LLP and Partnership, LLP and Company iii. LLP Agreement, iv. Partners and Designated Partners v. Incorporation Document vi. Incorporation by Registration vii. Partners and their Relationship	9	CO5	A1

Learning References:

- M.C. Kuchhal, and Vivek Kuchhal, Business Law, Vikas Publishing House, New Delhi.
- Avtar Singh, Business Law, Eastern Book Company, Lucknow.
- Ravinder Kumar, Legal Aspects of Business, Cengage Learning.
- S N Maheshwari and SK Maheshwari, Business Law, National Publishing House, New Delhi.
- Aggarwal S K, Business Law, Galgotia Publishers Company, New Delhi.
- Bhushan Kumar Goyal and Jain Kinneri, Business Laws, International Book House
- Sushma Arora, Business Laws, Taxmann Publications.
- Akhileshwar Pathak, Legal Aspects of Business, McGraw Hill Education, 6th ed
- P C Tulsian and Bharat Tulsian, Business Law, McGraw Hill Education
- Sharma, J.P. and Sunaina Kanojia, Business Laws, Ane Books Pvt. Ltd., New Delhi
- Garg, Sareen & Sharma, Business Laws, Kalyani Publishers

Note: Latest edition of text books should be used

Course Outcomes (Cos) and Cognitive Level Mapping		
Cos	STATEMENTS	REVISED BLOOM's TAXONOMY
CO1	Understand distinguish the different types of Contract and its features.	U
CO2	Examine the legality of different types of Contracts and distinguish between Contract of Sale and Agreement to Sell.	A1
CO3	Identify the rights and responsibilities of a Consumer.	A2
CO4	Compare the different types of Negotiable Instruments and Endorsements	A2

CO5	Understand and compare the different forms of organization with LLP and steps to incorporate LLP.	A1

2. ASSESSMENT

1. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College

2. *Summative Assessment:* 50 marks

- Five Very Short Questions to be answered out of seven given from lower order of RBT – (2 Marks each)
- Three Short to be answered out of five set from higher order of RBT – (5 Marks each).
- One Long Question to be answered out of two from higher order of RBT – (10 marks)
- One case study/Financial Interpretation to be answered from Creating level – (15 marks)
- Summative Assessment Time: 2 Hours for pen and paper test

Course Code	23COMMIN102
Course Title	Business Statistics
Credits	04
Lecture Hours	60
Hours/Week	04
Category	Minor
Semester	II
Regulation	2023
Course Overview: This course of Business Statistics lays foundation for gathering, analyzing and interpreting data. This course is designed to explore basic concepts in statistical methods and aims to make students comfortable to work with real time data.	
Prerequisites: Basic knowledge of statistical measures and critical thinking	
Course Objectives: This course – ● Provides a conceptual understanding of the key terminology, concepts tools and techniques used in business statistical analysis ● Makes the students aware of the techniques to calculate sample statistics and its importance in analyzing data ● Provides understanding about the application of the concepts of probability ● Generates awareness of the use of different sampling techniques ● Creates understanding to apply the concepts and use statistical software ● Creates understanding of basic analysis of data	

Course Outcomes Based on RBT and Cognitive Level Mapping

Cos	STATEMENTS	REVISED BLOOM'S TAXONOMY		
CO1	Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis	U		
CO2	Calculate sample statistics and positional average and measure the spread and dispersion of data	A2		
CO3	Apply the concepts of probability to real life instances	A1		
CO4	Use different sampling techniques to conduct research surveys and to understand Regression and Coefficient	A1		
CO5	Discuss critically the uses and limitations of statistical analysis	E		
CO6	Solve arrange of problems using the techniques covered and conduct basic statistical analysis of data using software	C		
Syllabus				
UNITS	CONTENT	LECTURE HOURS	Cos	CLs

UNIT-I	Statistical Data and Descriptive Statistics - Nature and Classification of data: univariate, bivariate and multivariate data; time-series and cross-sectional data - Measures of Central Tendency; Mean, Positional Averages, Mode and Median (and other partition value including quartiles, deciles, and percentiles) (including graphic determination) - Measures of Variation: absolute and relative. Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance - Idea of Moments, Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis	18	CO1 CO2	U A2

UNIT-II	Probability and Probability Distributions - Theory of Probability. Approaches to the calculation of probability; Calculation of event probabilities. Addition and multiplication laws of probability; Conditional probability and Bayes' Theorem. - Expectation and variance of a random variable - Probability Distributions - Binomial distribution: Probability distribution function, Constants, Shape, Fitting of binomial distribution - Poisson distribution: Probability function, (including Poisson approximation to binomial distribution), Constants, Fitting of Poisson distribution - Normal distribution: Probability distribution function, Properties of normal curve - Calculation of probabilities	14	CO3	A1

UNIT-III	Simple Correlation & Regression Analysis Correlation Analysis - Meaning of Correlation: simple, multiple and partial; linear and non-linear - Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties - Correlation and Probable error	14	CO4	A1

	Rank Correlation			
	Regression Analysis - Principle of least squares and regression lines - Regression equations and estimation - Properties of regression coefficients - Relationship between Correlation and Regression coefficients - Standard Error of Estimate and its use in interpreting the results			
UNIT-IV	Sampling Methods - Populations and samples, parameters and statistics - Sampling methods; - Random Sampling; Simple random Sampling, Stratified Sampling, Systematic Sampling - Non-Random Sampling; Judgment Sampling,	2	CO4 CO5	A1 E
	Convenience Sampling, Snowball Sampling			
UNIT V	LAB - Basics of Research Methodology and Introduction of SPSS/STATA/R/ Excel - Sample session - Open File - List Cases - Frequencies - Explore			

	○ Graphics • Descriptive statistics ○ Construction of frequency table ○ Measures of Central Tendency ○ Measures of dispersion ○ Skewness & Kurtosis • Graphing your data • Simple bar graph ○ Histogram ○ Pie chart ○ Box plot ○ Scatter plot ○ Correlation and Regression • Multivariate cases in Software) ng a Regression model	6*2= 12	CO6	C
	Fitti (Bivariate &			
Learning Resources: 1. Levin,Richard,DavidS.Rubin,SanjayRastogi,andHMSiddiqui.<i>StatisticsforManagement</i>.7thed.,PearsonEducation 2. Goon,GuptaandDasgupta,Fundamentals of Statistics, Vol.I. World Press Private Limited 3. N.G.Das Statistical Methods. McGraw Hill Education 4. J.K.Sharma, Business Statistics, Vikas 5. VohraN.D.,Business Statistics, McGraw Hill Education 6. Murray R Spiegel, Larry J. Stephens, Narinder Kumar. Statistics (Schaum's Outline Series),McGraw Hill Education 7. Gupta.S.C.Fundamentals of Statistics. Himalaya Publishing House 8. Anderson, Sweeney. and Williams, Statistics for Students of Economics and Business, Cengage Learning				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. ASSESSMENT

1. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

2. *Summative Assessment*: 50 marks

- Five Very Short Questions to be answered out of seven given from lower order of RBT – (2 Marks each)
- Three Short to be answered out of five set from higher order of RBT – (5 Marks each).
- One Long Question to be answered out of two from higher order of RBT – (10 marks)
- One case study/Financial Interpretation to be answered from Creating level – (15 marks)
- Summative Assessment Time: 2 Hours for pen and paper test

Course Code	23COMMDC102
Course Title	Principles of Management
Credits	03
Total Hours	45
Hours per Week	03
Course Type	Multi-disciplinary course
Semester	II
Intended Level	Certificate
Issue(s)Addressed	
Course Offered to	Commerce
Regulation	2023
Course Overview	This course aims to provide a comprehensive understanding of management, develop effective planning and decisionmaking skills, explore organizational dynamics, leadership principles, and motivation theories, and foster a sense of business ethics and corporate social responsibility
Prerequisite	No prior knowledge of management is required, Proficiency in written and oral communication.

Course Objectives	A student will be able to • Develop a comprehensive understanding of management principles, including the nature and importance of management, roles of managers, and different management approaches. • Apply knowledge and skills in planning, decision-making, and understanding organizational structures, authority, and delegation. • Explore directing, leadership styles, motivation theories, budgeting and the significance of employee morale with an understanding of controlling. • Critique the concepts of business ethics, corporate social responsibility, and their role in making a responsible business decision

Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
Cos	Statements	Cognitive Level Mapping		
CO1	Develop a comprehensive understanding of management principles, including the nature and importance of management, roles of managers, and different management approaches.	U		
CO2	Apply knowledge and skills in planning, decision-making and understanding organizational structures, authority, and delegation	A1		
CO3	Explore directing, leadership styles, motivation theories, budgeting and the significance of employee morale with an understanding of controlling.	A2		
CO4	Critique the concepts of business ethics, corporate social responsibility, and their role in making a responsible business decision	E		
Course Content				
Units	Content	Lecture Hours	COs	RBT
UNIT-I	Introduction to Management a) Management: Importance - Definition - Nature and scope of Management process. b) Role and Functions of a Manager – Management art or science -Levels of Management. c) Development of Scientific Management and other Schools of thoughts and approaches (Henry Fayol and Taylor)	12	CO1	U

UNIT-II	Planning and Organizing a) Planning: Nature - Importance - Forms - Types - steps in Planning – Objectives. Decision-making -Process of Decision-making - Types of Decision. b) Organizing: Types of Organizations - Organization Structure - Span of Control and Committees - Departmentalization - informal Organization. c) Authority - Delegation -Decentralization - Difference between Authority and Power - Responsibility	10	CO2	A1
UNIT-III	Directing and Controlling			
	a) Directing; Concept and Importance b) Staffing - Importance, Sources of Recruitment. c) Motivation: Concept, Theories (Maslow, Herzberg, McGregor), Morale d) Leadership: Concept, Functions, Leadership style, Qualities of Good Leader e) Coordination - Need, Type and Techniques and Requisites for excellent Coordination f) Controlling - Meaning and Importance. Control Process. Essentials of a good control system.	11	CO3	A2
UNIT-IV	Business Ethics and Corporate Social Responsibility a) Types of Ethical issues - Role and importance of Business Ethics and Values in Business - Responsibilities of Business. Concept of Corporate Social Responsibility- CSR provisions under the Companies Act 2013	12	CO4	E

Learning Resources:

- 8) Andrew Crane: Business Ethics, Oxford University Press.
- 9) Peter F. Drucker: Management Tasks, Responsibilities, Practices, Allied Publisher Limited.
- 10) K. Aswathappa: Management and Organisational Behaviour, Himalaya Publishing House.
- 11) J.S. Chandan: Management Concepts and Strategies, Vikas Publishing House Pvt. Limited.
- 12) Anil Bhatt: Management Principles. Process and Practices, Oxford University Press.
- 13) Gene Burton: Management Today, Principles and Practices, Tata Mcgraw Hill Publishing Company Limited

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating,
C:Creating

2. ASSESSMENT

1. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College

2. *Summative Assessment:* 50 marks

- Five Very Short Questions to be answered out of seven given from lower order of RBT – (2 Marks each)
- Three Short to be answered out of five set from higher order of RBT – (5 Marks each).
- One Long Question to be answered out of two from higher order of RBT – (10 marks)
- One case study/Financial Interpretation to be answered from Creating level – (15 marks)
- Summative Assessment Time: 2 Hours for pen and paper test

Course Code	23COMSEC102
Course Title	Computer Applications in Business
Credits	3
Total Hours	45
Hours per Week	3
Course Type	Skill Enhancement Course
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Commerce
Regulation	2023

Course Overview		This Course is framed to: a. Discuss the computer knowledge to the commerce students. b. Demonstrate the application of word-processing software (MS Word). c. Explain the application of MS-Power Point software. d. Discuss the application of MS-Excel in the field of business.		
Prerequisite		Basic knowledge of Computer, MS Office and critical thinking		
Course Objectives		A student will be able to: i. Understand the various concepts & terminologies used in computer. ii. Apply word-processing software in preparation & modification of various business documents. iii. Analyze and evaluate various business documents. iv. Create various business records, good presentation with the help of MS-Office software.		
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Understand the various concepts & terminologies used in computer.	R U		
CO2	Apply word-processing software in preparation & modification of various business documents.	A1 A2		
CO3	Analyze and evaluate various business documents.	A2 E		
CO4	Create various business records, good presentation with the help of MS-Office software.	C		
Course Content				
Unit	Content	Lecture Hours	COs	CLs
Unit I	Overview of Information Technology: a) Concepts of data b) Information system and computer c) Impact of information technology on business. d) Types of Information System	5	CO1	R U A2
Unit II	Word Processing: a) Introduction to Word Processing, b) Word processing concepts, c) Use of Templates d) Working with word document- Editing text, Find and Replace text, Formatting, Spell check, Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting,	10	CO1 CO2 CO3 CO4	R U A1 A2 E C
	Header and Footer, e) Tables: Inserting, filling and formatting a table; Insert Pictures and Video; Printing documents. (Practical: Creating Business Documents using the above facilities)			

Unit III	Power Point Presentations : a) Basics of MS Power Point presentations: Slides, Fonts, Drawing, Editing; b) Inserting: Tables, Images, texts, Symbols; Design; Transition; Animation; and Slideshow. (Practical: Creating Business Presentations using above facilities).	10	CO1 CO2 CO3 CO4	R U A1 A2 E C
Unit IV	Use of MS Excel in Business and Creating Business Spreadsheet: a) Concept of Spreadsheet- Managing, Formatting, Entering data, Editing, and Printing of worksheet. b) Operators in formula, Project involving multiple spreadsheets, Organizing Charts and graphs. Spreadsheet functions: Mathematical, Statistical, Financial, Logical, Date and Time, Lookup and reference, Text functions. c) Creating business spreadsheet: Loan and Lease statement; Ratio Analysis; Payroll statements; Capital Budgeting; Depreciation Accounting; Graphical representation of data; Frequency distribution and its statistical parameters; Correlation and Regression	20	CO1 CO2 CO3 CO4	R U A1 A2 E C
Suggested Readings: a) T.D. Malhotra and S. Malhotra, <i>Information Technology and Its Application in Business</i> . Kalyani Publishers, New Delhi. b) Sangita Sardana and Sunil Malhotra, <i>Information Technology and Its Application</i> . Kalyani Publishers, New Delhi. c) K Kumar and S Rajkumar, <i>Computer Application in Business</i> . McGraw Hill Education The suggested readings and guidelines shall be notified by the department at least once in three years based on the selected software. Note: Latest edition of text books may be used.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. ASSESSMENT

1. *Formative Assessment*: Evaluation Framework Document of Salesian College

2. *Summative Assessment*: Evaluation Framework Document of Salesian College

UNIVERSITY OF NORTH BENGAL

Raja Rammohunpur, Dt. Darjeeling, West Bengal, Pin: 734013

REVISED SYLLABUS FOR B.COM HONOURS PROGRAM UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

[Effective from: 2022-2023]

CREDIT DETAILS OF B.COM HONOURS PROGRAM

		Types of Courses					Semester-wise	
		Discipline Specific Core Course (DSC)	Discipline Specific Elective Course (DSE)	Generic Elective Course (GE)	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Total Courses	Total Credit
Credit (per course) ⇒		6	6	6	2	2		
Semester I		2	-	1	1	-	4	20
Semester II		2	-	1	1	-	4	20
Semester III		3	-	1	-	1	5	26
Semester IV		3	-	1	-	1	5	26
Semester V		2	2	-	-	-	4	24
Semester VI		2	2	-	-	-	4	24
Course type-wise	Total Courses	14	4	4	2	2	26	
	Total Credits	84	24	24	4	4		140

STRUCTURE OF THE B.COM HONOURS PROGRAM

	Course No.	Course Title	Course Type	Marks	Credits	Page No.
Semester I	AECC-1	Environmental Studies	AECC	100	2	4
	CC -1	Financial Accounting	DSC	75	5+1 (T)	4
	CC-2	Management Principles and Applications	DSC	75	5+1 (T)	5
	GE (H)-1	An Introduction to Economic Environment in India	GE	75	5+1 (T)	6
	Total in Semester I			325	20	
Semester II	AECC-2	English/MIL Communication	AECC	50	2	8
	CC -3	Corporate Accounting	DSC	75	5+1 (T)	8
	CC -4	Business Law	DSC	75	5+1 (T)	9
	GE (H)-2	Business Statistics	GE	75	5+1 (T)	10
	Total in Semester II			275	20	
Semester III	CC-5	Business Mathematics	DSC	75	5+1 (T)	13
	CC-6	Corporate Law	DSC	75	5+1 (T)	14
	CC-7	Human Resource Management	DSC	75	5+1 (T)	15
	GE (H)-3	Micro Economics	GE	75	5+1 (T)	16
	SEC (H)-1	Entrepreneurship	SEC	75	2	17
	Total in Semester III			375	26	

Semester IV	CC-8	Cost Accounting	DSC	75	5+1 (T)	19
	CC-9	Auditing and Corporate Governance	DSC	75	5+1 (T)	20
	CC-10	Principles of Marketing	DSC	75	5+1 (T)	21
	GE (H)-4	Macro Economics and Quantitative Techniques	GE	75	5+1 (T)	22
	SEC (H)-2	E-Commerce	SEC	75	2	23
	Total in Semester IV			375	26	
Semester V	CC-11	Fundamentals of Investment	DSC	75	5+1(T)	25
	CC-12	Income Tax Law and Practice in India	DSC	75	5+1(T)	25
	DSE (H)-1 (any ONE Course)	(a) Computer Applications in Business	DSE	75	4+2(P)	26
		(b) Computerized Accounting and Systems				27
	DSE (H)-2 (any ONE Course)	(a) Management Accounting	DSE	75	5+1(T)	28
		(b) Advertising				29
Total in Semester V			300	24		
Semester VI	CC-13	Fundamentals of Financial Management	DSC	75	5+1 (T)	31
	CC-14	Goods and Services Tax and Customs Duty	DSC	75	5+1 (T)	32
	DSE (H)-3 (any ONE Course)	(a) Business Research Methods and Project Work	DSE	75	(a)» 4+2(P) or (b) » 5+1(T)	33
		(b) Banking and Insurance				34
	DSE (H)-4 (any ONE Course)	(a) Financial Markets, Institutions and Financial Services	DSE	75	5+1(T)	35
		(b) Industrial Relations and Labour Laws				36
Total in Semester VI			300	24		
GRAND TOTAL				1950	140	

Notes:

1. Credit determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work field work per week.
2. 1 credit also means 2 practical periods
3. 1(T) means 1 tutorial period for doubt clearing and others
4. Each semester requires 90 actual teaching days in 15-18 weeks.
5. Odd Semesters i.e., Sem. I, Sem. III, and Sem. V last from July to December every year.
6. Even Semesters i.e., Sem. II, Sem. IV, and Sem. VI last from January to June every year

B.Com. Honours Program: Semester - I
COURSE AECC - 1: ENVIRONMENTAL STUDIES

Marks – 100

Common Syllabus to be notified by the Board of Studies in Environmental Science

B. Com Honours Program: Semester – I
COURSE CC – 1: FINANCIAL ACCOUNTING

Marks: 75 (Lectures: 65)

Objective: *The objective of this course is to help students to acquire conceptual knowledge of the Financial Accounting and to impart skills for recording various kinds of business transactions.*

Contents:

Unit I: Theoretical Framework (Lectures: 8)

- a) Accounting: As a subject and as an information system; Advantages, Limitations and Functions; Accounting Cycle.
- b) Bases of Accounting: Basic Concepts and Conventions.
- c) Generally Accepted Accounting Principles.
- d) Accounting Standards: Concept, Benefits; Indian Accounting Standards (IAS)– Features and objectives of AS-2, AS-6, AS-9, AS-10, AS-19, AS-27, AS-29; International Financial Reporting Standards (IFRS)-Need, Procedures.

Unit II: Accounting for Depreciation, Reserves and Provisions (Lectures: 7)

Unit III: Final Accounts (Lectures: 20)

- a) Trading Concern
- b) Non-Trading Concern.

Unit IV: Accounting for Hire Purchase and Installment Payment Systems, Consignment and Joint Venture (Lectures: 15)

- a) Hire Purchase: Concept, Features, Accounting treatment including stock and debtors system.
- b) Consignment: Concept, Features, Accounting treatment in the books of the consignor and consignee.
- c) Joint Venture: Concept, Features: Accounting procedure under different methods.

Unit V: Accounting for Inland Branches (Lectures: 9)

Concept, features, Accounting for dependent branches under different methods. Independent branches- Adjustment entries and preparation of consolidated profit and loss account and balance sheet

Unit VI: Accounting for Dissolution of the Partnership Firm (excluding sale to a company) (Lectures: 6)

Insolvency of partners including Garner vs. Murray and piecemeal distribution

Note:

a) *The relevant Indian Accounting Standards in line with the IFRS for all the above topics should be covered.*

b) *Any revision of relevant Indian Accounting Standard would become applicable immediately.*

Suggested Readings:

1. Robert N Anthony, David Hawkins, Kenneth A. Merchant, *Accounting: Text and Cases*. McGraw-Hill Education, 13th Ed. 2013.
2. Charles T. Horngren and Donna Philbrick, *Introduction to Financial Accounting*, Pearson Education.
3. J.R. Monga, *Financial Accounting: Concepts and Applications*. Mayur Course Backs, New Delhi.
4. M.C.Shukla, T.S. Grewal and S.C.Gupta. *Advanced Accounts. Vol.-I*. S. Chand & Co., New Delhi.
5. S.N. Maheshwari, and. S. K. Maheshwari. *Financial Accounting*. Vikas Publishing House, New Delhi.
6. Deepak Sehgal. *Financial Accounting*. Vikas Publishing H House, New Delhi.
7. Bhushan Kumar Goyal and HN Tiwari, *Financial Accounting*, International Book House
8. Goldwin, Alderman and Sanyal, *Financial Accounting*, Cengage Learning.
9. Tulsian, P.C. *Financial Accounting*, Pearson Education.
10. *Compendium of Statements and Standards of Accounting*. The Institute of Chartered Accountants of India, New Delhi
11. M. Haniff & A. Mukherjee, *Financial Accounting 2nd Edition*
12. Basu & Das, *Financial Accounting*, Rabindra Library
13. SP Jain & K.L Narang, *Financial Accounting*, Kalyani Publishers

Note: Latest edition of the text books should be used.

B.Com. Honours Program: Semester – I **COURSE CC-2: MANAGEMENT PRINCIPLES AND APPLICATIONS**

Marks: 75 (Lectures: 65)

Objective: *The objective of the course is to provide the students with an understanding of basic management concepts, principles and practices.*

Contents:

Unit I: Introduction (Lectures: 13)

- a) Management: Concept, Definition, Scope, Levels and Significance.
- b) Evolution of the Management Thoughts: Classical Approach -Taylor, Fayol; Neo-Classical Approach-Mayo, Hawthorne Experiments; Behavioural Approach; Systems Approach; Contingency Approach-Peter F. Drucker, Michael Porter, Senge and C.K. Prahalad.

Unit II: Planning and Organizing (Lectures: 26)

- a) Planning: Concept, Process, Steps in Planning, Significance and Types of Plan.

- b) Strategic Planning: Concept, Process, Importance and limitations.
- c) Environmental Analysis (internal and external environment): Importance and Techniques (SWOT and BCG Matrix).
- d) Decision-Making: Concept, Process, Types.
- e) Organizing: Concept, Process, Significance; Organizational Structure– Various forms; Span of Control, Different types of authority, Delegation of authority, Decentralization.

Unit III: Directing and Coordinating (Lectures: 16)

- a) Directing: Concept, Features, Importance and Limitations.
- b) Motivation: Concept, Importance, Extrinsic and Intrinsic motivation; Motivation Theories- McGregor, Maslow, Herzberg.
- c) Staffing: Concept and Process.
- d) Leadership: Concept, Importance, Qualities of a successful leader, Theories-Likert, Blake and Mouten, House's Path Goal theory.
- e) Communication: Concept, Purpose, Process; Types of communications, Barriers to communication, Overcoming barriers to communication.
- f) Coordinating: Concept, Features, Importance, Internal and External Coordination.

Unit IV: Controlling (Lectures: 10)

Controlling: Concept, Features, Importance and Limitations; Process; Essentials of a good control system, Principles of Effective Control; Relationship between Planning and Control.

Suggested Readings:

1. Harold Koontz and Heinz Weihrich, *Essentials of Management: An International and Leadership Perspective*, McGraw Hill Education.
2. Stephen P Robbins and Madhushree Nanda Agrawal, *Fundamentals of Management: Essential Concepts and Applications*, Pearson Education.
3. George Terry, *Principles of Management*, Richard D. Irwin
4. Newman, Summer, and Gilbert, *Management*, PHI
5. James H. Donnelly, *Fundamentals of Management*, Pearson Education.
6. B.P. Singh and A.K.Singh, *Essentials of Management*, Excel Books
7. Griffin, *Management Principles and Application*, Cengage Learning
8. Robert Kreitner, *Management Theory and Application*, Cengage Learning
9. TN Chhabra, *Management Concepts and Practice*, Dhanpat Rai & Co. (Pvt. Ltd.), New Delhi
10. Peter F Drucker, *Practice of Management*, Mercury Books, London
11. Sharma & Gupta, *Management Principle and Applications*, Kalyani Publishers

Note: Latest edition of text books should be used

B.Com. Honours Program: Semester - I

COURSE GE(H) – 1: AN INTRODUCTION TO ECONOMIC ENVIRONMENT OF INDIA

Marks: 75 (Lectures: 65)

Objective: This course seeks to enable the students to grasp the knowledge about the economic environment of business in India.

Contents:

Unit I: Indian Economic Environment (Lectures: 12)

Definition of Economic Environment; Indian Economic Environment: concept, components, importance, basic features of Indian economy. Economic development and growth–concept and measures of development, Human Development Index; National Income–Concept, composition, methods of estimation

Unit II: Economic Planning and Reforms (Lectures: 15)

Meaning, characteristics, types, objectives and importance of planning in India, Five year plans: importance, thrust areas and achievements, NITI Aayog: composition and role; Brief idea about major Economic Reforms in India since 1991

Unit III: Sectoral Trends and Issues (Lectures: 20)

- a) Agriculture Sector: Role of agricultural sector in Indian economy, growth, and performance in different phases of policy regimes i.e., pre- green revolution and the two phases of green revolution; factors influencing the productivity and growth; emerging issues – New Agriculture strategy, Agriculture finance, Agriculture price policy, the Public Distribution System (PDS) and food security.
- b) Industry and Service Sector: Industrialization - importance, phases; rate and pattern of industrial growth across alternative policy regimes, challenges of industrial growth; Export promotion policies and performance; Public sector – role, performance and reforms; Small scale sector – characteristics, role, importance, government policies for SSEs / MSMEs.
- c) Financial Sector – Structure, performance and reforms; Foreign Direct Investment (FDI) and Foreign Institutional Investor (FII) – Role, progress, issues and challenges.

Unit IV: Major Problems of Indian Economy (Lectures: 18)

- a) Poverty – Trend, causes and impact on the economy. Poverty alleviation programs in India.
- b) Unemployment – Types, causes and trends. Government schemes for unemployment.
- c) Over-population – Causes and impact on the economy.
- d) Illiteracy – Trend, causes, effects and solutions.
- e) Inflation- Trend, types, causes, effects and solutions.

Suggested Readings:

1. Mishra and Puri, *Indian Economy*, Himalaya Publishing House
2. IC Dhingra, *Indian Economics*, Sultan Chand & Sons
3. Shaikh Saleem, *Business Environment*, Pearson
4. GauravDutt and KPM Sundarum, *Indian Economy*, S. Chand & Company.
5. Bhagwati, J. and Desai, P. *India, Planning for industrialization*, OUP, Ch 2.
6. Patnaik, Prabhat, *Some Indian Debates on Planning*. T. J. Byres (ed.). *The India Economy: Major Debates since Independence*, OUP.
7. Ahluwalia, MontekS, *State-level Performance under Economic Reforms in India* in A. O. Krueger. (ed.). *Economic Policy Reforms and the Indian Economy*, The University of Chicago Press.
8. Dreze, Jean and Amartya Sen, *Economic Development and Social Opportunity*. Ch. 2. OUP.
9. Khanna, Sushil, *Financial Reforms and Industrial Sector in India*. *Economic and Political Weekly*. Vol. 34. No. 45.
10. Uma Kapila (ed), – “*Indian Economy since Independence*”, Relevant articles.

Note: Latest edition of the text books should be used.

B.Com. Honours Program: Semester – II
COURSE AECC-2: ENGLISH/MIL COMMUNICATION

Marks: 50

Common Syllabus to be notified by the Board of Studies in English/MIL subjects

B.Com. Honours Program: Semester – II
COURSE CC-3: CORPORATE ACCOUNTING

Marks: 75 (Lectures: 65)

Objective: *To help the students to acquire the conceptual knowledge of the corporate accounting and to learn the techniques of preparing the financial statements.*

Contents:

Unit I: Accounting for Share Capital & Debentures (Lectures: 12)

Issue, forfeiture and reissue of forfeited shares; Issue of right and bonus shares; Buy back of shares; Redemption of preference shares; Issue and Redemption of Debentures

Unit II: Final Accounts (Lecture: 9)

Preparation of profit and loss account and balance sheet of corporate entities (excluding calculation of managerial remuneration); Disposal of company profits

Unit III: Cash Flow Statement (Lectures: 10)

Concept of funds, Preparation of cash flow statement as per Indian Accounting Standard (Ind-AS):7

Unit IV: Valuation of Goodwill and Shares (Lectures: 10)

Concepts, methods and calculation

Unit V: Amalgamation of Companies (Lectures: 12)

Concepts, types and accounting treatment as per Accounting Standard: 14 (ICAI) (excluding inter-company holdings); Internal reconstruction: concepts and accounting treatment excluding scheme of reconstruction

Unit VI: Accounts of Holding Companies/Parent Companies (Lectures: 12)

Preparation of consolidated balance sheet with one subsidiary company; Relevant provisions of Accounting Standard: 21 (ICAI)

Note:

a) *The relevant Indian Accounting Standards in line with the IFRS for all the above topics should be covered.*

b) *Any revision of relevant Indian Accounting Standard would become applicable immediately.*

Suggested Readings:

1. J.R. Monga, *Fundamentals of Corporate Accounting*. Mayur Course Backs, New Delhi.
2. M.C. Shukla, T.S. Grewal, and S.C. Gupta. *Advanced Accounts*. Vol.-II. S. Chand & Co., New Delhi.
3. S.N. Maheshwari, and S. K. Maheshwari. *Corporate Accounting*. Vikas Publishing House, New Delhi.
4. Ashok Sehgal, *Fundamentals of Corporate Accounting*. Taxman Publication, New Delhi.
5. V.K. Goyal and Ruchi Goyal, *Corporate Accounting*. PHI Learning.
6. Jain, S.P. and K.L. Narang. *Corporate Accounting*. Kalyani Publishers, New Delhi.
7. Bhushan Kumar Goyal, *Fundamentals of Corporate Accounting*, International Book House
8. P. C. Tulsian and Bharat Tulsian, *Corporate Accounting*, S.Chand
9. Amitabha Mukherjee, Mohammed Hanif, *Corporate Accounting*, McGraw Hill Education
10. Jain & Narang, *Corporate Accounting*, Kalyani Publishers

Note: Latest edition of text books should be used.

B.Com. Honours Program: Semester - II
COURSE CC-4: BUSINESS LAW

Marks: 75 (Lectures: 65)

Objective: The objective of the course is to impart basic knowledge of the important business legislation along with relevant case laws.

Contents:

Unit I: The Indian Contract Act, 1872: General Principle of Law of Contract (Lectures: 13)

- a) Contract – meaning, characteristics and types
- b) Essentials of a valid contract - Offer and acceptance, consideration, contractual capacity, free consent, legality of objects.
- c) Void agreements
- d) Discharge of a contract – modes of discharge, breach and remedies against breach of contract.
- e) Contingent contracts
- f) Quasi – contracts

Unit II: The Indian Contract Act, 1872: Specific Contract (Lectures: 13)

- a) Contract of Indemnity and Guarantee
- b) Contract of Bailment
- c) Contract of Agency

Unit III: The Sale of Goods Act, 1930 (Lectures: 13)

- a) Contract of sale, meaning and difference between sale and agreement to sell.
- b) Conditions and warranties
- c) Transfer of ownership in goods including sale by non-owner
- d) Performance of contract of sale
- e) Unpaid seller – meaning, rights of an unpaid seller against the goods and the buyer.

Unit IV: The Limited Liability Partnership (LLP) Act, 2008 (Lectures: 13)

- a) Salient Features of LLP
- b) Differences between LLP and Partnership, LLP and Company LLP Agreement,

- c) Partners and Designated Partners, Incorporation Document, Incorporation by Registration, Partners and their Relationship

Unit V: Consumer Protection Act, 1986 (Lectures: 13)

- a) Salient features and basic provisions of the Act
- b) Consumer rights
- c) Organizational set up
- d) Complaint filing procedure and Redressal mechanism

Suggested Readings:

1. M.C. Kuchhal, and Vivek Kuchhal, *Business Law*, Vikas Publishing House, New Delhi.
2. Avtar Singh, *Business Law*, Eastern Book Company, Lucknow.
3. Ravinder Kumar, *Legal Aspects of Business*, Cengage Learning
4. S N Maheshwari and SK Maheshwari, *Business Law*, National Publishing House, New Delhi.
5. Aggarwal S K, *Business Law*, Galgotia Publishers Company, New Delhi.
6. Bhushan Kumar Goyal and Jain Kinneri, *Business Laws*, International Book House
7. Sushma Arora, *Business Laws*, Taxmann Publications.
8. Akhileshwar Pathak, *Legal Aspects of Business*, McGraw Hill Education, 6th ed
9. P C Tulsian and Bharat Tulsian, *Business Law*, McGraw Hill Education
10. Sharma, J.P. and Sunaina Kanojia, *Business Laws*, Ane Books Pvt. Ltd., New Delhi
11. Garg, Sareen & Sharma, *Business Laws*, Kalyani Publishers

Note: Latest edition of text books should be used

B.Com. Honours Program: Semester - II **COURSE GE(H)- 2: BUSINESS STATISTICS**

Marks: 75 (Lectures: 65)

Objective: The objective of this course is to familiarize students with the basic statistical tools used for managerial decision-making.

Contents:

Unit I: Statistical Data and Descriptive Statistics (Lectures: 11)

- a) Nature and Classification of data: Univariate, bivariate and multivariate data; time-series and cross-sectional data
- b) Measures of Central Tendency: Mathematical averages including arithmetic mean, geometric mean and harmonic mean. Properties and applications. Positional Averages, Mode and Median (and other partition values including quartiles, deciles, and percentiles) (including graphic determination)
- c) Measures of Variation: Absolute and relative, Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance
- d) Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis and its measurement.

Unit II: Probability and Probability Distributions (Lectures: 12)

- a) Theory of Probability. Approaches to the calculation of probability; Calculation of event probabilities. Addition and multiplication laws of probability (Proof not required); Conditional probability and Bayes' Theorem (Proof not required)

- b) Expectation and variance of a random variable
- c) Probability distributions:
 - Binomial distribution: Probability distribution function, Constants, Shape, Fitting of binomial distribution
 - Poisson distribution: Probability function, Constants, Fitting of Poisson distribution (including Poisson approximation to binomial distribution), Normal distribution: Probability distribution function, Properties of normal curve, Calculation of probability

Unit III: Simple Correlation and Regression Analysis (Lectures: 12)

- a) Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (Proof not required). Correlation and Probable error; Rank Correlation
- b) Regression Analysis: Regression lines, Regression equations, principle of least squares and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients; Standard Error of Estimate and its use in interpreting the results.

Unit IV: Index Numbers (Lectures: 12)

- a) Meaning and uses of index numbers; Construction of index numbers: fixed and chain base: univariate and composite. Aggregative and average of relatives – simple and weighted
- b) Tests of adequacy of index numbers, Base shifting, splicing and deflating.
- c) Problems in the construction of index numbers; Construction of consumer price indices: Important share price indices, including BSE SENSEX and NSE NIFTY

Unit V: Time Series Analysis (Lectures: 10)

- a) Components of time series; Additive and multiplicative models;
- b) Trend analysis: Fitting of trend line using principle of least squares – linear, second degree parabola and exponential. Conversion of annual linear trend equation to quarterly/monthly basis and vice-versa; Moving averages; Seasonal variations: Calculation of Seasonal Indices using Simple averages, Ratio-to- trend, and Ratio-to-moving averages methods. Uses of Seasonal Indices

Unit VI: Sampling- Concepts, Distributions and Estimation (Lectures: 8)

Sampling: Populations and samples, Parameters and Statistics, Descriptive and inferential statistics; Sampling methods (including Simple Random sampling, Stratified sampling, Systematic sampling, Judgment sampling and Convenience sampling)

Suggested Readings:

1. Levin, Richard, David S. Rubin, Sanjay Rastogi, and HM Siddiqui. *Statistics for Management*. 7th ed., Pearson Education.
2. David M. Levine, Mark L. Berenson, Timothy C. Krehbiel, P. K. Viswanathan, *Business Statistics: A First Course*, Pearson Education.
3. Siegel Andrew F. *Practical Business Statistics*. McGraw Hill Education
4. Gupta, S.P., and Archana Agarwal. *Business Statistics*, Sultan Chand and Sons, New Delhi.
5. Vohra N. D., *Business Statistics*, McGraw Hill Education.
6. Murray R Spiegel, Larry J. Stephens, Narinder Kumar. *Statistics (Schaum's Outline Series)*, McGraw Hill Education.

7. *Gupta, S.C. Fundamentals of Statistics. Himalaya Publishing House.*
8. *Anderson, Sweeney, and Williams, Statistics for Students of Economics and Business, Cengage Learning.*
9. *N.G. Das, Statistical Methods (Vol_I,II).*
10. *S.K. Nag, Business Math & statistics, Kalyani Publishers*

B.Com. Honours Program: Semester - III
COURSE CC - 5: BUSINESS MATHEMATICS

Marks: 75 (Lectures: 65)

Objective: The objective of this course is to familiarize the students with the basic mathematical tools, with an emphasis on applications to business and economic situations.

Contents:

Unit I: Matrices and Determinants (Lectures: 14)

- a) Algebra of matrices. Inverse of a matrix, Matrix Operation – Business Application
- b) Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion Method and Cremer's Rule, The Leontief Input Output Model (Open Model Only).

Unit II: Calculus-I (Lectures: 13)

- a) Mathematical functions and their types- linear, quadratic, polynomial, exponential, Logarithmic function
- b) Concepts of limit and continuity of a function
- c) Concept, rules and methods of differentiation and its calculation up to second order derivatives.
- d) Maxima and Minima of a function and its application, point of inflexion.

Unit III: Calculus-II (Lectures: 20)

- a) Partial Differentiation: Partial derivatives up to second order; Homogeneity of functions and Euler's theorem; Total differentials; Differentiation of implicit functions with the help of total differentials
- b) Integration: Standard forms. Methods of integration – by substitution, by parts, and by use of partial fractions; Definite integration.

Unit IV: Mathematics of Finance (Lectures: 18)

- a) Rates of interest-nominal, effective– and their inter-relationships in different compounding situations.
- b) Compounding and discounting of a sum using different types of rates.
- c) Types of Annuities: ordinary, due, deferred, continuous, perpetual, and their future and present values using different types of rates of interest. Depreciation of Assets (General annuities to be excluded).

Suggested Readings:

1. Budnick, P. *Applied Mathematics*. McGraw Hill Education.
2. R.G.D. Allen, *Mathematical Analysis For Economists*
3. Ayres, Frank Jr. *Schaum's Outlines Series: Theory and Problems of Mathematics of Finance*. McGraw Hill Education.
4. N.G. Das & J.K Das, *Business Mathematics & Statistics*
5. Thukral, J.K., *Mathematics for Business Studies*.
6. Vohra, N.D., *Quantitative Techniques in Management*. McGraw Hill Education.
7. Soni, R.S., *Business Mathematics*. Ane Books, New Delhi.
8. Singh J. K., *Business Mathematics*. Himalaya Publishing House.
9. S.K. Nag, *Business Math & Statistics*, Kalyani Publisher

B.Com. Honours Program: Semester – III
COURSE CC- 6: CORPORATE LAWS

Marks: 75 (Lectures: 65)

Objective: The objective of the course is to impart basic knowledge of the provisions of the Companies Act, 2013 and the Depositories Act, 1996. Students will also get to know several case studies involving issues of corporate laws.

Contents:

Unit I: Introduction (Lectures: 20)

Administration of Company Law [including National Company Law Tribunal (NCLT), National Company Law Appellate Tribunal (NCLAT), Special Courts]; Characteristics of a company; lifting of corporate veil; types of companies including one person company, small company, and dormant company; association not for profit; illegal association; formation of company, on-line filing of documents, promoters, their legal position, pre-incorporation contract; on-line registration of a company.

Unit II: Documents (Lectures: 15)

Memorandum of association, Articles of association, Doctrine of constructive notice and indoor management, prospectus-shelf and red herring prospectus, misstatement in prospectus, GDR;

Unit III: Management (Lectures: 18)

- a) Classification of directors, women directors, independent director, small shareholder's director; disqualifications, director identity number (DIN); appointment; Legal positions, powers and duties; removal of directors; Key managerial personnel, managing director, manager;
- b) Meetings: Meetings of shareholders and board of directors; Types of meetings, Convening and conduct of meetings, Requisites of a valid meeting, postal ballot, meeting through video conferencing, e-voting.
- c) Committees of Board of Directors - Audit Committee, Nomination and Remuneration Committee, Stakeholders Relationship Committee, Corporate Social Responsibility Committee

Unit IV: Winding Up (Lectures: 5)

Concept and modes of Winding Up; Insider-Trading: meaning and legal provisions; Whistle-blowing: Concept and Mechanism.

Unit V: The Depositories Act, 1996 (Lectures: 7)

Definitions; rights and obligations of depositories; participant issuers and beneficial owners; inquiry and inspections, penalty.

Suggested Readings:

- 1. MC Kuchhal, Modern Indian Company Law, Shri Mahavir Book Depot (Publishers), Delhi.
- 2. GK Kapoor and Sanjay Dhamija, Company Law, Bharat Law House, Delhi.
- 3. Anil Kumar, Corporate Laws, Indian Book House, Delhi
- 4. Reena Chadha and Sumant Chadha, Corporate Laws, Scholar Tech Press, Delhi.
- 5. Avtar Singh, Introduction to Company Law, Eastern Book Company

6. Ramaiya, A Guide to Companies Act, LexisNexis, Wadhwa and Buttersworth.
7. Manual of Companies Act, Corporate Laws and SEBI Guideline, Bharat Law House, New Delhi.
8. A Compendium of Companies Act 2013, along with Rules, by Taxmann Publications.
9. Gower and Davies, Principles of Modern Company Law, Sweet & Maxwell
10. Sharma, J.P., An Easy Approach to Corporate Laws, Ane Books Pvt. Ltd., New Delhi
11. Garg, Sareen, Sharma & Dhingra, Corporate Legal Framework, Kalyani Publishers

Note: Latest edition of text books should be used.

B.Com. Honours Program: Semester – III
COURSE CC - 7: HUMAN RESOURCE MANAGEMENT

Marks: 75 (Lectures: 65)

Objective: The objective of the course is to acquaint students with the procedures and principles of managing human resources of an organisation.

Contents:

Unit I: Introduction (Lectures: 13)

Human Resource Management: Concept and Functions, Role, Status and competencies of HR Manager, HR Policies, Evolution of HRM, HRM vs HRD. Emerging Challenges of Human Resource Management; Workforce diversity; Empowerment; Downsizing; VRS; Human Resource Information System

Unit II: Acquisition of Human Resource (Lectures: 13)

Human Resource Planning- meaning, objectives and importance; Quantitative and Qualitative dimensions of HRP; job analysis: job description and job specification; Recruitment: Concept and sources; Selection: Concept and process; test and interview; placement and induction.

Unit III: Training and Development (Lectures: 13)

Concept and Importance; Identifying Training and Development Needs; Designing Training Programmes; Role-Specific and Competency-Based Training; Evaluating Training Effectiveness; Training Process Outsourcing; Management Development; Career Development.

Unit IV: Performance Appraisal (Lectures: 13)

Nature, objectives and importance; Modern techniques of performance appraisal; potential appraisal and employee counseling; job changes - transfers and promotions; Compensation: concept and policies; job evaluation; methods of wage payments and incentive plans; fringe benefits; performance linked compensation.

Unit V: Maintenance (Lectures: 13)

Employee health and safety; employee welfare; social security; grievance-handling and redressal; Industrial Disputes: causes and settlement machinery

Suggested Readings:

1. Gary Dessler. A Framework for Human Resource Management. Pearson Education.

2. DeCenzo, D.A. and S.P. Robbins, *Personnel/HRM*, Pearson Education.
3. Bohlendar and Snell, *Principles of Human Resource Management*, Cengage Learning
4. Ivancevich, John M. *Human Resource Management*. McGraw Hill.
5. Wreather and Davis. *Human Resource Management*. Pearson Education.
6. Robert L. Mathis and John H. Jackson, *Human Resource Management*. Cengage Learning.
7. TN Chhabra, *Human Resource Management*, Dhanpat Rai & Co., Delhi
8. Biswajeet Patttanayak, *Human Resource Management*, PHI Learning
9. K. Aswathappa, *Human Resource Management- Text & Cases*.
10. Gupta & Rosy, *Human Resource Management*, Kalyani Publishers

B.Com. Honours Program: Semester – III
COURSE GE(H) – 3: MICRO ECONOMICS

Marks: 75 (Lectures: 65)

Objective: The objective of the course is to acquaint the students with the concepts of microeconomics dealing with consumer behavior. The course also makes the student understand the supply side of the market through the production and cost behavior of firms and also the price-output decision of the firm under different market conditions.

Contents:

Unit I: Demand and Consumer Behaviour (Lectures: 13)

Concepts of revenue: marginal and average; revenue under conditions of perfect and imperfect competition; elasticity of demand: price, income and cross.

Consumer Behaviour: Indifference curve analysis of consumer behavior; Consumer's equilibrium (necessary and sufficient conditions); price elasticity and price consumption curve; income consumption curve and Engel curve; price change and income and substitution effects; indifference curves as an analytical tool (cash subsidy v/s. kind subsidy).

Unit II: Production and Cost (Lectures: 13)

Production iso-quants; marginal rate of technical substitution; economic region of production; optimal combination of resources; the expansion path; isolines; returns to scale using iso-quants.

Cost of Production: Social and private costs; long run and short run costs; economies and diseconomies of scale and the shape to the long run average cost curve; learning curve.

Unit III: Perfect Competition (Lectures: 14)

Perfect competition: Assumptions; equilibrium of the firm and the industry in the short and the long runs; including industry's long run supply curve; measuring producer surplus; demand-supply analysis including impact of taxes and subsidy. Stability Analysis: Walrasian and Marshallian.

Unit IV: Imperfect Competitions (Lectures: 25)

- a) Monopoly: Definition and features; short run and long run equilibrium; shifts in demand curve and the absence of the supply curve; monopoly power; social costs of monopoly power including deadweight loss; discriminating monopoly and the degrees of price discrimination.
- b) Monopolistic Competition: Definition and features; equilibrium price-output

decision.

- c) Duopoly: Definition and features; Cournot's duopoly model; Stackelberg model; Kinked demand model.
- d) Oligopoly: Definition and features; Prisoner's dilemma, collusive oligopoly; price-leadership model: dominant firm, cartels, sales maximization.

Suggested Readings:

1. Pindyck, R.S., D. L. Rubinfeld and P. L. Mehta; *Microeconomics*, Pearson Education.
2. N. Gregory Mankiw, *Principles of Micro Economics*, Cengage Learning
3. Maddala G.S. and E. Miller; *Microeconomics: Theory and Applications*, McGraw-Hill Education.
4. Salvatore, D. *Schaum's Outline: Microeconomic Theory*, McGraw-Hill Education.
5. Case and Fair, *Principles of Micro Economics*, Pearson Education
6. Koutsyiannis, *Modern Micro Economic Theory*.
7. C Snyder, *Microeconomic Theory: Basic Principles and Extensions*, Cengage Learning
8. Bilas, Richard A., *Microeconomics Theory: A Graphical Analysis*, McGraw-Hill Education.
9. Paul A Samuelson, William D Nordhaus, *Microeconomics*, McGraw-Hill Education.
10. Amit Sachdeva, *Micro Economics*, Kusum Lata Publishers

B.Com. Honours Program: Semester – III
COURSE SEC (H)-1 : ENTREPRENEURSHIP

Marks: 75 (Lectures: 50)

Objective: *The purpose of the course is to orient the learner toward entrepreneurship as a career option and to imbibe creative thinking in their behavior.*

Contents:

Unit I: Introduction (Lectures: 10)

Entrepreneurship: Meaning, elements, determinants and importance of entrepreneurship and creative behavior; Entrepreneurship and creative response to the society's problems and at work; Dimensions of entrepreneurship: intrapreneurship, technopreneurship, cultural entrepreneurship, international entrepreneurship, netpreneurship, ecopreneurship, and social entrepreneurship

Unit II: Micro, Small and Medium Enterprises (MSME) (Lectures: 10)

Concept and role of business houses; family business in India; contemporary role models in Indian business: their values, business philosophy and behavioral orientations; Conflict in family business and its resolution

Unit III: Entrepreneurial sustainability (Lectures: 10)

Public and private system of stimulation; support and sustainability of entrepreneurship; requirement, availability, and access to finance; marketing assistance; technology and industrial accommodation; role of industries/entrepreneur's associations and self-help groups; the concept, role and functions of business incubators; angel investors; venture capital and private equity fund.

Unit IV: Business Plan Preparations (Lectures: 10)

Sources of business ideas and tests of feasibility; significance of writing the business plan/ project proposal; contents of business plan/ project proposal; designing business processes, location, layout, operation, planning & control; steps in preparation of project

report; project submission/ presentation and appraisal thereof by external agencies.

Unit V: Mobilizing Resources (Lectures: 10)

Mobilizing resources for start-up; accommodation and utilities; preliminary contracts with the vendors, suppliers, bankers, principal customers; contract management: basic start-up problems.

Suggested Readings:

1. Kuratko and Rao, *Entrepreneurship: A South Asian Perspective*, Cengage Learning.
2. Robert Hisrich, Michael Peters, Dean Shepherd, *Entrepreneurship*, McGraw-Hill Education
3. Desai, Vasant. *Dynamics of Entrepreneurial Development and Management*. Mumbai, Himalaya Publishing House.
4. Dollinger, Mare J. *Entrepreneurship: Strategies and Resources*. Illinois, Irwin.
5. Holt, David H. *Entrepreneurship: New Venture Creation*. Prentice-Hall of India, New Delhi.
6. Plsek, Paul E. *Creativity, Innovation and Quality*. (Eastern Economic Edition), New Delhi: Prentice-Hall of India. ISBN-81-203-1690-8.
7. Singh, Nagendra P. *Emerging Trends in Entrepreneurship Development*. New Delhi: ASEED.
8. SS Khanka, *Entrepreneurial Development*, S. Chand & Co. Delhi.
9. K Ramachandran, *Entrepreneurship Development*, McGraw-Hill Education
10. SIDBI Reports on Small Scale Industries Sector.

B.Com. Honours Program: Semester IV
COURSE CC-8: COST ACCOUNTING

Marks: 75 (Lectures: 65)

Objective: To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment and cost accounting book keeping systems.

Contents:

Unit I: Introduction (Lectures: 6)

Meaning, objectives and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost and preparation of Cost Sheet; Installation of a costing system; Role of a cost accountant in an organization.

Unit II: Elements of Cost: Material, Labour and Overheads (Lectures: 22)

- a) Materials: Material/inventory control techniques. Accounting and control of purchases, storage and issue of materials. Methods of pricing of materials issues — FIFO, LIFO, Simple Average, Weighted Average, EOQ.
- b) Labour: Accounting and Control of labour cost. Time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piecewage.
- c) Overheads: Classification, allocation, apportionment and absorption of overheads; Under and over-absorption; Capacity Levels and Costs; Activity based cost allocation.

Unit III: Methods of Costing (Lectures: 28)

Unit costing, Job costing, Contract costing, Process costing (process losses, valuation of work in progress), Service costing (only transport)

Unit IV: Book Keeping in Cost Accounting (Lectures: 9)

Integral and non-integral systems; Reconciliation of cost and financial accounts

Suggested Reading:

1. Charles T. Horngren, Srikant M. Datar, Madhav V. Rajan, *Cost Accounting: A Managerial Emphasis*, Pearson Education.
2. Drury, Colin. *Management and Cost Accounting*. Cengage Learning.
3. JawaharLal, *Cost Accounting*. McGraw Hill Education
4. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning
5. Rajiv Goel, *Cost Accounting*. International Book House
6. Singh, Surender. *Cost Accounting*, Scholar Tech Press, New Delhi.
7. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
8. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi.
9. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. Shri Mahavir Book Depot, New Delhi.
10. Iyengar, S.P. *Cost Accounting*. Sultan Chand & Sons
11. H.V. Jhamb, *Fundamentals of Cost Accounting*, Ane Books Pvt. Ltd.
12. JawaharLal & Seema Srivastava, *Cost Accounting*
13. M. Haniff, *Modern Cost & Management Accounting*

14. Jain & Narang, Cost & Management Accounting, Kalyani Publishers

15. Basu & Das, Cost & Management Accounting, Rabindra Library

Note: Latest edition of text books should be used.

B.Com. Honours Program: Semester IV
COURSE CC-9: AUDITING AND CORPORATE GOVERNANCE

Marks: 75 (Lectures: 65)

Objective: To provide knowledge of auditing principles, procedures and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of Corporate Governance and Corporate Social Responsibility.

Contents:

Unit I: Introduction (Lectures: 11)

Auditing: Meaning, Objectives, Basic Principles and Techniques; Classification of Audit; Audit Planning; Internal Control – Internal Check and Internal Audit; Audit Procedure, Vouching and Verification of Assets & Liabilities; Audit Programme.

Unit II: Audit of Companies (Lectures: 11)

Audit of Limited Companies: Company Auditor- Qualifications and disqualifications, Appointment, Rotation, Removal, Remuneration, Rights and Duties; Auditor's Report- Contents and Types. Liabilities of Statutory Auditors under the Companies Act 2013

Unit III: Special Areas of Audit (Lectures: 11)

Special Areas of Audit: Special features of Cost audit, Tax audit, and Management audit; Recent Trends in Auditing; Basic considerations of audit in EDP Environment; Computer aided audit techniques and tools; Auditing Standards.

Unit IV: Corporate Governance (Lectures: 11)

Conceptual framework of Corporate Governance: Theories & Models, Board Committees; Corporate Governance Reforms; Common Governance Problems noticed in various Corporate Failures; Codes & Standards on Corporate Governance.

Unit V: Business Ethics (Lectures: 10)

Business values and ethics, approaches and practices of business ethics, corporate ethics, ethics program, codes of ethics, ethics committee; Ethical Behaviour: Concepts and advantages; Rating Agencies of corporate governance; Green Governance

Unit VI: Corporate Social Responsibility (CSR) (Lectures: 11)

Concept of CSR, Strategic Planning and Corporate Social Responsibility; Relationship of CSR with Corporate Sustainability, business ethics and corporate governance; CSR provisions under the Companies Act 2013; CSR Committee; CSR Models, Codes, and Standards.

Suggested Readings:

1. Ravinder Kumar and Virender Sharma, Auditing Principles and Practice, PHI Learning

2. Aruna Jha, Auditing. Taxmann Publication.
3. A. K. Singh, and Gupta Lovleen. Auditing Theory and Practice. Galgotia Publishing Company.
4. Anil Kumar, Corporate Governance: Theory and Practice, Indian Book House, New Delhi
5. MC Kuchhal, Modern Indian Company Law, Shri Mahaveer Book Depot. (Publishers). (Relevant Chapters)
6. KV Bhanumurthy and Usha Krishna, Politics, Ethics and Social Responsibility of Business, Pearson Education
7. Erik Banks, Corporate Governance: Financial Responsibility, Controls and Ethics, Palgrave Macmillan
8. N Balasubramanian, A Casebook on Corporate Governance and Stewardship, McGraw Hill Education
9. B.N. Ghosh, Business Ethics and Corporate Governance, McGraw Hill Education
10. S K Mandal, Ethics in Business and Corporate Governance, McGraw Hill Education
11. Bob Tricker, Corporate Governance-Principles, Policies, and Practice (Indian Edition), Oxford University Press
12. Christine Mallin, Corporate Governance (Indian Edition), Oxford University Press
13. Relevant Publications of ICAI on Auditing (CARO)
14. Sharma, J.P., Corporate Governance, Business Ethics, and CSR, Ane Books Pvt Ltd, New Delhi

Note: Latest edition of text books should be used.

B.Com. Honours Program: Semester IV
COURSE CC-10: PRINCIPLES OF MARKETING

Marks: 75 (Lectures: 65)

Objective: The objective of this course is to provide basic knowledge of policies, principles and tools and techniques of marketing.

Contents:

Unit I: Introduction (Lectures: 13)

Nature, scope and importance of marketing; Evolution of marketing; Selling vs Marketing; Marketing mix, Marketing environment: concept, importance, and components (Economic, Demographic, Technological, Natural, Socio-Cultural and Legal).

Unit II: Consumer Behaviour and Market Segmentation (Lectures: 13)

- a) Consumer Behaviour: Nature and Importance, Consumer buying decision process; Factors influencing consumer buying behavior;
- b) Market segmentation: concept, importance and bases; Target market selection; Positioning concept, importance and bases; Product differentiation vs. market segmentation.

Unit III: Product (Lectures: 13)

Concept and importance, Product classifications; Concept of product mix; Branding, packaging and labeling; Product-Support Services; Product life-cycle; New Product Development Process; Consumer adoption process.

Unit IV: Pricing, Promotion and Distribution (Lectures: 18)

- a) Pricing: Significance; Factors affecting price of a product; Pricing policies and strategies

- b) Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotions; Promotion mix and factors affecting promotion mix decisions.
- c) Distribution Channel: Types and importance; Functions of middle man; Factors affecting choice of distribution channel; Wholesaling and retailing; Types of Retailers; e-tailing.

Unit V: Recent Developments in Marketing (Lectures: 8)

Consumerism, Social Marketing, Online marketing, Direct marketing, Services marketing, Green marketing, Rural marketing.

Suggested Readings:

1. Kotler, Philip, Gary Armstrong, Prafulla Agnihotri and Ehsanul Haque. *Principles of Marketing*. 13th edition. Pearson Education.
2. Michal, J. Etzel, Bruce J. Walker, William J Stanton and Ajay Pandit. *Marketing: Concepts and Cases. (Special Indian Edition)*, McGraw Hill Education
3. William D. Perreault, and McCarthy, E. Jerome., *Basic Marketing*. Pearson Education.
4. Majaro, Simon. *The Essence of Marketing*. Pearson Education, New Delhi.
5. *The Consumer Protection Act 1986*.
6. Prakash & Sontakki, *Principles of Marketing*: Kalyani Publishers
7. Dhruv Grewal and Michael Levy, *Marketing*, McGraw Hill Education.
8. Chhabra, T.N., and S. K. Grover. *Marketing Management*. Fourth Edition. Dhanpat Rai & Co.
9. Neeru Kapoor, *Principles of Marketing*, PHI Learning
10. Rajendra Maheshwari, *Principles of Marketing*, International Book House
11. Prakash and Sontakki, *Principles of Marketing*, Kalyani Publishers

B.Com. Honours Program: Semester IV

COURSE GE(H)-4: MACRO-ECONOMICS AND QUANTITATIVE TECHNIQUES

Marks: 75 (Lectures: 65)

Objective: The course aims at providing the student with knowledge of basic concepts of the macro-economic tools and techniques that are helpful for policy framework even in open economic concept and also to impart knowledge on quantitative methods in analyzing the situation.

Contents:

Unit I: Introduction (Lectures: 5)

Concepts and variables of macro-economics, income, expenditure and the circular flow, components of expenditure; Static macro-economic analysis in short and the long run, determination of demand and supply and conditions of equilibrium

Unit II: Economy in the Short Run (Lectures: 10)

IS–LM framework, fiscal and monetary policy, determination of aggregate demand, shifts in aggregate demand, aggregate supply in the short and long run.

Unit III: Inflation, Unemployment and Labour Market (Lectures: 15)

- a) Inflation: inflation and interest rates, social costs of inflation. Unemployment – natural rate of unemployment, frictional and wait unemployment.
- b) Labour market and its interaction with production system; Phillips curve, the trade-

off between inflation and unemployment, sacrifice ratio.

Unit IV: Open Economy (Lectures: 10)

Open economy – flows of goods and capital, saving and investment in a small and a large open economy, exchange rates; Mundell – Fleming model with fixed and flexible prices in a small open economy with fixed and flexible exchange rates

Unit V: Quantitative Techniques (Lectures: 25)

- a) Game Theory: Concept, 2 person Zero – sum game, Pure Strategy: Maximin-Minimax Principle (including saddle point), Mixed Strategy, Dominance Rule.
- b) Linear Programming:
 - i) Formulation of linear programming problem (LPP). Graphical solution to LPP; Cases of unique and multiple optimal solutions; Unbounded solutions, infeasibility, and redundant constraints.
 - ii) Solution to LPP using Simplex method – maximization and minimization cases (excluding cases of unbounded, infeasibility and degeneracy).

Suggested Readings

1. Mankiw, N. Gregory. *Principles of Macroeconomics*. Cengage Learning
2. Robert J Gordon, *Macroeconomics*, Pearson Education
3. Branson, William H. *Macroeconomic Theory and Policy*. HarperCollins India Pvt. Ltd.
4. Rudiger Dornbusch and Stanley Fischer, *Macroeconomics*. McGraw-Hill Education.
5. Rudiger Dornbusch, Stanley Fischer, and Richard Startz, *Macroeconomics*. McGraw-Hill Education
6. Oliver J. Blanchard, *Macroeconomics*, Pearson Education
7. G. S. Gupta, *Macroeconomics: Theory and Applications*, McGraw-Hill Education
8. Shapiro, *Macro economic Analysis*,
9. Paul A Samuelson, William D Nordhaus, and Sudip Chaudhuri, *Macroeconomic*, McGraw-Hill Education

Latest edition of text books should be used.

B.Com. Honours Program: Semester IV COURSE SEC(H)-2: E-COMMERCE

Marks: 75 (Lectures: 50)

Objective: To enable the students to become familiar with the mechanism of dealing with the business transactions through electronic means and the security mechanism.

Contents:

Unit I: Introduction (Lectures: 10)

Meaning, nature, concepts, advantages, disadvantages and reasons for transacting online; types of E-Commerce, e-commerce business models (introduction, key elements of a business model and categorizing major E-commerce business models), forces behind e-commerce; Designing, building and launching e-commerce website.

Unit II: E-payment System (Lectures: 10)

Models and methods of e-payments (Debit Card, Credit Card, Smart Cards, e-money),

digital signatures (procedure, working and legal position), payment gateways, online banking (meaning, concepts, importance, electronic fund transfer, automated clearing house, automated ledger posting), risks involved in e-payments.

Unit III: On-line Business Transactions (Lectures: 10)

Meaning, purpose, advantages and disadvantages of transacting online, E-commerce applications in various industries like banking and insurance; payment of utility bills, online marketing, e-tailing, online services (financial, travel and career), online auctions, online portal, online learning, online entertainment, Online shopping.

Unit IV: E- Security (Lectures: 10)

E-commerce security environment: definition and scope of E- security, security threats in the E-commerce environment (security intrusions and breaches, attacking methods like hacking, sniffing, cyber-vandalism etc.); Technology solutions: Encryption, security channels of communication, protecting networks and protecting servers and clients.

Unit V: IT Act 2000 and Cyber Crimes (Lectures: 10)

IT Act 2000: Definitions, Digital signature, electronic governance, Attribution, acknowledgement and dispatch of electronic records, Regulation of certifying authorities, Duties of subscribers, Penalties and adjudication, Appellate Tribunal, Offences and Cyber-crimes.

Suggested Readings

1. Kenneth C. Laudon and Carlo Guercio Traver, *E-Commerce*, Pearson Education.
2. David Whiteley, *E-commerce: Strategy, Technology and Applications*, McGraw Hill Education
3. Bharat Bhaskar, *Electronic Commerce: Framework, Technology and Application*, 4th Ed., McGraw Hill Education
4. PT Joseph, *E-Commerce: An Indian Perspective*, PHI Learning
5. KK Bajaj and Debjani Nag, *E-commerce*, McGraw Hill Education
6. TN Chhabra, *E-Commerce*, Dhanpat Rai & Co.
7. Sushila Madan, *E-Commerce*, Taxmann 8. TN Chhabra, Hem Chand Jain, and Aruna Jain, *An Introduction to HTML*, Dhanpat Rai & Co.

B.Com. Honours Program: Semester-V
COURSE CC-11: FUNDAMENTALS OF INVESTMENT

Marks: 75 (Lectures: 65)

Objective: To familiarize the students with different investment alternatives, introduce them to the framework of their analysis and valuation and highlight the role of investor protection.

Contents:

Unit I: The Investment Environment (Lectures: 10)

The investment decision process; Types of Investments – Commodities, Real Estate and Financial Assets; the Indian securities market- the market participants and trading of securities, security market indices, sources of financial information; Concept of return and risk; Impact of Taxes and Inflation on return.

Unit II: Fixed Income Securities (Lectures: 15)

Bond: Features, types of bonds, estimating bond yields, bond valuation, types of bond risks, default risk and credit rating.

Unit III: Approaches to Equity Analysis (Lectures: 15)

Introductions to Fundamental Analysis, Technical Analysis and Efficient Market Hypothesis; Dividend capitalization models and price-earnings multiple approach to equity valuation

Unit IV: Portfolio Analysis and Financial Derivatives (Lectures: 15)

Concept of Portfolio and Portfolio Management, Computation of Portfolio Risk and Return; Diversification; Mutual Funds; Introduction to Financial Derivatives; Financial Derivatives Markets in India

Unit V: Investor Protection (Lectures: 10)

Role of SEBI and stock exchanges in investor protection; Investor grievances and their redressal system, insider trading, investors' awareness and activism

Suggested Readings

1. C.P. Jones, *Investments Analysis and Management*, Wiley, 8th ed.
2. Prasanna Chandra, *Investment Analysis and Portfolio Management*, McGraw Hill Education
3. R.P. Rustogi, *Fundamentals of Investment*, Sultan Chand & Sons, New Delhi.
4. N.D. Vohra and B.R. Bagri, *Futures and Options*, McGraw Hill Education
5. Mayo, *An Introduction to Investment, Cengage Learning*

B.Com. Honours Program: Semester-V
COURSE CC - 12: INCOME TAX LAW AND PRACTICE IN INDIA

Marks: 75 (Lectures: 65)

Objective: To provide basic knowledge and equip students with application of principles and provisions of Income-tax Act, 1961 and the relevant Rules.

Contents:

Unit I: Introduction (Lectures: 10)

- a) Basic concepts: Income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, maximum marginal rate of tax; Permanent Account Number (PAN)
- b) Residential status; Scope of total income on the basis of residential status Exempted income under section 10

Unit II: Computation of Income of Individual under Different Heads-(Part-I) (Lectures: 24)

Income from Salaries; Income from house property

Unit III: Computation of Income of Individual under Different Heads-(Part-II) (Lectures:15)

Profits and gains of business or profession; Capital gains; Income from other sources

Unit IV: Computation of Total Income and Tax Liability of Individual (Lectures:16)

Income of other persons included in assessee's total income; Aggregation of income and set-off and carry forward of losses; Deductions from gross total income; Rebates and reliefs; Computation of total income of individuals; Tax liability of an individual.

Suggested readings:

- 1. Singhania, Vinod K. and Monica Singhania. *Students' Guide to Income Tax, University Edition*. Taxmann Publications Pvt. Ltd., New Delhi.
 - 2. Ahuja, Girish and Ravi Gupta. *Systematic Approach to Income Tax*. Bharat Law House,
 - 3. Narang, Gaur & Puri, *Income Tax Law*, Kalyani Publishers
- Journals:
- 1. *Income Tax Reports*. Company Law Institute of India Pvt. Ltd., Chennai.
 - 2. *Taxman*. Taxman Allied Services Pvt. Ltd., New Delhi.
 - 3. *Current Tax Reporter*. Current Tax Reporter, Jodhpur.

Note: Latest edition of text books should be used. Computation of Income under all heads is to be done considering both old and new regime.

B.Com. Honours Program: Semester -V
COURSE DSE(H) – 1(a): COMPUTER APPLICATIONS IN BUSINESS

Marks: 75 (Internal: 15, Theory: 40, Project/PPT: 20) (Lectures: 40, Practical Lab: 40)

Objective: To provide computer skills and knowledge among the students of commerce and to enhance their understanding of usefulness of information technology tools for business operations.

Contents:

Unit I: Word Processing (Lectures: 10, Practical Lab: 8)

Introduction to Word Processing, Word processing concepts, Use of Templates, Working with word document: Editing text, Find and replace text, Formatting, spell check,

Autocorrect, Auto text; Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and footer, Tables: Inserting, filling and formatting a table; Inserting Pictures and Video; Mail Merge: including linking with Database; Printing documents

(Practical: Creating Business Documents using the above facilities)

Unit II: Preparing Presentations (Lectures: 10, Practical Lab: 8)

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation; and Slideshow.

(Practical: Creating Business Presentations using above facilities)

Unit III: Spreadsheet and its Business Applications(Lectures: 10, Practical Lab:12)

Spreadsheet concepts: Managing worksheets; Formatting, Entering data, Editing, and Printing a worksheet; Handling operators in formula, Project involving multiple spreadsheets, Organizing Charts and graphs

Generally used Spreadsheet functions: Mathematical, Statistical, Financial, Logical, Date and Time, Lookup and reference, Database and Text functions

Unit IV: Creating Business Spreadsheet (Lectures: 10, Practical Lab: 12)

Creating Spreadsheet in the areas of: Loan and Lease statement; Ratio Analysis; Payroll statements; Capital Budgeting; Depreciation Accounting; Graphical representation of data; Frequency distribution and its statistical parameters; Correlation and Regression

Note:

1. Teaching arrangement need to be made in the computer Lab
2. Topics of Project/ppt to be decided by the respective colleges and the same to be examined by the University.

Suggested Readings:

The suggested readings and guidelines shall be notified by the university department at least once in three years based on the selected software.

B.Com. Honours Program: Semester -V

COURSE DSE(H)-1 (b): COMPUTERISED ACCOUNTING AND SYSTEMS

Marks: 75 (Internal: 15, Theory: 40, Practical: 20) (Lectures: 30, Practical Lab: 50)

Objective: This course seeks to enhance the skills needed for computerized accounting system and to enable the students to develop simple accounting applications.

Contents:

Unit-I: Computerized Accounting Systems (Lectures: 10, Practical Lab: 20)

Computerized Accounting Systems: Computerized Accounts by using Tally (last updated version): Creating a Company, Configure and Features settings, Creating Accounting Ledgers and Groups, Creating Stock Items and Groups, Vouchers Entry; Generating Reports - Cash Book, Ledger Accounts, Trial Balance, Profit and Loss Account, Balance Sheet, Cash Flow Statement; Selecting and shutting a Company; Backup and Restore data of a Company

Unit-II: Preparation of Return of Income (Lectures: 8, Practical Lab: 20)

Filing of returns: Manually, On-line filing of Returns of Income & TDS; Provision & Procedures of Compulsory On-Line filing of returns for specified assesses.

Unit-III: Computerized Accounting: Using Generic Software (Lectures: 12, Practical Lab: 10)

Taxation: TDS

Auditing in Computerized Accounting system: Statutory Audit, Voucher verification, Verification of related party transaction, Computer Assisted Audit Techniques (CAAT): Various Tools.

Note:

1. Teaching arrangements need to be made in the computer Lab
2. Practical examination to be conducted by the University.

Software

1. Vinod Kumar Singhania, e-filing of Income Tax Returns and Computation of Tax, Taxmann Publication Pvt. Ltd, New Delhi. Latest version
2. 'Excel Utility' available at incometaxindiaefiling.gov.in

Suggested Readings:

The suggested readings and guidelines shall be notified by the university department at least once in three years based on the selected software.

B.Com. Honours Program: Semester-V
COURSE DSE(H) – 2 (a): MANAGEMENT ACCOUNTING

Marks: 75 (Lectures: 65)

Objective: To impart knowledge among the students about the use of financial, cost and other data and their analysis for the purpose of managerial planning, control and decision making.

Contents:

Unit I: Introduction (Lectures: 6)

Meaning, Objectives, Nature and Scope of management accounting, difference between cost accounting and management accounting, Cost control and Cost reduction, Cost management

Unit II: Ratio Analysis (Lectures: 10)

Definition , Importance & limitations of Ratio Analysis, Interested Parties in Ratio Analysis, Classification & calculation of different types of Ratio and their implications

Unit III: Budgetary Control (Lectures: 20)

Concept of budget, budgeting and budgetary control, objectives, merits, and limitations; Types of Budgets; Preparation of Cash and Flexible Budgets; Zero Base Budgeting;

Programme and performance budgeting.

Unit IV: Standard Costing (Lectures: 12)

Meaning of standard cost and standard costing, advantages, limitations and applications; Variance Analysis–material, labour and overheads variances; Control Ratios

Unit V: Marginal Costing and Decision-Making (Lectures: 12)

- a) Marginal Costing: Meaning, Absorption versus Variable Costing; Cost-Volume-Profit Analysis, Profit/ Volume ratio; Break-even analysis-algebraic and graphical methods; Angle of incidence, margin of safety, Key factor, determination of cost indifference point
- b) Decision making: profitable product mix, Acceptance or Rejection of special/ export offers, Make or buy, Addition or Elimination of a product line, operate or shut down and Pricing decisions

Unit VI: Contemporary Issues (Lectures: 5)

Responsibility Accounting: Concept, Significance, Different Responsibility Centres; Transfer Pricing

Suggested Reading:

1. Charles T. Horngren, Gary L. Sundem, Dave Burgstahler, Jeff O. Schatzberg. *Introduction to Management Accounting*, Pearson Education.
2. Anthony A. Atkinson, Robert S. Kaplan, Ella Mae Matsumura, S. Mark Young.
3. *Management Accounting*. Dorling Kindersley (India) Pvt. Ltd.
4. Ronald W. Hilton and David E. Platt. *Managerial Accounting: Creating Value in a Global Business Environment*, McGraw Hill Education.
5. Singh, Surender. *Management Accounting*, Scholar Tech Press, New Delhi.
6. Goel, Rajiv, *Management Accounting*. International Book House,
7. Arora, M.N; *Management Accounting*. Vikas Publishing House, New Delhi
8. Maheshwari, S.N. and S.N. Mittal. *Management Accounting*. Shree Mahavir Book Depot, New Delhi.
9. Singh, S. K. and Gupta Lovleen. *Management Accounting – Theory and Practice*. Pinnacle Publishing House.
10. Khan, M.Y. and Jain, P.K. *Management Accounting*. McGraw Hill Education
11. H.V. Jhamb, *Fundamentals of Management Accounting*, Ane Books Pvt. Ltd.

Note: Latest edition of text books should be used.

B.Com. Honours Program: Semester-V
COURSE DSE(H)-2 (b): ADVERTISING

Marks: 75 (Lectures: 65)

Objective: The objective of this course is to familiarize the students with the basic concepts, tools and techniques of advertising used in marketing.

Contents:

Unit I: Advertising- Concept, Objectives and Budgeting (Lectures: 20)

Meaning, nature and importance of advertising; Types of advertising; Advertising as a tool of communication; Social, ethical and legal aspects of advertising in India; Setting

advertising objectives; Audience analysis; ; Setting of advertising budget: determinants and major methods

Unit II: Media Decisions (Lectures: 15)

Major media types - their characteristics, internet as an advertising media, merits and demerits; Factors influencing media choice; media selection, media Scheduling; Advertising through the Internet-media devices

Unit III: Message Development (Lectures: 15)

Advertising appeals, Advertising copy and elements, Preparing ads for different Media

Unit IV: Measuring Advertising Effectiveness (Lectures: 8)

Evaluating communication and sales effects; Pre- and Post-testing techniques

Unit V: Advertising Agency (Lectures: 7)

Role, types and selection of advertising agency

Suggested Readings:

1. George E Belch, Michael A Belch, Keyoor Purani, *Advertising and Promotion :An Integrated Marketing Communications Perspective (SIE)*, McGraw Hill Education
2. S. Wats Dunn, and Arnold M. Barban. *Advertising: Its Role in Marketing*. Dryden Press
3. Burnett, Wells, and Moriatty. *Advertising: Principles and Practice*. 5th ed. Prentice Hall of India, New Delhi.
4. Batra, Myers and Aakers. *Advertising Management*. PHI Learning.
5. Terence A. Shimp. *Advertising and Promotion: An IMC Approach*. Cengage Learning.
6. Sharma, Kavita. *Advertising: Planning and Decision Making*, Taxmann Publications
7. JaishreeJethwaney and Shruti Jain, *Advertising Management*, Oxford University Press, 2012
8. Chunawala and Sethia, *Advertising*, Himalaya Publishing House
9. Ruchi Gupta, *Advertising*, S. Chand & Co.
10. O'Guinn, *Advertising and Promotion: An Integrated Brand Approach*, Cengage Learning

Note: Latest edition of text books should be used.

B.Com. Honours Program: Semester-VI
COURSE CC-13: FUNDAMENTALS OF FINANCIAL MANAGEMENT

Marks: 75 (Lectures: 65)

Objective: To familiarize the students with the principles and practices of managing finance for short-term and long-term requirements.

Contents:

Unit I: Introduction (Lectures: 8)

Nature, scope and objective of Financial Management, Time value of money, Risk and return (including Capital Asset Pricing Model)

Unit II: Investment Decisions (Lectures: 18)

Capital Budgeting: Meaning, importance, the Capital Budgeting Process, Methods of Capital Budgeting - Payback Period method, Discounted Payback period method, Accounting Rate of Return, Net Present Value (NPV), Net Terminal Value, Internal Rate of Return (IRR), Profitability Index. Selection of projects/proposals using above methods

Unit III: Financing Decision (Lectures: 15)

- a) Cost of Capital: Concept and sources of long-term financing; Estimation of components of cost of capital: Methods of Calculation of cost of equity capital, cost of Retained Earnings, cost of Debt and cost of Preference Capital; meaning and calculation of Weighted Average cost of capital (WACC) and Marginal cost of capital.
- b) Capital structure: Theories of Capital Structure (Net Income, Net Operating Income, MM Hypothesis, Traditional Approach). Operating and financial leverage; Determinants of capital structure

Unit IV: Dividend Decisions (Lectures: 9)

Theories for Relevance and irrelevance of dividend decision for corporate valuation; Cash and stock dividends; Models of Dividend policies- M-M Hypothesis, Walter's Model, Gordon's Model

Unit V: Working Capital Decisions (Lectures: 15)

Concepts of working capital, significance and components, sources of short-term finance; risk-return trade off; financing of working capital; estimation of working capital requirements.

Suggested Readings

1. James C. Van Horne and Sanjay Dhamija, *Financial Management and Policy*, Pearson Education
2. Levy H. and M. Sarnat. *Principles of Financial Management*. Pearson Education
3. Brigham and Houston, *Fundamentals of Financial Management*, Cengage Learning
4. Khan and Jain. *Basic Financial Management*, McGraw Hill Education
5. Prasanna Chandra, *Fundamentals of Financial Management*. McGraw Hill Education
6. Singh, J.K. *Financial Management- text and Problems*. Dhanpat Rai and Company, Delhi.
7. Rustagi, R.P. *Fundamentals of Financial Management*. Taxmann Publication Pvt. Ltd.
8. Singh, Surender and Kaur, Rajeev. *Fundamentals of Financial Management*. Mayur Courseback, New Delhi.

9. Pandey, I.M. *Financial Management*. Vikas Publications.
10. Bhabatosh Banerjee, *Fundamentals of Financial Management*, PHI Learning
11. Gupta & Sharma, *Management Accounting*, Kalyani Publishers

Note: Latest edition of text books should be used.

B.Com. Honours Program: Semester-VI
COURSE CC - 14: GOODS AND SERVICES TAX AND CUSTOMS DUTY

Marks – 75 (Lectures: 65)

Objective: *This course aims at a glance towards the understanding of Indirect Taxes as prevail in India. The students will be exposed to Indirect Taxes as a whole as well as will be trained to computational techniques of Indirect Taxes in India.*

Contents:

Unit-I: Concept of Indirect Taxes (Lectures: 5)

- a) Concept and features of indirect taxes
- b) Principal indirect taxes

Unit-II: Goods and Services Tax (GST) Laws (Lectures: 40)

- a) GST Laws: An introduction including Constitutional aspects
- b) Levy and collection of CGST and IGST
 - i) Application of CGST/IGST law
 - ii) Concept of supply including composite and mixed supplies
 - iii) Charge of tax
 - iv) Exemption from tax
 - v) Composition levy
- c) Basic concepts of time and value of supply
- d) Input tax credit
- e) Computation of GST liability
- f) Registration
- g) Tax invoice; Credit and Debit Notes; Electronic waybill
- h) Returns
- i) Payment of tax including reverse charge

Unit-III: Customs Law as contained in the Customs Act, 1962 and the Customs Tariff Act, 1975 (Lectures: 20)

- (i) Introduction to customs law including Constitutional aspects (ii) Levy of and exemptions from customs duties: all provisions including application of customs law, taxable event, charge of customs duty, exceptions to levy of customs duty, exemption from custom duty (iii) Types of customs duties (iv) Classification and valuation of imported and export goods (v) Officers of Customs; Appointment of customs ports, airports etc. (vi) Import and Export Procedures: all import and export procedures including special procedures relating to baggage, goods imported or exported by post, stores (vii) Provisions relating to coastal goods and vessels carrying coastal goods (viii) Warehousing (ix) Drawbacks (x) Demand and Recovery; Refund (xi) Provisions relating to prohibited goods, notified goods, specified goods, illegal importation/exportation of

goods (xii) Searches, seizure and arrest; Offences; Penalties; Confiscation and Prosecution (xiii) Appeals and Revision; Advance Rulings; Settlement Commission and Other provisions.

Suggested Readings:

1. Dhingra Understanding Basic of GST, Kalyani Publishers
2. Goyal and Garg, Indirect Tax, Kalyani Publishers

Note: Latest edition of text books should be used.

B.Com. Honours Program: Semester-VI
COURSE DSE(H) - 3 (a): BUSINESS RESEARCH METHODS AND PROJECT WORK

Marks: 75 (Internal: 15, Theory: 40, Project: 20) (Lectures: 65)

Objective: This course aims at providing the general understanding of business research and the methods of business research. The course will impart learning about how to collect, analyze, present and interpret data.

Contents:

Section A: Business Research Methods

Unit I: Introduction (Lectures: 10)

Meaning of research; Scope of Business Research; Purpose of Research – Exploration, Description, Explanation; Unit of Analysis – Individual, Organization, Groups, and Data Series; Conception, Construct, Attributes, Variables, and Hypotheses

Unit II: Research Process (Lectures: 10)

An Overview; Problem Identification and Definition; Selection of Basic Research Methods- Field Study, Laboratory Study, Survey Method, Observational Method, Existing Data Based Research, Longitudinal Studies, Panel Studies

Unit III: Measurement and Hypothesis Testing (Lectures: 20)

Measurement: Definition; Designing and writing items; Uni-dimensional and multi-dimensional scales; Measurement Scales- Nominal, Ordinal, Interval, Ratio; Ratings and Ranking Scale, Thurstone, Likert and Semantic Differential scaling, Paired Comparison; Sampling –Steps, Types, Sample Size Decision; Secondary data sources
Hypothesis Testing: Tests concerning means and proportions; ANOVA, Chi-square test and other non-parametric tests; testing the assumptions of Classical Normal Linear Regression

Section B: Project Report

Unit IV: Report Preparation (Lectures: 25)

Meaning, types, and layout of research report; Steps in report writing; Citations, Bibliography and Annexure in report; JEL Classification

Note:

1. There shall be a written examination of 40 Marks based on Unit 1 to III.
2. The students shall be required to prepare a project under the supervision of a faculty member assigned by the college/institution based on field work. The Project Report

carries 20 Marks and will be evaluated by University appointed examiners.

Suggested Readings:

1. Gupta and Rangi, *Research Methodology*, Kalyani Publishers
2. C R Kothari and G Garg, *Research Methodology*, New Age International Publishers

B.Com. Honours Program: Semester-VI
COURSE DSE(H) - 3(b): BANKING AND INSURANCE

Marks: 75 (Lectures:65)

Objective: To impart knowledge about the basic principles and practices of the banking and insurance.

Contents:

Unit I: Introduction (Lectures: 13)

Origin of banking: definition, types of banks, banker-customer relationship, General and special types of customers; Types of deposits; Origin and growth of commercial banks in India, changing role of commercial banks; Financial Services offered by banks

Unit II: Cheques and Paying Banker (Lectures: 13)

Crossing and endorsement - meaning, definitions, types and rules of crossing; statutory protection in due course; collecting bankers: duties; statutory protection for holder in due course; concept of negligence

Unit III: Bank Lending (Lectures: 13)

Principles of sound lending, secured vs. unsecured advances, types of advances, advances against various securities;

Unit IV: Internet Banking (Lectures: 13)

Meaning, benefits, home banking, mobile banking, virtual banking, e-payments, ATM card/ biometric card, debit/credit card, smart card, NEFT, RTGS, ECS (credit/debit), e-money, electronic purse, digital cash

Unit V: Risk and Insurance (Lectures: 13)

- a) Basic concept of risk, Types of business risk; Assessment and Transfer
- b) Insurance: definition, types and basic principles-utmost good faith, Indemnity, Economic function, Proximate cause, Subrogation and contribution; Re-insurance; Online Insurance; Power, functions and Role of IRDA

Suggested readings:

1. Agarwal, O.P., *Banking and Insurance*, Himalaya Publishing House
2. Satyadevi, C., *Financial Services Banking and Insurance*, S. Chand
3. Suneja, H.R., *Practical and Law of Banking*, Himalya Publishing House
4. Chabra, T.N., *Elements of Banking Law*, Dhanpat Rai and Sons
5. Arthur, C. and C. William Jr., *Risk Management and Insurance*, McGraw Hill
6. Saxena, G.S; *Legal Aspects of Banking Operations*, Sultan Chand and Sons
7. Varshney, P.N., *Banking Law and Practice*, Sultan Chand and Sons
8. Jyotsna Sethi and Nishwan Bhatia, *Elements of Banking and Insurance*, PHI Learning

B.Com. Honours Program: Semester-VI
COURSE DSE(H) - 4 (a): FINANCIAL MARKETS, INSTITUTIONS AND FINANCIAL SERVICES

Marks: 75 (Lectures: 65)

Objective: To provide basic knowledge to the students about the financial markets and institutions and to familiarize them with major financial services in India.

Contents:

Unit I: Introduction (Lectures: 8)

Financial System and its Components – financial markets and institutions; Financial intermediation; Flow of funds matrix; Financial system and economic development; An overview of Indian financial system

Unit II: Financial Markets (Lectures: 17)

Money market – functions, organization and instruments. Role of central bank in money market; Indian money market – An overview; Capital Markets – functions, organization and instruments. Indian debt market; Indian equity market – primary and secondary markets; Role of stock exchanges in India

Unit III: Financial Institutions (Lectures: 20)

Commercial banking–introduction, its role in project finance and working capital finance; Development Financial institutions (DFIs) – An overview and role in Indian economy; Life and non-life insurance companies in India; Mutual Funds – Introduction and their role in capital market development. Non-banking financial companies (NBFCs)

Unit IV: Financial Services (Lectures: 8)

Overview of financial services industry: Merchant banking–pre and post issue management, underwriting. Regulatory framework relating to merchant banking in India

Unit V: Leasing and Hire–purchase (Lectures: 12)

Consumer and housing finance; Venture capital finance; Factoring services, bank guarantees and letter of credit; Credit rating; Financial counseling.

Suggested Readings:

1. L M Bhole, and Jitendra Mahakud. *Financial Institution and Markets*, McGraw-Hill Education
2. Khan, M.Y. *Indian Financial System*, McGraw-Hill Education.
3. Dhanekar. *Pricing of Securities*. New Delhi: Bharat Publishing House.
4. Prasanna, Chandra. *Financial Management: Theory and Practice*. McGraw-Hill Education.
5. Clifford Gomez, *Financial Markets, Institutions and Financial Services*, PHI Learning
6. MY Khan and PK Jain. *Financial Services*. McGraw Hill Education.
7. Singh, J.K. *Venture Capital Financing in India*. Dhanpat Rai and Company, New Delhi.
8. *Annual Reports of Major Financial Institutions in India*.
9. Kaur & Talwar, *Financial Markets Institution and Services*, Kalyani Publishers

Note: Latest edition of text books should be used

B.Com. Honours Program: Semester-VI
COURSE DSE(H) - 4 (b) INDUSTRIAL RELATIONS AND LABOUR LAWS

Marks:75 (Lectures: 65)

Objective: To enable the students to learn the concepts of industrial relations including trade unions, collective bargaining, discipline and various labour enactments.

Contents:

Unit I: Industrial Relations (Lectures: 13)

Concept of Industrial Relations; Nature of Industrial Relations; Objectives of IR; Factors affecting IR in changing Environment, Evolution of IR in India; Role of State; Trade Union; Employers' Organisation; Human Resource Management and IR Role of ILO in Industrial Relations, International Dimensions of IR.

Unit II: Trade Union (Lectures: 13)

Trade Union: Origin and growth, unions after Independence, unions in the era of liberalization; Factors Affecting Growth of Trade Unions in India, Multiplicity & Recognition of Trade Unions

Unit III: Collective Bargaining and Workers' Participation in Management (Lectures: 13)

- a) Collective Bargaining: Meaning, Nature, Types, Process and Importance of Collective Bargaining, pre-requisites, issues involved; Status of Collective Bargaining in India, Functions and role of Trade Unions in collective bargaining.
- b) Workers' Participation in Management: Concept, practices in India, Works Committees, Joint management councils; Participative Management and co-ownership

Unit IV: Discipline and Grievance Redressal (Lectures: 13)

- a) Discipline: Causes of indiscipline, Maintenance of discipline and misconduct; Highlights of domestic enquiries; Principle of Natural Justice; Labour turnover; Absenteeism;
- b) Grievance: Meaning of Grievance, Grievance redressal machinery in India, Grievance handling procedure; salient features of Industrial Employment (Standing orders) Act, 1946.

Unit V: Labour Laws (Lectures: 13)

- a) The Industrial Disputes Act, 1947: Definitions of Industry, workman, and Industrial Dispute; Authorities under the Act: Procedure, Powers and Duties of Authorities; Strikes and Lock outs: Lay-off and Retrenchment: Provisions relating to Layoff, Retrenchment, and closure
- b) The Factories Act, 1948: Provisions relating to Health, Safety, Welfare facilities, working hours, Employment of young persons, Annual Leave with wages
- c) New Labour Code of India: Features

Suggested Readings:

- 1. PK Padhi, *Industrial Relations and Labour Law*, PHI Learning
- 2. Arun Monappa, *Industrial Relations and Labour Law*, McGraw Hill Education

- 3. SC Srivastav, Industrial Relations and Labour Law, Vikas Publishing House*
- 4. C.S Venkata Ratnam, Industrial Relations, Oxford University Press*
- 5. P.L. Malik's Handbook of Labour and Industrial Law, Vol 1 and 2, Eastern Book Company*
- 6. JP Sharma, Simplified Approach to Labour Laws, Bharat Law House (P)Ltd*

Note: Latest edition of text books should be used.

UNIVERSITY OF NORTH BENGAL

Raja Rammohunpur, Dt. Darjeeling, West Bengal, Pin: 734013

REVISED SYLLABUS FOR B.COM PROGRAM UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

[Effective from: 2022-2023]

CREDIT DETAILS OF B.COM PROGRAM

		Types of Courses						Semester-wise	
		Discipline Specific Core Course (DSC)	Discipline Specific Elective Course (DSE)	Generic Elective Course (GE)	Language (LCC)	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Total Courses	Total Credit
Credit (per course) ⇒		6	6	6	6	2	2		
Semester I		2	-	-	1	1	-	4	20
Semester II		2	-	-	1	1	-	4	20
Semester III		2	-	-	1	-	1	4	20
Semester IV		2	-	-	1	-	1	4	20
Semester V		-	2	1		-	1	4	20
Semester VI		-	2	1		-	1	4	20
Course type-wise	Total Courses	8	4	2	4	2	4	24	
	Total Credits	48	24	12	24	4	8		120

STRUCTURE OF THE B.COM PROGRAM

	Course No.	Course Title	Course Type	Marks	Credits	Page No.
Semester I	AECC -1	Environmental Studies	AECC	100	2	4
	DSC-1	Financial Accounting	DSC	75	5+1 (T)	4
	DSC-2	Management Principles and Applications	DSC	75	5+1 (T)	5
	LCC - 1	MIL - 1	LCC	75	5+1 (T)	6
	Total in Semester I			325	20	
Semester II	AECC - 2	English/MIL Communication	AECC	50	2	7
	DSC - 3	Corporate Accounting	DSC	75	5+1 (T)	7
	DSC - 4	Business Law	DSC	75	5+1 (T)	7
	LCC - 2	English - 1	LCC	75	5+1 (T)	8
	Total in Semester II			275	20	
Semester III	DSC - 5	Business Mathematics	DSC	75	5+1 (T)	10
	DSC - 6	Corporate Law	DSC	75	5+1 (T)	11
	LCC - 1	MIL - 2	LCC	75	5+1 (T)	12
	SEC (P)-1	Entrepreneurship	SEC	75	2	12
	Total in Semester III			300	20	

Semester IV	DSC – 7	Cost Accounting	DSC	75	5+1 (T)	14
	DSC – 8	Auditing and Corporate Governance	DSC	75	5+1 (T)	15
	LCC - 2	English - 2	LCC	75	5+1 (T)	16
	SEC(P)-2	E-Commerce	SEC	75	2	16
	Total in Semester IV			300	20	
Semester V	DSE(P)-1 (any ONE Course)	(a) Income Tax Law and Practice in India (b) Human Resource Management	DSE	75	5+1 (T)	18 19
	DSE(P)-2 (any ONE Course)	(a) Management Accounting (b) Computerized Accounting and Systems	DSE	75	(A)» 5+1 (T) or (B)» 4+2 (P)	20 21
	GE (P) - 1	Elementary Concepts of Micro and Macro Economics	GE	75	5+1 (T)	22
	SEC(P) - 3	Computer Applications in Business	SEC	75	2	23
	Total in Semester V			300	20	
Semester VI	DSE(P)-3 (any ONE Course)	(a) Goods and Services Tax and Customs Duty (b) Principles of Marketing	DSE	75	5+1 (T)	25 26
	DSE(P)-4 (any ONE Course)	(a) Financial Markets, Institutions and Financial Services (b) Banking and Insurance	DSE	75	5+1 (T)	27 28
	GE(P)-2	Business Statistics	GE	75	5+1 (T)	29
	SEC (P)-4	Business Communication	SEC	75	2	31
	Total in Semester VI			300	20	
	GRAND TOTAL			1800	120	

Notes:

1. Credit determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work field work per week.
2. 1 credit also means 2 practical periods
3. 1(T) means 1 tutorial period for doubt clearing and others
4. Each semester requires 90 actual teaching days in 15-18 weeks.
5. Odd Semesters i.e. Sem. I, Sem. III and Sem. V last from July to December every year.
6. Even Semesters i.e. Sem. II, Sem. IV and Sem. VI last from January to June every year.

B.Com Program: Semester – I
COURSE AECC - 1: ENVIRONMENTAL STUDIES

Marks – 100

Common Syllabus to be notified by the Board of Studies in Environmental Science

B.Com Program: Semester - I
COURSE DSC - 1: FINANCIAL ACCOUNTING

Marks: 75 (Lectures: 65)

Objective: The objective of this course is to help students to acquire conceptual knowledge of the financial accounting and to impart skills for recording various kinds of business transactions.

Contents:

Unit I: Theoretical Framework (Lectures: 8):

- a) Accounting: As a subject and as an information system; Advantages, Limitations and Functions; Accounting Cycle.
- b) Bases of Accounting: Basic Concepts and Conventions.
- c) Generally Accepted Accounting Principles.
- d) Accounting Standards: Concept, Benefits; Indian Accounting Standards (IAS)- Features and Objectives of AS-2, AS-6, AS-9, AS-10, AS-19, AS-27, AS-29; International Financial Reporting Standards (IFRS)-Need, Procedures.

Unit II: Accounting for Depreciation, Reserves and Provisions (Lectures: 7)

Unit III: Final Accounts (Lectures: 20)

- a) Trading concern
- b) Non-trading concern

Unit IV: Accounting for Hire Purchase and Installment Payment Systems, Consignment and Joint Venture (Lectures: 18)

- a) Hire Purchase: Concept, Features, Accounting treatment including stock and debtors system.
- b) Consignment: Concept, Features, Accounting treatment in the books of the consignor and consignee.
- c) Joint Venture: Concept, Features: Accounting procedure under different methods.

Unit V: Accounting for Inland Branches (Lectures: 6):

Concept, features, Accounting for dependent branches under different methods.

Unit VI: Accounting for Dissolution of the Partnership Firm (excluding sale to a company): (Lectures: 6):

Insolvency of partners including Garner vs. Murray and piecemeal distribution

Note:

The relevant Indian Accounting Standards in line with the IFRS for all the above topics should be covered.

Any revision of relevant Indian Accounting Standard would become applicable immediately.

Suggested Readings:

1. Robert N Anthony, David Hawkins, Kenneth A. Merchant, Accounting: Text and Cases. McGraw-Hill Education, 13th Ed. 2013.
2. Charles T. Horngren and Donna Philbrick, Introduction to Financial Accounting, Pearson Education.
3. J.R. Monga, Financial Accounting: Concepts and Applications. Mayur Course Backs, New Delhi.
4. M.C. Shukla, T.S. Grewal and S.C. Gupta. Advanced Accounts. Vol.-I. S. Chand & Co., New Delhi.
5. S.N. Maheshwari, and S. K. Maheshwari. Financial Accounting. Vikas Publishing House, New Delhi.
6. Deepak Sehgal. Financial Accounting. Vikas Publishing House, New Delhi.
7. Bhushan Kumar Goyal and HN Tiwari, Financial Accounting, International Book House
8. Goldwin, Alderman and Sanyal, Financial Accounting, Cengage Learning.
9. Tulsian, P.C. Financial Accounting, Pearson Education.
10. Compendium of Statements and Standards of Accounting. The Institute of Chartered Accountants of India, New Delhi
11. M. Haniff & A. Mukherjee, Financial Accounting 2nd Edition
12. Basu & Das, Financial Accounting, Rabindra Library
13. SP Jain & K.L. Narang, Financial Accounting, Kalyani Publishers

Note: Latest edition of the text books should be used.

B.Com. Program: Semester - I

COURSE: DSC-2: MANAGEMENT PRINCIPLES AND APPLICATIONS

Marks: 75 (Lectures: 65)

Objective: The objective of the course is to provide the student with an understanding of basic management concepts, principles, and practices.

Contents:

Unit I: (Lectures: 13)

- a) Management: Concept, Definition, Scope, Levels and Significance.
- b) Evolution of the Management Thoughts: Classical Approach -Taylor, Fayol; Neo-Classical Approach-Mayo, Hawthorne Experiments; Behavioral Approach; Systems Approach

Unit II: Planning and Organizing (Lectures: 20)

- a) Planning: Concept, Process, Steps in Planning, Significance and Types of Plan.
- b) Environmental Analysis (internal and external environment): Importance and Techniques (SWOT and BCG Matrix).
- c) Decision-Making: Concept, Process, Types.
- d) Organizing: Concept, Process, Significance; Organizational Structure- Formal and Informal; Span of Control, Different types of authority, Delegation of authority, Decentralization.

Unit III: Directing and Coordinating (Lectures: 24)

- a) Directing: Concept, Features, Importance and Limitations.
- b) Motivation: Concept, Importance, Extrinsic and Intrinsic motivation; Motivation Theories-McGregor, Maslow
- c) Staffing: Concept and Process
- d) Leadership: Concept, Importance, Theories - Likert, Blake and Mouten
- e) Coordinating: Concept, Features, Importance, Internal and External Coordination

Unit IV: Controlling (Lectures: 8)

Controlling: Concept, Features, Importance and Limitations; Process; Essentials of a good control system, Principles of Effective Control

Suggested Readings:

1. Harold Koontz and Heinz Weihrich, *Essentials of Management: An International and Leadership Perspective*, McGraw Hill Education.
2. Stephen P Robbins and Madhushree Nanda Agrawal, *Fundamentals of Management: Essential Concepts and Applications*, Pearson Education.
3. George Terry, *Principles of Management*, Richard D. Irwin
4. Newman, Summer, and Gilbert, *Management*, PHI
5. James H. Donnelly, *Fundamentals of Management*, Pearson Education.
6. B.P. Singh and A.K.Singh, *Essentials of Management*, Excel Books
7. Griffin, *Management Principles and Application*, Cengage Learning
8. Robert Kreitner, *Management Theory and Application*, Cengage Learning
9. TN Chhabra, *Management Concepts and Practice*, Dhanpat Rai & Co. (Pvt. Ltd.), New Delhi
10. Peter F Drucker, *Practice of Management*, Mercury Books, London
11. Sharma & Gupta, *Management Principle and Applications*, Kalyani Publishers

Note: Latest edition of text books should be used

B.Com Program: Semester - I
COURSE LCC-1: MAJOR INDIAN LANGUAGE-1

Marks: 75

Common Syllabus to be notified by the Board of Studies in MIL subjects

B.Com Program : Semester – II

COURSE AECC-2: ENGLISH/ MIL COMMUNICATION

Marks: 50

Common Syllabus to be notified by the Board of Studies in English/ MIL subjects

B.Com. Program: Semester – II

COURSE LCC-2: ENGLISH-I

Marks: 75

Common Syllabus to be notified by the Board of Studies in English

B.Com. Program: Semester – II

COURSE DSC-3: CORPORATE ACCOUNTING

Marks: 75 (Lectures:65)

Objective: To help the students to acquire the conceptual knowledge of the corporate accounting and to learn the techniques of preparing the financial statements.

Contents:

Unit I: Accounting for Share Capital & Debentures (Lectures: 12): Issue, forfeiture, and reissue of forfeited shares; Issue of rights and bonus shares; Buy back of shares; Redemption of preference shares; Issue and Redemption of Debentures

Unit II: Final Accounts (Lectures: 9): Preparation of profit and loss account and balance sheet of corporate entities, (excluding calculation of managerial remuneration), Disposal of company profits.

Unit III: Cash Flow Statement (Lectures: 10): Concept of funds, Preparation of cash flow statement as per Indian Accounting Standard (Ind-AS):7

Unit IV: Valuation of Goodwill and Valuation of Shares (Lectures: 10): Concepts, methods, and calculation

Unit V: Amalgamation of Companies (Lectures: 12): Concepts, types, and accounting treatment as per Accounting Standard: 14 (ICAI) (excluding inter-company holdings). Internal Reconstruction: concepts and accounting treatment excluding scheme of reconstruction.

Unit VI: Accounts of Holding Companies/Parent Companies (Lectures: 12): Preparation of consolidated balance sheet with one subsidiary company. Relevant provisions of Accounting Standard: 21 (ICAI)

Note: The relevant Indian Accounting Standards in line with the IFRS for all the above topics should be covered. Any revision of relevant Indian Accounting Standard would become applicable immediately.

Suggested Readings:

1. J.R. Monga, *Fundamentals of Corporate Accounting*. Mayur Course Backs, New Delhi.
2. M.C. Shukla, T.S. Grewal, and S.C. Gupta. *Advanced Accounts*. Vol.-II. S. Chand & Co., New Delhi.
3. S.N. Maheshwari, and S. K. Maheshwari. *Corporate Accounting*. Vikas Publishing House, New Delhi.
4. Ashok Sehgal, *Fundamentals of Corporate Accounting*. Taxman Publication, New Delhi.
5. V.K. Goyal and Ruchi Goyal, *Corporate Accounting*. PHILearning.
6. Jain, S.P. and K.L. Narang. *Corporate Accounting*. Kalyani Publishers, New Delhi.
7. Bhushan Kumar Goyal, *Fundamentals of Corporate Accounting*, International Book House
8. P. C. Tulsian and Bharat Tulsian, *Corporate Accounting*, S.Chand
9. Amitabha Mukherjee, Mohammed Hanif, *Corporate Accounting*, McGraw Hill Education
10. Jain & Narang, *Corporate Accounting*, Kalyani Publishers

Note: Latest edition of text books should be used.

B.Com. Program: Semester-II

COURSE DSC-4: BUSINESS LAW

Marks: 75 (Lectures: 65)

Objective: *The objective of the course is to impart basic knowledge of the important business legislation along with relevant case laws.*

Contents:

Unit I: The Indian Contract Act, 1872: General Principle of the Law of Contract (Lectures: 13)

- a) Contract – meaning, characteristics and types
- b) Essentials of a valid contract; offer and acceptance, consideration, contractual capacity, free consent, legality of objects
- c) Void agreements
- d) Discharge of a contract – modes of discharge, breach and remedies against breach of contract.
- e) Contingent contracts
- f) Quasi – contracts

Unit II: The Indian Contract Act, 1872: Specific Contract (Lectures: 13)

- a) Contract of Indemnity and Guarantee
- b) Contract of Bailment
- c) Contract of Agency

Unit III: The Sale of Goods Act, 1930 (Lectures: 13)

- a) Contract of sale, meaning and difference between sale and agreement to sell
- b) Conditions and warranties

- c) Transfer of ownership in goods including sale by a non-owner
- d) Performance of contract of sale.
- e) Unpaid seller- meaning, rights of an unpaid seller against the goods and the buyer

Unit IV: Partnership Laws: The Limited Liability Partnership Act, 2008 (Lectures: 13)

- a) Salient Features of LLP
- b) Differences between LLP and Partnership, LLP and Company LLP Agreement
- c) Partners and Designated Partners, Incorporation Document, Incorporation by Registration. Partners and their Relationship

Unit V: Consumer Protection Act, 1986 (Lectures: 13)

- a) Salient features and basic provisions of the Act
- b) Consumer rights
- c) Organizational set up
- d) Complaint filing procedure and Redressal mechanism

Suggested Readings:

1. M.C. Kuchhal, and Vivek Kuchhal, *Business Law*, Vikas Publishing House, New Delhi.
2. Avtar Singh, *Business Law*, Eastern Book Company, Lucknow.
3. Ravinder Kumar, *Legal Aspects of Business*, Cengage Learning
4. S N Maheshwari and S K Maheshwari, *Business Law*, National Publishing House, N. Delhi
5. Aggarwal S K, *Business Law*, Galgotia Publishers Company, New Delhi.
6. Bhushan Kumar Goyal and Jain Kinneri, *Business Laws*, International Book House
7. Sushma Arora, *Business Laws*, Taxmann Publications.
8. Akhileshwar Pathak, *Legal Aspects of Business*, McGraw Hill Education, 6th ed
9. P C Tulsian and Bharat Tulsian, *Business Law*, McGraw Hill Education
10. Sharma, J.P. and Sunaina Kanojia, *Business Laws*, Ane Books Pvt. Ltd., New Delhi
11. Garg, Sareen & Sharma, *Business Laws*, Kalyani Publishers

Note: Latest edition of text books should be used.

B.Com. Program: Semester-III
COURSE DSC - 5: BUSINESS MATHEMATICS

Marks:75 (Lectures:65)

Objective: The objective of this course is to familiarize the students with the basic mathematical tools, with an emphasis on applications to business and economic situations.

Contents:

Unit I: Matrices and Determinants (Lectures:14)

- a) Algebra of matrices. Inverse of a matrix, Matrix Operation – Business Application
- b) Solution of system of linear equations (having unique solution and involving not more than three variables) using matrix inversion Method and Cramer's Rule, The Leontief Input Output Model (Open Model Only)

Unit II: Calculus-I (Lectures: 13)

- a) Mathematical functions and their types- linear, quadratic, polynomial, exponential, Logarithmic function
- b) Concepts of limit and continuity of a function
- c) Concept, rules and methods of differentiation and its calculation up to second order derivatives
- d) Maxima and Minima of a function and its application, point of inflexion

Unit III: Calculus-II (Lectures: 20)

- a) Partial Differentiation: Partial derivatives up to second order; Homogeneity of functions and Euler's theorem; Total differentials; Differentiation of implicit functions with the help of total differentials
- b) Integration: Standard forms. Methods of integration – by substitution, by parts, and by use of partial fractions; definite integration

Unit IV: Mathematics of Finance (Lectures: 18)

- a) Rates of interest-nominal, effective- and their inter-relationships in different compounding situations
- b) Compounding and discounting of a sum using different types of rates
- c) Types of Annuities: ordinary, due, deferred, continuous, perpetual, and their future and present values using different types of rates of interest. Depreciation of Assets (General annuities are to be excluded)

Suggested Readings:

1. Budnick, P. *Applied Mathematics*. McGraw Hill Education.
2. R.G.D. Allen, *Mathematical Analysis for Economists*
3. Ayres, Frank Jr. *Schaum's Outlines Series: Theory and Problems of Mathematics of Finance*. McGraw Hill Education.
4. N.G. Das & J.K Das, *Business Mathematics & Statistics*
5. Thukral, J.K., *Mathematics for Business Studies*.
6. Vohra, N.D., *Quantitative Techniques in Management*. McGraw Hill Education.

7. Soni, R.S, *Business Mathematics*. Ane Books, New Delhi.
8. Singh J. K., *Business Mathematics*. Himalaya Publishing House.
9. S.K. Nag, *Business Math & Statistics*, Kalyani Publisher

B.Com. Program: Semester – III
COURSE DSC- 6: CORPORATE LAWS

Marks: 75 (Lectures: 65)

Objective: The objective of the course is to impart basic knowledge of the provisions of the Companies Act, 2013 and the Depositories Act, 1996. Students will also get to know several case studies involving issues of corporate laws.

Contents:

Unit I: Introduction (Lectures: 20)

Administration of Company Law [including National Company Law Tribunal (NCLT), National Company Law Appellate Tribunal (NCLAT), Special Courts]; Characteristics of a company; lifting of corporate veil; types of companies including one person company, small company, and dormant company; association not for profit; illegal association; formation of company, on-line filing of documents, promoters, their legal position, pre-incorporation contract; on-line registration of a company.

Unit II: Documents (Lectures: 15)

Memorandum of association, Articles of association, Doctrine of constructive notice and indoor management, prospector-shelf and red herring prospectus, misstatement in prospectus, GDR.

Unit III: Management (Lectures: 18)

Classification of directors, women directors, independent director, small shareholder's director; disqualifications, director identity number (DIN); appointment; Legal positions, powers and duties; removal of directors; Key managerial personnel, managing director, manager

Meetings: Meetings of shareholders and board of directors; Types of meetings, Convening and conduct of meetings, Requisites of a valid meeting, postal ballot, meeting through video conferencing, e-voting.

Committees of Board of Directors - Audit Committee, Nomination and Remuneration Committee, Stakeholders Relationship Committee, Corporate Social Responsibility Committee

Unit IV: Winding Up (Lectures: 5)

Concept and modes of winding up; Insider-Trading: meaning and legal provisions; Whistle-blowing: Concept and Mechanism.

Unit V: Depositories Law (Lectures: 7)

The Depositories Act, 1996 – Definitions; rights and obligations of depositories; participant issuers and beneficial owners; inquiry and inspections, penalty

Suggested Readings:

1. M C Kuchhal, *Modern Indian Company Law*, Shri Mahavir Book Depot (Publishers), Delhi.
2. GK Kapoor and Sanjay Dhamija, *Company Law*, Bharat Law House, Delhi.
3. Anil Kumar, *Corporate Laws*, Indian Book House, Delhi
4. Reena Chadha and Sumant Chadha, *Corporate Laws*, Scholar Tech Press, Delhi.
5. Avtar Singh, *Introduction to Company Law*, Eastern Book Company
6. Ramaiya, *A Guide to Companies Act*, LexisNexis, Wadhwa and Buttersworth.
7. *Manual of Companies Act, Corporate Laws and SEBI Guideline*, Bharat Law House, New Delhi.
8. *A Compendium of Companies Act 2013, along with Rules*, by Taxmann Publications.
9. Gower and Davies, *Principles of Modern Company Law*, Sweet & Maxwell
10. Sharma, J.P., *An Easy Approach to Corporate Laws*, Ane Books Pvt. Ltd., New Delhi
11. Garg, Sareen, Sharma & Dhingra, *Corporate Legal Framework*, Kalyani Publishers

Note: Latest edition of text books should be used

B.Com. Program: Semester – III **COURSE LCC-1: MAJOR INDIAN LANGUAGE-2**

Marks 75

Common Syllabus to be notified by the Board of Studies in MIL subjects

B.Com Program: Semester III **COURSE SEC (P)-1: ENTREPRENEURSHIP**

Marks: 75 (Lectures: 50)

Objective: The purpose of the course is to orient the learner toward entrepreneurship as a career option and to imbibe creative thinking in their behavior.

Contents:

Unit I: Introduction (Lectures: 10)

Entrepreneurship: Meaning, elements, determinants and importance of entrepreneurship and creative behavior; Entrepreneurship and creative response to the society' problems and at work; Dimensions of entrepreneurship: intrapreneurship, technopreneurship, cultural entrepreneurship, international entrepreneurship, netpreneurship, ecopreneurship, and social entrepreneurship

Unit II: Micro, Small and Medium Enterprises (MSME) (Lectures: 10)

Concept and role of business houses; family business in India; contemporary role models in Indian business: their values, business philosophy and behavioral orientations; Conflict in family business and its resolution

Unit III: Entrepreneurial sustainability (Lectures: 10)

Public and private system of stimulation; support and sustainability of entrepreneurship; requirement, availability and access to finance; marketing assistance; technology and industrial accommodation; role of industries/entrepreneur's associations and self-help groups; the concept, role and functions of business incubators; angel investors; venture capital and private equity fund.

Unit IV: Business Plan Preparations (Lectures: 10)

Sources of business ideas and tests of feasibility; significance of writing the business plan/ project proposal; contents of business plan/ project proposal; designing business processes, location, layout, operation, planning & control; steps in preparation of project report; project submission/ presentation and appraisal thereof by external agencies.

Unit V: Mobilizing Resources (Lectures: 10)

Mobilizing resources for start-up; accommodation and utilities; preliminary contracts with the vendors, suppliers, bankers, principal customers; contract management: basic start-up problem

Suggested Readings:

1. Kuratko and Rao, *Entrepreneurship: A South Asian Perspective*, Cengage Learning.
2. Robert Hisrich, Michael Peters, Dean Shepherd, *Entrepreneurship*, McGraw-Hill Education
3. Desai, Vasant. *Dynamics of Entrepreneurial Development and Management*. Mumbai, Himalaya Publishing House.
4. Dollinger, Mare J. *Entrepreneurship: Strategies and Resources*. Illinois, Irwin.
5. Holt, David H. *Entrepreneurship: New Venture Creation*. Prentice-Hall of India, New Delhi.
6. Plsek, Paul E. *Creativity, Innovation and Quality*. (Eastern Economic Edition), New Delhi: Prentice-Hall of India. ISBN-81-203-1690-8.
7. Singh, Nagendra P. *Emerging Trends in Entrepreneurship Development*. New Delhi: ASEED.
8. SS Khanka, *Entrepreneurial Development*, S. Chand & Co, Delhi.
9. K Ramachandran, *Entrepreneurship Development*, McGraw-Hill Education
10. SIDBI Reports on Small Scale Industries Sector.

B.Com Program: Semester IV
COURSE DSC-7: COST ACCOUNTING

Marks: 75 (Lectures: 65)

Objective: To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment and cost accounting book keeping systems.

Contents:

Unit I: Introduction (Lectures: 6)

Meaning, objectives, and advantages of cost accounting; Difference between cost accounting and financial accounting; Cost concepts and classifications; Elements of cost; Installation of costing system; Role of a cost accountant in an organization

Unit II: Elements of Cost: Material, Labour and Overheads (Lectures:22)

- a) Materials: Material/Inventory control techniques; Accounting and control of purchases, storage and issue of materials, methods of pricing of materials issues- FIFO, LIFO, Simple Average, Weighted Average, EOQ.
- b) Labour: Accounting and Control of labour cost, time keeping and time booking. Concept and treatment of idle time, over time, labour turnover and fringe benefits. Methods of wage payment and the Incentive schemes- Halsey, Rowan, Taylor's Differential piece wage.
- c) Overheads: Classification, allocation, apportionment, and absorption of overheads; Under and over- absorption; Capacity Levels and Costs; Activity based cost allocation.

Unit III: Methods of Costing (Lectures: 28)

Unit costing, Job costing, Contract costing, Process costing (process losses, valuation of work in progress), Service costing (only transport)

Unit IV: Book Keeping in Cost Accounting (Lectures:9)

Integral and Non-integral systems; Reconciliation of cost and financial accounts

Suggested Reading:

1. Charles T. Horngren, Srikant M. Datar, Madhav V. Rajan, *Cost Accounting: A Managerial Emphasis*, Pearson Education.
2. Drury, Colin. *Management and Cost Accounting*. Cengage Learning.
3. Jawahar Lal, *Cost Accounting*. McGraw Hill Education
4. Nigam, B.M. Lall and I.C. Jain. *Cost Accounting: Principles and Practice*. PHI Learning
5. Rajiv Goel, *Cost Accounting*. International Book House
6. Singh, Surender. *Cost Accounting*, Scholar Tech Press, New Delhi.
7. Jain, S.P. and K.L. Narang. *Cost Accounting: Principles and Methods*. Kalyani Publishers
8. Arora, M.N. *Cost Accounting – Principles and Practice*. Vikas Publishing House, New Delhi.
9. Maheshwari, S.N. and S.N. Mittal. *Cost Accounting: Theory and Problems*. Shri Mahavir Book Depot, New Delhi.

10. Iyengar, S.P. Cost Accounting. Sultan Chand & Sons
11. H.V. Jhamb, Fundamentals of Cost Accounting, Ane Books Pvt. Ltd.
12. Jawahar Lal & Seema Srivastava, Cost Accounting
13. M. Haniff, Modern Cost & Management Accounting
14. Jain & Narang, Cost & Management Accounting, Kalyani Publishers
15. Basu & Das, Cost & Management Accounting, Rabindra Library

Note: Latest edition of text books should be used.

B.Com. Program: Semester IV

COURSE DSC-8: AUDITING AND CORPORATE GOVERNANCE

Marks: 75 (Lectures: 65)

Objective: To provide knowledge of auditing principles, procedures, and techniques in accordance with current legal requirements and professional standards and to give an overview of the principles of Corporate Governance and Corporate Social Responsibility

Contents:

Unit I: Introduction (Lectures: 11)

Auditing: Meaning, Objectives, Basic Principles and Techniques; Classification of Audit, Audit Planning, Internal Control – Internal Check and Internal Audit; Audit Procedure– Vouching and Verification of Assets & Liabilities. Audit Programme.

Unit II: Audit of Companies (Lectures: 11)

Audit of Limited Companies: Company Auditor- Qualifications and Disqualifications, Appointment, Rotation, Removal, Remuneration, Rights and Duties; Auditor's Report- Contents and Types; Liabilities of Statutory Auditors under the Companies Act 2013.

Unit III: Special Areas of Audit (Lectures: 11)

Special Areas of Audit: Special features of Cost audit, Tax audit, and Management audit; Recent Trends in Auditing: Basic considerations of audit in EDP Environment; Computer aided audit techniques and tools; Auditing Standards.

Unit IV: Corporate Governance (Lectures: 11)

Conceptual framework of Corporate Governance: Theories & Models, Board Committees; Corporate Governance Reforms, Common Governance Problems noticed in various Corporate Failures; Codes & Standards on Corporate Governance.

Unit V: Business Ethics (Lectures: 10)

Business values and ethics, approaches and practices of business ethics, corporate ethics, ethics program, codes of ethics, ethics committee; Ethical Behavior: Concepts and advantages; Rating Agencies of corporate governance; Green Governance.

Unit VI: Corporate Social Responsibility (CSR): (Lectures: 11)

Concept of CSR, Strategic Planning and Corporate Social Responsibility; Relationship of CSR with Corporate Sustainability; CSR provisions under the Companies Act 2013; CSR Committee; CSR Models, Codes, and Standards

Suggested Readings:

1. Ravinder Kumar and Virender Sharma, *Auditing Principles and Practice*, PHI Learning
2. ArunaJha, *Auditing*. Taxmann Publication. A. K. Singh, and Gupta Lovleen. *Auditing Theory and Practice*. Galgotia Publishing Company.
3. Anil Kumar, *Corporate Governance: Theory and Practice*, Indian Book House, NewDelhi
4. MC Kuchhal, *Modern Indian Company Law*, Shri Mahaveer Book Depot. (Publishers). (Relevant Chapters)
5. KV Bhanumurthy and Usha Krishna, *Politics, Ethics and Social Responsibility of Business*, Pearson Education
6. Erik Banks, *Corporate Governance: Financial Responsibility, Controls and Ethics*, Palgrave Macmillan
7. N Balasubramanian, *A Casebook on Corporate Governance and Stewardship*, McGraw Hill Education
8. B.N. Ghosh, *Business Ethics and Corporate Governance*, McGraw Hill Education
9. S K Mandal, *Ethics in Business and Corporate Governance*, McGraw Hill Education
10. Bob Tricker, *Corporate Governance-Principles, Policies, and Practice (Indian Edition)*, Oxford University Press
11. Christine Mallin, *Corporate Governance (Indian Edition)*, Oxford University Press
12. *Relevant Publications of ICAI on Auditing(CARO)*
13. Sharma, J.P., *Corporate Governance, Business Ethics, and CSR*, Ane Books Pvt Ltd, New Delhi

Note: Latest edition of text books should be used.

B.Com. Program: Semester IV

COURSE LCC – 2: ENGLISH – 2

Marks 75

Common Syllabus to be notified by the Board of Studies in English

B.Com. Program: Semester-IV

COURSE SEC(P)-2: E-COMMERCE

Marks: 75 (Lectures: 50)

Objective: To enable the students to become familiar with the mechanism of dealing with the business transactions through electronic means and the security mechanism.

Contents:

Unit I: Introduction (Lectures: 10)

Meaning, nature, concepts, advantages, disadvantages and reasons for transacting online, types of E-Commerce, e-commerce business models (introduction , key elements of a business model and categorizing major E-commerce business models), forces behind e-commerce

Technology used in E-commerce: The dynamics of world wide web and internet (meaning, evolution, and features); Designing, building, and launching e-commerce website (a systematic approach involving decisions regarding selection of hardware, software, outsourcing vs. in-house development of a website)

Unit II: Security and Encryption (Lectures: 10)

Need and concepts, the e-commerce security environment: (dimension, definition and scope of e- security), security threats in the E-commerce environment (security intrusions and breaches, attacking methods like hacking, sniffing, cyber-vandalism etc.), technology solutions (encryption, security channels of communication, protecting networks and protecting servers and clients)

Unit III: IT Act 2000 and Cyber Crimes (Lectures: 10)

IT Act 2000: Definitions, Digital signature, electronic governance, Attribution, acknowledgement and dispatch of electronic records, Regulation of certifying authorities, Digital signatures certificates, Duties of subscribers, Penalties and adjudication, Appellate Tribunal, Offences and Cyber-crimes.

Unit IV: E-payment System (Lectures: 10)

Models and methods of e-payments (Debit Card, Credit Card, Smart Cards, e-money), digital signatures (procedure, working and legal position), payment gateways, online banking (meaning, concepts, importance, electronic fund transfer, automated clearing house, automated ledger posting), risks involved in e-payments

Unit V: On-line Business Transactions (Lectures: 10)

Meaning, purpose, advantages and disadvantages of transacting online, E-commerce applications in various industries like banking, insurance, payment of utility bills, online marketing, e-tailing (popularity, benefits, problems and features), online services (financial, travel and career), auctions, online portal, online learning, publishing and entertainment} Online shopping (amazon, snapdeal, alibaba, flipkart,etc.)

Suggested Readings:

1. Kenneth C. Laudon and Carlo Guercio Traver, *E-Commerce*, Pearson Education.
2. David Whiteley, *E-commerce: Strategy, Technology and Applications*, McGraw Hill Education
3. Bharat Bhaskar, *Electronic Commerce: Framework, Technology and Application*, 4thEd., McGraw Hill Education
4. PT Joseph, *E-Commerce: An Indian Perspective*, PHI Learning
5. KK Bajaj and Debjani Nag, *E-commerce*, McGraw Hill Education
6. TN Chhabra, *E-Commerce*, Dhanpat Rai & Co.
7. Sushila Madan, *E-Commerce*, Taxmann 8. TN Chhabra, Hem Chand Jain, and Aruna Jain, *An Introduction to HTML*, Dhanpat Rai & Co

B.Com. Program: Semester-V

COURSE DSE(P)-1(a): INCOME TAX LAW AND PRACTICE IN INDIA

Marks: 75 (Lectures: 65)

Objective: To provide basic knowledge and equip students with application of principles and provisions of Income-tax Act, 1961 and the relevant Rules.

Contents:

Unit I: Introduction (Lectures: 10)

- a) Basic concepts: Income, agricultural income, person, assessee, assessment year, previous year, gross total income, total income, maximum marginal rate of tax; Permanent Account Number (PAN)
- b) Residential status; Scope of total income on the basis of residential status Exempted income under section 10

Unit II: Computation of Income of Individual under Different Heads-I (Lectures: 24)
Income from Salaries; Income from house property

Unit III: Computation of Income of Individual under Different Heads-II (Lectures:15)

Profits and gains of business or profession; Capital gains; Income from other sources

Unit IV: Computation of Total Income and Tax Liability of Individual (Lectures: 16)
Income of other persons included in assessee's total income; Aggregation of income and set-off and carry forward of losses; Deductions from gross total income; Rebates and Reliefs; Computation of total income of individuals; Tax liability of an individual.

Suggested readings:

1. Singhania, Vinod K. and Monica Singhania. *Students' Guide to Income Tax, University Edition*. Taxmann Publications Pvt. Ltd., New Delhi.
2. Ahuja, Girish and Ravi Gupta. *Systematic Approach to Income Tax*. Bharat Law House,
3. Narang, Gaur & Puri, *Income Tax Law*, Kalyani Publishers

Journals:

1. *Income Tax Reports*. Company Law Institute of India Pvt. Ltd., Chennai.
2. *Taxman*. Taxman Allied Services Pvt. Ltd., New Delhi.
3. *Current Tax Reporter*. Current Tax Reporter, Jodhpur.

Note: Latest edition of text books should be used. **Computation of Income under all heads should be done considering both old and new regime.**

B.Com Program: Semester V
COURSE DSE(P)-1(b): HUMAN RESOURCE MANAGEMENT

Marks: 75 (Lectures: 65)

Objective: The objective of the course is to acquaint students with the procedures and principles of managing human resources of an organization.

Contents:

Unit I: Introduction (Lectures: 13)

Human Resource Management: Concept and Functions, Role, Status and competencies of HR Manager, HR Policies, Evolution of HRM, HRM vs HRD. Emerging Challenges of Human Resource Management; Workforce diversity; Empowerment; Downsizing; VRS; Human Resource Information System

Unit II: Acquisition of Human Resource (Lectures: 13)

Human Resource Planning-Meaning, objective and importance; Quantitative and Qualitative dimensions; job analysis-job description and job specification; Recruitment-Concept and sources; Selection-Concept and process; test and interview; placement and induction

Unit III: Training and Development (Lectures: 13)

Concept and Importance; Identifying Training and Development Needs; Designing Training Programmes; Role-Specific and Competency-Based Training; Evaluating Training Effectiveness; Training Process Outsourcing; Management Development; Career Development.

Unit IV: Performance Appraisal (Lectures: 13)

Nature, objectives and importance; Modern techniques of performance appraisal; Potential appraisal and employee counseling; Job changes - transfers and promotions; Compensation: concept and policies; Job evaluation; methods of wage payments and incentive plans; fringe benefits; performance linked compensation.

Unit V: Maintenance (Lectures: 13)

Employee health and safety; Employee welfare; Social security; Employer-Employee relations-an overview; Grievance-handling and redressal; Industrial Disputes: causes and settlement machinery.

Suggested Readings:

1. Gary Dessler. *A Framework for Human Resource Management*. Pearson Education.
2. DeCenzo, D.A. and S.P. Robbins, *Personnel/HRM*, Pearson Education.
3. Bohlendar and Snell, *Principles of Human Resource Management*, Cengage Learning
4. Ivancevich, John M. *Human Resource Management*. McGrawHill.
5. Wreather and Davis. *Human Resource Management*. Pearson Education.
6. Robert L. Mathis and John H. Jackson. *Human Resource Management*. Cengage Learning.
7. TN Chhabra, *Human Resource Management*, Dhanpat Rai & Co., Delhi
8. Biswajeet Patttanayak, *Human Resource Management*, PHI Learning

9. K. Aswathappa, *Human Resource Management- Text & Cases*.

10. Gupta & Rosy, *Human Resource Management*, Kalyani Publishers

Note: Latest edition of text books should be used.

B.Com. Program: Semester V

COURSE DSE (P)-2 (a): MANAGEMENT ACCOUNTING

Marks: 75 (Lectures: 65)

Objective: To impart knowledge among the students about the use of financial, cost and other data and their analysis for the purpose of managerial planning, control and decision making.

Contents:

Unit I: Introduction (Lectures:6)

Meaning, Objectives, Nature and Scope of management accounting, difference between cost accounting and management accounting, Cost control and Cost reduction, Cost management

Unit II: Ratio Analysis (Lectures: 10)

Definition , Importance & limitations of Ratio Analysis, Interested Parties in Ratio Analysis, Classification & calculation of different types of Ratio and their implications

Unit III: Budgetary Control (Lectures: 20)

Concept of budget, budgeting and budgetary control, objectives, merits, and limitations; Types of Budgets; Preparation of Cash and flexible Budgets; Zero base budgeting; Programme and performance budgeting

Unit IV: Standard Costing (Lectures: 12)

Meaning of standard cost and standard costing, advantages, limitations and applications; Variance Analysis – material, labour and overheads variances; Control Ratios

Unit V: Marginal Costing and Decision-Making (Lectures:17)

Meaning, Absorption versus Variable Costing; Cost-Volume-Profit Analysis, Profit/Volume ratio; Break-even analysis-algebraic and graphical methods; Angle of incidence, margin of safety, Key factor, determination of cost indifference point; Various short-term decision-making situations – profitable product mix, Acceptance or Rejection of special/export offers, Make or buy, Addition or Elimination of a product line, operate or shut down and pricing decision

Suggested Reading:

1. Charles T. Horngren, Gary L. Sundem, Dave Burgstahler, Jeff O.Schatzberg. *Introduction to*

- Management Accounting, Pearson Education.*
2. Anthony A. Atkinson, Robert S. Kaplan, Ella Mae Matsumura, S. Mark Young.
 3. *Management Accounting. Dorling Kindersley(India) Pvt. Ltd.*
 4. Ronald W. Hilton and David E. Platt. *Managerial Accounting: Creating Value in a Global Business Environment, McGraw Hill Education.*
 5. Singh, Surender. *Management Accounting, Scholar Tech Press, New Delhi.*
 6. Goel, Rajiv, *Management Accounting. International Book House,*
 7. Arora, M.N. *Management Accounting. Vikas Publishing House, New Delhi.*
 8. Maheshwari, S.N. and S.N. Mittal. *Management Accounting. Shree Mahavir Book Depot, New Delhi.*
 9. Singh, S. K. and Gupta Lovleen. *Management Accounting–Theory and Practice. Pinnacle Publishing House.*
 10. Khan, M.Y. and Jain, P.K. *Management Accounting. McGraw Hill Education*
 11. H.V. Jhamb, *Fundamentals of Management Accounting, Ane Books Pvt.Ltd.*

Note: Latest edition of text books should be used.

B.Com. Program: Semester-V

COURSE DSE (P)-2 (b) COMPUTERISED ACCOUNTING AND SYSTEMS

Marks: 75 (Lectures: 30, Practical Lab: 70)

Objective: *This course seeks to enhance the skills needed for computerized accounting system and to enable the students to develop simple accounting applications.*

Contents:

Unit-I: Computerized Accounting Systems (Lectures: 10, Practical Lab: 26)

Computerized Accounting Systems: Computerized Accounts by using any popular accounting software: Creating a Company; Configure and Features settings; Creating Accounting Ledgers and Groups; Creating Stock Items and Groups; Vouchers Entry; Generating Reports - Cash Book, Ledger Accounts, Trial Balance, Profit and Loss Account, Balance Sheet, Cash Flow Statement Selecting and shutting a Company; Backup and Restore data of a Company

Unit-II: Preparation of Return of Income (Lectures: 8, Practical Lab: 26)

Filing of returns: Manually, On-line filing of Returns of Income & TDS; Provision & Procedures of Compulsory On-Line filing of returns for specified assesses.

Unit III: Computerized Accounting: Using Generic Software (Lectures: 12, Practical Lab: 18)

Taxation: TDS Auditing in Computerized Accounting system: Statutory Audit, Voucher verification, Verification of related party transaction, CAAT: Various Tools

Note:

Teaching arrangements need to be made in the computer Lab

Software:

1. Vinod Kumar Singhania, *e-filing of Income Tax Returns and Computation of Tax,*

Taxmann Publication Pvt. Ltd, New Delhi. Latest version

2. 'Excel Utility' available at incometaxindiaefiling.gov.in

Suggested Readings:

The suggested readings and guidelines shall be notified by the university department at least once in three years based on the selected software.

B.Com. Program: Semester-V

COURSE GE(P) – 1: ELEMENTARY CONCEPTS OF MICRO AND MACRO ECONOMICS

Marks: 75 (Lectures: 65)

Objective: *The objective of the course is to acquaint the students with the concepts of micro macroeconomics. The course also enhances the understanding of the market through the production and cost behavior of firms and thereby to frame the policies of the economy as a whole.*

Contents:

Unit I: Demand Analysis (Lectures: 13)

Concepts of revenue: Marginal and Average; Revenue under conditions of Perfect and Imperfect competition; Elasticity of demand- Price, Income and Cross; Consumer's equilibrium (necessary and sufficient conditions) through Indifference curve analysis.

Unit II: Production and Cost (Lectures: 13)

Production Iso-quants, Marginal Rate of Technical Substitution, Economic Region of production, Expansion Path, Isolines, Returns to Scale using Iso-quants.

Cost of Production: Social and Private costs of production, long run and short run costs of production. Economies and Diseconomies of scale and the shape to the long run average cost.

Unit III: Perfect Competition and Imperfect Competitions (Lectures: 13)

- a) Perfect competition: Assumptions, Equilibrium of the firm and the industry in the short and the long runs, measuring producer surplus under perfect competition.
- b) Monopoly: Monopoly short run and long run equilibrium. Shifts in demand curve and the absence of the supply curve. Discriminating Monopoly and the Measurement of Monopoly power
- c) Concept and features of monopolistic competition, oligopoly and duopoly

Unit IV: Introduction to Macroeconomics (Lectures: 11)

Concepts and variables of macro-economics, income, expenditure and the circular flow, components of expenditure; Static macro-economic analysis in short and the long run, determination of demand and supply and conditions of equilibrium

Unit V: Inflation, Unemployment and Open Economy (Lectures: 15)

- a) Inflation: Causes of rising and falling inflation, inflation and interest rates, social costs of inflation.
- b) Unemployment – natural rate of unemployment, frictional and wait unemployment

- c) Open economy-flows of goods and capital, saving and investment in a small and a large open economy, exchange rates

Suggested Readings:

1. Pindyck, R.S., D. L. Rubinfeld and P. L. Mehta; *Microeconomics*, Pearson Education.
2. N. Gregory Mankiw, *Principles of Micro Economics*, Cengage Learning
3. Maddala G.S. and E. Miller; *Microeconomics: Theory and Applications*, McGraw-Hill Education.
4. Salvatore, D. *Schaum's Outline: Microeconomic Theory*, McGraw-Hill Education.
5. Case and Fair, *Principles of Micro Economics*, Pearson Education
6. Koutsiyannis, *Modern Micro Economic Theory*.
7. C Snyder, *Microeconomic Theory: Basic Principles and Extensions*, Cengage Learning
8. Bilas, Richard A., *Microeconomics Theory: A Graphical Analysis*, McGraw-Hill Education.
9. Paul A Samuelson, William D Nordhaus, *Microeconomics*, McGraw-Hill Education. Amit Sachdeva, *Micro Economics*, Kusum Lata Publishers

B.Com. Program: Semester-V

COURSE SEC(P) - 3: COMPUTER APPLICATIONS IN BUSINESS

Marks: 75 (Internal: 15, Theory: 40, Project/PPT: 20) (Lectures: 40, Practical Lab: 40)

Objectives: *To provide computer skills and knowledge among the students of commerce and to enhance their understanding of usefulness of information technology tools for business operations.*

Contents:

Unit I: Word Processing (Lectures: 9, Practical Lab: 8)

Introduction to Word Processing, Word processing concepts, Use of Templates, Working with word document; Editing text, Find and Replace text, Formatting, Spell check, Autocorrect, Auto text; Bullets and numbering, Tabs, Paragraph Formatting, Indent, Page Formatting, Header and Footer, Tables: Inserting, filling and formatting a table; Inserting Pictures and Video; Mail Merge: including linking with Database; Printing documents; Creating Business Documents using the above facilities
(Practical: Creating Business Documents using the above facilities)

Unit II: Preparing Presentations (Lectures: 12, Practical Lab: 8)

Basics of presentations: Slides, Fonts, Drawing, Editing; Inserting: Tables, Images, texts, Symbols, Media; Design; Transition; Animation; and Slideshow; Creating Business Presentations using above facilities
(Practical: Creating Business Presentations using above facilities)

Unit III: Spreadsheet and its Business Applications (Lectures: 12, Practical Lab: 12)

Spreadsheet concepts, Managing worksheets; Formatting, Entering data, Editing, and Printing a worksheet; Handling operators in formula, Project involving multiple spreadsheets, Organizing Charts and graphs; Generally used Spreadsheet functions: Mathematical, Statistical, Financial, Logical, Date and Time, Lookup and reference, Database, and Text functions.

Unit IV: Creating Business Spreadsheet (Lectures: 12, Practical Lab: 12)

Creating spreadsheet in the area of: Loan and Lease statement; Ratio Analysis; Payroll statements; Capital Budgeting; Depreciation Accounting; Graphical representation of data; Frequency distribution and its statistical parameters; Correlation and Regression

Note:

a) Teaching arrangement need to be made in the computer Lab.

b) Topics of Project/ppt to be decided by the respective colleges and the same to be examined by the University.

Suggested Readings:

The suggested readings and guidelines shall be notified by the university department at least once in three years based on the selected software.

B.Com. Program: Semester-VI
COURSE DSE(P) – 3(a): GOODS AND SERVICES TAX AND CUSTOMS DUTY

Marks – 75 (Lectures: 65)

Objective: This course aims at a glance towards the understanding of Indirect Taxes as prevail in India. The students will be exposed to Indirect Taxes as a whole as well as will be trained to computational techniques of Indirect Taxes in India.

Contents:

UNIT-I: Concept of Indirect Taxes (Lectures: 5)

- a) Concept and features of indirect taxes
- b) Principal indirect taxes

UNIT-II: Goods and Services Tax (GST) Laws (Lectures: 40)

- a) GST Laws: An introduction including Constitutional aspects
- b) Levy and collection of CGST and IGST
 - i) Application of CGST/IGST law
 - ii) Concept of supply including composite and mixed supplies
 - iii) Charge of tax
 - iv) Exemptions
 - v) Composition levy
- c) Basic concepts of time and value of supply
- d) Input tax credit
- e) Computation of GST liability
- f) Registration
- g) Tax invoice; Credit and Debit Notes; Electronic waybill
- h) Returns
- i) Payment of tax including reverse charge

UNIT-III: Customs Law as contained in the Customs Act, 1962 and the Customs Tariff Act, 1975 (Lectures: 20)

- (i) Introduction to customs law including Constitutional aspects, (ii) Levy of and exemptions from customs duties: all provisions including application of customs law, taxable event, charge of customs duty, exceptions to levy of customs duty, exemption from custom duty (iii) Types of customs duties (iv) Classification and valuation of imported and export goods (v) Officers of Customs; Appointment of customs ports, airports etc. (vi) Import and Export Procedures: all import and export procedures including special procedures relating to baggage, goods imported or exported by post, stores (vii) Provisions relating to coastal goods and vessels carrying coastal goods (viii) Warehousing (ix) Drawback (x) Demand and Recovery; Refund (xi) Provisions relating to prohibited goods, notified goods, specified goods, illegal importation/exportation of goods (xii) Searches, seizure and arrest; Offences; Penalties; Confiscation and Prosecution (xiii) Appeals and Revision; Advance Rulings; Settlement Commission and (xiv) Other provisions.

Suggested Readings:

1. Dhingra Understanding Basic of GST, Kalyani Publishers
2. Goyal and Garg, Indirect Tax, Kalyani Publishers

Note: Latest edition of text books should be used.

B.Com. Program: Semester-VI

COURSE DSE(P) - 3 (b): PRINCIPLES OF MARKETING

Marks: 75 (Lectures: 65)

Objective: The objective of this course is to provide basic knowledge of concepts, policies, principles and tools and techniques of marketing.

Contents:

Unit I: Introduction: (Lectures: 13)

Nature, scope and importance of marketing; Evolution of marketing; Selling vs. Marketing; Marketing mix, Marketing environment: concept, importance, and components (Economic, Demographic, Technological, Natural, Socio-Cultural and Legal)

Unit II: (Lectures: 13)

- a) Consumer Behaviour: Nature and Importance, Consumer buying decision process; Factors influencing consumer buying behavior;
- b) Market Segmentation: Concept; Importance and Bases; Target market selection; Positioning concept, importance and bases; Product differentiation vs. market segmentation.

Unit III: Product: (Lectures: 13)

Concept and importance, Product classifications; Concept of product mix; Branding, packaging and labeling; Product-Support Services; Product life-cycle; New Product Development Process; Consumer adoption process.

Unit IV: Pricing, Promotion and Distribution (Lectures: 18)

- a) Pricing: Significance; Factors affecting price of a product; Pricing policies and strategies
- b) Promotion: Nature and importance of promotion; Communication process; Types of promotion: advertising, personal selling, public relations & sales promotions; Promotion mix and factors affecting promotion mix decisions.
- c) Distribution Channel: Types and importance; Functions of middle man; Factors affecting choice of distribution channel; Wholesaling and retailing; Types of Retailers; e-tailing.

Unit V: Recent Developments in Marketing (Lectures: 8)

Consumerism, Social Marketing, Online marketing, Direct marketing, Services marketing, Green marketing, Rural marketing.

Suggested Readings:

1. Kotler, Philip, Gary Armstrong, Prafulla Agnihotri and Ehsanul Haque. *Principles of Marketing*. 13th edition. Pearson Education.
2. Michael, J. Etzel, Bruce J. Walker, William J Stanton and Ajay Pandit. *Marketing: Concepts and Cases. (Special Indian Edition)*, McGraw Hill Education
3. William D. Perreault, and McCarthy, E. Jerome., *Basic Marketing*. Pearson Education.
4. Majaro, Simon. *The Essence of Marketing*. Pearson Education, New Delhi.
5. *The Consumer Protection Act 1986*.
6. Prakash & Sontakki, *Principles of Marketing: Kalyani Publishers*
7. Dhruv Grewal and Michael Levy, *Marketing*, McGraw Hill Education.
8. Chhabra, T.N., and S. K. Grover. *Marketing Management. Fourth Edition*. Dhanpat Rai & Company.
9. Neeru Kapoor, *Principles of Marketing*, PHI Learning
10. Rajendra Maheshwari, *Principles of Marketing*, International Book House
- Prakash and Sontakki, *Principles of Marketing*, Kalyani Publishers

B.Com. Program: Semester VI

COURSE DSE(P) – 4(a): FINANCIAL MARKETS, INSTITUTIONS AND FINANCIAL SERVICES

Marks: 75 (Lectures: 65)

Objective: To provide the student a basic knowledge of financial markets and institutions and to familiarize them with major financial services in India.

Contents:

Unit I: Introduction (Lectures: 8)

Financial System and its Components – Financial markets and institutions; Financial intermediation; Flow of funds matrix; Financial system and economic development; An overview of Indian financial system

Unit II: Financial Markets (Lectures: 17)

Money market-Functions, organization and instruments; Role of central bank in money market; Indian money market – An overview

Capital Markets-Functions, organization and instruments. Indian debt market; Indian equity market-primary and secondary markets; Role of stock exchanges in India

Unit III: Financial Institutions (Lectures: 20)

Commercial banking-Introduction, its role in project finance and working capital finance; Development Financial institutions (DFIs) – An overview and role in Indian economy; Life and non-life insurance companies in India; Mutual Funds – Introduction and their role in capital market development. Non-banking financial companies (NBFCs)

Unit IV: Financial Services (Lectures: 8)

Overview of financial services industry: Merchant banking-pre and post issue management, underwriting. Regulatory framework relating to merchant banking in India

Unit V: Leasing and Hire-purchase (Lectures: 12)

Consumer and housing finance; Venture capital finance; Factoring services, bank guarantees and letter of credit; Credit rating; Financial counseling

Suggested Readings:

1. L. M. Bhole, and Jitendra Mahakud. *Financial Institution and Markets*, McGraw-Hill Education
2. Khan, M.Y. *Indian Financial System*, McGraw-Hill Education.
3. Dhanekar. *Pricing of Securities*. New Delhi: Bharat Publishing House.
4. Prasanna, Chandra. *Financial Management: Theory and Practice*. McGraw-Hill Education.
5. Clifford Gomez, *Financial Markets, Institutions and Financial Services*, PHI Learning
6. M.Y. Khan and P.K. Jain. *Financial Services*. McGraw Hill Education.
7. Singh, J.K. *Venture Capital Financing in India*. Dhanpat Rai and Company, New Delhi.
8. *Annual Reports of Major Financial Institutions in India*.
9. Kaur & Talwar, *Financial Markets Institution and Services*, Kalyani Publishers

Note: Latest edition of text books should be used

B.Com. Program: Semester-VI **COURSE DSE(P) - 4(b): BANKING AND INSURANCE**

Marks: 75 (Lectures: 65)

Objective: To impart knowledge about the basic principles of the banking and insurance

Contents:

Unit I: Introduction (Lectures: 13)

Origin of banking: definition, types of banks, banker-customer relationship, General and special types of customers; Types of deposits; Origin and growth of commercial banks in India, changing role of commercial banks; Financial Services offered by banks

Unit II: Cheques and Paying Banker (Lectures: 13)

Crossing and endorsement - meaning, definitions, types and rules of crossing; Statutory protection in due course; collecting bankers: duties; statutory protection for holder in due course; Concept of negligence.

Unit III: Bank Lending (Lectures: 13)

Principles of sound lending, Secured vs. unsecured advances, Types of advances, Advances against various securities;

Unit IV: Internet Banking (Lectures: 13)

Meaning, Benefits, Home banking, Mobile banking, Virtual banking, E-payments, ATM Card/ Biometric card, Debit/Credit card, Smart card, NEFT, RTGS, ECS (credit/debit), E-money, Electronic purse, Digital cash.

Unit V: Risk and Insurance (Lectures: 13)

- a) Basic concept of risk, Types of business risk; Assessment and Transfer
- b) Insurance: definition, types and basic principles-utmost good faith, Indemnity,

Economic function, Proximate cause, Subrogation and contribution; Re-insurance; Online Insurance; Power, functions and Role of IRDA

Suggested readings:

1. Agarwal, O.P., *Banking and Insurance*, Himalaya Publishing House
2. Satyadevi, C., *Financial Services Banking and Insurance*, S.Chand
3. Suneja, H.R., *Practical and Law of Banking*, Himalaya Publishing House
4. Chabra, T.N., *Elements of Banking Law*, Dhanpat Rai and Sons
5. Arthur, C. and C. William Jr., *Risk Management and Insurance*, McGrawHill
6. Saxena, G.S; *Legal Aspects of Banking Operations*, Sultan Chand and Sons
7. Varshney, P.N., *Banking Law and Practice*, Sultan Chand and Sons
8. Jyotsna Sethi and Nishwan Bhatia, *Elements of Banking and Insurance*, PHIL earning

Note: Latest edition of text books may be used.

B.Com. Program: Semester-VI
COURSE GE(P)-2: BUSINESS STATISTICS

Marks: 75 (Lectures: 65)

Objective: The objective of this course is to familiarize students with the basic statistical tools used for managerial decision-making.

Contents:

Unit I: Statistical Data and Descriptive Statistics (Lectures: 11)

- a) Nature and Classification of data: univariate, bivariate and multivariate data; time-series and cross-sectional data
- b) Measures of Central Tendency: Mathematical averages including arithmetic mean, geometric mean and harmonic mean. Properties and applications; Positional Averages, Mode and Median (and other partition values including quartiles, deciles, and percentiles) (including graphic determination)
- c) Measures of Variance: absolute and relative, Range, quartile deviation, mean deviation, standard deviation, and their coefficients, Properties of standard deviation/variance
- d) Skewness: Meaning, Measurement using Karl Pearson and Bowley's measures; Concept of Kurtosis and its measurement

Unit II: Probability (Lectures: 10)

Theory of Probability: Approaches to the calculation of probability; Calculation of event probabilities. Addition and multiplication laws of probability (Proof not required); Conditional probability and Bayes' Theorem (Proof not required), Expectation

Unit III: Simple Correlation and Regression Analysis (Lectures: 16)

- a) Correlation Analysis: Meaning of Correlation: simple, multiple and partial; linear and non-linear, Correlation and Causation, Scatter diagram, Pearson's co-efficient of correlation; calculation and properties (Proof not required). Correlation and Probable error; Rank Correlation
- b) Regression Analysis: Regression lines, Regression equations, Principles of least squares and estimation; Properties of regression coefficients; Relationship between Correlation and Regression coefficients; Standard Error of Estimate and its use in interpreting the results

Unit IV: Index Numbers (Lectures: 14)

- a) Meaning and uses of index numbers; Construction of index numbers: fixed and chain base: univariate and composite. Aggregative and average of relatives – simple and weighted
- b) Tests of adequacy of index numbers, Base shifting, splicing, and deflating.
- c) Problems in the construction of index numbers; Construction of consumer price indices: Important share price indices, including BSE SENSEX and NSE NIFTY.

Unit V: Time Series Analysis (Lectures: 14)

- a) Components of time series; Additive and multiplicative models;
- b) Trend analysis: Fitting of trend line using principle of least squares – linear, second-degree parabola and exponential. Conversion of annual linear trend equation to quarterly/monthly basis and vice-versa; Moving averages; Seasonal variations: Calculation of Seasonal Indices using Simple averages, Ratio-to-trend, and Ratio-to-moving averages methods. Uses of Seasonal Indices

Suggested Readings:

1. Levin, Richard, David S. Rubin, Sanjay Rastogi, and HM Siddiqui. *Statistics for Management*. 7th ed., Pearson Education.
2. David M. Levine, Mark L. Berenson, Timothy C. Krehbiel, P. K. Viswanathan, *Business Statistics: A First Course*, Pearson Education.
3. Siegel Andrew F. *Practical Business Statistics*. McGraw Hill Education.
4. Gupta, S.P., and Archana Agarwal. *Business Statistics*, Sultan Chand and Sons, New Delhi.
5. Vohra N. D., *Business Statistics*, McGraw Hill Education.
6. Murray R Spiegel, Larry J. Stephens, Narinder Kumar. *Statistics (Schaum's outline series)*, McGraw Hill Education.
7. Gupta, S.C. *Fundamentals of Statistics*. Himalaya Publishing House.
8. Anderson, Sweeney, and Williams, *Statistics for Students of Economics and Business*, Cengage Learning.
9. N.G. Das, *Statistical Methods (Vol_I,II)*
10. S.K. Nag, *Business Math & statistics*, Kalyani Publishers

B.Com. Program: Semester-VI

COURSE SEC(P)-4: BUSINESS COMMUNICATION

Marks: 75 (Lectures: 50)

Objective: To equip students of the B. Com course effectively to acquire skills in reading, writing, comprehension, and communication, as also to use electronic media for business communication.

Content:

Unit I: Nature of Communication (Lectures: 12)

Process of Communication, Types of Communication (Verbal & Nonverbal), Importance of Communication, Different forms of Communication, Barriers to Communication Causes, Linguistic Barriers, Psychological Barriers, Interpersonal Barriers, Cultural Barriers, Physical Barriers, Organizational Barriers

Unit II: Business Correspondence (Lectures: 13)

Letter Writing, presentation, inviting quotations, Sending quotations, Placing orders, Inviting tenders, Sales letters, claim & adjustment letters and social correspondence, Memorandum, Inter-office Memo, Notices, Agenda, Minutes, Job application letter, preparing the Resume.

Unit III: Report Writing (Lectures: 15)

Business reports, Types, Characteristics, Importance, Elements of structure, Process of writing, Order of writing, the final draft, check lists for reports.

Unit IV: Oral Presentation (Lectures: 10)

Importance, Characteristics, Presentation Plan, Power point presentation, Visual aids

Suggested Readings:

1. Bovee, and Thill, *Business Communication Today*, Pearson Education
2. Lesikar, R.V. & Flatley, M.E. Kathryn Rentz; *Business Communication Making Connections in Digital World*, 11th ed., McGraw Hill Education.
3. Shirley Taylor, *Communication for Business*, Pearson Education
4. Locker and Kaczmarek, *Business Communication: Building Critical Skills*, TMH
5. Leena Sen, *Communication Skills*, PHI Learning.
6. Kumar Varinder & Bodh Raj *Business Communication*, Kalyani Publisher



Salesian College
(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts in Political Science

Department of Political Science

Curriculum Document
2023 – 2024

Vision

The department promotes the study of the principles of social justice, secularism, democratic way of life and focuses on the different approaches to the problems of society encouraging an interdisciplinary epistemology.

Mission

The department of Political Science caters to create responsible, knowledgeable and morally upright citizens in our Country.

1. Programme Overview

Bachelor of Arts in Political Science is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Relate his/her understanding on the significance of theorizing and of applying theory into practice.
	PO02: Develop knowledge of theories, concepts, and research methods in humanities and social science
	PO03: Gain awareness about how global, national and regional developments affect society.
	PO04: Grasp information related to the structure and functions of various units of government.
Skills	PO05: Construct multiple frames by which the idea of political community is debated.
	PO06: Students will develop and be able to demonstrate skills in analytical and critical thinking.
	PO07: Demonstrate an understanding of fundamental political process, institutions, actors, behaviours, ideas and familiarity with major theories, methods and concepts of Political Science.
	PO08: Comprehend the basic structure and process of government system/ theoretical underpinning.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical framework of Political Science
	PO10: Exhibit in critical analysis, effectively evaluating and synthesizing complex political information and arguments.
	PO11: Propose innovative solutions to contemporary political challenges, drawing on evidence-based analysis.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops knowledge about various traditions and approaches of political theory and appreciate how they get reflected in organizing social living.
	PSO2: A student develops knowledge about basic of Political Philosophy and also develops knowledge about the importance of different schools of philosophy in the field of Political Science
	PSO3: A student develops knowledge about major political theories, including classical and contemporary perspectives.
	PSO4: A student gathers proficiency in defining and explaining key

	political concepts, such as justice, power, democracy, and authority. PSO5: A Student develops a deep understanding of foundational public administration theories and concepts, including public management principles, bureaucracy, and public policy. PSO6: A student develops knowledge about the dynamic role of public administration in the functioning of government and its impact on society. PSO7: A student develops knowledge about the origin and nature of political theory and the ways political theoretical thinking can enhance our capacities for critical reflection and democratic citizenship.
Skills	PSO1 : Students will critically analyse and evaluate political texts, arguments, and policies. PSO2 : Students will demonstrate knowledge of fundamental political ideologies, such as liberalism, conservatism, socialism, feminism, and environmentalism. PSO3 : Students will be able to analyse the historical evolution of political ideologies and their impact on political thought. PSO4 : Students will be able to conduct political theory research proficiently, including literature reviews and data analysis PSO5 : Students will be able to communicate about political theories and arguments effectively in written and oral form. PSO6 : Students will be able to develop skills in using research methodologies relevant to political theory. PSO7: Students will identify logical fallacies and biases in political discourse.
Competence	PSO1: Students will be able to analyse what are social movements and make a distinction between the old and new social movements. PSO2 : Students will be able to analyse political issues and engage in discussions on global governance. PSO3 : Students will exhibit ethical behaviour and adhere to professional standards in legal practice. PSO4 : The student will be able to appreciate the centrality and importance of the term ‘politics’ in everyday aspects of our lives. PSO5 : Students will exhibit leadership skills in advocating for political change or promoting awareness. PSO6: Students will demonstrate competence in ethical analysis and reasoning within the political context. PSO7 : Students will apply legal reasoning to analyse complex legal dilemmas and propose solutions.

4. Programme Matrix

Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Honours	Total Marks
I	23PLSMAJ101	Major	Introduction to Political Science	4	4+0+0	60	100
	23PLSMAJ102	Major	Indian Government and Politics	4	4+0+0	60	100
	23PLSMIN101	Minor	Indian Polity: Issues and Concerns	4	4+0+0	60	100
	23PLSMDC101	MDC	Introduction to Indian Constitution	3	3+0+0	45	75
	23PLSAEC100	AEC	Compulsory English	2	2+0+0	30	50
	23PLSSEC101	SEC	Laws and Legal Awareness	3	2+0+1	45	75
	23PLSVED100	VAC	Value Education	1+1	1+1	30	25
	Total			22			
II	23PLSMAJ 103	Major	Dynamics of Political Theory	4	4+0+0	60	100
	23PLSMAJ104	Major	Introduction to Public Administration	4	4+0+0	60	100
	23PLSMIN 102	Minor	Human Rights	4	4+0+0	60	100
	23PLSMDC102	MDC	International Organisation: United Nations	3	3+0+0	45	75
	23PLSAEC101	AEC	ALT English	2	2+0+0	30	50
	23PLSSEC102	SEC	Innovation, Entrepreneurship and Governance	3	2+0+1	45	75
	23VACEVS101	VAC	Environmental Education	1	1+0+0	15	25
	23VACCCA101	VAC	CCA	1	0+0+1	15	25
	Total			22			

1. Course Description

Course Code	23PLSMAJ101	
Course Title	Introduction to Political Science	
Credits	04	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course: a) Outlines the significance of the term ‘political’ in its broadest socio-political connotations. b) Explains the nature and scope of the term ‘political’ as an art and a science. c) Covers with different conceptual and empirical categories in detail. d) Discusses the origin and evolution of the term ‘political’ to understand it in connection with the contemporary.	
Prerequisite	Basic understanding of political concepts and political philosophy.	
Course Objectives	A student will be able to: i. Understand the various traditions and approaches of political theory and appreciate how they get reflected in organizing social living ii. Understand multiple frames by which the idea of political community is debated iii. Understand the significance of theorizing and of applying theory into practice.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Explain the normative, historical and empirical theory of Political Science.	R & A1
CO2	Analyse different theories to the origin of the State.	U & A2
CO3	Define and interpret the concept of Power, Authority and Legitimacy.	R & U A1 & A2
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit I	Politics and Political Science a) Meaning of Politics b) Nature and Scope of Political Science c) Relationship of Political Science with History, Economics and Sociology	12	CO1	R U A1 A2 E
Unit II	Approaches to Political Science a) Normative, Historical and Empirical b) Behaviouralism and Post-Behaviouralism	12	CO1	R U A1 A2 E
Unit III	State a) The concept of State b) Elements of State c) Functions of State: Liberal, Socialist and Marxist d) The concept of Sovereignty and State: Monistic and Pluralistic Theory	12	CO2	R U A1 A2 E
Unit IV	Theories on Origin of the State a) Idealist Theory b) Social Contract Theory c) Marxist Theory d) Historical Theory.	12	CO2	R U A1 A2 E
Unit V	Power, Authority and Legitimacy: Conceptual Issues	12	CO3	R U A1 A2 E

Learning Resources:

- McKinnon, C. (2008). *Introduction. In Issues in Political Theory*. New York: Oxford University Press.
- Bhargava, R. (2008). What is Political Theory. In R. Bhargava & A. Acharya (Eds.), *Political Theory: An Introduction* (pp. 2-16). New Delhi: Pearson Longman.
- Glaser, D. (1995). Normative Theory. In D. Marsh & G. Stoker (Eds.), *Theory and Methods in Political Science* (pp. 21-40). London: Macmillan.

- Sanders, D. (1995). Behavioral Analysis. In D. Marsh & G. Stoker (Eds.), *Theory and Methods in Political Science* (pp. 58-75). London: Macmillan.
- Ball, T. (2004). History and the Interpretation of Texts. In G. F. Gaus & C. Kukathas (Eds.), *Handbook of Political Theory* (pp. 18-30). London, Thousand Oaks, New Delhi: Sage Publications.
- Ramswamy, S. (2002). *Political Theory: Ideas & Concepts*. Delhi: Macmillan.
- Agarwal, N. N., Bhushan, V. (1998). *Principles of Political Science*. New Delhi: Vishnoo Bhawan, R. Chand & Co.
- Pant, S. C. (1998). *Political Science Theory*. Lucknow: Prakashan Kendra.
- Kapur, A. C. (2010). *Principles of Political Science*. S Chand & Co Ltd.
- Dubey, S. N. (2002). *Political Science Theory*. Agra: Lakshmi Narain Agarwal.
- Johari, J. C. (2009). *Principle of Modern Political Science*. Sterling Publications.
- Verma, S. P. (1983). *Modern Political Theory*. New Delhi: Vikas.
- Heywood, Andrew. (2022). *Political Theory: An Introduction (4th ed.)*. New Delhi Manohar.
- Heywood, Andrew. (2022). *Key Concepts in Politics and International Relations*. New Delhi, Manohar.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment*: 50 marks
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Chimme Tamang Signature:	Name: Signature:	Name: Signature:

2. Course Description

Course Code	23PLSMAJ 102	
Course Title	Indian Government and Politics	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course: a) Covers the historical background and making of Indian Constitution. b) Explains different fundamental rights and duties in the Constitution. c) Classifies the nature and functions of three organs of Government. d) Discusses the federal concept and its practicality. e) Demonstrates the electoral system of the country.	
Prerequisite	A general familiarity with colonial history and Indian independence movement along with basic understanding of theories of political science can be beneficial for understanding the course.	
Course Objectives	A student will be able to: i. Gain knowledge about the historical, cultural and social foundation of Indian Politics. ii. Develop a deep understanding of Fundamental Rights, Duties and Directive Principles of State Policy. iii. Learn about the functioning and significance of Political institutions such as Executive, Legislature and Judiciary. iv. Understand the federal structure of India and distribution of powers between centre and states. v. Understand the process of decentralisation and working of local units in India. vi. Analyse the role of Political Parties and Electoral process in India	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping

CO1	Recall key historical events and development in Indian Politics.	R		
CO2	Explains various parts, schedules and articles under Indian Constitution.	U		
CO3	Demonstrates an understanding of the functioning of various institutions of government.	A1		
CO4	Analyze the working of different units of government to understand nature of federation.	A2		
CO5	Evaluate the strengths and weaknesses of Indian political system.	E		
CO6	Develop awareness regarding the systems and processes under Indian political system.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Historical background and understanding Indian Constitution a. Constituent Assembly and the framing of the Indian Constitution b. The Preamble c. Features of Indian Constitution d. Fundamental Rights and Duties e. Directive Principles of State Policy	16	CO1 CO2	R U A1 A2 E C
Unit II	Organs of Government a. <i>Legislature:</i> Union and States I. Two houses of Parliament, Law making procedures, Amendment II. State Legislature: Composition and functions b. <i>Executive:</i> Union and States I. President, Vice-President, Prime Minister and Council of Ministers II. Governor, Chief Minister c. <i>Judiciary:</i> Supreme Court, High Courts, Subordinate	18	CO3	R U A1 A2 E C

	Courts, Judicial Review and Judicial activism			
Unit III	Indian Federalism a. Nature of Indian Federalism b. Tension Areas between centre and state c. Emergency Provisions	08	CO4	R U A1 A2 E C
Unit IV	Local Self Governments: Rural and Urban a. Panchayats In India: Evolution, Features and Functions b. Municipalities: Evolution, Features, Types and Functions	08	CO5	R U A1 A2 E C
Unit V	Election and Party System a. Election Commission; Composition and Functions b. Party System in India: Features, National and State Parties	10	CO6	R U A1 A2 E C

Learning Resources:

- Austin, G. (2010). The Constituent Assembly: Microcosm in Action. In The Indian Constitution: Cornerstone of a Nation (15th print, pp. 1-25). Oxford University Press.
- Basu, D.D (2012). Introduction to the Constitution of India. LexisNexis.
- Chaube, S. (2009). The Making and Working of the Indian Constitution. National Book Trust.
- Mellalli, P. K. Constitution of India, Professional Ethics and Human Rights. SAGE.
- Bakshi, P. M. The Constitution of India.
- Hiregowder, Maheswarappa et al. (2016). The Indian Constitution: An Introduction. Orient Blackswan.
- Austin, Granville. Working a Democratic Constitution: The Indian Experience.
- Pylee, M. V. Constitutional Government in India.
- Kashyap, Subhas C. Our Constitution.
- Johari, J. C. Indian Government and Politics.
- Rao, Shiva. The Framing of India's Constitution.
- Basu, Durga Das. Shorter Constitution of India.
- Aiyer, Alladi Krishnaswami. Constitution and Fundamental Rights.
- Noorani, A. G. Constitutional Questions and Citizens' Rights.
- Chopra, Pran (Ed.). The Supreme Court versus the Constitution: A Challenge to Federalism.
- Setalvad, M. C. Union and State Relations under the Constitution.
- Sen, D. N. From Raj to Swaraj.
- Brass, Paul. The Politics of India since Independence.
- Chatterjee, Partha (Ed.). State and Politics in India.
- Chatterjee, Rakhahari (Ed.). Politics in India – State Society Interface.
- Chandhoke, Neera, & Priyadarshini, Pravin (Eds.). (Year of publication not provided). Contemporary India: Economy, Society, Politics.
- Jayal, N. G., & Mehta, P. B. (Eds.). Oxford Companion to Indian Politics.
- Paylee, M. V. India's Constitution (16th ed.). S. Chand.
- Jones, Morris. Government and Politics in India.
- Raghunandan, J. R. (2012). Decentralization and Local Governments: The Indian Experience. Orient Black Swan.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. Summative Assessment: 50 marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah Signature:	Name: Signature:	Name: Signature:

3. Course Description

Course Code	23PLSMIN101	
Course Title	Indian Polity: Issues and Concerns	
Credits	04	
Total Hours	60	
Hours per Week	04	
Course Type	Minor Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course – a) Covers the basic concepts and debates of Indian Polity. b) Explains the different political institutions and actors shaping Indian politics. c) Discuss the multiple trajectories and contestations of Indian democracy. d) Develops skill of critical thinking and analyze day-to-day politics by understanding multiple dimensions and social fabric of Indian society.	
Prerequisite	Basic knowledge of democratic polity and societal issues.	
Course Objectives	The students will be able to – i. Understand the concept of Democracy and Indian polity. ii. Discusses the different institutions and actors involve in democratic process in India. iii. Explain the role of institutions and actors in Indian democracy. iv. Analyze the debate and contentions in Indian democracy. v. Develop the skill of critical thinking and analysis on functioning of Indian democracy.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Discusses the institutions and actors involved in democratic process in India.	R
CO2	Interpret key challenges in the Indian democratic structure.	U
CO3	Utilize political theories to analyze current political events and developments.	U & A1

CO4	Analyze, evaluate ,debate and contentions of Indian democracy.	A2 & E		
CO5	Develop the skill of critical thinking and analysis on functioning of Indian democracy.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit-I	Socio-economic Factors in Indian Politics a) Caste b) Religion c) Gender d) Class	15	CO1	R U A1 A2 E C
Unit-II	Challenges to Secular Polity a) Secularism: Theory and Practice b) Challenges to Secularism c) Contemporary Debates	10	CO2 CO3 CO4	R U A1 A2 E C
Unit-III	Issues in Indian Democracy a) Regionalism b) Criminalization of Politics c) Corruption national security	13	CO4	R U A1 A2 E C
Unit-IV	Marginalized Sections a) Dalits and Tribals b) Women and Children	10	CO 2 CO 4 CO 5	R U A1 A2 E C
Unit-V	New Social Movements in India a) Women’s Movement b) Environmental Movements c) Politics of Sexuality (LGBTQIA+)	12	CO 4 CO 5	R U A1 A2 E C
Learning Resources:				

- Ada, Arvind N. (1992). *India Invented: A Nation in the Making*. New Delhi: Manohar.
- Bhargava, R. (1999). *Secularism and Its Critics*. Oxford University Press
- Bhat, Planning and Development. *Alpha Publications Pvt. Ltd.* New Delhi.
- Chatterjee, P. (Ed.). (1998). *State and Politics in India*. Oxford University Press.
- Kaviraj, S. (Ed.). (1999). *Politics in India*. New Delhi: Oxford University Press.
- Kohli, Atul. (1991). *Democracy and Discontent: India's Growing Crisis of Governability*. Cambridge: Cambridge University Press.
- Kothari, Rajani. (2010). *Caste in Indian Politics*. Hyderabad: Orient Black Swan.
- Kramer, M. H., et al. (2000). *A Debate Over Rights*. London: Oxford University Press.
- Mehta, V. R. (1988). *Ideology, Modernization and Politics in India*. New Delhi: Manohar.
- Mohanan, (Ed.). (1995). *Globalization of Economy, Vision for the Future*. New Delhi: Gyan Publications.
- Narain, Iqbal. (Ed.). (1976). *State Politics in India*. Meerut: Meenakshi Pub.
- Narang, A. S. (1995). *Ethnic Identities and Federalism*. Shimla: IIAS.
- O'Neil, Michel, & Austin, Dennis. (2000). *Democracy and Cultural Diversity*. London: Oxford University Press.
- Shah, G. (Ed.). (2001). *Social Movements and the State*. Sage India
- Singh, Randhir. (1990). *Of Marxism and Indian Politics*. Delhi: Ajanta Publications.
- Singh, Randhir. (1993). *Five Essays in Marxist Mode*. Delhi: Ajanta Publications.
- Weiner, Myron. (1989). *The Indian Paradox, Essays in Indian Politics*. New Delhi: Sage.

Reference Books:

- Brass, P. R. (1994). *The Politics of India since Independence*. New Delhi: Cambridge.
- Kohli, A. (2004). *The Success of India's Democracy*. London: Cambridge University Press.
- Jayal, Niraja & Mehta P.B. (2007) *Oxford Companion to Indian Politics*. Oxford University Press.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. *Summative Assessment*: 50 marks

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah	Name:	Name:
Signature:	Signature:	Signature:

4. Course Description

Course Code	23PLSMDC101	
Course Title	Introduction to Indian Constitution	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multidisciplinary Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course: a. Covers the historical background and making of Indian Constitution. b. Explains different fundamental rights and duties in the Constitution. c. Classifies the nature and functions of the three organs of Government. d. Develops skill of group discussion and debate through academic simulation of Lok Sabha.	
Prerequisite	A general familiarity with colonial history and Indian independence movement along with basic understanding of theories of political science can be beneficial for understanding the course.	
Course Objectives	A student will be able to: i. Gain knowledge about the historical, cultural and social foundation of Indian Politics. ii. Develop a deep understanding of Fundamental Rights, Duties and Directive Principles of State Policy. iii. Learn about the functioning and significance of Political institutions such as Executive, Legislature and Judiciary. iv. Develop leadership skills, including public speaking negotiations, debate and consensus building.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Recall key historical events and development in Indian Politics.	R
CO2	Explains various parts, schedules and articles under Indian Constitution.	U
CO3	Demonstrates an understanding of the	A1

	functioning of various institutions of government.			
CO4	Analyze the working of different units of government to understand nature of federation.	A2		
CO5	Evaluate the strengths and weaknesses of Indian political system.	E		
CO6	Develop awareness regarding the systems and processes under Indian political system.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Historical background and understanding Indian Constitution a. Constituent Assembly and framing of the Indian Constitution, b. Preamble c. Features of Indian Constitution, d. Citizenship	09	CO1	R U A1 A2 E C
Unit II	Rights and Duties a. Fundamental Rights b. Fundamental Duties c. Directive Principles of State Policy	08	CO2	R U A1 A2 E C
Unit III	Legislature a. Union Parliament: Lok Sabha and Rajya Sabha b. Law making procedure c. Procedure of amendment d. State Legislatures: Composition and Functions	08	CO3	R U A1 A2 E C
Unit IV	Executive a. President b. Vice-President c. Prime Minister and Council of Ministers d. Governor e. Chief Minister	9	CO3	R U A1 A2 E C
Unit V	Judiciary a. Supreme Court b. High Courts c. Subordinate Courts d. Judicial Review and Judicial activism	08	CO3	R U A1 A2 E C

Unit VI	Youth Parliament Sessions (Academic simulation of Lok Sabha)	03	CO4	R U A1 A2 E C
Learning Resources: • Austin, G. (2010). The Constituent Assembly: Microcosm in Action. In The Indian Constitution: Cornerstone of a Nation (15th print, pp. 1-25). Oxford University Press. • Basu, D. D (2012). Introduction to the Constitution of India. LexisNexis. • Chaube, S. (2009). The Making and Working of the Indian Constitution. National Book Trust. • Mellalli, P. K. Constitution of India, Professional Ethics, and Human Rights. SAGE. • Bakshi, P. M. The Constitution of India. • Hiregowder, Maheswarappa et al. (2016). The Indian Constitution: An Introduction. Orient Blackswan. • Austin, Granville. Working a Democratic Constitution: The Indian Experience. • Pylee, M. V. Constitutional Government in India. • Kashyap, Subhas C. Our Constitution. • Johari, J. C. Indian Government and Politics. • Rao, Shiva. The Framing of India's Constitution. • Basu, Durga Das. Shorter Constitution of India. • Aiyer, Alladi Krishnaswami. Constitution and Fundamental Rights. • Bakshi, P.M. (2023). <i>The Constitution of India (latest edition)</i>. LexisNexis				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. Summative Assessment: 50 marks

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah	Name:	Name:
Signature:	Signature:	Signature:

5. Course Description

Course Code	23PLSSEC101	
Course Title	Law and Legal Awareness	
Credits	03	
Lecture hours	45	
Hours/Week	03	
Course Type	Skill Enhancement Course (SEC)	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview:		This course: a) Gives a detail outline of judicial system and its structures in India. b) Explains various legal procedures of both civil and criminal law. c) Discusses various legal mechanisms available to Indian citizens to safeguard his/her rights.
Prerequisites		Basic knowledge of Indian Constitution and legal system of India
Course Objectives:		The students will be able to – i. Understand various legal structures of India with emphasis on Judiciary, its structures, its role and jurisdictions. ii. Attain sufficient knowledge on various laws of our country hence to enable him/her to make use of it positively for one’s protection of individual rights as well as to prevent anyone from committing acts that aims to hamper rights equally available to others. iii. Understand various legal mechanisms available to an individual in our country to safeguard his/her rights and privileges.
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Outline the judicial structure and the legal system of India	R
CO2	Explain key legal concepts under	U

	the Indian Legal System			
CO3	Apply various civil, criminal and personal laws to address various day to day issues arising in the society.	A1&A2		
CO4	Develop clear understanding on the legal mechanisms in India.	C		
CO5	Evaluate legal arguments by doing case studies.	E		
UNITS	CONTENT	HOURS	COs	Revised Bloom's Taxonomy
Unit-I	Brief introduction to the Judicial system in India a) System of Courts b) Civil and Criminal Courts c) Juvenile Justice Courts d) Mahila Courts e) Lok Adalat f) Debt Recovery Tribunal	9	CO1	R U A E C
Unit-II	Understanding Laws applicable in India a) Laws relating to Criminal Procedure: FIR, Arrest, Bail (Bailable and Non Bailable, Cognizable and Non Congnizable Offences), Notice under 41A of CrPc b) Provisions related to search, seizure and collecting evidences under Criminal Procedure Codes c) Lokpal and Lokyukta	15	CO2	R U A E C
Unit-III	Special Laws in India a) Laws relating to atrocities on Scheduled Castes/Tribes b) Laws relating to dowry, sexual harassment, domestic violence c) Laws relating to consumer rights d) Laws relating to cyber crime	18	CO3	R U A E C

	e) Personal Laws: Marriage, Divorce and Inheritance			
Unit-IV	Case Study Visit a court or a legal aid center set up by the legal service authority or an NGO or a Lok Adalat or to interview a litigant or a person being counseled	3	CO4 CO5	A C

Learning Resources:

- Agarwala, S.K. (1985). *Public Interest Litigation in India*. K.M. Memorial Lecture, Second Series, Indian Law Institute, Delhi.
- Aggarwal, N. (2002). *Women and Law in India*. New Century, Delhi.
- Agnes, F. (1997). *Law and Gender Equality*. OUP.
- Bajpai, A. (2003). *Child Rights in India: Law, Policy, and Practice*. Oxford University Press, New Delhi.
- Indian Social Institute, New Delhi. *Legal Literacy Series Booklets*.
- Institute of Life Long Learning (Delhi University). (n.d.). *Legal Literacy: Available Amongst Interdisciplinary Courses on Institute of Life Long Learning (Delhi University) Virtual Learning Portal*. Retrieved from vle.du.ac.in
- Multiple Action Research Group. (n.d.). *Our Laws* (Vols. 1-10). Delhi. Available in Hindi also.
- Rao, P.C., & Sheffield, W. (2002). *Alternative Dispute Resolution: What It Is and How It Works*. Universal Law Books and Publishers, Delhi.
- Sagade, J. (1996). *Law of Maintenance: An Empirical Study*. ILS Law College, Pune.
- Sankaran, K., & Singh, U. (Eds.). (2007). *Creating Legal Awareness*. Delhi: OUP.
- Sathe, S.P. (1993). *Towards Gender Justice*. Research Centre for Women's Studies, SNDT Women's University, Bombay.
- Shukla, V.N. (2001). *V.N. Shukla's Constitution of India*. Eastern Book Co., 10th edition.
- Sing, P. (1981-82). *Access to Justice and the Indian Supreme Court*. *Delhi Law Review*, 10(1), 156.
- Wadhera, B.L. (2003). *Public Interest Litigation: A Handbook*. University Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. *Summative Assessment*: 50 marks

- Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Sangam Ghatani Signature:	Name: Signature:	Name: Signature:

6. Course Description

Course Code	23PLSMAJ102	
Course Title	Dynamics of Political Theory	
Credits	04	
Lecture hours	60	
Hours per Week	4	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Issue(s) Addressed	Political Science	
Regulation	2023	
Course Overview:		This course: a) Recognizes the meaning of Theory and Philosophy of Political Science. b) Explains Political Theory and its Values. c) Covers the role of Political Theorists.
Course Objectives:		The students will be able to: i. Understand the concept of Political Theory and Philosophy. ii. Discuss the various concepts of Political Theory. iii. Explain the relationship between Political Theory and Philosophy. iv. Analyze various Political Theories v. Develop an understanding of Political Theorists, their theory and contribution.
Prerequisites:		Basic knowledge of Political theory and Philosophy
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept of Political theory and Philosophy.	R
CO2	Discuss the various concepts of Political theory.	U
CO3	Explain the relationship between Political theory and Philosophy.	U & A1
CO4	Analyze the dynamics of Political Theory	A2 & E
CO5	Develop and understand Political	C

	Theorists, their theories and Contribution.			
Course Content				
UNITS	CONTENT	HOURS	COs	Revised Bloom's Taxonomy
Unit-I	Political Theory a. Definition, Nature and scope of Political theory. b. Relationship between Political Theory and Philosophy. c. Debate on the Decline of Political Theory	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-II	Traditions of Political Theory a. Liberal b. Marxist c. Anarchist d. Conservative e. Feminist	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-III	Importance of Freedom a. Negative Freedom: Liberty b. Positive Freedom: Freedom as Emancipation and Development	8	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-IV	Significance of Equality a. Formal Equality: Equality of opportunity b. Political equality c. Egalitarianism: Social inequalities and differential treatment	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-V	Indispensability of Justice a. Procedural Justice b. Distributive Justice c. Global Justice	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-VI	The Universality of Rights a)Natural Rights b)Moral and Legal Rights c)Three Models of Rights: Political, Civil and Communitarian	12	CO1 CO2 CO3 CO4	R U A1 A2

	d) Rights and Obligations		CO5	E C
Learning Sources: • Acharya, A. (2008). Affirmative Action. In R. Bhargava & A. Acharya (Eds.), <i>Political Theory: An Introduction</i> (pp. 298-307). New Delhi: Pearson Longman. • Amoah, J. (2007). The World on Her Shoulders: The Rights of the Girl-Child in the Context of Culture & Identity. <i>Essex Human Rights Review</i>, 4(2), 1-23. • Bedau, H.A. (2003). Capital Punishment. In H. LaFollette (Ed.), <i>The Oxford Handbook of Practical Ethics</i> (pp. 705–733). New York: Oxford University Press. • Campbell, T. (2008). Human Rights. In C. McKinnon (Ed.), <i>Issues in Political Theory</i> (pp. 194-210). New York: Oxford University Press. • Carter, I. (2003). Liberty. In R. Bellamy & A. Mason (Eds.), <i>Political Concepts</i> (pp. 4-15). Manchester: Manchester University Press. • Casal, P., & William, A. (2008). Equality. In C. McKinnon (Ed.), <i>Issues in Political Theory</i> (pp. 149-165). New York: Oxford University Press. • Heywood, A. (1992). <i>Political Ideologies</i>. Basingstoke: Macmillan. • Hyums, K. (2008). Political Authority and Obligation. In C. McKinnon (Ed.), <i>Issues in Political Theory</i> (pp. 9-26). New York: Oxford University Press. • Knowles, D. (2001). <i>Political Philosophy</i>. London: Routledge (pp. 69-132). • Martin, R. (2003). Political Obligation. In R. Bellamy & A. Mason (Eds.), <i>Political Concepts</i> (pp. 41-51). Manchester: Manchester University Press. • McKinnon, C. (2003). Rights. In R. Bellamy & A. Mason (Eds.), <i>Political Concepts</i> (pp. 16-27). Manchester: Manchester University Press. • Menlowe, M.A. (1993). Political Obligations. In R. Bellamy (Ed.), <i>Theories and Concepts of Politics</i> (pp. 174-194). New York: Manchester University Press. • Menon, K. (2008). Justice. In R. Bhargava & A. Acharya (Eds.), <i>Political Theory: An Introduction</i> (pp. 74–86). New Delhi: Pearson Longman. • Riley, J. (2008). Liberty. In C. McKinnon (Ed.), <i>Issues in Political Theory</i> (pp. 103-119). New York: Oxford University Press. • Seglow, J. (2003). Multiculturalism. In R. Bellamy & A. Mason (Eds.), <i>Political Concepts</i> (pp. 156-168). Manchester: Manchester University Press. • Sethi, A. (2008). Freedom of Speech and the Question of Censorship. In R. Bhargava & A. Acharya (Eds.), <i>Political Theory: An Introduction</i> (pp. 308-319). New Delhi: Pearson Longman. • Swift, A. (2001). <i>Political Philosophy: A Beginner's Guide for Students and Politicians</i>. Cambridge: Polity Press (pp. 51-88, 91-132). • Tulkdar, P.S. (2008). Rights. In R. Bhargava & A. Acharya (Eds.), <i>Political Theory: An Introduction</i> (pp. 88-104). New Delhi: Pearson Longman. • Turner, R. (1993). Anarchism: What is it? <i>Politics Review</i>, 3(1), 28-32. • Wolf, J. (2008). Social Justice. In C. McKinnon (Ed.), <i>Issues in Political Theory</i> (pp. 172-187). New York: Oxford University Press. • Working Group on the Girl Child (2007). A Girl's Right to Live. Female Foeticide and Girl Infanticide, available on http://www.crin.org/docs/Girl's infanticide CSW 2007.txt • Heywood, Andrew.(2022). <i>Key Concepts in Politics and International Relations</i>.New Delhi, Manohar.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. Summative Assessment: 50 marks

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

a) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mingu Sherpa Signature:	Name: Signature:	Name: Signature:

7. Course Description

Course Code	23PLSMAJ103	
Course Title	Introduction to Public Administration	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course: a. Provides a comprehensive knowledge of the basic concepts and importance of Public Administration. b. Expose learners to various theories and perspectives in Administration. c. Develops in students an inclusive approach in Administration.	
Prerequisite	A general understanding and interest in process of government, politics or public policy can be useful in understanding Public Administration.	
Course Objectives	A student will be able to: i. Gain a comprehensive understanding of the historical development, theories and key concepts that forms the foundation of Public Administration as a field of study and practice. ii. Explore the major theories and approaches in Public Administration including classical, neo-classical, behavioural and contemporary perspectives. iii. Promote an understanding of complex managerial structure and changing administrative needs related to Public sector. iv. Introduce students to principle of public finance, budget and financial accountability in the public sector. v. Provide insight into recruitment, training, performance evaluation, and human resource management in Public Sector.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level

		Mapping		
CO1	Recall key theories and concept of public administration and list the historical development of Public Administration.	R		
CO2	Interpret the theories and principles of Public Administration and its application.	U		
CO3	Analyse principles of administration and its practical application in day to day administration.	A1		
CO4	Compare and contrast the emerging trends in Public Administration and its relevance in the field.	A2		
CO5	Asses the structure and process of personnel administration and working of financial institutions.	E		
CO6	Develop innovative solutions to address complex Public Administration challenges.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Understanding Public Administration a. Meaning, nature of Public Administration b. Evolution of Public Administration c. Public and Private Administration	12	CO1	R U A1 A2 E C
Unit II	Theories of Organization: The Classical Theories a. Scientific Management b. Bureaucratic Theory c. The Human Relation Theory d. Decision Making Theory	12	CO2	R U A1 A2 E C
Unit III	Principles of Organization a. Hierarchy b. Unity of Command c. Authority and Responsibility d. Coordination e. Span of Control f. Line and Staff Agency g. Centralisation and Decentralisation,	12	CO3	R U A1 A2 E C

Unit IV	Trends in Public Administration - Development Administration - Comparative Public Administration - New Public Administration - New Public Management - Good Governance - E- governance/Digital Governance	12	CO4	R U A1 A2 E C
Unit V	Personnel and Financial Administration - Concept and Problems of Recruitment - Training and Promotion of Public Personnel - Civil Service Neutrality - Concept of Budget - Budget Process in India - Legislative Control	12	CO5 CO6	R U A1 A2 E C

Learning Resources:

- Henry, N. (1999). Public Administration and Public Affairs. Prentice Hall.
- Rosenbloom, D., Kravchuk, R., & Clerkin, R. (2009). Public Administration: Understanding Management, Politics and Law in Public Sector (7th ed.). McGraw Hill.
- Wilson, W. (2004). The Study of Administration. In B. Chakrabarty & M. Bhattacharya (Eds.), Administrative Change and Innovation: a Reader. Oxford University Press, 85-101.
- Basu, R. (2014). Public Administration: Concepts and Theories. Sterling Publishers.
- Maheshwari, S. (Administrative Thinkers. Macmillan.
- Drucker, P. F. (2006). The Practice of Management. Harper Collins.
- Dye, T. (1984). Understanding Public Policy (5th ed.). Prentice Hall.
- Xun Wu, M. Ramesh, Michael Howlett, & Scott Fritzen. (2010). The Public Policy Primer: Managing The Policy Process. Rutledge.
- Howlett, M. (2011). Designing Public Policies: Principles And Instruments. Rutledge.
- Vaidyanatha Ayyar, R. V. (2009). Public Policy Making In India. Pearson.
- Bhattacharya, M. (2006). Social Theory, Development Administration and Development Ethics. Jawahar Publishers.
- Riggs, F. (1961). The Ecology of Public Administration, Part 3. Asia Publishing House.
- Bhattacharya, M. (2012). Public Administration: Issues and Perspectives. Jawahar Publishers.
- Wharton, A. S. (2012). The Sociology Of Gender. Blackwell-Wiley Publishers.
- Menon, N. (Ed.). (1999). Gender and Politics. Oxford University Press.
- Bhagawan, V. B., & Vidya. (1994). Public Administration. S. Chand and Company.
- Avasthi, & Maheswari. (2000). Public Administration. Laxmi Narayan Agarwal.
- Sharma, M. P. (2007). Public Administration (Theory Concept). Kitab Mehal Allahabad.
- Maheshwari, S. (2009). Administrative Theory. McMillan.
- Fadia, & Fadia. (2007). Public Administration. Sahitya Bhawan Publication Agra.
- Tyagi, A. R. (1987). Principles & Practice of Public Administration.
- Chakrabarty, B., & Chand; Prakash. (2012). Public Administration in a Globalizing World: Theories and Practices. Sage.

- Srivatava, S. (2011). Theory and Practice of Public Administration. Pearson.
- Singh, H., & Sachdeva; Pradeep. (2010). Public Administration Through Practice. Pearson.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

ii. Summative Assessment: 50 marks

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

i. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah Signature:	Name: Signature:	Name: Signature:

8. Course Description

Course Code	23PLSMIN102	
Course Title	Human Rights	
Credits	04	
Total Hours	60	
Hours per Week	04	
Course Type	Minor Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course – a. Covers the historical background of Human Rights. b. Explains the evolution of Human Rights. c. Discusses the multiple concepts and issues on different forms of rights. d. Develops skill of critical thinking and awareness on basic rights of human in society.	
Prerequisite	Basic knowledge on Rights and Duties.	
Course Objectives	The students will be able to – i. Understand the concept of Human Rights. ii. Discuss different types of Human Rights. iii. Explain the role of conventions in the development of Human Rights. iv. Analyze the debates on rights and duties. v. Develop the skill of critical thinking and awareness on basic rights of human in society.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept of Human Rights.	R
CO2	Discuss the different types of Human Rights	U
CO3	Explain the role of conventions in the development of Human Rights.	U & A1

CO4	Analyze and evaluate the debates on rights and duties.	A2 & E		
CC05	Develop the skill of critical thinking and awareness on basic rights of human in society.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit-I	Introduction to Human Rights a) Historical background of Human Rights b) Difference between Civil, Democratic and Human Rights c) Theories of Right.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-II	Human Rights and Duties a) Correlation of Rights and Duties/Responsibilities. b) Tension between Rights and Duties. c) Importance of Human Rights and Duties.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-III	International Human Rights a) Evolution of Human Rights at international Stage. b) UN Charter and the Declaration of Human Rights. c) Universal Declaration of Human Rights. d) International Convention on Civil, Criminal ,Political, Economic and Cultural Rights.	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Unit-IV	Human Rights in India a) Labour Legislation in India b) Problems of Human Rights in India: Poverty, Unemployment and Illiteracy. c) Social practices and Human Rights	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-V	Human Rights for disadvantaged sections in India a) SCs, STs, and Other Backward Classes. b) Women and Children's Rights. c) Minorities, Differently abled and Elderly people	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Learning Resources • Cranston, M. (1973). <i>What are Human Rights?</i>. London: The Bodley Head. • Hoffman, J., & Graham, P. (2006). Human Rights. In <i>Introduction to Political Theory</i> (pp. 436-458). Delhi: Pearson. • Kannabiran, K. G. (2004). <i>The Wage of Impunity</i>. Orient Longman. • Nirmal, C. J. (Ed.). (2004). <i>Human Rights in India: Historical, Social and Political Perspectives</i>. OIP, Delhi. • O'Byrne, D. J. (2008). <i>Human Rights: An Introduction</i>. New Delhi: Pearson Education in South Asia. • SAHRDC. (2006). <i>Introduction to Human Rights; Classification of Human Rights: An Overview of the First, Second, and Third Generational Rights</i>. In <i>Introducing Human Rights</i>. New Delhi: Oxford University Press.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. Summative Assessment: 50 marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
- b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Sangam Ghatani Signature:	Name: Signature:	Name: Signature:

9. Course Description

Course Code	23PLSMDC102	
Course Title	International Organization : United Nations	
Credits	03	
Total Hours	45	
Hours per Week	03	
Course Type	Multidisciplinary Course (MDC)	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course – a. Covers the background of United Nations. b. Discusses in detail the various organs of United Nations. c. Discusses the various programmes under United Nations. d. Provides an academic simulation of United Nations through sessions on Model United Nations.	
Prerequisite	Basic knowledge of United Nations.	
Course Objectives (total 5)	The students will be able to – i. Provide a detailed explanation on the background and working of the United Nations and its organs. ii. Understand and examine the various programmes initiated by the United Nations for socio- economic development of humans across the globe. iii. Gain a practical experience of the working of United Nations through sessions on Model United Nations (an academic simulation of UNO)	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	List out the various organs of United Nations organization.	R
CO2	Discuss the functions and role of Security Council in maintaining International Peace and Security	U

CO3	Explain the role of International Court of Justice in resolving international disputes.	U & A1		
CO2	Examine the effectiveness of World Health Organization in addressing world health issues.	A2 & E		
CC3	Plan out various mechanisms to solve an ongoing global issue through Model United Nations.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit-I	Background of UNO a) Emergence of UNO b) UN Charter c) A brief overview of various Organs of UNO	15	CO1	R U A1 A2 E C
Unit-II	General Assembly and Security Council a) Composition and Functions b) Role of Security Council in maintaining International Peace and Security. c) Uniting for Peace Resolutions	12	CO1	R U A1 A2 E
Unit-III	International Court of Justice a) Evolution of ICJ b) Composition and Functions c) Effectiveness of ICJ in resolving international disputes	10	CO1	R U A1 A2 E C
Unit-IV	Programmes under UNO a) UNESCO b)UNDP c) UNICEF d) WHO	4	C O 1 C O 2	R U A1 A2 E C

	e) SDG Goals			
Unit-V	Model United Nations (Academic simulation of UNO)	4	CO3	C

Learning Resources:

- Basu, R. (2008). *The United Nations: Structure and Functions of an International Organization*. Sterling Publishers Private Limited.
- Moore, J. A., & Pubantz, J. (2017). *The New United Nations: International Organization in the Twenty-First Century* (2nd ed.). Routledge.
- Taylor, P., & Groom, A. J. R. (2000). *The United Nations at the Millennium: The Principal Organs*. Bloomsbury Publishing.
- Garcis, S.B., & Varwick, J. (2005). *The United Nations: An Introduction*. Palgrave Macmillan
- Thakur, R. (1998). *Past Imperfect, Future Uncertain: The UN at Fifty*. Palgrave Macmillan
- Hanhimaki, J.M. (2015). *The United Nations: A Very Short Introduction*. Oxford University Press.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i) *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii) *Summative Assessment*: 50 marks

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Sangam Ghatani Signature:	Name: Signature:	Name: Signature:

10. Course Description

Course Code	23PLSSEC 102	
Course Title	Innovation, Entrepreneurship and Governance	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Skill Enhancement Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course: a. Explores theory and practice of innovation in various domains, including government, society and day to day innovation. b. Enables students to learn about the processes, strategies and factors that drive Innovation, as well as the practical skills needed to foster real world settings.	
Prerequisite	A basic understanding of Political Science and governance, including knowledge of government structures and policy processes, can be useful for studying governance in the context of innovation and entrepreneurship.	
Course Objectives	A student will be able to: i. Develop a comprehensive understanding of the concept of entrepreneurship, its significance and various forms. ii. Understand the relationship between creativity and innovation and develop techniques to enhance creative thinking. iii. Analyze the impact of government structures and regulations on entrepreneurship and innovation. iv. Examine the characteristics and dynamics of the entrepreneurial ecosystem in India. v. Explore case studies on successful entrepreneurs and public sector undertakings to have insights on their strategies as well as to present assessment of concerned cases based on critical thinking.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping

CO1	Identify and defines key terms and concepts related to entrepreneurship.	R		
CO2	Explain concept of Innovation and concepts related to innovation.	U		
CO3	Apply knowledge of government policies to analyze their impact on specific industries or sectors in India.	A1		
CO4	Analyze the effectiveness of specific government policies in promoting or hindering entrepreneurship in India.	A2		
CO5	Synthesise information from various sources to develop recommendations for improving entrepreneurial ecosystem in India.	E		
CO6	Develop a research project exploring innovative governance practices through assessing public sector undertakings.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Concept of Entrepreneurship a. Meaning, Definition, Characteristics and functions of Entrepreneur b. Types of Entrepreneurs c. Phases of Training of Entrepreneur d. Development of Rural Entrepreneurship and Women Entrepreneurship	10	CO1	R U A1 A2 E C
Unit II	Concept of Innovation a. Creativity b. Invention and Innovation: Meaning and types c. Relevance of Technology for Innovation d. Role of government in fostering Innovation.	10	CO2	R U A1 A2 E C
Unit III	Growth and promotion of Entrepreneurship in India a. Historical context of Innovation and Entrepreneurship in India b. Social Entrepreneurship as a catalyst for change. c. Research and development in India d. Public and private sector	10	CO3 CO4	R U A1 A2 E C

	collaboration.			
Unit IV	Innovation and the Governance a. Entrepreneur Government: Meaning, Characteristics and Role b. India's global position in Innovation and Entrepreneurship. c. Contemporary issues.	10	CO4 CO5	R U A1 A2 E C
Unit V	Case study on successful Entrepreneurs/Public Sector Undertakings.	05	CO6	R U A1 A2 E C

Learning Resources:

- Drucker, P. F. (1985). Innovation and Entrepreneurship. Collins Publications.
- Khandwalla, P. N. (2004). Lifelong Creativity: An Unending Quest. Tata McGraw Hill.
- Jauhari, V., & Bhushan, S. (2014). Innovation Management. Oxford Higher Education.
- Krishnamacharyulu, C. S. G., & Lalitha, R. (2010). Innovation Management. Himalaya Publishing House.
- Timpe, D. (2003). Creativity. Jaico Publishing House.
- Clegg, B., & Birch, P. (2009). Creativity. Kogan Page.
- Kanungo, R. N. (1998). Entrepreneurship and Innovation. Sage Publications.
- Entrepreneurship Development Institute of India. (1986). Faculty and External Experts – A Handbook for New Entrepreneurs. Publisher: Entrepreneurship Development Institute of India, Ahmadabad.
- Philips, Bonefiel, & Sharma. (2011). Social Entrepreneurship. Global Vision Publishing House.
- Kaushik, D. (2013). Studies in Indian Entrepreneurship. Cyber Tech Publications.
- Gopalkrishnan. (2014). The Entrepreneur's Choice: Cases on Family Business in India. Routledge Taylor & Francis Group.
- Kaliyamoorthy and Chandrasekhar (Eds.). (2007). Entrepreneurial Training: Theory and Practice. Kanishka Publishers.
- Hisrich, R., Peters, M., & Shepherd, D. (2009). Entrepreneurship. Tata McGraw-Hill Publishing Company Limited.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii. Summative Assessment: 50 marks

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah Signature:	Name: Signature:	Name: Signature:



Salesian College
(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts in Political Science

Department of Political Science

Curriculum Document
2024 – 2025

Vision

The department promotes the study of the principles of social justice, secularism, democratic way of life and focuses on the different approaches to the problems of society encouraging an interdisciplinary epistemology.

Mission

The department of Political Science caters to create responsible, knowledgeable and morally upright citizens in our Country.

1. Programme Overview

Bachelor of Arts in Political Science is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Relate his/her understanding on the significance of theorizing and of applying theory into practice.
	PO02: Develop knowledge of theories, concepts, and research methods in humanities and social science.
	PO03: Gain awareness about how global, national and regional developments affect society.
	PO04: Grasp information related to the structure and functions of various units of government.
Skills	PO05: Construct multiple frames by which the idea of political community is debated.
	PO06: Students will develop and be able to demonstrate skills in analytical and critical thinking.
	PO07: Demonstrate an understanding of fundamental political process, institutions, actors, behaviours, ideas and familiarity with major theories, methods and concepts of Political Science.
	PO08: Comprehend the basic structure and process of government system/ theoretical underpinning.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical framework of Political Science.
	PO10: Exhibit in critical analysis, effectively evaluating and synthesizing complex political information and arguments.
	PO11: Propose innovative solutions to contemporary political challenges, drawing on evidence-based analysis.

3. Programme Specific Objectives& Outcomes (PSOs)

Knowledge	PSO1: A student develops knowledge about various traditions and approaches of political theory and appreciates how they get reflected in organizing social living.
	PSO2:A student develops knowledge about basic of Political Philosophy and also develops knowledge about the importance of different schools of philosophy in the field of Political Science
	PSO3: A student develops knowledge about major political theories, including classical and contemporary perspectives.
	PSO4: A student gathers proficiency in defining and explaining key political concepts, such as justice, power, democracy, and authority.
	PSO5: A Student develops a deep understanding of foundational public administration theories and concepts, including public management principles, bureaucracy, and public policy.
	PSO6: A student develops knowledge about the dynamic role of public administration in the functioning of government and its impact on society.
	PSO7: A student develops knowledge about the origin and nature of political theory and the ways political theoretical thinking can enhance our capacities for critical reflection and democratic citizenship.
Skills	PSO1: Students will critically analyze and evaluate political texts, arguments, and policies.
	PSO2: Students will demonstrate knowledge of fundamental political ideologies, such as liberalism, conservatism, socialism, feminism, and environmentalism.
	PSO3: Students will be able to analyze the historical evolution of political ideologies and their impact on political thought.
	PSO4: Students will conduct political theory research proficiently, including literature reviews and data analysis.
	PSO5: Students will develop skills in using research methodologies relevant to political theory.
	PSO6: Students will communicate their political theories and arguments effectively in written and oral form.
	PSO7: Students will identify logical fallacies and biases in political discourse.
Competence	PSO1: Students will exhibit ethical behaviour and adhere to professional standards in legal practice.

	PSO2: Students will be able to analyze what are social movements and make a distinction between the old and new social movements.
	PSO3: Students will analyze global political issues and engage in discussions on global governance.
	PSO4: The student will be able to appreciate the centrality and importance of ‘politics’ concepts and institutions in the more ordinary and everyday aspects of our lives – the politics and policies that determine how we interact at work and in our more private worlds with family and friends, as well as in the public sphere.
	PSO5: Students will exhibit leadership skills in advocating for political change or promoting political awareness.
	PSO6: Students will demonstrate competence in ethical analysis and reasoning within the political context.
	PSO7: Students will apply legal reasoning to analyze complex legal dilemmas and propose solutions.

4. Programme Matrix

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Honours	Total Marks
I	24PLSMAJ101	Major	Introduction to Political Science	4	4+0+0	60	100
	Core B	Major	-	4	4+0+0	60	100
	24PLSMDC101	MDC	Introduction to Indian Constitution	3	3+0+0	45	75
	24PLSSEC101	SEC	Laws and Legal Awareness	3	3+0+0	45	75
	24ENGAEC101	AEC	Compulsory English	2	2+0+0	30	50
	24GEOVAC101	AEC	Environmental Studies	2	2+0+0	30	50
	24PLSVAC101	VAC	Political Debates: Issues and Concerns - I	2	0+0+2	30	50
	Total			20			
II	24PLSMAJ102	Major	Dynamics of Political Theory	4	4+0+0	60	100
	24PLSMAJ103	Major	Indian Government And Politics	4	4+0+0	60	100
	CORE B	Major	-	4	4+0+0	60	100
	CORE B	Major	-	4	4+0+0	60	100
	24PLSMDC102	MDC	International Organizations	3	3+0+0	45	75
	24PLSSEC101	SEC	Laws and Legal Awareness	3	3+0+0	45	75
	24SCSVED101	VAC	Value Education	2	2+0+0	15	25
	Total			24			

1. Course Description

Course Code	24PLSMAJ101	
Course Title	Introduction to Political Science	
Credits	04	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2024	
Course Overview	This course: a) Outlines the significance of the term ‘political’ in its broadest socio-political connotations. b) Explains the nature and scope of the term ‘political’ as an art and a science. c) Covers with different conceptual and empirical categories in detail. d) Discusses the origin and evolution of the term ‘political’ to understand it in connection with the contemporary.	
Prerequisite	Basic understanding of political concepts and political philosophy.	
Course Objectives	A student will be able to: i. Understand the various traditions and approaches of political theory and appreciate how they get reflected in organizing social living ii. Understand multiple frames by which the idea of political community is debated iii. Understand the significance of theorizing and of applying theory into practice.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Explain the normative, historical and empirical theory of Political Science.	R&A1
CO2	Analyse different theorist on the origin of the State.	U&A2
CO3	Define and interpret the concept of Power, Authority and Legitimacy.	R & U A1&A2

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Politics and Political Science a) Meaning of Politics and Political b) Nature and Scope of Political Science c) Political Science as an inter disciplinary subject (History, Economics and Sociology)	12	CO1	R U A1 A2 E
Unit II	Approaches to Political Science a) Historical, Normative and Empirical b) Behaviouralism and Post-Behaviouralism	12	CO1	R U A1 A2 E
Unit III	State a) The concept of State b) Elements of State c) Functions of State: Liberal, Socialist and Marxist d) The concept of Sovereignty and State: Monistic and Pluralistic Theory	12	CO2	R U A1 A2 E
Unit IV	Theories on Origin of the State a) Idealist Theory b) Social Contract Theory c) Marxist Theory d) Historical Theory.	12	CO2	R U A1 A2 E
Unit V	Definition and Major ideas: Power, Authority and Legitimacy	12	CO3	R U A1 A2 E
Learning Resources:				

- Agarwal, N. N, Bhushan, V. (1998). *Principles of Political Science*. New Delhi: Vishnoo Bhawan, R. Chand & Co.
- Ball, T. (2004). History and the Interpretation of Texts. In G.F. Gaus & C. Kukathas (Eds.), *Handbook of Political Theory* (pp. 18-30). London, Thousand Oaks, New Delhi: Sage Publications.
- Bhargava, Rajeev & Acharya, Ashok. (2008). *Political Theory: An Introduction*. Pearson.
- Dubey, S. N. (2002). *Political Science Theory*. Agra: Lakshmi Narain Agarwal.
- Gauba, O.P. (2009). *An Introduction to Political Theory*. Macmillan.
- Glaser, D. (1995). Normative Theory. In D. Marsh & G. Stoker (Eds.), *Theory and Methods in Political Science* (pp. 21-40). London: Macmillan.
- Heywood, Andrew. (2022). *Political Theory: An Introduction (4th ed.)*. New Delhi Manohar.
- Heywood, Andrew. (2022). *Key Concepts in Politics and International Relations*.
- Johari, J.C. (2009). *Principle of Modern Political Science*. Sterling Publications.
- Kapur, A.C. (2010). *Principles of Political Science*. S Chand & Co Ltd.
- McKinnon, C. (2008). *Introduction In Issues in Political Theory*. New York: Oxford University Press.
- Pant, S.C. (1998). *Political Science Theory*. Lucknow: Prakashan Kendra.
- *Political Theory: An Introduction* (pp.2-16). New Delhi: Pearson Longman.
- Ramswamy, S. (2002). *Political Theory: Ideas & Concepts*. Delhi: Macmillan.
- Sanders, D. (1995). 'Behavioral Analysis' in Marsh & G. Stoker (Eds.), *Theory and Methods in Political Science* (pp. 58-75). London: Macmillan.
- Verma, S.P. (1983). *Modern Political Theory*. New Delhi: Vikas.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment*: 50 marks
 - a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of six given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mingu Sherpa Signature:	Name: Signature:	Name: Signature:

2. Course Description

Course Code	23PLSMDC101	
Course Title	Introduction to Indian Constitution	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multidisciplinary Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2024	
Course Overview	This course: a. Covers the historical background and making of Indian Constitution. b. Explains different fundamental rights and duties in the Constitution. c. Classifies the nature and functions of the three organs of Government. d. Develops skill of group discussion and debate through academic simulation of Lok Sabha.	
Prerequisite	A general familiarity with colonial history and Indian independence movement along with basic understanding of theories of political science can be beneficial for understanding the course.	
Course Objectives	A student will be able to: i. Gain knowledge about the historical, cultural and social foundation of Indian Politics. ii. Develop a deep understanding of Fundamental Rights, Duties and Directive Principles of State Policy. iii. Learn about the functioning and significance of Political institutions such as Executive, Legislature and Judiciary. iv. Develop leadership skills including public speaking negotiations, debate and consensus building.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Recall key historical events and development in Indian Politics.	R

CO2	Explains various parts, schedules and articles under Indian Constitution.	U		
CO3	Demonstrates an understanding of the functioning of various institutions of government.	A1		
CO4	Analyze the working of different units of government to understand nature of federation.	A2		
CO5	Evaluate the strengths and weaknesses of Indian political system.	E		
CO6	Develop awareness regarding the systems and processes under Indian political system.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Background to the making of Indian Constitution and its basic features a. Brief Introduction to making of the Indian Constitution b. Preamble c. Features of Indian Constitution, d. Citizenship	09	CO1	R U A 1 A 2 E C
Unit II	Rights and Duties a. Fundamental Rights b. Fundamental Duties c. Directive Principles of State Policy	08	CO2	R U A1 A2 E C
Unit III	Legislature a. Union Parliament: Lok Sabha and Rajya Sabha b. Law making procedure c. Procedure of amendment d. State Legislatures: Composition and Functions	08	CO3	R U A1 A2 E C
Unit IV	Executive a. President b. Vice-President c. Prime Minister and Council of Ministers d. Governor e. Chief Minister	09	CO3	R U A1 A2 E C
Unit V	Judiciary a. Supreme Court	08		R U

	b. High Courts c. Writ Jurisdiction d. Subordinate Courts e. Judicial Review and Judicial activism		CO3	A1 A2 E

Learning Resources:

- Austin, G. (2010). The Constituent Assembly: Microcosm in Action. In The Indian Constitution: Cornerstone of a Nation (15th print, pp.1-25). Oxford University Press.
- Basu, D. D. (2012). Introduction to the Constitution of India. Lexis Nexis.
- Chaube, S. (2009). The Making and Working of the Indian Constitution. National Book Trust.
- Mellalli, P.K. Constitution of India, Professional Ethics, and Human Rights. SAGE.
- Bakshi, P.M. The Constitution of India.
- Hiregowder, Maheswarappa et al. (2016). The Indian Constitution: An Introduction. Orient Blackswan.
- Austin, Granville. Working a Democratic Constitution: The Indian Experience.
- Pylee, M.V. Constitutional Government in India.
- Kashyap, Subhas C. Our Constitution.
- Johari, J.C. Indian Government and Politics.
- Rao, Shiva. The Framing of India's Constitution.
- Basu, Durga Das. Shorter Constitution of India.
- Aiyer, Alladi Krishnaswami. Constitution and Fundamental Rights.
- Bakshi, P.M. (2023). *The Constitution of India (latest edition)*. LexisNexis

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i) *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii) *Summative Assessment*: 50 marks
 - a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of six given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah Signature:	Name: Signature:	Name: Signature:

3. Course Description

Course Code	24PLSSEC101	
Course Title	Laws and Legal Awareness	
Credits	03	
Total Hours	45	
Hours per Week	03	
Course Type	Skill Enhancement Course(SEC)	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2024	
Course Overview	This course: a) Gives a detail outline of judicial system and its structures in India. b) Explains various legal procedures of both civil and criminal law. c) Discusses various legal mechanisms available to Indian citizens to safeguard his/her rights.	
Prerequisite	Basic knowledge of Indian Constitution and legal system of India	
Course Objectives	The students will be able to – i. Understand various legal structures of India with emphasis on Judiciary, its structures, its role and jurisdictions. ii. Attain sufficient knowledge on various laws of our country hence to enable him/her to make use of it positively for one’s protection of individual rights as well as to prevent anyone from committing acts that aims to hamper rights equally available to others. iii. Understand various legal mechanisms available to an individual in our country to safeguard his/her rights and privileges.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Outline the judicial structure and the legal system of India	R
CO2	Explain key legal concepts under the Indian Legal System	U
CO3	Apply various civil, criminal and personal laws to address various day to day issues arising in the society.	A1&A2
CO4	Develop clear understanding on the legal mechanisms in India.	C
CO5	Evaluate legal arguments by doing case studies.	E
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit-I	Brief introduction to the Judicial system in India a) System of Courts b) Civil and Criminal Courts c) Juvenile Justice Courts d) Mahila Courts e) Lok Adalat f) Debt Recovery Tribunal g) Lokpal and Lokayukta	9	CO1	R U A E C
Unit-II	Understanding Laws applicable in India a. Laws relating to Criminal Procedure: i. FIR, ii. Arrest; rights of the prisoners iii. Bail (Bailable and Non-Bailable) iv. Cognizable and Non-Cognizable Offences v. Notice under Section 35 (1)/(2) of Bharatiya Nagarik Suraksha Sanhita b. Provisions related to search and seizure. c. Right to Information Act (RTI) d. Public Interest Litigation (PIL)	15	CO2	R U A E C
Unit-III	General Laws in India a) Crime against Women under Section 74 to 78 of Bharatiya Nyaya Sanhita (BNS) 2023. b) Protection of Women from Domestic Violence Act 2005 c) Laws relating to atrocities on Scheduled Castes/Tribes. d) Laws relating to consumer rights	18	CO3	R U A E C

	e) Laws relating to cyber crime f) Personal Laws: Divorce and Inheritance			
Unit-IV	Case Study Visit a court or a legal aid center setup by the legal service authority or an NGO or a Lok Adalat or to interview a litigant or a person being counseled	3	CO4 CO5	A C

Learning Resources

- Agarwala, S.K. (1985). *Public Interest Litigation in India*. K.M. Memorial Lecture, Second Series, Indian Law Institute, Delhi.
- Aggarwal, N. (2002). *Women and Law in India*. New Century, Delhi.
- Agnes, F. (1997). *Law and Gender Equality*. OUP.
- Bajpai, A. (2003). *Child Rights in India: Law, Policy, and Practice*. Oxford University Press, New Delhi.
- Indian Social Institute, New Delhi. *Legal Literacy Series Booklets*.
- Institute of Life Long Learning (Delhi University). (n.d.). *Legal Literacy: Available Amongst Interdisciplinary Courses on Institute of Life Long Learning (Delhi University) Virtual Learning Portal*. Retrieved from vle.du.ac.in
- Multiple Action Research Group. (n.d.). *Our Laws* (Vols. 1-10). Delhi. Available in Hindi also.
- Rao, P. C. & Sheffield, W. (2002). *Alternative Dispute Resolution: What It Is and How It Works*. Universal Law Books and Publishers, Delhi.
- Sagade, J. (1996). *Law of Maintenance: An Empirical Study*. ILS Law College, Pune.
- Sankaran, K., & Singh, U. (Ed.). (2007). *Creating Legal Awareness*. Delhi: OUP.
- Sathe, S.P. (1993). *Towards Gender Justice*. Research Centre for Women's Studies, SNDT Women's University, Bombay.
- Shukla, V.N. (2001). *V.N. Shukla's Constitution of India*. Eastern Book Co. 10th edition.
- Sing, P. (1981-82). *Access to Justice and the Indian Supreme Court*. *Delhi Law Review*, 10(1), 156.
- Wadhwa, B.L. (2003). *Public Interest Litigation: A Handbook*. University of Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment*: 50 marks
 - Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Short Questions to be answered out of six given from lower order of RBT – (20 Marks)
 - Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Sangam Ghatani Signature:	Name: Signature:	Name: Signature:

4. Course Description

Course Code	24PLSMAJ102	
Course Title	Dynamics of Political Theory	
Credits	04	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2024	
Course Overview	This course: i. Recognizes the meaning of Theory and Philosophy of Political Science. ii. Explains Political Theory and its Values. iii. Covers the role of Political Theorists.	
Course Objectives:	The students will be able to: i. Understand the concept of Political Theory and Philosophy. ii. Discuss the various concepts of Political Theory. iii. Explain the relationship between Political Theory and Philosophy. iv. Analyze various Political Theories v. Develop an understanding of Political Theorists, their theory and contribution.	
Prerequisites:	Basic knowledge of Political theory and Philosophy	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept of Political theory and Philosophy.	R
CO2	Discuss the various concepts of Political theory.	U
CO3	Explain the relationship between Political theory and Philosophy.	U&A1
CO4	Analyze the dynamics of Political Theory	A2&E
CO5	Develop and understand Political Theorists, their theories and Contribution.	C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Political Theory a. Definition, Nature and scope of Political theory. b. Relationship between Political Theory and Philosophy. c. Debate on the Decline of Political Theory	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit II	Traditions of Political Theory a) Liberal b) Socialist and Marxist c) Conservative d) Feminist	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit III	Concept of Liberty and Equality i. Concept of Liberty ii. Types of Liberty iii. Freedom as Emancipation and Development iv. Concept of Equality v. Types of Equality vi. Equality of Opportunity and Outcome	18	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit V	Indispensability of Justice a) Concept of Justice b) Procedural Justice c) Distributive Justice d) Global Justice	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit VI	The Universality of Rights; Rights and Obligations a) Concept of Rights: Meaning, Nature and Characteristics b) Types of Rights c) Three generation of Rights: Political, Civil and Communitarian d) Rights and Obligations	12	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Learning Resources:				

- Bhargava, Rajeev & Acharya, Ashok. (2008). Political Theory: An Introduction. Pearson.
- Acharya, A. (2008). Affirmative Action. In R. Bhargava & A. Acharya (Eds.), Political Theory: An Introduction (pp. 298-307). New Delhi: Pearson Longman.
- Amoah, J. (2007). The World on Her Shoulders: The Rights of the Girl-Child in the Context of Culture & Identity. Essex Human Rights Review, 4(2), 1-23.
- Bedau, H.A. (2003). Capital Punishment. In H. La Follette (Ed.), The Oxford Handbook of Practical Ethics (pp. 705-733). New York: Oxford University Press.
- Campbell, T. (2008). Human Rights. In C. McKinnon (Ed.), Issues in Political Theory (pp. 194-210). New York: Oxford University Press.
- Carter, I. (2003). Liberty. In R. Bellamy & A. Mason (Eds.), Political Concepts (pp. 4-15). Manchester: Manchester University Press.
- Casal, P., & Williams, A. (2008). Equality. In C. McKinnon (Ed.), Issues in Political Theory (pp. 149-165). New York: Oxford University Press.
- Heywood, Andrew. (1992). Political Ideologies. Basingstoke: Macmillan.
- Hyman, K. (2008). Political Authority and Obligation. In C. McKinnon (Ed.), Issues in Political Theory (pp. 9-26). New York: Oxford University Press.
- Knowles, D. (2001). Political Philosophy. London: Routledge (pp. 69-132).
- Martin, R. (2003). Political Obligation. In R. Bellamy & A. Mason (Eds.), Political Concepts (pp. 41-51). Manchester: Manchester University Press.
- McKinnon, C. (2003). Rights. In R. Bellamy & A. Mason (Eds.), Political Concepts (pp. 16-27). Manchester: Manchester University Press.
- Menlowe, M.A. (1993). Political Obligations. In R. Bellamy (Ed.), Theories and Concepts of Politics (pp. 174-194). New York: Manchester University Press.
- Menon, K. (2008). Justice. In R. Bhargava & A. Acharya (Eds.), Political Theory: An Introduction (pp. 74-86). New Delhi: Pearson Longman.
- Riley, J. (2008). Liberty. In C. McKinnon (Ed.), Issues in Political Theory (pp. 103-119). New York: Oxford University Press.
- Seglow, J. (2003). Multiculturalism. In R. Bellamy & A. Mason (Eds.), Political Concepts (pp. 156-168). Manchester: Manchester University Press.
- Sethi, A. (2008). Freedom of Speech and the Question of Censorship. In R. Bhargava & A. Acharya (Eds.), Political Theory: An Introduction (pp. 308-319). New Delhi: Pearson Longman.
- Swift, A. (2001). Political Philosophy: A Beginner's Guide for Students and Politicians. Cambridge: Polity Press (pp. 51-88, 91-132).
- Tulkdar, P.S. (2008). Rights. In R. Bhargava & A. Acharya (Eds.), Political Theory: An Introduction (pp. 88-104). New Delhi: Pearson Longman.
- Turner, R. (1993). **Anarchism:** What is it? Politics Review, 3(1), 28-32.
- Wolf, J. (2008). Social Justice. In C. McKinnon (Ed.), Issues in Political Theory (pp. 172-187). New York: Oxford University Press.
- Working Group on the Girl Child (2007). A Girl's Right to Live. Female Foeticide and Girl Infanticide, available on <http://www.crin.org/docs/Girl'sinfanticideCSW2007.txt>
- Heywood, Andrew. (2022). *Key Concepts in Politics and International Relations*. New Delhi, Manohar.
- Leopold, David & Stears, Marc (Eds.). (2008). Political Theory: Methods and Approaches. Oxford University Press.
- Farrelly, Colin. (2003). Contemporary Political Theory: A Reader. Sage

Assessment

- i) *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii) *Summative Assessment:* 50 marks
 - a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mingu Sherpa Signature:	Name: Signature:	Name: Signature:

5. Course Description

Course Code	24PLSMAJ103	
Course Title	Indian Government and Politics	
Credits	4	
Lecture hours	60	
Hours/Week	4	
Course Type	Major	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2024	
Course Overview:	This course: a) Covers the historical background and making of Indian Constitution. b) Explains different fundamental rights and duties in the Constitution. c) Classifies the nature and functions of three organs of Government. d) Discusses the federal concept and its practicality. e) Demonstrates the electoral system of the country.	
Prerequisites	A general familiarity with colonial history and Indian independence movement along with basic understanding of theories of political science can be beneficial for understanding the course.	
Course Objectives:	A student will be able to: i. Gain knowledge about the historical, cultural and social foundation of Indian Politics. ii. Develop a deep understanding of Fundamental Rights, Duties and Directive Principles of State Policy. iii. Learn about the functioning and significance of Political institutions such as Executive, Legislature and Judiciary. iv. Understand the federal structure of India and distribution of powers between centre and states. v. Understand the process of decentralization and working of local units in India. vi. Analyse the role of Political Parties and Electoral process in India	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Recall key historical events and development In Indian Politics.	R
CO2	Explains various parts, schedules and articles	U

	Under Indian Constitution.			
CO3	Demonstrate an understanding of the functioning of various institutions of government.	A1		
CO4	Analyze the working of different units of Government to understand nature of federation.	A2		
CO5	Evaluate the strengths and weaknesses of Indian political system.	E		
CO6	Develop awareness regarding the systems and processes under Indian political system.	C		
Course Content				
UNITS	CONTENT	HOURS	COs	RBT
Unit-I	Background to the making of Indian Constitution and its major features a. Constituent Assembly and the framing of the Indian Constitution b. The Preamble c. Features of Indian Constitution d. Fundamental Rights and Duties e. Directive Principles of State Policy	16	CO1 CO2	R U A1 A2 E C
Unit-II	Organs of Government Legislature: Union and States i. Two houses of Parliament: Composition and Functions, Lawmaking procedures, Amendment ii. State Legislature: Composition and functions Executive: Union and States i. President, Vice- President, Prime Minister and Council of Ministers ii. Governor, Chief Minister Judiciary: Supreme Court, High Courts, Subordinate Courts, Judicial Review and Judicial activism	18	CO3	R U A1 A2 E C
Unit III	Indian Federalism a. Nature of Indian Federalism b. Changing Scenario of Indian	08	CO4	R U A1 A2 E

	Federal Structure c. Emergency Provisions			C
Unit IV	Local Self Governments: Rural and Urban a. Panchayats In India: Evolution, Features and Functions b. Municipalities: Evolution, Features, Types and Functions	08	CO5	R U A1 A2 E C
Unit V	Election and Party System a. Election Commission: Composition and Functions b. Party System in India: Features, National and State Parties	10	CO6	R U A1 A2 E C

Learning Resources:

- Austin, G. (2010). The Constituent Assembly: Microcosm in Action. In The Indian Constitution: Cornerstone of a Nation (15th print, pp.1-25). Oxford University Press.
- Basu, D. D. (2012). Introduction to the Constitution of India. Lexis Nexis.
- Chaube, S. (2009). The Making and Working of the Indian Constitution. National Book Trust.
- Mellalli, P.K. (2015) Constitution of India, Professional Ethics and Human Rights. SAGE.
- Bakshi, P.M. (2017) The Constitution of India. Universal Law Publishing
- Austin, Granville. (2003) Working a Democratic Constitution: The Indian Experience. Oxford University Press
- Pylee, M.V. (2012) Constitutional Government in India. S. Chand
- Kashyap, Subhas C. (2021) Our Constitution. National Book Trust
- Ghosh, Peu. (2021) Indian Government and Politics. PH Learning
- Rao, B Shiva. (2021) The Framing of India's Constitution. Law and Justice Publishing Company
- Basu, Durga Das. (2021) Shorter Constitution of India. Lexis Nexis
- Aiyer, Alladi Krishnaswami. (1955) Constitution and Fundamental Rights. Srinivasa Sastri Institute of Politics.
- Noorani, A.G. (2005) Constitutional Questions and Citizens' Rights: An Omnibus Comprising Constitutional Questions in India. OUP India
- Chopra, Pran (Ed.). (2005) The Supreme Court versus the Constitution: A Challenge to Federalism. Sage Publications.
- Setalvad, M.C. (1974) Union and State Relations under the Constitution. Eastern Law House.
- Sen, D.N. (1954) From Raj to Swaraj. Vidyodaya Library.
- Brass, Paul. (2003) The Politics of India since Independence. Cambridge University Press.
- Chatterjee, Partha (Ed.). (1998) State and Politics in India. Oxford University Press.
- Chatterjee, Rakhahari (Ed.). (2002) Politics in India–State Society Interface. South Asian Publisher.

- Chandhoke, Neera, & Priyadarshini, Pravin (Eds.). (2009) Contemporary India: Economy, Society, Politics. Pearson Education India.
- Jayal, N.G. & Mehta, P. B.(Eds.). (2011) Oxford Companion to Indian Politics. Oxford University Press.
- Pylee, M.V. (2016) India's Constitution (16th ed.). S. Chand & Company
- Jones, Morris. (1987) Government and Politics in India. The Eothen Press
- Raghunandan, J.R.(2012). Decentralization and Local Governments: The Indian Experience. Orient Black Swan.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i) *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii) *Summative Assessment*: 50 marks
 - a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah Signature:	Name: Signature:	Name: Signature:

6. Course Description

Course Code	24PLSMDC102	
Course Title	International Organizations	
Credits	03	
Total Hours	45	
Hours per Week	03	
Course Type	Multidisciplinary Course (MDC)	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2024	
Course Overview	This course – a. Covers the background of United Nations. b. Discusses in detail the various organs of United Nations. c. Discusses the various programmes under United Nations. d. Discusses in brief the composition, functions and role of various regional organizations	
Prerequisite	Basic knowledge on United Nations.	
Course Objectives	The students will be able to – i. Provide a detailed explanation on the background and working of the United Nations and its organs. ii. Understand and examine the various programmes initiated by the United Nations for socio- economic development of humans across the globe. iii. Examine the functions and role of various regional organizations.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	List out the various organs of United Nations organization.	R
CO2	Discuss the functions and role of Security Council in maintaining International Peace and Security.	U
CO3	Explain the role of International Court of Justice in resolving international disputes.	U & A1
CO2	Examine the effectiveness of World Health Organization in addressing world health issues.	A2 & E

CC3	Examine the functions and role of various regional organizations.	A2
Course Content		
Units	Content	Lecture Hours COs RBT
Unit-I	United Nations Organization (UNO) a) League of Nations and the Emergence of UNO b) A brief overview of various organs of UNO c) Relevance of UNO in a post cold war era	14 CO1 R U A1 A2 E C
Unit-II	General Assembly and Security Council a) Composition and Functions b) Role of Security Council in maintaining International Peace and Security. c) UN Peace Keeping missions	12 CO1 R U A1 A2 E
Unit-III	International Court of Justice (ICJ) a) Evolution of ICJ b) Composition and Functions c) Effectiveness of ICJ in resolving international disputes	9 CO1 R U A1 A2 E C
Unit-IV	Programmes under UNO a) UNESCO b) UNDP c) UNICEF d) WHO	4 CO1 CO2 R U A1 A2 E C
Unit-V	Regional Organizations a) SAARC b) ASEAN c) European Union d) African Union	6 CO3 R U A1 A2 E C

	e) BRICS			
Learning Resources: - Basu, R. (2008). <i>The United Nations: Structure and Functions of an International Organization</i>. Sterling Publishers Private Limited. - Moore, J. A., & Pubantz, J. (2017). <i>The New United Nations: International Organization in the Twenty-First Century</i> (2nd Edition). Routledge. - Taylor, P., & Groom, A. J. R. (2000). <i>The United Nations at the Millennium: The Principal Organs</i>. Bloomsbury Publishing. - Garcis, S.B., & Varwick, J. (2005). <i>The United Nations: An Introduction</i>. Palgrave Macmillan - Thakur, R. (1998). <i>Past Imperfect, Future Uncertain: The UN at Fifty</i>. Palgrave Macmillan - Mackenzie, David. (2010). <i>A World Beyond Borders: An Introduction to the History of International Organizations</i>. University of Toronto Press. - Hanhimaki, J.M. (2015). <i>The United Nations: A Very Short Introduction</i>. Oxford University Press.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

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- ii) *Summative Assessment*: 50 marks
- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Sangam Ghatani Signature:	Name: Signature:	Name: Signature:

7. Course Description

Course Code	24PLSSEC101	
Course Title	Laws and Legal Awareness	
Credits	03	
Total Hours	45	
Hours per Week	03	
Course Type	Skill Enhancement Course(SEC)	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2024	
Course Overview	This course: d) Gives a detail outline of judicial system and its structures in India. e) Explains various legal procedures of both civil and criminal law. f) Discusses various legal mechanisms available to Indian citizens to safeguard his/her rights.	
Prerequisite	Basic knowledge of Indian Constitution and legal system of India	
Course Objectives	The students will be able to – iv. Understand various legal structures of India with emphasis on Judiciary, its structures, its role and jurisdictions. v. Attain sufficient knowledge on various laws of our country hence to enable him/her to make use of it positively for one’s protection of individual rights as well as to prevent anyone from committing acts that aims to hamper rights equally available to others. vi. Understand various legal mechanisms available to an individual in our country to safeguard his/her rights and privileges.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Outline the judicial structure and the legal system of India	R
CO2	Explain key legal concepts under the Indian Legal System	U
CO3	Apply various civil, criminal and personal laws to address various day to day issues arising in the society.	A1&A2
CO4	Develop clear understanding on the legal mechanisms in India.	C
CO5	Evaluate legal arguments by doing case studies.	E

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit-I	Brief introduction to the Judicial system in India - System of Courts - Civil and Criminal Courts - Juvenile Justice Courts - Mahila Courts - Lok Adalat - Debt Recovery Tribunal - Lokpal and Lokayukta	9	CO1	R U A E C
Unit-II	Understanding Laws applicable in India - Laws relating to Criminal Procedure: - FIR, - Arrest; rights of the prisoners - Bail (Bailable and Non- Bailable) - Cognizable and Non-Cognizable Offences - Notice under Section 35 (1)/(2) under (Bharatiya Nagarik Suraksha Sanhita) - Provisions related to search and seizure. - Right to Information Act (RTI) - Public Interest Litigation (PIL)	15	CO2	R U A E C
Unit-III	General Laws in India - Crime against Women under Section 74 to 78 of Bharatiya Nyaya Sanhita (BNS) 2023. - Protection of Women from Domestic Violence Act 2005 - Laws relating to atrocities on Scheduled Castes/Tribes. - Laws relating to consumer rights	18	CO3	R U A E C

	e. Laws relating to cyber crime f. Personal Laws: Divorce and Inheritance			
Unit-IV	Case Study Visit a court or a legal aid center setup by the legal service authority or an NGO or a Lok Adalat or to interview a litigant or a person being counseled	3	CO4 CO5	A C
Learning Resources • Agarwala, S.K. (1985). <i>Public Interest Litigation in India</i>. K.M. Memorial Lecture, Second Series, Indian Law Institute, Delhi. • Aggarwal, N.(2002). <i>Women and Law in India</i>. New Century, Delhi. • Agnes, F. (1997). <i>Law and Gender Equality</i>. OUP. • Bajpai, A.(2003). <i>Child Rights in India: Law, Policy, and Practice</i>. Oxford University Press, New Delhi. • Indian Social Institute, New Delhi. <i>Legal Literacy Series Booklets</i>. • Institute of Life Long Learning (Delhi University). (n.d.). <i>Legal Literacy: Available Amongst Interdisciplinary Courses on Institute of Life Long Learning (Delhi University) Virtual Learning Portal</i>. Retrieved from vle.du.ac.in • Multiple Action Research Group. (n.d.). <i>Our Laws</i> (Vols.1-10). Delhi. Available in Hindi also. • Rao, P. C. & Sheffield, W.(2002). <i>Alternative Dispute Resolution: What It Is and How It Works</i>. Universal Law Books and Publishers, Delhi. • Sagade, J. (1996). <i>Law of Maintenance: An Empirical Study</i>. ILS Law College, Pune. • Sankaran, K., & Singh, U. (Ed.).(2007). <i>Creating Legal Awareness</i>. Delhi: OUP. • Sathe, S.P. (1993). <i>Towards Gender Justice</i>. Research Centre for Women's Studies, SNDT Women's University, Bombay. • Shukla, V.N. (2001). <i>V.N. Shukla's Constitution of India</i>. Eastern Book Co. 10th edition. • Sing, P. (1981-82). <i>Access to Justice and the Indian Supreme Court</i>. <i>Delhi Law Review</i>, 10(1), 156. • Wadhera, B.L. (2003). <i>Public Interest Litigation: A Handbook</i>. University of Delhi.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- j) *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- iii) *Summative Assessment*: 50 marks
 - d) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - e) Four Short Questions to be answered out of six given from lower order of RBT – (20 Marks)

- f) Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Sangam Ghatani Signature:	Name: Signature:	Name: Signature:



Salesian College
(Autonomous)
Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts in Political Science

Department of Political Science

Curriculum Document
2023 – 2024

Vision

The department promotes the study of the principles of social justice, secularism, democratic way of life and focuses on the different approaches to the problems of society encouraging an interdisciplinary epistemology.

Mission

The department of Political Science caters to create responsible, knowledgeable and morally upright citizens in our Country.

1. Programme Overview

Bachelor of Arts in Political Science is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Relate his/her understanding on the significance of theorizing and of applying theory into practice.
	PO02: Develop knowledge of theories, concepts, and research methods in humanities and social science.
	PO03: Gain awareness about how global, national and regional developments affect society.
	PO04: Grasp information related to the structure and functions of various units of government.
Skills	PO05: Construct multiple frames by which the idea of political community is debated.
	PO06: Students will develop and be able to demonstrate skills in analytical and critical thinking.
	PO07: Demonstrate an understanding of fundamental political process, institutions, actors, behaviours, ideas and familiarity with major theories, methods and concepts of Political Science.
	PO08: Comprehend the basic structure and process of government system/ theoretical underpinning.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical framework of Political Science.
	PO10: Exhibit in critical analysis, effectively evaluating and synthesizing complex political information and arguments.
	PO11: Propose innovative solutions to contemporary political challenges, drawing on evidence-based analysis.

3. Programme Specific Objectives& Outcomes (PSOs)

Knowledge	PSO1: A student develops knowledge about various traditions and approaches of political theory and appreciates how they get reflected in organizing social living.
	PSO2:A student develops knowledge about basic of Political Philosophy and also develops knowledge about the importance of different schools of philosophy in the field of Political Science
	PSO3: A student develops knowledge about major political theories, including classical and contemporary perspectives.
	PSO4: A student gathers proficiency in defining and explaining key political concepts, such as justice, power, democracy, and authority.
	PSO5: A Student develops a deep understanding of foundational public administration theories and concepts, including public management principles, bureaucracy, and public policy.
	PSO6: A student develops knowledge about the dynamic role of public administration in the functioning of government and its impact on society.
	PSO7: A student develops knowledge about the origin and nature of political theory and the ways political theoretical thinking can enhance our capacities for critical reflection and democratic citizenship.
Skills	PSO1: Students will critically analyze and evaluate political texts, arguments, and policies.
	PSO2: Students will demonstrate knowledge of fundamental political ideologies, such as liberalism, conservatism, socialism, feminism, and environmentalism.
	PSO3: Students will be able to analyze the historical evolution of political ideologies and their impact on political thought.
	PSO4: Students will conduct political theory research proficiently, including literature reviews and data analysis.
	PSO5: Students will develop skills in using research methodologies relevant to political theory.
	PSO6: Students will communicate their political theories and arguments effectively in written and oral form.
	PSO7: Students will identify logical fallacies and biases in political discourse.
Competence	PSO1: Students will exhibit ethical behaviour and adhere to professional standards in legal practice.

	PSO2: Students will be able to analyze what are social movements and make a distinction between the old and new social movements.
	PSO3: Students will analyze global political issues and engage in discussions on global governance.
	PSO4: The student will be able to appreciate the centrality and importance of ‘politics’ concepts and institutions in the more ordinary and everyday aspects of our lives – the politics and policies that determine how we interact at work and in our more private worlds with family and friends, as well as in the public sphere.
	PSO5: Students will exhibit leadership skills in advocating for political change or promoting political awareness.
	PSO6: Students will demonstrate competence in ethical analysis and reasoning within the political context.
	PSO7: Students will apply legal reasoning to analyze complex legal dilemmas and propose solutions.

4. Programme Matrix

Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Honours	Total Marks
III	23POSMAJ201	Major	Western Political Thought - I	4	4+0+0	60	100
	23POSMAJ202	Major	Comparative Government and Politics	4	4+0+0	60	100
	23POSMIN201	Minor	Human Rights	4	4+0+0	60	100
	23POSMD201	MDC	International Relations: Concepts in IR	3	3+0+0	45	75
	23GEOVAC101	AECC	Environmental Education	2	2+0+0	30	50
	23POSSEC201	SEC	Human Resource Management	3	2+0+1	45	75
	23SCSVED103	VAC	Value Education	1	1+0+0	15	25
	23POSVAC201	VAC	Political Debates III	1	0+0+1	15	25
	Total			22			
IV	23POSMAJ 203	Major	Western Political Thought - II	4	4+0+0	60	100
	23POSMAJ204	Major	Political Sociology	4	4+0+0	60	100
	23POSMAJ205	Major	Introduction to International Relations	4	4+0+0	60	100
	23POSMIN201	Minor	Human Rights	4	4+0+0	60	100
	23GEOVAC102	AECC	Environmental Studies	2	2+0+0	30	50
	23SCSVED104	VAC	Value Education	1	1+0+0	15	25
	23POSVAC202	VAC	Political Debates IV	1	0+0+1	15	25
	Total			20			

1. Course Description

Course Code	23POSMAJ201	
Course Title	Western Political Thought - I	
Credits	04	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course: a) Recognizes the contribution of Philosophy in shaping the political landscape of the Western world. b) Explains the Statecraft, Virtues, Justice, and Sovereignty. c) Covers the role of Philosophers in shaping the western political thought.	
Prerequisite	Basic knowledge of political concepts such as Rights, Justice, liberty and equality.	
Course Objectives	A student will be able to: a) Understand the historical development of Western political thought. b) Discuss key concepts and theories central to Western political philosophy. c) Explain the intersections between political theory and thought. d) Analyze the contributions of major political thinkers and their impact on Western political discourse. e) Develop critical thinking skills through engagement with primary texts, scholarly analysis, and class discussions.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define various concepts as propounded by political philosophers.	R
CO2	Discuss the different philosophical trends in western political thought.	U

CO3	Explain the relationship between Political theory, thought and philosophy.	U&A1		
CO4	Analyze the ethical dimensions of political thought addressing questions of justice, rights and the role of the state in promoting the common good.	A2 & E		
CO5	Develop an understanding of Political Theorists, their theories and Contribution.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	PLATO (i) Ideal State & Theory of Justice (ii) Philosopher King (iii) Communism of Wives and Property (iv) Education	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit II	ARISTOTLE (i) Classification of Constitution (ii) Theory of Revolution	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit III	MACHIAVELLI (i) On Politics and State Craft (ii) Views on ends and means	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit IV	JEAN BODIN (i) Views on State (ii) Theory of Sovereignty	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit V	THE CONTRACTARIAN TRADITIONS: (i) Hobbes: Theory of Sovereignty (ii) Locke: Social Contract and Theory of Government (iii) Rousseau: Social Contract and General Will	20	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Learning Resources:

- Mukherjee, Subrata and Ramaswamy, Sushila. (2017). A History of Political Thought. Plato to Marx. PHI Learning Private limited.
- Barker, E. (1960). Social Contract: Locke, Hume Rousseau. London: Oxford University Press.
- Barker, E. (1970). Greek Political Theory: Plato and his Predecessors. London: Methuen & Co.
- Butterfield, M. (1956). The State Craft of Machiavelli. New York: The Macmillan Company.
- Colleti, L. (1969). From Rousseau to Lenin. New Delhi: Oxford University Press.
- Dunn, J. (1968). The Political Thought of John Locke – An Historical Account of the Argument of the Two Treatises of Government. Cambridge: Cambridge University Press.
- Hacker, A. (1961). Political Theory: Philosophy, Ideology, Science. New York: Macmillan.
- Political Theory. New Delhi: Oxford and IBH.
- Shepard, M. A. (n.d.). Sovereignty at the Crossroads: A Study of Bodin. Political Science Quarterly, 45, 580-603.
- Vaughan, C. E. (1962). The Political Writings of Jean Jacques Rousseau (2 Vols.). New York: John Wiley.
- Warrender, H. (1957). The Political Philosophy of Hobbes: His Theory of Obligation. Oxford: Clarendon Press.
- Wayper, C. L. (1977). Political Thought. Bombay: B.I. Publications.
- Plato. (1908). The Republic. Translated by Jowett, Benjamin. Third Edition. Oxford. Clarendon Press.
- Aristotle. (1981). Politics. Translated by Jowett, Benjamin. Penguin Classics.
- Machiavelli, Niccolo. (1903). The Prince. Translated by Ricci, Luigi. London Grand Richards.
- Hobbes, Thomas. (1904). Leviathan. Edited by Waller, A.R. Cambridge University Press.
- Locke, John. (1884). Two Treatises on Civil Government: Preceded by Sir Robert Filmer. London. George Routledge and Sons.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i. *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. *Summative Assessment*: 50 marks
 - a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of six given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT – (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mingu Sherpa Signature:	Name: Signature:	Name: Signature:

2. Course Description

Course Code	23POSMAJ202	
Course Title	Comparative Government and Politics	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course: a) Outlines the significance of the term ‘Comparative Politics’ in its broadest socio-political connotations. b) Explains the meaning, nature and scope of the term ‘Comparative Politics’. c) Discusses the various approaches to the study of Political System. d) Covers the functioning of different political systems in comparative manner and their major governing principles.	
Prerequisite	Basic understanding of different political system.	
Course Objectives	A student will be able to: i. Explain the basic concepts of ‘Comparative Politics’ ii. Understand the various traditions and approaches of ‘Comparative Politics’ and appreciate how they get reflected in contemporary scenario. iii. Understand the working of various forms of governments and their differences. iv. Analyze the significance of comparative studies of different Political System. v. Discuss the historical context of modern governments & classify the different political system.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Explain the meaning, nature & scope of comparative politics.	R & A1
CO2	Analyse different approaches to the study of Comparative Politics.	U & A2
CO3	Develop a comparative idea of various political systems.	R & U, A1 & A2

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction - Meaning, Nature and Scope of Comparative Politics - Evolution of Comparative Politics	8	CO1	R U A1 A2 E
Unit II	Approaches to the study of Comparative Politics Traditional approaches: - Institutional - Philosophical - Historical Modern approaches: - Systems approach, - Structural – functional, - Neo – Institutional - Marxist	10	CO2	R U A1 A2 E
Unit III	Forms of Government and Major Governing Principles: - Classification of Government (Unitary and Federal, Parliamentary and Presidential) - Major Governing principles: - Constitutionalism - Parliamentary Sovereignty - Separation of powers - Democratic Centralism - Referendum and Initiative.	15	CO3	R U A1 A2 E
Unit IV	Comparative Studies of different Political System: - Comparative Studies of Legislature, Executive and Judiciary: UK, USA and France - Federalism: Canada and USA	15	CO3	R U A1 A2 E

Unit V	Other major Government and their systems a) People's Republic of China (PRC) i. Communist Party: structure, functions, Role ii. The National Government: The Executive, The Legislature & Judiciary b) Party System: UK, PRC c) Russia: Legislature, Executive, Judiciary	12	CO3	R U A1 A2 E

Learning Resources:

- Mukherjee, Subrata and Ramaswamy, Sushila. (2017). Theoretical Foundations of Comparative Politics. Orient Blackswan.
- Almond, Gabriel. Powell, G Bingham and Strom, Kaare. (2003). Comparative Politics Today: A World View. Pearson.
- Chatterjee, Rakhahari. (2014). Introduction to Comparative Political Analysis. Sarat Book House.
- Bhattacharya, D.C. (2007). Modern Political Constitutions. Vijaya Publishing House. Kolkata.
- Ray, S. N. (1998). Modern Comparative Politics: Approaches, Methods and Issues. Prentice Hall India learning Private Limited.
- Munck, Gerardo L. (2006). The Past Present of Comparative Politics. The Hellen Kellogg Institute for International Studies.
- Roberts, Geoffrey. (1986). An Introduction to Comparative Politics. Hodder Arnold.
- Peters, Guy. (1998). Comparative Politics: Theory and Methods. New York University Press.
- Blondel, Jean. (2013). Comparative Government: An Introduction. Routledge.
- Kopstein, J and Lichbach, M. (eds). (2005) Comparative Politics: Interests, Identities, and Institutions in a Changing Global Order. Cambridge: Cambridge University Press, pp.1-5; 16-36; 253-290.
- Blondel, J. (1996). 'Then and Now: Comparative Politics', in Political Studies. Vol.47 (1), pp.
- Chandhoke, N. (1996). 'Limits of Comparative Political Analysis', in Economic and Political Weekly, Vol.31(4), January 27, pp. PE 2-PE2-PE8
- Barrington, Lowell. (2011). Comparative Politics: Structures & Choices. Cengage Learning Custom Publishing.
- Grant, M. (2009). 'United Kingdom Parliamentary System' in the UK Parliament.
- McCormick, J. (2007). Comparative Politics in Transition.
- Kesselman, M. Krieger, J and William. (2010). Introduction to Comparative Politics: Political Challenges and Changing Agendas.
- Rutland, P. (2007). 'Britain' in Kopstein, J and Lichbach, M (eds.) Comparative Politics: Interest, Identities and Institutions in a Changing Global Order.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i) *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii) *Summative Assessment*: 50 marks
- a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of six given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT – (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jyoti Gupta Signature:	Name: Signature:	Name: Signature:

3. Course Description

Course Code	23POSMIN201	
Course Title	Human Rights	
Credits	04	
Total Hours	60	
Hours per Week	04	
Course Type	Minor Course	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course – a. Covers the historical background of Human Rights. b. Explains the evolution of Human Rights. c. Discusses the multiple concepts and issues on different forms of rights. d. Develops skill of critical thinking and awareness on basic rights of human in society.	
Prerequisite	Basic knowledge on Rights and Duties.	
Course Objectives	The students will be able to – i. Understand the concept of Human Rights. ii. Discuss different types of Human Rights. iii. Explain the role of conventions in the development of Human Rights. iv. Analyze the debates on rights and duties. v. Develop the skill of critical thinking and awareness on basic rights of human in society.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept of Human Rights.	R
CO2	Discuss the different types of Human Rights	U
CO3	Explain the role of conventions in the development of Human Rights.	U & A1

CO4	Analyze and evaluate the debates on rights and duties.	A2 & E		
CC05	Develop the skill of critical thinking and awareness on basic rights of human in society.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit-I	Understanding Human Rights a) Historical and Conceptual background of Human Rights b) Difference between Civil, Democratic and Human Rights c) Theories of Right.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-II	Human Rights and Duties a) Correlation of Rights and Duties/Responsibilities.. b) Importance of Human Rights and Duties.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-III	International Human Rights a) Bill of International Rights b) Universal Declaration of Human Rights. c) African Charter of Human Rights/European Charter of Human Rights/Asian Charter of Human Rights. (Any two) d) International Convention on Civil, Political, Economic and Cultural Rights.	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-IV	Human Rights in India a) Constitution of India and Human Rights. b) Institutions/Commissions of Human Rights in India c) Labour Legislation in India	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Unit-V	Human Rights for disadvantaged sections in India a) Scheduled Castes, Scheduled Tribes and Other Backward Classes. b) Women and Children's Rights. c) Differently abled and Elderly people d) Human Rights in India: Issues and Challenges (Illiteracy, Poverty, Unemployment)	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Learning Resources • Cranston, M. (1973). <i>What are Human Rights?</i>. London: The Bodley Head. • Hoffman, J., & Graham, P. (2006). Human Rights. In <i>Introduction to Political Theory</i> (pp. 436-458). Delhi: Pearson. • Kannabiran, K. G. (2004). <i>The Wage of Impunity</i>. Orient Longman. • Nirmal, C. J. (Ed.). (2004). <i>Human Rights in India: Historical, Social and Political Perspectives</i>. OIP, Delhi. • O'Byrne, D. J. (2008). <i>Human Rights: An Introduction</i>. New Delhi: Pearson Education in South Asia. • SAHRDC. (2006). <i>Introduction to Human Rights; Classification of Human Rights: An Overview of the First, Second, and Third Generational Rights</i>. In <i>Introducing Human Rights</i>. New Delhi: Oxford University Press. • Freeman, Michael. (2022). <i>Human Rights</i>. Fourth Edition. Polity Press.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i) *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii) *Summative Assessment*: 50 marks
 - a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of six given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah Signature:	Name: Signature:	Name: Signature:

4. Course Description

Course Code	23POSMDC201	
Course Title	International Relations: Concepts in IR	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multidisciplinary	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course: 1. Defines the meaning, evolution and scope of IR. 2. Examines the various theoretical traditions to better understand, explain and analyze the working of International Relations. 3. Analyzes major concepts and issues relevant in IR such as National Power, National interest, Balance of Power, globalization, international terrorism, environment etc, all of which have a tremendous influence in shaping the International system.	
Prerequisite	Basic Knowledge of International affairs.	
Course Objectives	A student will be able to: 1. Understand the meaning, evolution and scope of IR through various theoretical perspectives and how it shapes working of nation states. 2. Examine major concepts of IR such as National Power, National Interest etc 3. Analyze the major issues that shape International relations such as globalization, international terrorism, environment etc	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Discuss the growth of IR as an academic	R

	discipline			
CO2	Critically evaluate the various theoretical traditions of International Relations.	U		
CO3	Explain the concept of Balance of Power	R		
CO4	Analyze the impact of Cold War on Global Politics.	R & A1		
CO5	Examine the impact of Globalisation on International Relations.	A1 & A2		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Meaning and Development of International Relations (IR) a) Meaning, Nature and Scope of International Relations b) Evolution of IR as an academic discipline	5	CO1	R U A1 A2 E C
Unit II	Basic Concepts of IR a) Nation -State b) Non - State Actors c) Sovereignty d) National Interest : Determinants e) Power and National Power: Determinants	6	CO1 CO3	R U A1 A2 E C
Unit III	Basic Theories of IR a) Liberalism b) Realism	19	CO1 CO2 CO5	R U A1 A2 E C
Unit IV	A brief outline of Cold War and the New World Order	3	CO4	R U A1 A2 E C
Unit V	Contemporary Issues in International Relations a) Globalisation and its impact b) Nuclear Proliferation and Disarmament: NPT, CTBT, FMCT, MTCR c) Terrorism d) Environment e) Gender	12	CO1 CO2 CO5	R U A1 A2 E C

Learning Resources:

- Jackson, Robert and Sorensen, Georg. (2013). Introduction to International Relations. Theories and Approaches. Fifth Edition. Oxford University Press.
- Baylish, John. Smith, Steve and Owens, Patricia. (2020). The Globalization of World Politics. An Introduction to International Relations. Eighth Edition. Oxford University Press.
- Sutch, Peter and Elias, Juanita. (2007). International Relations. The Basics. Routledge. Taylor and Francis Group.
- Burchill, Scott. Linklater, Andrew. Devetak, Richard. Donnelly, Jack. Paterson, Matthew. Reus-Smit, Christian and True, Jacqui. (2005). Theories of International Relations. Third Edition. Palgrave Macmillan.
- W. Mansbach, Richard and L. Taylor, Kirsten. (2018). Introduction to Global Politics. Third Edition. Routledge. Taylor and Francis Group.
- Heywood, Andrew. (2011). Global Politics. Palgrave Macmillan.
- Chatterjee, Aneek. (2010). International Relations Today. Concepts and Applications. Pearson Education.
- W. Thompson, Kenneth. (1952). The Study of International Politics: A Survey of Trends and Developments. The Review of Politics, Vol.14, pp.433-467. Cambridge University Press.
- W. Thompson, Kenneth. (1977). Idealism and Realism: Beyond the Great Debate. British Journal of International Studies. Vol.3. Cambridge University Press.
- David Singer, J. (1961). The Level of Analysis Problem in International Relations. World Politics. Vol.14. No.1. The International System: Theoretical Essays. pp. 77-92. Cambridge University Press.
- Griffiths, Martin and Callaghan, Terry O'. (2002). International Relations: Key Concepts. Routledge.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i) *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii) *Summative Assessment:* 50 marks
 - a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Sangam Ghatani Signature:	Name: Signature:	Name: Signature:

5. Course Description

Course Code	23POSSEC201
Course Title	Human Resource and Management
Credits	03
Lecture hours	45
Hours/Week	03
Course Type	Skill Enhancement Course (SEC)
Semester	III
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Political Science
Regulation	2023
Course Overview:	This course: a) Defines and explains the key concepts and functions of Human Resource Management (HRM). b) Explains the strategic role of HRM in achieving organizational goals. c) Demonstrates proficiency in recruitment and selection processes. d) Understands the mathematical models used in game theory and their application to strategic decision making. e) Examines the strategic role of HRD in achieving organizational objectives.
Prerequisites	A general familiarity with administrative theories and management theories can be beneficial for understanding the course.
Course Objectives:	The students will be able to – i. Define and explain the role of HRM within an organization. ii. Learn the process of recruitment and selection including job analysis, sourcing, screening and interview. iii. Understand effective communication within the workplace. iv. Analyze and model decision-making in competitive situations where the outcome for each participant depends not only on their own actions but also on the actions of others. v. Explain the key concepts, theories, and frameworks related to Human Resource Development.

Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Articulate the strategic role of Human Resource Management in achieving organizational goals and competitive advantages.	R		
CO2	Learn the basics of acquiring Human resource.	U		
CO3	Analyze the basics of establishing effective communication for better HRM.	A1		
CO4	Understand the models of game theory and their application in strategic decision making.	A2		
CO5	Evaluate the effectiveness of HRD programs using various metrics and assessment tools.	E		
UNITS	CONTENT	HOURS	COs	Revised Bloom's Taxonomy
Unit-I	Introduction to Human Resource Management (HRM) 1) Meaning, Nature and Importance of HRM 2) Evolution of HRM, Difference between HRM and Personnel Management 3) HR Policy and Environment in India	10	CO1 CO2	R U A1 A2 E C
Unit-II	Acquiring of Human Resources 1) Human Resource Planning: Concept, Importance and Process 2) Recruitment and Selection: Concept, Process and Sources 3) Placement and Induction	10	CO3	R U A1 A2 E C
Unit III	Human Resource Development (HRD) 1) HRD: Concept, scope and importance 2) Learning Theories: Individual and Group, Self-directed learning and Behaviour Modeling 3) Training: On-the-job & Off-the-job	15	CO4	R U A1 A2 E C

	training, Simulation, Vestibule Training 4) Industrial Relations and Labour Laws			
Unit IV	Communication & Feedback 1) Definition, Process of communication (Personal and Interpersonal) 2) Formal & Informal communication, rumour & grapevine. 3) Effective Communication: Challenges & Solutions	15	CO5	R U A1 A2 E C
Unit V	Case Study A Case study on the process of recruitment, training and placement of various personnel at Union/State level/Local level	10	CO6	R U A1 A2 E C

Learning Resources:

- Venkata Raman, C.S & Srivastava, B.K. (1991). Personnel Management and Human Resource Management. Tata Mc Grawhill Publishing Co. Delhi.
- Decenzo, David. A and P. Robbins, Stephen. (1997). Personnel and Human Resource Management. Printice Hall India. New Delhi.
- Monappa, Arun. (2015). Managing Human Resource. Trinity Press. Laxmi Publications.
- Arya, P.P and Tandon, B.B. (1995). Human Resource Development. Deep and Deep Publications. New Delhi.
- D.Fisher, Cynthia, Schoenfeldt, Lyle F. and Shaw, James B. Shah. (1999). Human Resource Management. Dreamtech Press.
- Singh, N.K. (1999). Human Resource Management. Excel Books. New Delhi.
- Prasad, Lallan and Banerjee, A.M. (1994). Management of Human Resource. Sterling Publishers. New Delhi.
- Mamoria, C.B and Gankar, S.V. (2011). Personal Management. Himalaya Publishing House.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

i) *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College

ii) *Summative Assessment:* 50 marks

- a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
- b) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
- c) Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah Signature:	Name: Signature:	Name: Signature:

6. Course Description

Course Code	23POSMAJ203	
Course Title	Western Political Thought - II	
Credits	04	
Lecture hours	60	
Hours per Week	4	
Course Type	Major	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed		
Issue(s) Addressed	Political Science	
Regulation	2023	
Course Overview:	This course: a) Recognizes the contribution of modern philosophy in shaping the political landscape of the Western world. b) Explains the Statecraft, Virtues, Justice, and Sovereignty. c) Covers the role of Philosophers in shaping the modern western political thought.	
Prerequisites:	Basic knowledge on Political theory and Philosophy	
Course Objectives:	The students will be able to: a) Understand the historical development of modern Western political thought. b) Discuss modern concepts and theories central to Western political philosophy. c) Explain the intersections between political theory and thought. d) Analyze the contributions of modern political thinkers and their impact on Western political discourse. e) Develop critical thinking skills through engagement with primary texts, scholarly analysis, and class discussions.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define various concepts as propounded by modern political philosophers.	R
CO2	Discuss the different philosophical trends in western political thought.	U
CO3	Explain the relationship between Political theory, thought and philosophy.	U&A1
CO4	Analyze the ethical dimensions of political thought addressing questions of justice,	A2 & E

	rights and the role of the state in promoting the common good.			
CO5	Develop an understanding of modern Political Theorists, their theories and Contribution.	C		
Course Content				
UNITS	CONTENT	HOURS	COs	Revised Bloom's Taxonomy
Unit-I	IMMANUEL KANT : (i) Political Ideas, (ii) Philosophy of History (iii) Notion of Perpetual Peace and Cosmopolitanism	12	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-II	JEREMY BENTHAM AND J.S. MILL (i) Bentham: Theory of Utilitarianism (ii) J.S. Mill: Views on Liberty	12	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-III	HEGEL i) Dialectics ii) Idea of State	14	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-IV	KARL MARX (i) Historical and Dialectical Materialism (ii) Theory of Surplus Value (iii) Classless and stateless society	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-V	EDMUND BURKE: (i) Critique of French Revolution, (ii) Political Ideas.	12	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C

Learning Sources:

- Mukherjee, Subrata and Ramaswamy, Sushila. (2017). A History of Political Thought. Plato to Marx. PHI Learning Private limited.
- Jha, Shefali. 2010. Western Political Thought: From Plato to Marx. New Delhi: Pearson Education India.
- Sabine, George H. and Thorsan, Thomas L. (2019). A History of Political Theory. Fourth Edition. Oxford University Press.
- Das, P.G. (2011). History of Political Thought. Fourth Edition. New Central Book Agency.
- Guaba, O.P. (2017). Western Political Thought.
- Getell, Raymond G. (2021). History of Political Thought. Routledge.
- Parekh, Bhikhu (ed.) 1993. Jeremy Bentham: Critical Assessments. London: Routledge.
- Todor, Jones. 2002. Political Thinkers and Ideas: A Historical Introduction. New York: Routledge Publication.
- Mukhopadhyay, Amal Kumar. (2020). Western Political Thought: From Ancient Greeks to Modern Political Scientists. Sage Publications.
- Strauss, Leo and Joseph Cropsey. 1987. A History of Political Philosophy. Chicago: University of Chicago Press.
- McClelland, J.S. (1998). A History of Western Political Thought. London: Routledge.
- Coleman, Janet. 2000. A History of Political Thought. New Delhi: Wiley-Blackwell.
- Marx, Karl and Friedrich Engels. 2011. Communist Manifesto. New Delhi: Penguin Classics.
- Stark, Warner. 2004. Jeremy Bentham's Economic Writings: Critical Edition. London: Francis and Taylor.
- Singer, Peter. 2000. Marx: A Very Short Introduction. Oxford: Oxford University Press.
- Bell, D. (2001). Communitarianism.
- Alejandro, R. (1993). Rawls's Communitarianism. *Canadian journal of philosophy*, 23(1), 75-99.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment:* 50 marks
 - Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mingu Sherpa Signature:	Name: Signature:	Name: Signature:

7. Course Description

Course Code	23POSMAJ204
Course Title	Political Sociology
Credits	4
Total Hours	60
Hours per Week	4
Course Type	Major
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Political Science
Regulation	2023
Course Overview	This course: a) Defines Political sociology and its various concepts applicable in day to day life. b) Develops a critical understanding of logical flaws and gaps in the society. c) Explores the modes of knowledge-construction of Indian history, society, Culture and politics. d) Analyse the relationship between state and society in shaping politics. e) Discusses multiple voices within a society, with relation to the State.
Prerequisite	A basic understanding of Political concepts and societal issues.
Course Objectives	A Student will be able to: i) Understand political sociology as a substantial sub-discipline of political science. ii) Develop a critical understanding of political issues that exists in the society. iii) Explain the roles of institutions and actors in Indian democracy.

	iv) Analyse the changing perspective within the democratic discourse, and understand certain historical paradoxes and difficulties in understanding Indian society, and society in general.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define the concept of political sociology..	R		
CO2	Discuss the relationship between society and state.	U		
CO3	Examine various sociologists, their theories and contribution.	A1		
CO4	Analyse and evaluate the debates of various political issues and developments.	A2		
CO5	Develop critical thinking and awareness on the basic understanding of Indian society and politics.	E		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Political Sociology a. Political sociology as a sub-discipline. b. Historical background and its development. c. Nature and changing perspectives	10	CO1	R U A1 A2 E C
Unit II	Sociology of Power a. Karl Marx; Class antagonism b. Max Weber; Authority and Bureaucracy c. Elitist Theory: C. Wright Mills d. Michel Foucault: Power as knowledge	15	CO2	R U A1 A2 E C
Unit III	Social Stratification a. Concept of class	15	CO3 CO4	R U A1 A2

	b. Elitism in the society c. Caste in India: Social & Political Dynamics			E C
Unit IV	Political Culture, Political Socialisation and Civil Society a. Political Culture: Meaning, Types and Agents. b. Political Socialization: Meaning and Agents c. Political participation and Political Non - participation d. Civil Society	10	CO4 CO5	R U A1 A2 E C
Unit V	Political Development a. Concepts and theories. b. Modernisation and social change. c. Political communication.	10	CO6	R U A1 A2 E C

Learning Resources:

- Bottomore, T. (1993) Political sociology. Second edition. Pluto Press.
- Nash, K. (1999). Contemporary Political sociology. Second edition. Blackwell Publishers Ltd.
- Sharma, N. L and Ashraf, Ali. (1983). Political Sociology. Universities Press.
- Mukhopadhyay, Amal Kumar. (1977). Political Sociology: An Introductory Analysis. K.P Bagchi.
- Chakraborty, Satyabrata. (2022). Political Sociology. Laxmi Publications
- Mills C. Wright. (1999). The Power Elite. Oxford University Press.
- Marx, Karl. (2008). Communist Manifesto. Reissue edition. Oxford University Press.
- Miliband, Ralph. (1973). The State in capitalist society. Quartet Books Ltd.
- Rabinow, Paul. (1984). The Foucault Reader. Pantheon Books. New York
- Joseph, Rouse. (2005). Power/Knowledge. Gutting, Gary (ed.). The Cambridge Companion to Foucault. Cambridge University Press.
- Kothari, Rajni. (2010). Caste in Indian Politics. Second edition. Orient Black Swan.
- B. Dirks, Nicholas. (2011). Autobiography of an Archive. Routledge
- Jaffrelot, Christopher. (2008). 'Why Should We Vote? The Indian Middle Class and the Functioning of World's Largest Democracy', in Religion, Caste and Politics in India. Primus. Delhi.

- Chadda, M. (2010) 'Integration through Internal Reorganisation', in S. Baruah (ed.) Ethno nationalism in India: A Reader, New Delhi: Oxford University Press, pp. 379-402. P. Brass, (1999) 'Crisis of National Unity: Punjab, the Northeast and Kashmir', in The Politics of India Since Independence, New Delhi: Cambridge University Press and Foundation Books, pp.192-227
- Almond and S. Verba, Civic Culture. Princeton University Press; Reprint edition (8 December 2015)
- Pye, L. Aspects of Political development. Princeton University Press (1 July 1992)
- McNair, B. An introduction to Political Communication. Routledge; 5th edition (8 March 2011)
- Blackshaw, T. Key concepts in community studies. 2010 sage publication.
- Servaes, J. Communication for Development and Social Change. 2008. Sage Publications India Pvt Ltd

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i) *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii) *Summative Assessment:* 50 marks
 - a) Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - b) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - c) Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Nihal Mangrati Signature:	Name: Signature:	Name: Signature:

8. Course Description

Course Code	23POSMAJ205
Course Title	Introduction to International Relations
Credits	04
Total Hours	60
Hours per Week	04
Course Type	Major
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Political Science
Regulation	2023
Course Overview	This course – 1) Defines the meaning, evolution and scope of IR. 2) Examines various theoretical traditions to better understand, explain and analyze the working of International Relations. 3) Analyzes major concepts and issues relevant in IR such as National Power, National interest, Balance of Power, globalization, international terrorism, environment etc, all of which have a tremendous influence in shaping the International system. 4) Discusses the composition, functions and role of various International Organizations.
Prerequisite	Basic knowledge of Global Politics
Course Objectives	The students will be able to – 1. Understand the meaning, evolution and scope of IR through various theoretical perspectives and how it shapes working of nation states. 2. Examine major concepts of IR such as National Power, National Interest, Balance of power etc 3. Analyze the major issues that shape International relations such as globalization, international terrorism, environment etc

	4. Explain the composition, functions and role of various International Organizations.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define the meaning of International Relations.	R		
CO2	Discuss the growth of IR as an academic discipline	R		
CO3	Critically discuss the various theoretical traditions of International Relations.	U		
CO4	Discuss the concept of Balance of Power	A1		
CC05	Analyze the impact of War on International Politics along with mechanism to resolve war.	E		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Meaning and Development of International Relations (IR) a) Meaning, Nature and Relevance of International Relations b) Evolution of IR c) The Great Debates	5	CO1 CO2	R U A1 A2 E C
Unit II	Key Concepts in IR a) National Interest b) National Power c) Anarchy d) Hegemony e) Diplomacy	10	CO1 CO2 CO3	R U A1 A2 E C
Unit III	Major Theories of IR a) Liberalism b) Realism c) The English School d) Marxism, Dependency and World Systems Theory e) Feminism	18	CO1 CO2 CO3	R U A1 A2 E C

Unit IV	Contemporary Issues in International Relations a) Globalisation and its impact b) War, Peace and Security: Major Approaches c) Nuclear Proliferation and Disarmament: CTBT, NPT, FMCT, MTCR d) Terrorism e) Environment f) Energy	13	CO2 CO4	R U A1 A2 E C
Unit V	International Organizations a) League of Nations, UNO and its relevance. b) NAM: Origin, growth and NAM 2.0 c) SAARC: Composition, Functions, role and Contemporary relevance d) ASEAN: Composition, Role and contemporary relevance e) European Union: Composition and Role f) African Union: Composition, role and functions g) BRICS	14	CO2 CO5	R U A1 A2 E C

Learning Resources

- Jackson, Robert and Sorensen, Georg. (2013). Introduction to International Relations. Theories and Approaches. Fifth Edition. Oxford University Press.
- Baylish, John. Smith, Steve. and Owens, Patricia.(2020).The Globalization of World Politics. An Introduction to International Relations. Eighth Edition. Oxford University Press.
- Sutch, Peter and Elias, Juanita.(2007).International Relations. The Basics. Routledge. Taylor and Francis Group.
- Burchill, Scott.Linklater, Andrew. Devetak, Richard. Donnelly, Jack. Paterson, Matthew. Reus-Smit, Christian and True, Jacqui.(2005). Theories of International Relations. Third Edition. Palgrave Macmillan.
- W. Mansbach, Richard and L. Taylor, Kirsten. (2018).Introduction to Global Politics. Third Edition. Routledge. Taylor and Francis Group.
- Heywood, Andrew. (2011).Global Politics. Palgrave Macmillan.
- Chatterjee, Aneek. International Relations Today. Concepts and Applications. Pearson Education.
- W. Thompson, Kenneth.(1952).The Study of International Politics: A Survey of

Trends and Developments. The Review of Politics, Vol.14, pp.433-467. Cambridge University Press.

- W. Thompson, Kenneth. (1977). Idealism and Realism: Beyond the Great Debate. British Journal of International Studies. Vol.3. Cambridge University Press.
- David Singer, J. (1961). The Level of Analysis Problem in International Relations. World Politics. Vol.14. No.1. The International System: Theoretical Essays. pp. 77 - 92. Cambridge University Press.
- Griffiths, Martin and Callaghan, Terry O'. (2002). International Relations: Key Concepts. Routledge.
- Morgenthau, Hans J. (1948). Politics among Nations: The Struggle for Power and Peace. Alfred A. Knopf Inc.
- Waltz, Kenneth N. (1979). Theory of International Politics. Addison – Wesley Publishing Company.
- Mearsheimer, John J. (2001). The Tragedy of Great Power Politics. W.W Norton & Company Ltd.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- i) *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- iii) *Summative Assessment*: 50 marks
- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Sangam Ghatani Signature:	Name: Signature:	Name: Signature:

9. Course Description

Course Code	23POSMIN201	
Course Title	Human Rights	
Credits	04	
Total Hours	60	
Hours per Week	04	
Course Type	Minor Course	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Political Science	
Regulation	2023	
Course Overview	This course – e. Covers the historical background of Human Rights. f. Explains the evolution of Human Rights. g. Discusses the multiple concepts and issues on different forms of rights. h. Develops skill of critical thinking and awareness on basic rights of human in society.	
Prerequisite	Basic knowledge on Rights and Duties.	
Course Objectives	The students will be able to – i) Understand the concept of Human Rights. ii) Discuss different types of Human Rights. iii) Explain the role of conventions in the development of Human Rights. iv) Analyze the debates on rights and duties. v) Develop the skill of critical thinking and awareness on basic rights of human in society.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept of Human Rights.	R
CO2	Discuss the different types of Human Rights	U
CO3	Explain the role of conventions in the	U & A1

	development of Human Rights.			
CO4	Analyze and evaluate the debates on rights and duties.	A2 & E		
CC05	Develop the skill of critical thinking and awareness on basic rights of human in society.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit-I	Understanding Human Rights d) Historical and Conceptual background of Human Rights e) Difference between Civil, Democratic and Human Rights f) Theories of Right.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-II	Human Rights and Duties c) Correlation of Rights and Duties/Responsibilities.. d) Importance of Human Rights and Duties.	10	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-III	International Human Rights a) Bill of International Rights b) Universal Declaration of Human Rights. c) African Charter of Human Rights/European Charter of Human Rights/Asian Charter of Human Rights. (Any two) d) International Convention on Civil, Political, Economic and Cultural Rights.	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Unit-IV	Human Rights in India d) Constitution of India and Human Rights. e) Institutions/Commissions of Human Rights in India	10	CO1 CO2 CO3 CO4	R U A1 A2

	f) Labour Legislation in India		CO5	E C
Unit-V	Human Rights for disadvantaged sections in India e) Scheduled Castes, Scheduled Tribes and Other Backward Classes. f) Women and Children's Rights. g) Differently abled and Elderly people h) Human Rights in India: Issues and Challenges (Illiteracy, Poverty, Unemployment)	15	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C
Learning Resources • Cranston, M. (1973). <i>What are Human Rights?</i> . London: The Bodley Head. • Hoffman, J., & Graham, P. (2006). Human Rights. In <i>Introduction to Political Theory</i> (pp. 436-458). Delhi: Pearson. • Kannabiran, K. G. (2004). <i>The Wage of Impunity</i>. Orient Longman. • Nirmal, C. J. (Ed.). (2004). <i>Human Rights in India: Historical, Social and Political Perspectives</i>. OIP, Delhi. • O'Byrne, D. J. (2008). <i>Human Rights: An Introduction</i>. New Delhi: Pearson Education in South Asia. • SAHRDC. (2006). <i>Introduction to Human Rights; Classification of Human Rights: An Overview of the First, Second, and Third Generational Rights</i>. In <i>Introducing Human Rights</i>. New Delhi: Oxford University Press.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

- e) *Formative Assessment*: 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii) *Summative Assessment*: 50 marks
- Five Short Questions to be answered out of eight given from lower order of RBT – (10 Marks)
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Two Long Questions to be answered out of four set from higher order of RBT - (20 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jeetendra Sah Signature:	Name: Signature:	Name: Signature:



**(Autonomous)
Sonada – Siliguri**

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts in English

Department of English

Curriculum Document (2024- 2025)

Vision:

The Department of English, Salesian College (Autonomous) envisages empowering the students to develop and build knowledge of the content and methods of literary studies, academic, professional, creative and critical reading/ writing, thereby championing in undergraduate/ postgraduate research, knowledge creation, and reaching to the marginalized.

Mission:

1. To provide appropriate pedagogies in keeping with the signs of the time
2. To help students develop criticality of the text by way of presenting/writing research papers for (inter)national symposia, conferences etc
3. To give students a sense of themselves as citizens of a larger community by encouraging participation in service learning
4. To assure that students encounter creativity crucial to English studies through theatre productions, readings by professional writers, and their own creative and critical production and presentation.
5. To balance the needs of general education – communication, diversity, global perspectives, inter(trans)disciplinary studies
6. 6. To value faculty scholarship and service through greater support for and participation in activities of the profession.

1. Programme Overview

Bachelor of Arts in English is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Acquaint oneself with the history of English literature and understand its social, political, and historical context(s).
	PO02: Gain understanding of the growth of diverse literatures and the English language.
	PO03: Relate one's understanding to explore identity, values, manners, and morals through different engagements
	PO04: Grasp literary forms, types, literary theory and gain an alternate understanding of the contemporary issues of the modern world.
Skills	PO05: Demonstrate his/her critical understanding of texts and issues through presenting/writing research papers for (inter)national symposia, conferences etc.
	PO06: Construct writing projects like essays, short-stories, poems
	PO07: Develop presentation skills with discussions, debates, public-speaking, and integrating ICT.
	PO08: Acquaint oneself with the diverse current issues like environmental crisis, climate change, gender discrimination, marginality, and politics through reading of relevant literature.
Competence	PO09: Explore new/revised understanding of issues through the application of literary and cultural theories.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as research and education is a lifelong process for empowering the student to face all challenges in their future endeavours, and develop new ideas and new understanding.
	PO11: Develop concern for the society and nation through understanding of regional and vernacular literatures and comparing our literary content, themes, and usage of language with that of literatures of other developing countries.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops a clear idea about the details of the history, development and growth of English language.
	PSO2: A student gathers knowledge about the content, context, and nature of the subject
	PSO3: A student develops knowledge about the detailed history of English literature from Old English Period to 20 th century
	PSO3: A student develops knowledge about the social, political, historical and economical movements that helped shaped literature, and also trace the development of human civilization and culture under these fields.
	PSO4: A student develops knowledge about the interconnections and interrelations across disciplines and cultures by studying world literatures including Indian writing in English.

	PSO5: A student develops knowledge about the gendered aspect of writing and gain awareness about the issues and concerns of women writers and women's writing as a separate genre.
	PSO6: A student develops understanding of different concepts like Modern/Modernity/Modernism amongst others.
	PSO7: A student develops understanding of critical literary and cultural theories to interpret and analyse texts.
Skills	PSO1: A student will develop the skills required for Creative Writing.
	PSO2: A student will develop presentation skills with discussions, debates, publicspeaking, and integrating ICT.
	PSO3: A student will exhibit and awareness with the diverse current issues like environmental crisis, climate change, gender discrimination, marginality, and politics through reading of relevant literature.
	PSO4: A student will develop critical aptitude to write research papers and present them in conferences of different levels.
	PSO5: A student will develop the ability to interpret older texts from contemporary point of view.
	PSO6: A student will gain awareness of connection between literary and political movements impacting different literary eras and movements.
	PSO7: A student will develop critical thinking skills through various literary and cultural theories.
Competence	PSO1: A student will be able to apply critical literary theory to formulate arguments about literary and other critical texts as well as contemporary cultural practices.
	PSO2: A student will be able to re-interpret society and culture through the theoretical lens developed by philosophers and literary theorists.
	PSO3: A student will be able to question the problems of identity through text.
	PSO4: A student will be able to locate and represent subaltern voices through their own writings.
	PSO5: A student will envision a society where diverse people irrespective of gender, caste, religion and sexuality, coming from various backgrounds enjoy equal and equitable rights and opportunities.
	PSO6: A student will be able to demonstrate his/her critical understanding of texts and social issues through presenting/writing research papers and designing research proposals.
	PSO7: A student will analyse the contemporary trends in literature both English and vernacular.

4. Programme Matrix

Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23ENGMAJ101	Major	History of English Literature	4	4+0+0	60	100

	23ENGMAJ102	Major	Literary Types & Growth of the Language	4	4+0+0	60	100
	23ENGMIN101	Minor	Selections from Indian Literature	4	4+0+0	60	100
	23ENGMD101	MDC	Business English	3	3+0+0	45	75
	23ENGAECE101	AEC	Compulsory English	2	2+0+0		50

	23ENGSEC101	SEC	English Phonetics & Pronunciation	3	2+0+1	45	75
	23ENGVED101	VED	Value Education	1			25
	23SCSVAC1/ 23ENG VAC101	VAC	Theatre and Theatrics/ Remedial Grammar	1			25
	Total			22			
Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
II	23ENGMAJ103	Major	Chaucer to Shakespeare	4	4+0+0	60	100
	23ENGMAJ104	Major	Indian Literature in English	4	4+0+0	60	100
	23ENGMIN102	Minor	Selections from British Literature	4	4+0+0	60	100
	23ENGMD102	MDC	Writing and Reading Skills	3	3+0+0	45	75
	23ENGAECE102	AEC	Alternative English	2	2+0+0		50
	23ENGSEC102	SEC	Aspects of Editing	3	2+0+1	45	75
	23ENGVED101	VED	Value Education	1			25
	23SCSVAC1/ 23ENG VAC102	VAC	Theatre and Theatrics/Writing Skills	1			25
	Total			22			

Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	23ENGMAJ201	Major	British Literature: 17th century and 18th Century	4	4+0+0	60	100
	23ENGMAJ202	Major	Genre Literature: Popular Fiction	4	4+0+0	60	100
	23ENGMIN201	Minor	British Literature	4	4+0+0	60	100
	23ENGMD201	MDC	Writings From the Northeast	3	3+0+0	45	75
	23GEOAEC201	AEC	EVS1	2	2+0+0		50

	23ENGSEC201	SEC	Technical Writing	3	2+0+1	45	75
	23SCSVED201	VED	Value Education	1			25
	23ENGVAC201/ 23BIBVAC201	VAC	Writing in Practice/ Bible Studies	1			25
	Total			22			
Semester	Course Code	Course Type	Title of the Course (40 characters including space)	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
IV	23ENGMAJ203	Major	British Literature: Pre-Romantics and Romantics	4	4+0+0	60	100
	23ENGMAJ204	Major	American Literature	4	4+0+0	60	100
	23ENGMAJ205	Major	British Literature: Victorian Literature	4	4+0+0	60	100
	23ENGMIN201	Minor	Genre Fiction II (Science Fiction)	4	4+0+0	60	100

	23GEOAEC202	AEC	EVS2	2	2+0+0		50
	23SCSVED202	VED	Value Education	1			25
	23ENGVAC202/ 23BIBVAC202	VAC	Communicative English/ Bible Studies	1			25
	Total			22			

SEMESTER 3:

MAJOR 1 : Course Description

Course Code	23ENGMAJ201
Course Title	British Literature 17th and 18th Century
Credits	4
Lecture Hours	60
Hours/Week	4
Category	Major
Semester	3
Regulation	2024
Course Overview: This course will a. Offer a broad introduction to British Literature and to the distinctive characteristics of texts and the literary techniques employed by them. b. Cover major works of fiction, non-fiction, poetry, and drama. c. Introduce students to the historical context, author's influence, and literary impact of the works.	
Course Objectives: Students will be able to a. Critically analyse British literary texts across genres and times. b. Identify key ideas and characteristic perspectives or attitudes as expressed in British Literature c. Compare/contrast literary works through an analysis of genre, theme, character, and other literary devices.	

Prerequisites: Students must have a proficiency in English Language and an interest in English literature.

Course Outcomes (COs) and Cognitive Level Mapping

At the end of the course the students will be able to

Cos	Statements	Cognitive Level Mapping
CO1	Identify key ideas and characteristic perspectives or attitudes as expressed in literary text.	R
CO2	Explain concepts and theories expressed in the texts.	U
CO3	Relate literary works through a comparison and contrast of genre, theme, character, and other literary devices.	A1
CO4	Analyse literary works through an analysis of genre, theme, character, and other literary devices.	A2
CO5	Evaluate British literary texts across genres and times.	E
CO6	Develop critical thinking skills along with writing and reading skills.	C

Syllabus

Units	Contents	Hours	COs	RBT	Methods Used
Unit 1	Poetry: a. Andrew Marvell: To His Coy Mistress. b. Samuel Johnson: "London" c. John Milton: "Paradise Lost, Book1"	20	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C	Lectures, PPTs, Writing exercises, Peer Teaching, Debate, G.D.
Unit 2	Drama: a. John Dryden: All for Love b. Oliver Goldsmith: She Stoops to Conquer or c. William Congreve: The Way of the World	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C	DO

Unit 3	Essay: a. Samuel Johnson: Preface to Shakespeare. b. Francis Bacon: Of Studies, Of Travel	10	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C	DO
Unit 4	Novel: a. Samuel Richardson: Pamela b. Daniel Defoe: Robinson Crusoe c. Voltaire: Candide	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C	DO

Suggested Readings:

1. *The Norton Anthology of English Literature*, edited by Stephen Greenblatt et al., 10th ed., vol. B, Norton, 2018.
2. *The Norton Anthology of English Literature: The Restoration and the Eighteenth Century.* Edited by Stephen Greenblatt et al., 10th ed., vol. C, Norton, 2018.
3. Milton, John. *Paradise Lost*. Edited by John Leonard, Oxford UP, 2008.
4. Johnson, Samuel. "Preface to Shakespeare." *The Norton Anthology of English Literature*, edited by Stephen Greenblatt et al., 10th ed., vol. B, Norton, 2018, pp. 313-330.
5. Congreve, William. *The Way of the World*. Edited by Tiffany Stern, Oxford UP, 2007.
6. Dryden, John. *All for Love*. Edited by John Sargeant, Oxford UP, 1970.
7. Goldsmith, Oliver. *She Stoops to Conquer*. Edited by Tony Lumpkin, Penguin Classics, 2008.
8. Defoe, Daniel. *Robinson Crusoe*. Edited by Thomas Keymer, Oxford UP, 2008.
9. Richardson, Samuel. *Pamela*. Penguin UK, 2000.
10. Poplawski, Paul. *English Literature in Context*. 2nd ed., Cambridge University Press, 2017.
11. Nayar, Pramod K. *A Short History of English Literature*. Amity University Press, 2018.

2. Assessment

i. **Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College

ii. **Summative Assessment: 50 marks**

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b) Three Long Questions to be answered out of six set from higher order of RBT –(30 Marks).

Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty

(Prepared by)

Name: Ms Rinchen Sherpa

Signature:

Head of the Department

(Checked and verified by)

Name: Ms Pratibha Soni

Signature:

Dean

(Approved by)

Name: Mr Ravi Bhushan

Singh

Signature:

MAJOR 2 : Course Description

Course Code	23ENGMAJ202
Course Title	Genre Literature: Popular Fiction
Credits	4
Lecture Hours	60
Hours per Week	4
Course Type	Major Core
Semester	III
Regulation	2024
Intended Level	Certificate

Issue(s)Addressed	N/A
Course Offered to	English
Regulation	2024
Course Overview:	This course will: - Provide with an overview of Genre Literatures. - Help the students understand the nature and notions of genre literatures.
Prerequisite	Basic understanding and appreciation of genres in literature is needed before taking this course.
Course Objectives:	A student will be able to: - Understand Genre Fiction. - Read and appreciate writings in different genres. - Understand the nature, types and content of genre literatures. - Appreciate fiction and critical essays by various authors in the domain.

Course Content

Units	Contents	Lecture Hours	Cos	RBT	
Unit I	Overview - Leslie Fiedler, “Towards a Definition of Popular Literature”, in <i>Superculture: American Popular Culture and Europe</i>. - Introduction to Forms of Popular Fiction - Christopher Pawling, “Popular Fiction: Ideology or Utopia?”, in <i>Popular Fiction and Social Change</i>.	15	CO 1C O2	R,U, E, A,C	

Unit II	Novels: 4. Selections: “Danger in Darjeeling” and “Trouble in Gangtok,” Satyajit Ray, <i>The Complete Adventures of Feluda</i>. OR 5. Agatha Christie, <i>The Murder of Roger Ackroyd</i>.		15	CO2	R,U,E, A,C
Unit III	SHORT STORIES: 6. Philip K. Dick, “Minority Report” in <i>The Complete Stories of Philip K. Dick Vol. 4: The Minority Report and Other Classic Stories</i> (Citadel Books: New York, 1987) pp. 62-90 OR 7. Vandana Singh, “The Woman Who Thought She Was a Planet” from <i>The Woman Who Thought She Was a Planet and Other Stories</i>.		10	CO3	R,U, E, A, C

Unit IV	NOVEL: 8. Neil Gaiman, <i>The Sandman, Vol. 2: The Doll's House.</i> OR 9. Antoine de Saint-Exupéry, <i>The Little Prince.</i> OR 10. The Fault in Our Stars: John Green		20	CO 3C O4	R,U, E, A,C

Course Outcomes (COs) and Cognitive Level Mapping At the end of the course a student will be able to:		
Cos	Statements	RBT
CO1	Understand Popular Literature	R,U,E,A,C
CO2	Understand the key aspects of Popular Literature	R,U,E,A,C
CO3	Understand the nature of Popular Literature.	R,U,E,A,C
CO4	Analyse critical essays, novels and short stories written by various major/minor authors.	R,U,E,A,C

2. Assessment

i. **Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College

ii. **Summative Assessment: 50 marks**

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
- b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Faculty Member (Course prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Anik Sarkar Signature:	Name: Pratibha Soni Signature:	Name: Mr Ravi Bhushan Singh Signature:

MINOR: Course Description

Course Code	23ENGMIN201	
Course Title	Selections from British Literature	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	3	
Intended Level	Certificate	
Issue(s) Addressed	N/A	
Course Offered to	Other than English	
Regulation	2024	
Course Overview	This course will: a. Offer a broad introduction to British Literature and to the distinctive characteristics of texts and the literary techniques employed by them. b. Cover major works of fiction, non-fiction, poetry, and drama. c. Introduce students to the historical context, author’s influence, and literary impact of the works.	
Prerequisite	Students must have a proficiency in English Language and an interest in English literature.	
Course Objectives	Students will be able to: a. Critically analyse British literary texts across genres and times. b. Identify key ideas and characteristic perspectives or attitudes as expressed in British Literature c. Compare/contrast literary works through an analysis of genre, theme, character, and other literary devices.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping

CO1	Identify key ideas and characteristic perspectives or attitudes as expressed in literary text.	R
CO2	Explain concepts and theories expressed in the texts.	U

CO3	Relate literary works through a comparison and contrast of genre, theme, character, and other literary devices.	A1		
CO4	Analyse literary works through an analysis of genre, theme, character, and other literary devices.	A2		
CO5	Evaluate British literary texts across genres and times.	E		
CO6	Develop critical thinking skills along with writing and reading skills.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Poetry: 1 a. William Shakespeare: Sonnets 18, 65 b. William Wordsworth: Daffodils	10	CO1 CO2 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Poetry: 2 a. John Keats: Ode to Autumn b. William Blake: The Chimney Sweeper c. Robert Browning: The Last Duchess	15	CO1 CO2 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Short Stories: a. Virginia Woolf: The Duchess and the Jeweller. b. George Orwell: Shooting an Elephant c. Charles Dickens : The signalman d. O.Henry: The Last Leaf	15	CO1 CO2 CO3 CO4 CO6	R U A1 A2 E C
Unit IV	Drama: G. B. Shaw: Arms and the Man / Pygmalion	20	CO1 CO2 CO4 CO6	R U A1 A2 E C

SUGGESTED READING:

Ahlawatelal, Menka(2019). *Selections from British Literature: Poems and Short Stories.* Worldview.

Jack,Ian(1973) *Browning's Major Poetry.* Clarendon Press: Oxford

Abrams,M.H.(Ed)(1975). *English Romantic Poets: Modern Essays in Criticism.*Oxford University Press.

Ford, Borris(ed) (1075). *From Blake to Byron. The Pelican Guide to English Literature.*Vol5.

2. Assessment

- i. *Formative Assessment:* 50 marks as per Assessment & Evaluation Framework Document of Salesian College**
- ii. *Summative Assessment:* 50 marks**
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)**
 - b) Three Long Questions to be answered out of six set from higher order of RBT –(30 Marks). Summative Assessment Time: 2 Hours for pen and paper test**

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Pratibha Soni	Name: Ms Pratibha Soni	Name: Mr Ravi Bhushan Singh
Signature:	Signature:	Signature:

MDC: COURSE DESCRIPTION

Course Code	23ENGMDC201	
Course Title	Writings from the NorthEast.	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	III	
Intended Level	Certificate	
Issue(s)Addressed	Identity, insurgency, gender issues and Nature, works in translation.	
Course Offered to	Various Disciplines.	
Regulation	2024	
Course Overview	This course: a. Provides fundamental understanding of the regional literature from the North East. b. Focuses on issues related to identity, nature and gender issues. c. Builds awareness about the current trends in emerging literature from the North East.	
Prerequisite	Understanding of the genre of poetry and short stories.	
Course Objectives	A student will be able to: a. To understand the current themes, issues in North East literature. b. Provide them with understanding of the oral tradition present in North Eastern writings. c. Help the students appreciate the different genres used in writings from the North East.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Recognise the important voices in Northeastern. Selection of writers and poets from different states of the North East to show diversity in their writing.	R,U
CO2	Analyse the key issues in poetry and short stories from Northeast.	A1,A2,C

CO3	Understand the cultural and political context of writings from the Northeast.	U,C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Poems - Irom Chanu Sharmila “In the Glory of the Monarch of diseases”, “The value of songs” - Brucellisha K Sangma “A pair of spectacles ”; "I believe" - Mamang Dai “No dreams”, “I am going back to old”. - Hiren Bhattacharya “Autumnal Landscape, "Quest".	15	CO1 CO3	R U A1 A2 E C
Unit II	Short stories - The Pot Maker or The Jungle Mayor by Temsula Ao. - Pinyar, the widow or A homecoming by Mamang Dai. - A Waterfall of Horses or The Discovery of Flight by Janice Pariat	30	CO2 CO3	R U A1 A2 E C
Learning Resources: - Misra, Tilottoma. <i>The Oxford Anthology of writings from Northeast India</i>: OUP India, December, 2010, Print. - Ch Zama, Margaret. <i>Emerging literatures from Northeast India the dynamics of culture, society and identity</i>: SAGE India, March 1900 ,1st edition, Print. - Kakoti, Priyanka. <i>English writings from Northeast India: Of Inclusions, Exclusions and Beyond</i>, Cambridge Scholars Publishing, September, 2021, Print.				

2. Assessment

- Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment: 50 marks**
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Three Long Questions to be answered out of six set from higher order of RBT –(30 Marks).
Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Verified By)	Dean (Approved By)
Name: Mimansa Subedi. Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

VAC: Course Description

Course Code	23SCSVAC2	
Course Title	Writing in Practice 1	
Credits	1	
Total Hours	30	
Hours per Week	2	
Course Type	Value Added Course	
Semester	3	
Intended Level	Certificate	
Issue(s)Addressed	Reading and Writing	
Course Offered to	English and Others	
Regulation	2024	
Course Overview	This course: a. Provides the students the basic technical and stylistic skills necessary to write creative prose b. Aims at acquainting the students with the basics of the major prose genres c. Focuses on the craft of writing and the art of evoking reader response	
Prerequisite	Good Grammar Skills	
Course Objectives	A student will be able to: a. understand the nuances of literary tropes. b. develop her critical thinking. c. clarify her thoughts and emotions into a logical process. d. expand her vocabulary as she explores new ways of expressing herself.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understand the stylistic and technical nuances of prose writing.	R, U, A1, E

CO2	Train her mind to think logically for clear and concise writing.	R, U, A1, A2, C
CO3	Boost her memory and imagination.	R, A1, C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Prose Genres - Short Stories (“The Tell-Tale Heart”) - Essay (“New Year’s Eve”/Diary (<i>A Book of Disquiet</i>, No. 7) - Vignette (<i>Invisible Cities</i>, “Cities & Names 5”) - Journalistic Writing (Editorials, Columns, Review)	10	CO1 CO3	R U A1 A2 E C
Unit II	Theoretical Reading - Reader Response and Reception Theory : Wolfgang Iser - Practical Criticism: Analysis of Fiction	10	CO1 CO2	R U A1 A2 E C
Unit III	Practice - Writing for the Media - Diary Entries - Critical Analysis	10	CO1 CO2 CO3	R U A 2 C

Suggested Readings:

Habib, M.A.R. *A History of Literary Criticism: From Plato to the Present*. Blackwell, 2005.

James, Neill. *Writing at Work: How to Write Clearly, Effectively and Professionally*. Allen&Unwin, 2007.

King, Stephen. *On Writing: A Memoir of the Craft*. Scribner, New York, 2000.

Seturaman, V.S., et al, editors. *Practical Criticism*. Macmillan Publishers India, 2000.

Strunk, William Jr. and E.B. White. *The Elements of Style*. Pearson, 1999.

2. Assessment

- Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College

ii. Summative Assessment: 50 marks

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).

Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Course Prepared by)	H.O.D. (Checked and verified by)	Dean (Approved by)
Name: Ms. Jyotismita Sarkar Signature:	Name: Ms. Pratibha Soni Signature:	Name: Mr Ravi Bhushan Singh Signature:

SEC: Course Description

Course Code	23ENGSEC201
Course Title	Literature in Social Spaces
Credits	3
Total Hours	45
Hours per Week	2
Course Type	Skill Enhancement Course
Semester	III
Intended Level	Certificate
Issue(s)Addressed	NA
Course Offered to	English
Regulation	2024
Course Overview	• This course draws attention to the link between critical thinking skills developed by studying the Humanities, especially Literature, and other skills that are often termed, ‘soft skills’. • The course focuses on the empathy building capacity of Literature and the application of critical thinking and problem solving skills employed in literary analysis to develop an understanding of the value of literature in social and professional spaces. • Literary readings will provide the foundation for developing skills such as better communication and empathy, understanding the value of teamwork, the need for adaptability, and the role of leadership and mentoring.

Prerequisite	Basic knowledge of communication, writing skills and technical writing	
Course Objectives	• Students will be familiarised with the link between the Humanities and, ‘soft skills’ • They will be encouraged to focus on the value of literature as an empathy-building experience. • They will learn to apply critical thinking and problem solving skills developed by the study of literature to personal social and professional situations. • Students will be encouraged to enhance their teamwork skills by working in groups and to understand the processes of leadership and mentoring. • Students will work on their presentation skills and build on the idea of, ‘narratives’, to better communicate with target audiences.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understanding basics of technical writing and writing skills	R,U
CO2	Apply the knowledge of technical writing in the development of thesis.	A2
CO3	Understand the distinct features of speech and Writing	U

Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit 1	Humanities and Soft skills: a) ‘Creative and Arts Graduates have the Soft Skills needed to make them Work- Ready’, by Mark Harman in The Independent 22 June 2016 (https://www.independent.co.uk/student/career-planning/creative-arts-graduates-soft-skills-graduate-employment-university-subjects-work-ready-a7095311.html) b) ‘Leadership in Literature’, by Diane Coutu in The Harvard Business Review March 2006 (https://hbr.org/2006/03/leadership-in-literature) c) ‘How Literature informs Notions of Leadership’, by Gregory L. Eastwood in Journal of Leadership, education Vol 9 Issue 1 2010 (http://journalofleadershiped.org/attachments/article/161/JOLE_9_1_Eastwood.pdf)	15	CO1 CO2 CO3	R, U A2 U
Unit II	Emotional Intelligence Adaptability and Mental Health: a) Daniel Goleman., ‘Don’t let a bully boss affect your mental health’, http://www.danielgoleman.info/dont-let-a-bully-boss-affect-your-mental-health/ b) William Blake, ‘The Chimney Sweeper’, from Songs of Innocence and Songs of Experience (both versions - 2 poems) c) W. Somerset Maugham, ‘The Verger’, (short story)	15	CO1 CO2 CO3	R, U A2 U
Unit III	Critical Thinking and Problem Solving: a) ‘On the Writers Philosophy of Life’, by Jack London in The, editor October 1899	15	CO1 C O2C	R,U A2 U

	(essay) b) Nicholas Bentley, 'The Lookout Man', (short story) in S. P. Dhanvel's English and Soft Skills (Delhi: Orient Blackswan 2010). c) J. K. Rowling., 'The Fringe Benefits of Failure and the Importance of Imagination', (extract from her speech at Harvard 2008) https://news.harvard.edu/gazette/story/2008/06/text-of-j-k-rowling-speech/		O3	
unit IV	Leadership and Mentoring: a) 'If', by Rudyard Kipling (poem) b) 'Are you my Mentor?', by Sheryl Sandberg in Lean in: Women Work and the Will to Lead (London: Penguin Random House 2015).			

Suggested readings:

This is a literature-based course, and students will be examined on all the prescribed readings in Units 1 through 4. Therefore, all those texts are to be considered essential reading.

2. Assessment

i. Formative Assessment: 50 marks **as per Assessment & Evaluation Framework Document of Salesian College**

ii. Summative Assessment: 50 marks

a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Prepared by)	Head of the Department	Dean
Name: Sharon Lepcha Signature:	Name: Ashwini Tamang Signature:	Name: Signature:

1. MAJOR1: Course Description

Course Code	23ENGMAJ203	
Course Title	British Literature: Pre-Romantics and Romantics	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	IV	
Intended Level	Certificate	
Issue(s)Addressed	NA	
Course Offered to	English	
Regulation	2024	
Course Overview	This course will: a. Provide a fundamental understanding of the Romantic Age. b.Help the students have an idea of the major Romantic authors and their works.	
Prerequisite	Understanding and appreciating major literary figures and their works of the Romantic Age.	
Course Objectives	A student will be able to: a. Explore a wide variety of literature from a period characterised by radical ideas and rebellion against tradition. b. Appreciate prose/short stories and plays written by various major/minor Romantic poets and authors. c. Analyse Romantic literature as a domain of art and theory.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understand comprehensively the history of Romantic Literature.	R, U
CO2	Remember major literary and philosophical schools of the Romantic age.	R, U
CO3	Analyse situations in real life by gaining an understanding of these texts.	A2

CO4	Evaluate the major Romantic authors and their texts.	E

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Pre- Romantics a. Thomas Gray: ‘Elegy Written in a Country Churchyard’ b. Robert Blair: ‘The Grave’ c. William Cowper: ‘Light Shining out of Darkness’	15	CO1 CO2 CO3 CO4	R U A2 E
Unit II	The Romantics a. William Wordsworth- ‘Composed upon Westminster Bridge’ b. Samuel Taylor Coleridge: ‘Rime of the Ancient Mariner’ c. William Blake: ‘Songs of Innocence’	15	CO1 CO2C O3 CO4	R U A2 E
Unit III	Second Generation a. John Keats- ‘Ode to a Nightingale’ b. Lord Byron: ‘She Walks in Beauty’ c. P.B. Shelley- ‘Ode to the West Wind’ d. Wil	15	CO1 CO2 CO3 CO4	R U A2 E
Unit IV	Novels a. Jane Austen- ‘Sense and Sensibility’ b. Mary Shelley: ‘Frankenstein’ c. Walter Scott: ‘Ivanhoe’	15	CO1 CO2 CO3 CO4	R U A2 E

2. Assessment

- i. ***Formative Assessment* 50 marks as per Assessment & Evaluation Framework Document of Salesian College**
- ii. ***Summative Assessment*: 50 marks**
 - a) **Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)**
 - b) **Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test**

Course Faculty (Prepared by)	Head of the Department	Dean
Name: Vasudeva Naidu Ashwini Tamang Signature:	Name: Ashwini Tamang Signature:	Name: Signature:

MAJOR 2: Course Description

Course Code	23ENGMAJ204	
Course Title	American Literature	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	4	
Intended Level	Certificate	
Issue(s)Addressed	N/A	
Course Offered to	English	
Regulation	2024	
Course Overview	This course: a. Provides an understanding of literature produced in the United States and colonies preceding it. b. Aims at acquainting the students with the basics of the major genres. c. Introduces and engages with the historical, socio-political aspects of the country and its people.	
Prerequisite	Basic understanding and appreciation of genres in literature is needed before taking this course.	
Course Objectives	A student will be able to: d. Understand the nuances of literary tropes. e. Develop critical thinking. f. Engage and interpret texts in consonance with aspects related to race, class and colonialism	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understand the stylistic and technical nuances of prose writing.	R, U, A1, E
CO2	Train her mind to think logically for clear and concise writing.	R, U, A1, A2, C

CO3	Boost her memory and imagination.	R, A1, C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Poetry - Walt Whitman: ‘O Captain! My Captain’, ‘Song of Myself’ - Emily Dickinson: ‘Hope is the thing with feathers’, ‘Success is counted sweetest’. - T.S. Eliot: The Waste Land - Langston Hughes: ‘Harlem’, ‘I Look at the World’ - Mary Oliver: ‘The Summer Day’, ‘Wild Geese’	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Drama - Arthur Miller: ‘All my Sons’, ‘Death of a Salesman’ - Tennessee Williams: ‘A Streetcar Named Desire’, ‘Cat on a Hot Tin Roof’ - Edward Albee: ‘Who is Afraid of Virginia Woolf?’	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C
Unit III	Short Stories and Essays - Jack London: ‘To Build a Fire’, ‘The Law of Life’ - Henry James: ‘The Turn of the Screw’ - Ursula K Le. Guin: ‘The ones who walk away from the Omelas’ - James Baldwin: ‘Notes of a Native Son’ - Susan Sontag: ‘Notes on ‘Camp’, 1964 - David Foster Wallace: ‘Consider the Lobster’, 2004	15	CO1 CO2 CO3 CO4 CO5 CO6	R U A 2 C
Unit IV	Novels - Harper Lee: ‘To Kill a Mockingbird’ - John Steinbeck: ‘Of Mice and Men’ - Mark Twain: ‘The Adventures of Tom Sawyer’ - Ernest Hemingway: ‘The Old Man and the Sea’	15	CO1 CO2 CO3 CO4 CO5 CO6	

Suggested Readings:

1. Bercovitch, Sacvan, ed. (1994–2005). *The Cambridge History of American Literature*. Vol. 1–8. Cambridge: Cambridge University Press.
2. Bloom, Harold: *How to Read and Why*. Touchstone Press, 2000.
3. Trent, W. P.; Erskine, J.; Sherman, S. P.; Van Doren, C., eds. (1917–1921). *The Cambridge History of American Literature*. Vol. 1–4. Cambridge; New York: Cambridge University Press; G. P. Putnam's Sons.
4. Woodberry, George Edward (1911). "American Literature" . In Chisholm, Hugh (ed.). *Encyclopædia Britannica*. Vol. 1 (11th ed.). Cambridge University Press.
5. Mailer, Norman. "The white negro." *On Bohemia*. Routledge, 2017. 185-194.
6. *American Literature: The Makers and the Making*, 2 vol. (1973)

2. Assessment

i. **Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College

ii. **Summative Assessment: 50 marks**

- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
- b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty

(Prepared by)

Name: Mr Vasudeva Naidu

Signature:

Head of the Department

(Checked and verified by)

Name: Ms Pratibha Soni

Signature:

Dean

(Approved by)

Name: Mr Ravi Bhushan

Singh

Signature:

MAJOR 3: Course Description

Course code	23ENGMAJ205
Course title	Victorian literature
Credits	4
Total hours	60
Hours per week	4
Course type	Major
Semester	IV

Intended level	Certificate
Issue(s) Addressed	N/A
Course offered to	English
Regulation	2023
Course overview	This course will: a) Provide an introduction to Victorian literature. b) Give an overview of the major novelists and poets of the age. c) Give an understanding of the Victorian norms and values of the society.
Prerequisite	Understanding and appreciating major literary figures and their works of Victorian literature.
Course objectives	a. To offer students a fundamental understanding of how nineteenth-century developments in England around industrialization, colonization and gender relations foreshadow later thinking on the subject. b. To offer students a basic sense of the deep-rooted nature of contemporary social and cultural challenges as having their origins in earlier times. c. The literature, culture and thought of the period help us understand ‘modernity’ in all its complexity. This course will introduce students to some significant literary and non-literary texts of the period.

Course outcomes based on RBT and Cognitive Level Mapping.

At the end of the course, a student will be able to:

Cos	STATEMENTS	COGNITIVE LEVEL MAPPING
CO1	To understand the writings of Victorian age	R,U,E,A,C
CO2	Students’ imagination will be kindled to the way in which a range of genres speak to the spirit of an era.	R,U,E,A,C

CO3	Understand the idea of marriage, sexuality and its effects on society	R,U,E,A,C
CO4	Understand the impact of women writers in Victorian literature and the characteristics of the Victorian society.	R,U,E,A,C

COURSE CONTENT

UNITS	CONTENT	LECTURE HOURS	Cos	RBT
UNIT I	NOVELS a. Emily Bronte- Wuthering Heights B. Charles Dickens- The Great Expectations C. Frederick Marriet: The Children of the New Forest	15	CO1,CO2, CO4	R,U,E,A, C
UNIT II	POETRY a. Alfred Tennyson- The Lotus Eaters, In Memoriam A.H.H b. Robert Browning- Pophyria's Lover, My Last Duchess. c. Mathew Arnold- Dover Beach, The Scholar Gypsy	15	CO1,CO2	R,U,A1,A2,E,C
UNIT III	ESSAYS a. Harriet Taylor: 'The Enfranchisement of Women', 1841 b. Mathew Arnold: 'The Study of Poetry'	15	CO1,CO2, CO4, CO5	R,U,E,A,C
UNIT IV	DRAMA a. Oscar Wilde: 'The Importance of Being Earnest' b. Bernard Shaw: 'Pygmalion'	15	CO1,CO2, CO4, CO5	R,U,E,A,C

Learning Resources: Latest edition books listed on APA style: seventh edition

Suggested Readings:

1. Charles Darwin, 'Natural Selection and Sexual Selection', in The Descent of Man in The Norton Anthology of English literature. 8th edn,.vol.2, ed. Stephen Greenblatt, New York: Northon ,2006.pp 1545-9
2. Karl Marx and Friedrich Engels, 'Mode of Production: The Basis of Social Life', 'The Social Nature of Consciousness', and 'Classes and Ideology', in A Reader in Marxist Philosophy, ed. Howard Selsam and Harry Martel (New York: International Publishers,1963) pp. 186–8, 190–1,199–201)
3. John Stuart Mill, The Subjection of Women in Norton Anthology of English Literature, 8th edn, vol. 2, ed. Stephen Greenblatt (New York: Norton, 2006) chap.1,pp. 1061–9.

Video links

NPTEL Video Course English Language and Literature
Lecture 54 - The Age of Tennyson: Victorian Era

<http://www.digimat.in/nptel/courses/video/109106124/L54.html>

2. ASSESSMENT

- i. **Formative Assessment: 50** marks as per Assessment & Evaluation Framework document of Salesian College.
- ii. **Summative Assessment:50 marks**
 - a. Four short questions to be answered out of eight given from lower order of RBT-(20 Marks)
 - b. Three long questions to be answered out of six set from higher order of RBT- (30 marks). Summative Assessment Time : 2 hours for pen and paper test.

Course faculty (prepared by)	Head of the department	Dean
Name: Ms. Shenaz Naznin Vasudeva Naidu	Name: Ms. Ashwini Tamang	Name: Mr. Ravi.B.Singh
Signature:	Signature:	Signature:

MINOR: Course Description

Course Code	23ENGMIN201	
Course Title	Selections from British Literature	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Minor	
Semester	3	
Intended Level	Certificate	
Issue(s) Addressed	N/A	
Course Offered to	Other than English	
Regulation	2024	
Course Overview	This course will: d. Offer a broad introduction to British Literature and to the distinctive characteristics of texts and the literary techniques employed by them. e. Cover major works of fiction, non-fiction, poetry, and drama. f. Introduce students to the historical context, author’s influence, and literary impact of the works.	
Prerequisite	Students must have a proficiency in English Language and an interest in English literature.	
Course Objectives	Students will be able to: d. Critically analyse British literary texts across genres and times. e. Identify key ideas and characteristic perspectives or attitudes as expressed in British Literature f. Compare/contrast literary works through an analysis of genre, theme, character, and other literary devices.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping

CO1	Identify key ideas and characteristic perspectives or attitudes as expressed in literary text.	R
CO2	Explain concepts and theories expressed in the texts.	U

CO3	Relate literary works through a comparison and contrast of genre, theme, character, and other literary devices.	A1		
CO4	Analyse literary works through an analysis of genre, theme, character, and other literary devices.	A2		
CO5	Evaluate British literary texts across genres and times.	E		
CO6	Develop critical thinking skills along with writing and reading skills.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Poetry: 1 c. William Shakespeare: Sonnets 18, 65 d. William Wordsworth: Daffodil	10	CO1 CO2 CO4 CO5 CO6	R U A1 A2 E C
Unit II	Poetry: 2 d. John Keats: Ode to Autumn e. William Blake: The Chimney Sweeper f. Robert Browning: The Last Duchess	15	CO1 CO2 CO4 CO5 CO6	R U A1 A2 E C

Unit III	Short Stories: e. Virginia Woolf: The Duchess and the Jeweler. f. George Orwell: Shooting an Elephant g. Charles Dickens: The signalman h. O.Henry : The Last Leaf	15	CO1 CO2 CO3 CO4 CO6	R U A1 A2 E C
Unit IV	Drama: G. B. Shaw: Arms and the Man / Pygmalion	20	CO1 CO2 CO4 CO6	R U A1 A2 E C

SUGGESTED READING:

Ahlawatelal, Menka(2019). *Selections from British Literature: Poems and Short Stories*. Worldview.

Jack,Ian(1973).*Browning's Major Poetry*. Clarendon Press: Oxford.

Abrams,M.H.(Ed)(1975). *English Romantic Poets: Modern Essays in Criticism*.Oxford University Press.

Ford, Borris(ed) (1075). *From Blake to Byron. The Pelican Guide to English Literature*.Vol5.

3. Assessment

- iii. **Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College**
- iv. **Summative Assessment: 50 marks**
 - c) **Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)**
 - d) **Three Long Questions to be answered out of six set from higher order of RBT –(30 Marks). Summative Assessment Time: 2 Hours for pen and paper test**

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Pratibha Soni Signature:	Name: Ms Pratibha Soni Signature:	Name: Mr Ravi Bhushan Singh Signature:

VAC: Course Description

Course Code	23SCSVAC2
Course Title	Writing in Practice-2
Credits	1
Total Hours	30
Hours per Week	2

Course Type	Value Added Course	
Semester	4	
Intended Level	Certificate	
Issue(s)Addressed	Reading and Writing	
Course Offered to	English and Others	
Regulation	2024	
Course Overview	This course: d. Provides the students the basic technical and stylistic skills necessary to write creative prose e. Aims at acquainting the students with the basics of the major prose genres f. Focuses on the craft of writing and the art of evoking reader response	
Prerequisite	Good Grammar Skills	
Course Objectives	A student will be able to: e. understand the nuances of literary tropes. f. develop her critical thinking. g. clarify her thoughts and emotions into a logical process. h. expand her vocabulary as she explores new ways of expressing herself.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understand the stylistic and technical nuances of prose writing.	R, U, A1, E
CO2	Train her mind to think logically for clear and concise writing.	R, U, A1, A2, C
CO3	Boost her memory and imagination.	R, A1, C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Prose Genres e. Short Stories (“Barn Burning”) f. Essay (“Echoes of the Jazz Age”) g. Autobiography/Diary (<i>A Book of Disquiet</i>, No. 8) h. Vignette (<i>Invisible Cities</i>, “Cities & The Sky1”) i. Journalistic Writing (Editorials, Columns, Review)	10	CO1 CO3	R U A1 A2 E C
Unit II	Theoretical Reading c. Reader Response and Reception Theory : Stanley Fish d. Practical Criticism: Analysis of Fiction	10	CO1 CO2	R U A1 A2 E C
Unit III	Practice a. Writing for the Media b. Diary Entries c. Critical Analysis	10	CO1 CO2 CO3	R U A 2 C

Suggested Readings:

Habib, M.A.R. *A History of Literary Criticism: From Plato to the Present*. Blackwell, 2005.

James, Neill. *Writing at Work: How to Write Clearly, Effectively and Professionally*. Allen&Unwin, 2007.

King, Stephen. *On Writing: A Memoir of the Craft*. Scribner, New York, 2000.

Seturaman, V.S., et al, editors. *Practical Criticism*. Macmillan Publishers India, 2000.

Strunk, William Jr. and E.B. White. *The Elements of Style*. Pearson, 1999.

3. Assessment

iii. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of

Salesian College

iv. Summative Assessment: 50 marks

- c) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
- d) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).

Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Course Prepared by)	H.O.D. (Checked and verified by)	Dean (Approved by)
Name: Ms. Jyotismita Sarkar Signature:	Name: Ms. Pratibha Soni Signature:	Name: Mr Ravi Bhushan Singh Signature:

Semester 5

Major

MC 10: Modern and Postmodern Literature

MC 11: Literature & Marginality (Disability, Queer, Dalit)

MC 12: Literature & Science (Plant Studies, Zoological Studies, Chemical Literature, Technology and Literature)

Minor

MN 5: American Literature

Semester 6

Major

MC 13: European & South Asian Classical Literature

MC 14: Postcolonial Literature

MC 15: Literary Theory & Criticism I

Minor

MN 6: Contemporary Literature

4th Year with Research Semester 7

MC 16: Research Methodology

MC 17: Himalayan Literature

MC 18: Posthumanism & Anthropocene

Semester 8

Major

MC 19: Translation Studies

MC 20: Dissertation (12 Credits)

4th Year without Research Semester 7

MC 16: Himalayan Literature

MC 17: Posthumanism & Anthropocene

MC 18: Translation Studies

MC 19: Diaspora Literature

Semester 8

MC 20: Art History; Aesthetics & Literature

MC 21: Women's Writings

MC 22: Cinema & Literature

MC 23: Literary Theory & Criticism II

Signatures:

Dean:

Head:

External Expert/Experts:

Alumni Member:



Salesian College

(Autonomous)

Sonada – Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Bachelor of Arts (Double Major)

Department of English

Curriculum Document (2024- 2025)

Vision:

The Department of English, Salesian College (Autonomous) envisages empowering the students to develop and build knowledge of the content and methods of literary studies, academic, professional, creative and critical reading/ writing, thereby championing in undergraduate/ postgraduate research, knowledge creation, and reaching to the marginalised .

Mission:

1. To provide appropriate pedagogies in keeping with the signs of the time
2. To help students develop criticality of the text by way of presenting/writing research papers for (inter)national symposia, conferences etc
3. To give students a sense of themselves as citizens of a larger community by encouraging participation in service learning
4. To assure that students encounter creativity crucial to English studies through theatre productions, readings by professional writers, and their own creative and critical production and presentation.
5. To balance the needs of general education – communication, diversity, global perspectives, inter(trans)disciplinary studies
6. 6. To value faculty scholarship and service through greater support for and participation in activities of the profession.

1. Programme Overview

Bachelor of Arts in English is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:	
Knowledge	PO01: Acquaint oneself with the history of English literature and understand its social, political, and historical context(s).
	PO02: Gain understanding of the growth of diverse literatures and the English language.
	PO03: Relate one's understanding to explore identity, values, manners, and morals through different engagements
	PO04: Grasp literary forms, types, literary theory and gain an alternate understanding of the contemporary issues of the modern world.
Skills	PO05: Demonstrate his/her critical understanding of texts and issues through presenting/writing research papers for (inter)national symposia, conferences etc.

	PO06: Construct writing projects like essays, short-stories, poems
	PO07: Develop presentation skills with discussions, debates, public speaking, and integrating ICT.
	PO08: Acquaint oneself with the diverse current issues like environmental crisis, climate change, gender discrimination, marginality, and politics through reading of relevant literature.
Competence	PO09: Explore new/revised understanding of issues through the application of literary and cultural theories.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as research and education is a lifelong process for empowering the student to face all challenges in their future endeavours, and develop new ideas and new understanding.
	PO11: Develop concern for the society and nation through understanding of regional and vernacular literatures and comparing our literary content, themes, and usage of language with that of literatures of other developing countries.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops a clear idea about the details of the history, development and growth of the English language.
	PSO2: A student gathers knowledge about the content, context, and nature of the subject
	PSO3: A student develops knowledge about the detailed history of English literature from Old English Period to 20 th century
	PSO3: A student develops knowledge about the social, political, historical and economical movements that helped shape literature, and also trace the development of human civilization and culture under these fields.
	PSO4: A student develops knowledge about the interconnections and interrelations across disciplines and cultures by studying world literatures including Indian writing in English.
	PSO5: A student develops knowledge about the gendered aspect of writing and gain awareness about the issues and concerns of women writers and women's writing as a separate genre.
	PSO6: A student develops understanding of different concepts like Modern/Modernity/Modernism amongst others.
	PSO7: A student develops understanding of critical literary and cultural theories to interpret and analyse texts.

Skills	PSO1: A student will develop the skills required for Creative Writing.
	PSO2: A student will develop presentation skills with discussions, debates, public speaking , and integrating ICT.
	PSO3: A student will exhibit an awareness of the diverse current issues like environmental crisis, climate change, gender discrimination, marginality, and politics through reading of relevant literature.
	PSO4: A student will develop critical aptitude to write research papers and present them in conferences of different levels.
	PSO5: A student will develop the ability to interpret older texts from a contemporary point of view.
	PSO6: A student will gain awareness of connection between literary and political movements impacting different literary eras and movements.
	PSO7: A student will develop critical thinking skills through various literary and cultural theories.
Competence	PSO1: A student will be able to apply critical literary theory to formulate arguments about literary and other critical texts as well as contemporary cultural practices.
	PSO2: A student will be able to re-interpret society and culture through the theoretical lens developed by philosophers and literary theorists.
	PSO3: A student will be able to question the problems of identity through text.
	PSO4: A student will be able to locate and represent subaltern voices through their own writings.
	PSO5: A student will envision a society where diverse people irrespective of gender, caste, religion and sexuality, coming from various backgrounds enjoy equal and equitable rights and opportunities.
	PSO6: A student will be able to demonstrate his/her critical understanding of texts and social issues through presenting/writing research papers and designing research proposals.
	PSO7: A student will analyze the contemporary trends in literature both English and vernacular.

PROGRAM MATRIX:

Qualification	Exit Stage
Certificate in English	After successful completion of semesters I and II with 44 credits
Diploma in English	After successful completion of semesters I and IV with 85 credits
B.A. in English	After successful completion of semesters I and VI with 127 credits
B.A. in English and (Second Major)	After successful completion of semesters I and VI with 135 credits
B.A. (Hons.) in English	After successful completion of semesters I and VIII with 167 credits
B.A (Hons. with Research) in English	After successful completion of semesters I and VIII with 167 credits, including 12 research credits
B.A (Hons.) in English and B.A. in (Second Major)	After successful completion of semesters I and VIII with 175 credits
B.A (Hons. with Research) in English and B.A. in (Second Major)	After successful completion of semesters I and VIII with 175 credits, including 12 research credits

Sem	Core A	Core B	SEC A/B	MDC	AEC (Lang)	AEC (EVS)	VAC	Intern	Tot
1	1(4)	1(4)	1(3) – A	1(3)	1(2)	1(2)	1(2)	-	20
2	2(8)	2(8)	1(3) – B	1(3)	-	-	1(2) – A	-	24
3	1(4)	1(4)	1(3) – A	1(3)	1(2)	1(2)	1(2)	-	20
4	2(8)	2(8)	1(3) – B	-	-	-	1(2) - B	4	25
TOT	24	24	12	9	4	4	8	4	
5 (DM)	3(12)	3(12)	-	-	-	-	-	-	24
6 (DM)	3(12)	3(12)	-	-	-	-	-	-	24
Tot	48	48	12	9	4	4	8	4	137
5	5(20)	-	-	-	-	-	-	-	20
6	5(20)	-	-	-	-	-	-	-	20
Tot	64	24	12	9	4	4	8	4	129

SEM 1	PAPER CODE	PAPER	COURSE	CREDITS =(L+T+P)	MODE OF EXAM	CLASS HOURS
Core A	24ENGMAJ101	ENGLISH	History of English Language and Literature	4 (3+1+0)	Theory	60
Core B		Another Subject of choice		4(3+1+0)	Theory	60
SEC A	24ENGSEC101	ENGLISH	English Phonetics, Pronunciation , Literary Devices & Types	3(2+0+1)	Th+P	45
MDC	24ENGMDC101		Writings in English	3(2+1+0)	Theory	45
AEC(ENG)	24ENGAEC101		Compulsory English	2	Theory	30
AEC(EVS)	24GEOAEC101			2	Th+ Viva	30
VAC (English)	24ENGVAC101	English	Ecology and Literature	2	Viva	30
		7 Papers		20		

SEM 2	PAPER CODE	PAPER	COURSE	CREDITS =(L+T+P)	MODE OF EXAM	CLASS HOURS
Core A	24ENGMAJ102	ENGLISH	Chaucer to Shakespeare	4 (3+1+0)	Theory	60
Core A	24ENGMAJ103	ENGLISH	Indian Literature in English	4 (3+1+0)	Theory	60
Core B		Another Subject of choice		4(3+1+0)	Theory	60
Core B		Another Subject of choice		4(3+1+0)	Theory	60
SEC B	24ENGSEC101		English Phonetics, Pronunciation, Literary Devices & Types	3(2+0+1)	Th+P	45
MDC	24ENGMDC102	English	American Writings in English	3(2+1+0)	Theory	45
VAC (Val Ed/Bible Studies)	24SCSVED101/ 24VACBIB101		Value Education/ Bible Studies	2	Viva	30
		7 Papers		24		

SEMESTER I

Course Content

1. Course Description

Course Code	23ENGMAJ101	
Course Title	History of English Language and Literature	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	N/A	
Course Offered to	English	
Regulation	2024	
Course Overview	This course will: a. Will provide an introduction to the evolution of the language and the literature b. Account for the social, cultural and political changes in England in the last millennia. c. Acquaint the students in broad terms with the major artistic and philosophical movements.	
Prerequisite	Proficiency in basic levels of comprehension in the English language	
Course Objectives	A student will be able to: a. Understand the whole realm of the history of English literature. b. Remember major literary and philosophical schools. c. Analyze literature as a domain of art and theory. d. Evaluate the major authors and their canonical works.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understand the whole realm of the history of English literature.	R U
CO2	Remember major literary and philosophical schools.	R U

CO3	Analyze literature as a domain of art and theory.	R,A1
CO4	Evaluate the major authors and their Canonical works.	A2,E

Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit I	Old and Middle English a. Overview b. Socio-Political Background c. Noted authors and their Works Age of Chaucer a. Overview of the age b. Noted works c. Literary importance	12	CO1 CO2 CO3 CO4	R, U
Unit 2	Age of Elizabeth a. Historical overview b. Noted authors and their works c. Literary importance Age of Milton a. Social and political atmosphere b. Noted works c. literary importance	12	CO2 CO3 CO4	R,U,A2 E
Unit 3	Age of Dryden and Pope a. Social and political atmosphere b. Noted works c. literary importance Age of Wordsworth a. Social and political atmosphere b. Noted writers and their works c. Literary importance	12	CO1 CO2 CO3 CO4	R,U, A2,E

Unit 4	Victorian Age a. Social and political atmosphere b. Noted writers and their works c. literary importance Modern and Postmodern Age a. The World Wars and their impact b. Philosophical changes c. Notable schools of thoughts d. Notable authors and their works	12	CO1 CO2 CO3 CO4	R,U, A2,E
Unit 5	Growth of English Language a. Scandinavian Influence b. French Influence c. Classical Influence English Language and Regional Influence a. American and British English b. Indian English	12	CO1 CO2 CO3 CO4	R U A E

Text Books

1. Baugh, A. C., & Cable, Thomas. (2013). *A History of the English Language*. Routledge.
2. Jespersen, O. (2022). *Growth and Structure of English Language*. Atlantic Publishers and Distributors Pvt Ltd.
3. Baldick, C. (2015). *The Oxford Dictionary of Literary terms*. Oxford University Press.
4. Peck, John & Coyle, Martin (2002). *Literary Terms and Criticism*. Macmillan Education.

Suggested readings

1. Gail M. Coelho. (1997). Anglo-Indian English: A Nativized Variety of Indian English. *Language in Society*, 26(4), 561–589. <http://www.jstor.org/stable/4168803>
2. Hoffmann, S., & Mukherjee, J. (2007). Ditransitive verbs in Indian English and British English: a corpus-linguistic study. *AAA: Arbeiten Aus Anglistik Und Amerikanistik*, 32(1), 5–24. <http://www.jstor.org/stable/43025781>

Open online resources

1. Indian English, egyankosh.ac.in
(<https://egyankosh.ac.in/bitstream/123456789/22565/1/Unit-4.pdf>)
2. Global English and Indian English, egyankosh.ac.in
<https://egyankosh.ac.in/bitstream/123456789/26750/1/Unit-2.pdf>

Video links

1. Bown, C. (2015). Where did English come from?. TED-Ed.
(<https://www.youtube.com/watch?v=YFaSxhcns7Y>)
2. A Short History of English Language. The Generalist Papers.
(<https://www.youtube.com/watch?v=iSSTv8-2358>)

Case Study

1. Betageri, A. (2017). A Case for the Standardization of Indian English. *Indian Literature*, 61(1 (297)), 171–181.
<https://www.jstor.org/stable/26791193>

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

- i. **Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment: 50 marks**
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Vasudeva Naidu K Signature:	Name: Ms. Prathiba Soni Signature:	Name: Mr. Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23ENGSEC101	
Course Title	English Phonetics, Pronunciation, Literary Devices & Types	
Credits	3	
Total Hours	45	
Hours per Week	2	
Course Type	Skill Enhancement Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	NA	
Course Offered to	English	
Regulation	2024	
Course Overview	This course: a. Provides fundamental understanding of English Phonetics b. Aims at providing knowledge of Vowels, Consonants and Consonant Clusters c. Enhances the skill of learning proper accents	
Prerequisite	Basic knowledge of spoken English	
Course Objectives	A student will be able to: a. Have a thorough understanding of Phonetics and Phonology. b. Know the syllable and Word Accent. c. Enhance skills of English pronunciation and speech mechanism.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understanding English Phonetics and Phonology	R, U
CO2	Analyze and remember the syllable and Word Accent. .	R, A2
CO3	Apply proper English pronunciation and speech mechanism	C

Course Content				
Units	Content	Lecture Hours	COs	RBT

Unit I	Linguistics and Phonetics - Phonetics and Phonology - Syllable - Word Accent Pronunciation - Speech Mechanism - The Speech Organs - Vowels and Consonants-Consonant Cluster in English	15	CO1 CO2 CO3	R,U,A1, A2 E, C
Unit II	Literary Devices (Simile, Metaphor, Irony, Dramatic Irony, Bathos, Pathos, Oxymoron, Litotes, Alliteration, Climax, Anti-climax, Synecdoche, Metonymy, Chiasmus, Personification, Anaphora, Transferred epithet, Epigram, Pathetic fallacy, Euphemism)	15	CO1 CO2 CO3	R,U,A1, A2,E,C
Unit III	Literary Types - Poetry (Ballad, Lyric, Ode, Elegy, Sonnet, Verse Romance, Blank Verse) - Tragedy (Tragic Hero, Hamartia, Catharsis, Aristotelian Unities, Revenge Tragedy, Domestic Tragedy). - Comedy (Comedy of Manners, Comedy of Humours, Sentimental Comedy, Romantic Comedy).	15	CO1 CO2 CO3	R,U,A1, A2,E,C
Learning Resources: - An Introduction to the Pronunciation of English: A.C. Gimson. - A text Book of English Phonetics for Indian Students: T. Balasubramaniam (Macmillan) - Peck, John & Coyle, Martin (2002). <i>Literary Terms and Criticism</i>. Macmillan Education. - Baldick, C. (2015). <i>The Oxford Dictionary of Literary terms</i>. Oxford University Press. - Jespersion, O. (2022). <i>Growth and Structure of English Language</i>. Atlantic Publishers and Distributors Pvt. Ltd.				

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

- Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment: 50 marks**
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Three Long Questions to be answered out of six set from higher order of RBT – (30

Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Dr. Terence Mukhia	Name: Ms. Ashwini Tamang	Name: Mr. Ravi Bhushan Singh
Signature:	Signature:	Signature:

1. Course Description

Course Code	23ENGMDC101
Course Title	Writings in English
Credits	3
Total Hours	45
Hours per Week	3
Course Type	Multi-Disciplinary Course
Semester	I
Intended Level	Certificate
Issue(s) Addressed	Compositions, Fundamental Grammar, Official Writings
Course Offered to	
Regulation	2024
Course Overview	This course: a. Provides fundamental skill enhancement related to English fundamental communication. b. Focuses on Basic English grammar. c. Builds compositional skills in the students.
Prerequisite	Understanding and writing business communication in proper and formal ways.

Course Objectives	A student will be able to: a. To enhance the comprehension, reading, writing and speaking skills of the students. b. Provide a thorough understanding of Basic English grammar and construction. c. Help the students write business communication in proper and official formats.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understand basic English grammar and sentence construction.	R, U
CO2	Write business communication in proper and official formats.	A1, A2, C
CO3	Enhance the comprehension, reading, writing and speaking skills of the students.	U, C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Writing Skill: - Comprehension - Summary Writing - Resume Writing	15	CO1 CO3	R U A1 A2 E C
Unit II	Drama: Mahesh Dattani: <i>Tara</i>	15	CO2 CO3	R
Unit III	Short Story: Munshi Premchand: <i>God Lives in the Panch</i> Poem: Sarojini Naidu: <i>The Coromandel Fishers</i>			U
		15		A1 A2 E C

Learning Resources:

1. *Applied English Grammar and Composition*, Dr. P. C. Das, New Central Book Agency: 2012.
2. *Creative Writing: A Beginner's Manual*, Anjana Neira Dev, Pearson Education India, 2008.
3. *On Track: English Skills For Success*, Board of Editors, Solapur University 2013

2. Assessment

- i. ***Formative Assessment: 50 marks*** as per Assessment & Evaluation Framework Document of Salesian College
- ii. ***Summative Assessment: 50 marks***
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT –(30 Marks). Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms Pratibha Soni	Name: Ms Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

1. Course Description

Course Code	23AECE101	
Course Title	Compulsory English	
Credits	2	
Total Hours	30	
Hours per Week	1	
Course Type	Ability Enhancement course	
Semester	I	
Intended Level	Certificate	
Issue(s)Addressed	Comprehension, Writing, Literary Types	
Course Offered to	English	
Regulation	2024	
Course Overview	This course: a. Provides fundamental understanding of formal-writing based communication. b. Aims at basic aspects needed for coherent and well-structured paragraphs. c. Focuses on how to write concisely and effectively.	
Prerequisite	Basic knowledge of reading journals, articles and newspapers.	
Course Objectives	A student will be able to: a. Gain basic understanding of formal writing-based communication. b. Develop their skills in essay/formal writing. c. Enhance their writing skills.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understand basics of formal-writing based communication and identify different forms and types of literary writings.	R,U
CO2	Develop skills in essay/formal writing.	R,A2
CO3	Enhance their writing skills	C
CO4	Critique different types of literature	E

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Reading & Writing a) Comprehension b) Essay Writing c) Formal and informal Letter Writing	15	CO1 CO2	R U A1 A2 E C
Unit II	Literature Poem a) William Wordsworth: <i>Daffodils</i> Short Story b) George Orwell: <i>Shooting an Elephant</i> Novel c) Anita Desai: <i>Fasting, Feasting</i>	15	CO2 CO3	R U A1 A2 E C
Learning Resources: - Bly, R W. (2004) <i>Webster's New World Letter Writing Handbook</i>. Wiley Publishing House. - Kumar, S, & Pushp, L. (2018) <i>Communication Skills: A Workbook</i>. OUP. - Ahlawat, Menka, et al. <i>Selections from British Literature: Poems and Short Stories</i>. Worldview, 2019. - Curtius, Ernst Robert. <i>Essays on European Literature</i>. Translated by Michael Kowal, Princeton Legacy Library, 1973. - Desai, A. (2000). <i>Fasting, Feasting</i>. Vintage				

2. Assessment

- Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College.
- Summative Assessment: 50 marks**
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Ms. Rinchen Sherpa	Name: Ms. Pratibha Soni	Name: Mr. Ravi Bhushan Singh
Signature:	Signature:	Signature:

1. Course Description

Course Code	23SCSVAC1	
Course Title	ECOLOGY AND LITERATURE	
Credits	2	
Total Hours	30	
Hours per Week	2	
Course Type	Value Added Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	English and Others	
Regulation	2024	
Course Overview	This course: • Will emphasize the urgency of the environmental crisis and make students aware of the role each of us plays. • Students will be trained to be environmentally sensitive and adopt responsible Ecological behaviors. • Students will be encouraged to respond to issues like habitat destruction and deforestation and understand the need for urgent action.	
Prerequisite	N/A	
Course Objectives	A student will be able to: • To become aware of the urgent issues faced by our environment and the importance of reducing carbon footprint. • To develop a strong sense of responsibility towards the environment and adopt eco-friendly behaviour. • To view environmental concerns as raised through plays, stories and poems.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Learn to creatively explore and understand environmental issues	R, U, A1, C
CO2	Think critically and act responsibly	R, A1, A2, C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Negotiating environmental issues creatively - William Wordsworth: 'In April Beneath the Scented Thorn' - Gieve Patel: 'On Killing a Tree'	10	CO1	R,A1 A2,E,C
Unit II	Eco critical literary representations - A K Ramanujan: 'A Flowering Tree' - Mamang Dai: 'Small Towns and the River' - Thangjam Ibopishak: 'Volcano, you cannot erupt' from Dancing Earth: An Anthology of Poetry from North-East India.	20	CO2	R,U A1,2 E,C
Learning Resources: - Akhter, Tawhida, and Ahmad Bhat, Tariq. Literature and Nature. United Kingdom, Cambridge Scholars Publishing, 2022. - Shiva, Vandana. 'Development, Ecology and Women', Staying Alive: Women Ecology and Development. India: Zed Books, 1988. pp 1-14 - Carl, Safina. Prologue & Chapter 1, Beyond Words: What animals think and feel. Souvenir Press, 2015. - Garrard, Greg. Ecocriticism. United Kingdom: Taylor & Francis, 2011. - Wohlleben, Peter. The Hidden Life of Trees: What They Feel, How They Communicate-Discoveries from a Secret World. India: Penguin Books Limited, 2016.				

2. Assessment

- Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment: 50 marks**
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks). Summative Assessment Time: 2 Hours for pen and paper test.

Course Faculty (Course Prepared by)	Head of the Department (Checked and Verified by)	Dean (Approved by)
Name: Sr. Pascalina Lepcha	Name: Ms. Pratibha Soni	Name: Mr. Ravi Bhushan Singh
Signature:	Signature:	Signature:

SEMESTER II

1. Course Description

Course Code	23ENGMAJ102
Course Title	Chaucer to Shakespeare
Credits	4
Total Hours	60
Hours per Week	4
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	N/A
Course Offered to	English
Regulation	2024
Course Overview	This course will: a. Provide the introduction and insight into major works of 14th to 17th century’s British literature ranging from Geoffrey Chaucer to William Shakespeare; b. Give a critical understanding of major texts of this era.
Prerequisite	Understand the historical, social, and political context of England and English literature from 14 th to 17 th Century.

Course Objectives	A student will be able to:	
	i. Identify and differentiate between various literary terms through textual examples.	
	ii. Understand and critique the society of the time through the works of Geoffrey Chaucer and Thomas More.	
	iii. Analyze and gain critical insight into English poetry through William Shakespeare and other famous poets of the era.	
	iv. Examine the dramas of Elizabethan era and gain a preliminary overview of the Elizabethan stage.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student is able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Identify and differentiate between various Literary terms through textual examples.	R,U
CO2	Understand and critique the society of the	A2,E

	time through the works of Geoffrey Chaucer and Thomas More.			
CO3	Analyse and gain critical insight into English poetry through William Shakespeare and other famous poets of the era.		A2,E	
CO4	Examine the dramas of Elizabethan era and gain a preliminary overview of the Elizabethan stage.		A2,E	
Course Content				
Units	Content	Lecture Hours	C Os	RBT
Unit I	Middle English Prose: a. Chaucer: <i>General Prologue</i> , <i>The Canterbury Tales</i> -Introduction-Lines 1-31, <i>Prologue to the Wife of Bath</i>	15	CO1 CO2	R U A1 A2 E C
Unit II	Renaissance Prose: Thomas More: <i>Utopia</i> Or Nicolo Machiavelli : <i>The Prince</i>	15	CO1 CO2	R U A1 A2 E C
	Poetry:			
Unit III	William Shakespeare: Fair Youth Sonnets: <i>Sonnet 18</i> (Shall I Compare Thee To A Summer's Day?), Dark Lady Sonnets: <i>Sonnet 127</i> (In The Old Age Black Was Not Counted Fair), a. Sir Philip Sidney: From <i>Astrophel and Stella</i> sonnet sequence: <i>Sonnets 31, 39, 71</i> .	15	CO1 CO3	R U A1 A2 E C
	c. Edmund Spenser: From <i>Amoretti</i> sonnet sequence: <i>Sonnets LXXV, LXVII, LXVIII</i>			
	d. Sir Thomas Wyatt: <i>Whoso List to Hunt</i>			

	Drama (<i>Any one text to be taught</i>)		CO1 CO4	
Unit IV	a. Christopher Marlowe's <i>Dr. Faustus</i> b. William Shakespeare's <i>The Twelfth Night</i> c. William Shakespeare's <i>The Merchant of Venice</i> d. Thomas Kyd's <i>The Spanish Tragedy</i>	15		R U A1 A2 E C

Learning Resources: (Latest edition books listed in APA style:Seventh Edition)				

Text Books

1. Chaucer, G.(2003). *The Canterbury Tales* (N.Coghill, Trans.). Penguin.(Original work published 1476).
2. More, T. (2016). *Utopia* (R.M. Adams, Trans.). Cambridge University Press. (Original work published 1516).
3. Norbrook, D., & Woudhuysen, H.R.(Eds.).(1993). *The Penguin Book of Renaissance Verse: 1509- 1659*. (Reprint edition). Penguin Classics.
4. Elam, K.,(Ed.). (2013). *Twelfth Night* . Arden Shakespeare.
5. Andrews, R., Smith, R., Wienand, V.,(Eds.).(2014). *The Merchant of Venice*. Cambridge University Press.
6. Mukherjee, S.,(Ed.).(2000). *Doctor Faustus*. Worldview Publications.
7. Edwards, P.,(Ed.).(1977). *The Spanish Tragedy*. Manchester University Press.

Suggested Readings

1. Abrams, M.H., & Harpham, G.H.(2019). *A Glossary of Literary Terms*.(11th ed.). Cengage.
2. Carter, R., & McRae J.(2017). *The Routledge History of Literature in English*.(3rd ed.). Routledge.
3. Poplawski, P.(2017). *English Literature in Context*.(2nd ed.). Cambridge University Press.
4. Nayar, P. K.(2018). *A Short History of English Literature*. Amity University Press.
5. Boitani, P., & Mann J. (Eds.).(2004). *The Cambridge Companion to Chaucer*.(2nd ed.). Cambridge University Press.
6. Grazia, M.D., & Wells S.(2010). *The New Cambridge Companion to Shakespeare*. Cambridge University Press.
7. Ricks, C., (Ed.).(1970). *English Poetry and Prose, 1540-1674*. Barrie & Jenkins.
8. Burch, D., (Ed.).(2009). *The Oxford Companion to English Literature*.(7th ed.). Oxford University Press.

Open online resources

[https://www.thoughtco.com/how-to-identify-a-shakespeare-comedy-](https://www.thoughtco.com/how-to-identify-a-shakespeare-comedy-2985155)

[2985155 https://www.britannica.com/art/tragedy-literature/Tragedy-and-](https://www.britannica.com/art/tragedy-literature/Tragedy-and-modern-drama)

[modern-drama https://www.britannica.com/art/tragicomedy](https://www.britannica.com/art/tragicomedy)

Video links

NPTEL Video Course: English Language and Literature **Lecture 3 - Shakespeare's Life and Times**

<https://www.digimat.in/nptel/courses/video/109106120/L03.html>

NPTEL Video Course: English Language and Literature. **Lecture 14: The Age of Shakespeare**

<http://www.digimat.in/nptel/courses/video/109103020/L14.html>

2. Assessment

- i. **Formative Assessment: 50 marks** as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment: 50 marks**
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT –(30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Vasudeva Naidu K Signature:	Name: Ms. Prathiba Soni Signature:	Name: Mr. Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23ENGMAJ103
Course Title	Indian Literature in English
Credits	4
Lecture Hours	60
Hours per Week	4
Course Type	Major Core
Semester	II
Regulation	2024
Intended Level	Certificate
Issue(s) Addressed	N/A
Course Offered to	English
Course Overview:	This course will: a. Provide with an overview of Indian writing in English. b. Help the students understand the nature and notions of major Indian authors and their works.

Prerequisite	A student must have previous knowledge of the major papers offered in the first semester that gives the foundation to this course. Basic understanding and appreciating major literary figures of Indian English Literature is needed before taking this course.				
Course Objectives:	A student will be able to: a. Understand Anglo-Indian writing b. Read and appreciate Indo-Anglian writing. c. Understand the nature of Indian writing in English. d. Appreciate poetry, novels and prose written by various major/minor Indian poets and authors.				
Course Content					
Units	Contents	Lecture Hours	Cos	RBT	Meth ods Used
Unit I	Overview a. Macaulay’s Minutes, b. Anglo-Indian Writing, c. Indo-Anglian Writing	12	CO 1 CO 2	R, U, E, A, C	Lectures, PPTs, Writing exercises, Peer Teaching , Debate, GD.
Unit II	Poetry (Any 4) a. Rabindranath Tagore: “Arrival”, “The Golden Boat”, “The Conch” b. Toru Dutt: “Our Casuarina Tree”, “The	12	CO2	R, U, E, A, C	DO

	Sower” c. AK Ramanujan: d. Dom Moraes: “Absences”, “Behind the Door” e. Nissim Ezekiel: “Enterprise”, “Night of the Scorpion”				
Unit III	Essays (Any two) a. Jawaharlal Nehru: Selections from <i>My Autobiography</i> b. Arundhati Roy: <i>End of Imagination</i> , Selections from <i>Listening to Grasshoppers</i> c. Amit Chaudhuri: <i>On Strangeness in Indian Writing</i>	12	CO3	R, U, E,A, C	DO
Unit IV	Plays (Any one) a. Mahesh Dattani: <i>Dance Like a Man/Bravely Fought the Queen</i> b. Girish Karnad: <i>Tughlaq/Nagamandl a</i> c. Manjula Padmanabhan: <i>Harv est</i>	12	CO3 CO4	R, U, E, A, C	DO
Unit V	Novels (Any one) a. R. K. Narayan: <i>Swami and Friends</i> b. Arvind Adiga: <i>The White Tiger</i> c. Sashi Deshpande: <i>The Long Silence</i> d. Janice Pariat: <i>Everything the Light Touches</i>	12	CO3 CO4	R, U, E, A, C	DO
Suggested Readings: 1. ‘Commonwealth Literature does not Exist’ by Salman Rushdie. 2. <i>Indian Writing in English</i> , K. R. Srinivasa Iyengar, Sterling Publications: 1984. 3. <i>A History of Indian English Literature</i> , M. K. Naik, Sahitya Akademi: 2009. 4. ‘Divided by a Common Language’, in <i>The Perishable Empire</i> , Meenakshi Mukherjee, OUP: 2000. 5. ‘Introduction’ in <i>Modern Indian Poetry in English</i> , Bruce King, OUP: 2005.					

Course Outcomes (COs) and Cognitive Level Mapping		
At the end of the course a student will be able to:		
Cos	Statement s	R B T
CO1	Understand Anglo Indian writing.	R, U, E, A, C
CO2	Understand the key aspects of Indo-Anglian writing.	R, U, E, A, C
CO3	Understand the nature of Indian writing in English.	R, U, E, A, C
CO4	Analyse poetry, novels and prose written by various major/minor Indian poets and authors.	R, U, E, A, C

Course Outcomes (COs) and Cognitive Level Mapping		
At the end of the course a student will be able to:		
Cos	Statement s	R B T
CO1	Understand Anglo Indian writing.	R, U, E, A, C
CO2	Understand the key aspects of Indo-Anglian writing.	R, U, E, A, C
CO3	Understand the nature of Indian writing in English.	R, U, E, A, C
CO4	Analyse poetry, novels and prose written by various major/minor Indian poets and authors.	R, U, E, A, C

Cos	Statements	R B T
CO1	Understand Anglo Indian writing.	R, U, E, A, C
CO2	Understand the key aspects of Indo-Anglian writing.	R, U, E, A, C
CO3	Understand the nature of Indian writing in English.	R, U, E, A, C
CO4	Analyse poetry, novels and prose written by various major/minor Indian poets and authors.	R, U, E, A, C

2. Assessment

- i. ***Formative Assessment: 50 marks*** as per Assessment & Evaluation Framework Document of Salesian College
- ii. ***Summative Assessment: 50 marks***
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT –(30 Marks). Summative Assessment Time: 2 Hours for pen and paper test

Faculty Member (Course Prepared by)	Head of the Department (Checked and Verified by)	Dean (Approved by)
Name: Mr. Peter Lepcha	Name: Ms. Prathiba Soni	Name: Mr. Ravi Bhushan Singh
Signature:	Signature:	Signature:

1. Course Description

Course Code	23ENGSEC101	
Course Title	English Phonetics, Pronunciation, Literary Devices & Types	
Credits	3	
Total Hours	45	
Hours per Week	2	
Course Type	Skill Enhancement Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	NA	
Course Offered to	English	
Regulation	2024	
Course Overview	This course: d. Provides fundamental understanding of English Phonetics. e. Aims at providing knowledge of Vowels, Consonants and Consonant Clusters. f. Enhances the skill of learning proper accents.	
Prerequisite	Basic knowledge of spoken English	
Course Objectives	A student will be able to: d. Have a thorough understanding of Phonetics and Phonology. e. Know the syllable and Word Accent. f. Enhance skills of English pronunciation and speech mechanism.	
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:		
Cos	Statements	Cognitive Level Mapping
CO1	Understanding English Phonetics and Phonology	R, U
CO2	Analyze and remember the syllable and Word Accent.	R, A2
CO3	Apply proper English pronunciation and speech mechanism	C

Course Content				
Units	Content	Lecture Hours	COs	RBT

Unit I	Linguistics and Phonetics d. Phonetics and Phonology e. Syllable f. Word Accent Pronunciation a. Speech Mechanism b. The Speech Organs c. Vowels and Consonants- Consonant Cluster in English.	15	CO1 CO2 CO3	R U A1 A2 E C
Unit II	Literary Devices (Simile, Metaphor, Irony, Dramatic Irony, Bathos, Pathos, Oxymoron, Litotes, Alliteration, Climax, Anti-climax, Synecdoche, Metonymy, Chiasmus, Personification, Anaphora, Transferred epithet, Epigram, Pathetic fallacy, Euphemism)	15	CO1 CO2 CO3	R,U, A1,A 2,E, C
Unit III	Literary Types d. Poetry (Ballad, Lyric, Ode, Elegy, Sonnet, Verse Romance, Blank Verse) e. Tragedy (Tragic Hero, Hamartia, Catharsis, Aristotelian Unities, Revenge Tragedy, Domestic Tragedy). c. Comedy (Comedy of Manners, Comedy of Humours, Sentimental Comedy, Romantic Comedy).	15	CO1 CO2 CO3	R,U, A1,A 2,E, C

Learning Resources:

1. An Introduction to the Pronunciation of English: A.C. Gimson.
2. A text Book of English Phonetics for Indian Students: T. Balasubramaniam (Macmillan)
3. Peck, John & Coyle, Martin (2002). *Literary Terms and Criticism*. Macmillan Education.
4. Baldick, C. (2015). *The Oxford Dictionary of Literary terms*. Oxford University Press.
5. Jespersen, O. (2022). *Growth and Structure of English Language*. Atlantic Publishers and Distributors Pvt. Ltd.

R: Remembering, U: Understanding, A1: Applying, A2: Analyzing, E: Evaluating, C: Creating

2. Assessment

- Formative Assessment: 50 marks** as per Assessment & Evaluation Framework

Course Faculty (Course Prepared by)	Head of the Department (Checked and Verified by)	Dean (Approved by)
Name: Dr Terence Mukhia	Name: Ms Ashwini Tamang	Name: Mr. Ravi Bhushan Singh
Signature:	Signature:	Signature:

Course Code	23ENGMDC102
Course Title	American Writings in English
Credits	3
Total Hours	45
Hours per Week	3
Course Type	Multi-Disciplinary Course
Semester	II
Intended Level	Certificate
Issue(s) Addressed	Poems, short stories, novella
Course Offered to	Other than English Department
Regulation	2023

Course Overview	This course Provides knowledge of the genres of poetry, short stories and novella in American literature. Understanding the themes and the writings of American literature.			
Prerequisite	Basic knowledge of literature in English' and different genres of writing			
Course Objectives	A student will be able to: To understand poetry as a genre. To differentiate between prose, poetry and novella. Understanding American Literature in context of the assigned periods. To understand the American poets like Longfellow, Frost and Walt Whitman in the historical context of the period. Understand novella as a genre.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Identify major poets and writers in American Literature and how it reflects the concerns of the society.	R,U		
CO2	Analyse the thematic concerns in the poems and short stories in relation to American society.	A1,A2,C		
CO3	Analyze the novella as a genre of writing.	U,C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Poems 1.The Village Blacksmith- H W Longfellow 2. Walt Whitman- O Captain! My Captain 3. The Road Not Taken - Robert Frost.	15	CO1 CO2 CO3	R U A 1 A 2 E C

Unit II	Short stories The Lamb to the Slaughter- Roald Dahl The Last Leaf - O Henry	15	CO1 CO2 CO3	R U A 1 A 2 E C
Unit III	Novella The Lorax - Dr. Seuss	15		

Learning Resources:

The Robert Frost Reader: Poetry and Prose, Holt Paperbacks, Reprint edition 1st April, 2002.

A Short History of American Literature, The Orient Blackswan, 1 January 2017

The Cambridge Introduction to Walt Whitman (Cambridge Introductions to Literature) 1st Edition - 8 March 2007.

American Short Story Masterpieces (Thrift Editions, Dover Publications, 2013.

The Robert Frost Reader: Poetry and Prose, Holt Paperbacks, Reprint edition 1st April, 2002.
A Short History of American Literature, The Orient Blackswan, 1 January 2017
The Cambridge Introduction to Walt Whitman (Cambridge Introductions to Literature)
1st Edition - 8 March 2007.
American Short Story Masterpieces (Thrift Editions, Dover Publications, 2013).

i. Formative Assessment: 50 marks as per Assessment & Evaluation Framework Document of Salesian College

Four Short Questions to be answered out of eight given from lower order of RBT–
(20Marks)

Course Faculty (Course Prepared by)	Head of the Department (Checked and Verified by)	Dean (Approved by)
Name: Ms. Mimansa Subedi Signature:	Name: Ms Pratibha Soni Signature:	Name: Mr Ravi Bhushan Singh Signature:

Signature of Head

Signature of External Experts

Signature of Alumni

Date:

DEPARTMENT OF ENGLISH
BOS MEETING, 2024
LIST OF EXAMINERS
UG SEMESTER I

Course code and Name Semester I	Paper Setter	Examiner	Moderators	Scrutineer	Head Examiner	Post Publication Reviewers
CORE A ENGLISH	Rinchen Sherpa	Mimansa Subedi	Jyotisma Sarkar	Pratibha Soni	Peter Lepcha	Minuka Tamang
SEC	Sr. Pascalina	Pratibha Soni	Minuka Tamang	Mimansa Subedi	Peter Lepcha	Jyotisma Sarkar
MDC	Pratibha Soni	Peter Lepcha	Mimansa Subedi	Minuka Tamang	Sr. Pascalina	Jyotisma Sarkar
AEC	Minuka Tamang	Jyotisma Sarkar	Pratibha Soni	Mimansa Subedi.	Sr. Pascalina	Peter Lepcha

DEPARTMENT OF ENGLISH
BOS MEETING, 2024
LIST OF EXAMINERS
UG SEMESTER II

Course code and Name Semester II	Paper Setter	Examiner	Moderators	Scrutineer	Head Examiner	Post Publication Reviewers
CORE A ENGLISH	Rinchen Sherpa	Mimansa Subedi	Jyotisma Sarkar	Pratibha Soni	Peter Lepcha	Minuka Tamang
CORE B ENGLISH	Sr. Pascalina	Jyotisma Sarkar	Minuka Tamang	Peter Lepcha	Pratibha Soni	Mimansa Subedi
SEC	Sr. Pascalina	Pratibha Soni	Minuka Tamang	Mimansa Subedi	Peter Lepcha	Jyotisma Sarkar
MDC	Pratibha Soni	Peter Lepcha	Mimansa Subedi	Minuka Tamang	Sr. Pascalina	Jyotisma Sarkar
VAC	Minuka Tamang	Jyotisma Sarkar	Pratibha Soni	Mimansa Subedi	Sr. Pascalina	Peter Lepcha



Salesian College
(Autonomous)
Sonada - Siliguri

PG Curriculum Framework (2024-2025)

For

Master of Arts in English

Curriculum Document
2024 – 2025

Vision:

The Department of English, Salesian College (Autonomous) envisages empowering the students to develop and build knowledge of the content and methods of literary studies, academic, professional, creative and critical reading/ writing, thereby championing in undergraduate/ postgraduate research, knowledge creation, and reaching to the marginalised.

Mission:

1. To provide appropriate pedagogies in keeping with the signs of the time
2. To help students develop criticality of the text by way of presenting/writing research papers for (inter)national symposia, conferences etc
3. To give students a sense of themselves as citizens of a larger community by encouraging participation in service learning
4. To assure that students encounter creativity crucial to English studies through theatre productions, readings by professional writers, and their own creative and critical production and presentation.
5. To balance the needs of general education – communication, diversity, global perspectives, inter(trans)disciplinary studies
6. 6. To value faculty scholarship and service through greater support for and participation in activities of the profession.

1. Programme Overview

Bachelor of Arts in English is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

After completion of the programme, a student will be able to:

Knowledge	PO01: Acquaint oneself with the history of English literature and understand its social, political, and historical context(s).
	PO02: Gain understanding of the growth of diverse literatures and the English language.
	PO03: Relate one's understanding to explore identity, values, manners, and morals through different engagements
	PO04: Grasp literary forms, types, literary theory and gain an alternate understanding of the contemporary issues of the modern world.
Skills	PO05: Demonstrate his/her critical understanding of texts and issues through presenting/writing research papers for (inter)national symposia, conferences etc.
	PO06: Construct writing projects like essays, short-stories, poems
	PO07: Develop presentation skills with discussions, debates, public-speaking, and integrating ICT.
	PO08: Acquaint oneself with the diverse current issues like environmental crisis, climate change, gender discrimination, marginality, and politics through reading of relevant literature.
Competence	PO09: Explore new/revised understanding of issues through the application of literary and cultural theories.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as research and education is a lifelong process for empowering the student to face all challenges in their future endeavours, and develop new ideas and new understanding.
	PO11: Develop concern for the society and nation through understanding of regional and vernacular literatures and comparing our literary content, themes, and usage of language with that of literatures of other developing countries.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops a clear idea about the details of the history, development and growth of the English language.
	PSO2: A student gathers knowledge about the content, context, and nature of the subject

	PSO3: A student develops knowledge about the detailed history of English literature from Old English Period to 20 th century
	PSO3: A student develops knowledge about the social, political, historical and economical movements that helped shape literature, and also trace the development of human civilization and culture under these fields.
	PSO4: A student develops knowledge about the interconnections and interrelations across disciplines and cultures by studying world literatures including Indian writing in English.
	PSO5: A student develops knowledge about the gendered aspect of writing and gain awareness about the issues and concerns of women writers and women's writing as a separate genre.
	PSO6: A student develops understanding of different concepts like Modern/Modernity/Modernism amongst others.
	PSO7: A student develops understanding of critical literary and cultural theories to interpret and analyse texts.
Skills	PSO1: A student will develop the skills required for Creative Writing.
	PSO2: A student will develop presentation skills with discussions, debates, public speaking, and integrating ICT.
	PSO3: A student will exhibit an awareness of the diverse current issues like environmental crisis, climate change, gender discrimination, marginality, and politics through reading of relevant literature.
	PSO4: A student will develop critical aptitude to write research papers and present them in conferences of different levels.
	PSO5: A student will develop the ability to interpret older texts from a contemporary point of view.
	PSO6: A student will gain awareness of connection between literary and political movements impacting different literary eras and movements.
	PSO7: A student will develop critical thinking skills through various literary and cultural theories.
Competence	PSO1: A student will be able to apply critical literary theory to formulate arguments about literary and other critical texts as well as contemporary cultural practices.
	PSO2: A student will be able to re-interpret society and culture through the theoretical lens developed by philosophers and literary theorists.
	PSO3: A student will be able to question the problems of identity through text.
	PSO4: A student will be able to locate and represent subaltern voices through their own writings.

	PSO5: A student will envision a society where diverse people irrespective of gender, caste, religion and sexuality, coming from various backgrounds enjoy equal and equitable rights and opportunities.
	PSO6: A student will be able to demonstrate his/her critical understanding of texts and social issues through presenting/writing research papers and designing research proposals.
	PSO7: A student will analyse the contemporary trends in literature both English and vernacular.

Program Matrix

SEM 1	PAPER	COURSE	CREDITS =(L+T+P)	MODE OF EXAM	CLASS HOURS
Major 1	24ENGMAJ501	Renaissance Studies	5	Theory	75
Major 2	24ENGMAJ502	Shakespeare Studies	5	Theory	75
Major 3	24ENGMAJ503	17th and 18th Century Studies	5	Theory	75
Major 4	24ENGMAJ504A	Environment and Literature I /Film Studies I/Himalayan Literature I	5	Theory	75
	4 Papers		20		

SEM 2	PAPER	COURSE	CREDITS =(L+T+P)	MODE OF EXAM	CLASS HOURS
Major 1	24ENGMAJ505	The Romantics	5	Theory	75
Major 2	24ENGMAJ506	19th Century Studies I	5	Theory	75
Major 3	24ENGMAJ507	19th Century Studies II	5	Theory	75
Major 4	24ENGMAJ508B	Environment and Literature II /Film Studies II/Himalayan Literature II	5	Theory	75
	4 Papers		20		

COURSE DETAILS:

SEMESTER I

Major Courses: 04

1. 24ENGMAJ501: Renaissance Studies
2. 24ENGMAJ502: Shakespeare Studies
3. 24ENGMAJ503: 17th and 18th Century Studies
4. 24ENGMAJ504A: Any one to be chosen from the following:
 - a) Film Studies 1
 - b) Environment & Literature 1
 - c) Himalayan Studies 1

100 Marks each

5 Credits each

Contact Hours: 5 hrs per week

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

SEMESTER II

Major Courses: 04

5. 24ENGMAJ505: The Romantics
6. 24ENGMAJ506: 19th Century Studies I
7. 24ENGMAJ507: 19th Century Studies II
8. 24ENGMAJ508B: Any one to be chosen from the following:
 - a) Film Studies 2
 - b) Environment & Literature 2
 - c) Himalayan Studies 2

100 Marks each
5 Credits each
Contact Hours: 5 hrs per week

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

SEMESTER 1

Course Description

Course Code	24ENGMAJ501
Course Title	Renaissance Studies
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	1
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2024

Course Objectives	• The Renaissance is an important historical era in the history of English Literature. The course aims to introduce the students to the rise and development of Renaissance literature through dominant forms like poetry, essays and dramas. • This course will serve to make students familiar with literary history and enable them to relate the texts with the socio- political trends of contemporary England. • The students will be able to interpret and explain the dominant poetic forms, dramatic forms of the era in a nuanced manner and compare them with the texts of the other period.
Course Outcomes	A student will be able: • To familiarize oneself with the representative features of the Renaissance age and the ideas that have influenced the literary works. • To review the texts against the background of the age. • To appreciate transformation like the development of humanistic ideas, and the scientific outlook of the era. • To gain the ability to employ their understanding to compose their own answers and envisage potential research areas in the field of Renaissance, Humanism and Reformation.
Course Content	
1	Edmund Spenser: Faerie Queens, Book- 1
2	Philip Sidney: An Apology for Poetry
3	Christopher Marlowe: Doctor Faustus
4	Bacon: Of Adversity, Of Truth, Of Studies, Of Travel, Of Friendship, Of Youth and Age.

Learning Resources:**Suggested Readings –**

1. Pico Della Mirandola, excerpts from The Oration on the Dignity of Man, in The Portable Renaissance Reader, ed. James Bruce Ross, and Mary Martin McLaughlin (New York: Penguin Books, 1953)
2. John Calvin, 'Predestination and Free Will', in The Portable Renaissance Reader, ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books, 1953) pp.704–11.
3. Baldassare Castiglione, 'Longing for Beauty' and 'Invocation of Love', in Book 4 of The Courtier, 'Love and Beauty', tr. George Bull (Harmondsworth: Penguin, rpt. 1983) pp. 324–8,330–5.
4. Greenblatt, Stephen. Renaissance Self Fashioning: From More to Shakespeare, (U Chicago P, 1980) Braunmuller, A.N., and Michael Hattaway, eds. The Cambridge Companion to English Renaissance Drama

Assessment:**i. Formative Assessment: 50 Marks.**

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Pratibha Soni	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

Course Description

Course Code	24ENGMAJ502
Course Title	Shakespeare Studies
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	1
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2024
Course Objectives	• The paper will offer a great range of William Shakespeare's dramatic oeuvre. • The students will engage with Shakespeare's great tragedies like <i>Hamlet</i>, <i>Othello</i>, <i>Antony and Cleopatra</i>, along with comedies like <i>Measure for Measure</i> and <i>The Tempest</i>. • The course will not only allow the students to engage with different forms of drama but also study Shakespearean criticism through the ages.
Course Outcomes	• A student will be able to: • Have a comprehensive knowledge of Shakespeare as a playwright. • Have a knowledge of forms like tragedy, comedy, and romance. • Gain insight into the thematic and technical aspects of Shakespearean drama and performance.
Course Content	
1	Hamlet/ Othello
2	Measure for Measure
3	Antony and Cleopatra
4	The Tempest/ A Midsummer Night's Dream

Learning Resources:

Suggested Readings –

1. Bradley, A. C. Shakespearean tragedy: Lectures on Hamlet, Othello, King Lear, Macbeth.
2. Macmillan Brown, John Russell. Shakespeare and His Comedies (Routledge, 2005)
3. Dollimore, Jonathan, and Alan Sinfield, eds. Political Shakespeare (Manchester UP, 1994)
4. Drakakis, John., ed. Alternative Shakespeares. Routledge
5. Grazia, Margareta de., and Stanley Wells, eds. The Cambridge Companion to Shakespeare

Assessment:**i. Formative Assessment: 50 Marks.**

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Pratibha Soni	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

Course Description

Course Code	24ENGMAJ503
Course Title	17th and 18th Century Studies
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	1
Intended Level	PG
Issue(s)	
Course Offered to	English
Regulation	2024
Course Objectives	• This course will offer a concise knowledge of literary forms from the seventeenth and eighteenth centuries. • Ben Jonson's comedies and the Metaphysical poetry of John Donne and Herbert will introduce the students to the major concerns of the seventeenth century. • The students will be able to interpret the texts in a nuanced manner and compare them with other texts from another periods. • Writers like Alexander Pope and Laurence Sterne will bring forth themes and concerns of the eighteenth century in England.
Course Outcomes	A student will be able: • To equip oneself with a well-rounded knowledge of the seventeenth and eighteenth centuries in England, through a study of selected literary texts from those periods. • To think and form new paradigms of understanding of the Restoration age through comparison with texts from other periods. • To get acquainted with the cultural, social, political and intellectual history of the period.
Course Content	
1	Ben Jonson: Every Man in his Humour / Volpone
2	John Donne: The Anniversary, The Flea, A Hymn to God the Father, Holy Sonnets: Thou Hast Made me, Shall thy Work Decay
3	Pope: Epistle to Dr. Arbuthnot/ Essay on Man/ Essay on Criticism
4	Laurence Sterne: Tristram Shandy/Ann Radcliffe: The Mysteries of Udolpho

Learning Resources:

Suggested Readings –

- 1) John Dryden, ‘A Discourse Concerning the Origin and Progress of Satire’, in The Norton Anthology of English Literature, vol. 1, ed. Stephen Greenblatt
- 2) Jeremy Collier, A Short View of the Immorality and Profaneness of the English Stage.
- 3) Routledge Samuel Johnson, ‘Essay 156’, in The Rambler, in Selected Writings: Samuel Johnson, ed. Peter Martin (Harvard UP, 2009);
- 4) Rasselas Chapter 10; ‘Pope’s Intellectual Character: Pope and Dryden Compared’, in The Norton Anthology of English Literature, vol. 1
- 5) David Reid, The Metaphysical Poets (Taylor & Francis, 2014)

Assessment:**i. Formative Assessment: 50 Marks.**

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jyotismita Sarkar Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

(CHOOSE ANY ONE OF THE FOLLOWING COURSES)

Course Description

Course Code	24ENGMAJ504A
Course Title	Film Studies 1
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	1
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2024
Course Objectives	• The course attempts to introduce film studies to students through the works of early thinkers on film, and reflect upon the articulation of a film's content, form and structure. • It tries to trace the development of the medium in terms of techniques and aesthetics by studying the early European film movements of the 1910s and the 1930s, leading up to the 'art cinema' of the 1950s and the '60s. • The course also attempts to explore the literature/film relationship and the relationship between film form and its historical and cultural contexts with a theme-based discussion on film adaptations. • Finally, the course tries to engage in the understanding of the stylistic and thematic aspects of film by studying select film genre(s).
Course Outcomes	A student will be able: • To acquire a basic understanding of film theory and global film history, to be able to identify significant movements and articulate key concepts. • To form a basic understanding of film as a medium and its early developments in terms of techniques and aesthetics. • To gain an introductory understanding of film adaptations and film genres, and develop an understanding of film language to analyse the ways in which this language constructs meaning and ideology.
Course Content	
1	Film Theory: Selected essays from What is Cinema? Vols. 1 and 2 by Andre Bazin / Selections from Theory of Film: The Redemption of Physical Reality by Siegfried Kracauer / 'Methods of Montage' by Sergei Eisenstein in Film Form: Essays in Film Theory, ed. And trans. Jay Leyda

2	History of Film and Film Movements: German Expressionism (Robert Wiene, Fritz Lang) / Soviet Montage (Kuleshov, Pudovkin, Eisenstein) / French New Wave (Francois Truffaut, Jean-Luc Godard)
3	Studying Film Adaptations (Theme-based, i.e., culture, with representative films)
4	Studying the Genre (with representative films): Action / Drama / Horror / Thriller
Learning Resources: Suggested Readings – 1) Balazs, Bela. Theory of the Film: Character and Growth of a New Art. London: D. Dobson, 1952. 2) Robert Stam and Toby Miller. (Eds). Film and Theory: An Anthology. Malden, MA: Blackwell, 2000 Sikov, Ed. Film Studies: An Introduction. Columbia UP, 2020. 3) Withall, Keith. Studying Early and Silent Cinema. Columbia UP, 2017.	

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Anik Sarkar	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

Course Description

Course Code	24ENGMAJ504A
Course Title	Environment & Literature 1

Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	1
Intended Level	PG
Issue(s)	Environment
Course Offered to	English
Regulation	2024
Course Objectives	• To examine the representation of the natural world in literary works. • To gain familiarity with traditions of thought about wilderness, nature writing and environment. • To help students frame a positive attitude towards nature and help them understand how their own lived experiences play a key role in this.
Course Outcomes	A student will be able: • To understand the complex intersections between environment and culture, where human culture is connected to the physical world, affecting it and affected by it. • To learn the application of ecology and ecological concepts to the study of literature. • To understand several tropes used in ecocriticism such as pastoral, wilderness and ecofeminism. • To analyse how nature is represented in a text. • To understand how the concept of nature has changed over time. • To understand the importance of farming and identify the misuse of food globally
Course Content	
1	Introduction to the Course: • Ecocriticism, Definition, Variants, Origin & Historical Context • Anthropocentrism and the Environmental Crisis • Nature & Culture Reading Texts ecocritically & the role of the Ecocritic, Jonathan Bate “The Ode ‘To Autumn’ as Ecosystem” (In The Green Studies Reader: From Romanticism to Ecocriticism)
2	Henry David Thoreau: <i>Walden</i>

3	Rachel Carson: <i>Silent Spring</i>
4	Margaret Atwood: <i>Surfacing</i> / Charlotte McConaghy: <i>Migrations</i>
5	Gary Snyder: <i>Civilisation, Three Deer One Coyote Running In the Snow</i> , Mother Earth: <i>Her Whales, Endless Streams and Mountains</i> , <i>The Dead by the Side of the Road</i>

Learning Resources:

Suggested Readings –

- 1) Glotfelty, Cheryll and Fromm, Harold, eds. *The Ecocriticism Reader: Landmarks in Literary Ecology* (University of Georgia Press, 1996)
- 2) Kerridge, Richard and Sammells, Neil, eds, *Writing the Environment* (Zed Books, 1998)
- 3) Coupe, Laurence, ed, *The Green Studies Reader: From Romanticism to Ecocriticism* (Routledge, 2000)
- 4) Barry, Peter *Beginning Theory- An Introduction to Literary and Cultural Theory* (Chapter 13) 2008
- 5) Garrard, Greg, ed, *The Oxford Handbook of Ecocriticism* (Oxford University Press, 2014)
- 6) Cronon, William, ed. *Uncommon Ground: Toward Reinventing Nature*. W. W Norton & Company, 1995.
- 7) Emerson, Ralph Waldo. "Nature" *Selected Essays*. Ed, Larzer Ziff. Penguin, 1982.
- 8) Garrard, Greg. *Ecocriticism*. Routledge, 2004.
- 9) Glotfelty, Cheryll and Harold Fromm, eds. *Ecocriticism Reader – Landmarks in*
- 10) *Literary Ecology*. The University of Georgia Press. 1996.
- 11) Naess, Arne, et al., *Ecology of Wisdom: Writings by Arne Naess*. Counterpoint, 2008.
- 12) Shiva, Vandana. *Staying Alive*.
- 13) Williams, Raymond. *The Country and the City*. Vintage, 2016.

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Peter Lepcha	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

Course Description

Course Code	24ENGMAJ504A
Course Title	Himalayan Studies 1
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	1
Intended Level	PG
Issue(s)	
Course Offered to	English
Regulation	2024
Course Objectives	• To introduce the students to a variety of literary forms from the region known as the Eastern Himalayas. • To give the students a comprehensive view of the socio-political history of the region, through a selection of literary texts. • To allow them to engage with a variety of literary forms from novels and memoirs to poems and short stories, while gaining the skills to analyse them through the lens of indigenous and worldly traditions.

Course Outcomes	A student will be able: ● To gain knowledge of the history and culture of the Himalayan belt that they inhabit. ● To learn the ability to use theories from around the world, like studies on diaspora, border and borderland, memory, post memory, along with an engagement with comparative literature, that would find a resonance and aid the students in having a better understanding of texts from these regions
Course Content	
1	Manjushree Thapa- <i>The Tutor of History</i> / Parijat- <i>Blue Mimosa</i> - / Chudena Kavimo- <i>Faatsung</i>
2	Parimal Bhattacharya - <i>No Path in Darjeeling is Straight: Memories of a Hill Town</i> / Gyalo Dhondup - <i>The Noodle Maker of Kalimpong</i>
3	I.B. Rai- <i>Stories from Gorkhas Imagined</i> / Prajwal Parajuly- <i>The Gurkha's Daughter</i> / Sushma Joshi- <i>The End of the World</i> / Chetan Raj Shrestha- <i>The King's Harvest</i>
4	Rohan Chettri- <i>Lost, hurt, In Transit Beautiful</i> / Sumana Roy- <i>Selected Poems</i>
Learning Resources: Suggested Readings – 1) Thapa, Deepak, and Bandita Sijapati. <i>A Kingdom Under Siege</i>. The Printhouse, 2004. 2) Middleton, Townsend, and Sara Shneiderman, editors. <i>Darjeeling Reconsidered: Histories, Politics, Environments</i>. Oxford University Press, 2018. 3) Gohain, Swargajyoti. <i>Imagined Geographies in the Indo-Tibetan Borderlands: Culture, Politics, Place</i>. Amsterdam University Press, 2020. 4) Subba, Tanka Bahadur, and A.C. Sinha, editors. <i>Nepali Diaspora in a Globalized Era</i>. Taylor and Francis Inc, 2017.	

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each

c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mimansa Subedi	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

SEMESTER 2

Course Description

Course Code	24ENGMAJ505
Course Title	The Romantics
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	2
Intended Level	PG
Issue(s)	
Course Offered to	English
Regulation	2024
Course Objectives	• The students would have knowledge of Romanticism as a philosophical and literary movement. • This paper would offer a detailed study of the Romantic movement in English literature. • While the course would enable an engagement with major poets of the Romantic era like Wordsworth, Shelley, Keats, and so on, it would also provide for a study of Romantic philosophy through a study of Kant/Burke.
Course Outcomes	A student will be able to: • Study different forms of writings of the Romantic period. • Accumulate knowledge of the socio-historical as well as philosophical debates that made up the Romantic period of English literary history.
Course Content	
1	Kant: <i>“Analytic of the Sublime”</i> [from Critique of Judgement] /Burke: <i>Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful</i> [Excerpts]

2	Wordsworth: <i>Preface to Lyrical Ballads, The Prelude</i> [Books I & II]; Coleridge: Chapters 13,14,17 of <i>Biographia Literaria</i>
3	Blake: <i>The Marriage of Heaven and Hell</i>
4	Keats: <i>The Spring Odes, To Autumn, The Fall of Hyperion: A Dream</i> / Shelley: <i>Hymn to Intellectual Beauty, Epipsychidion, A Defence of Poetry</i>
Learning Resources: Suggested Readings – 1) Jean-Jacques Rousseau, ‘Preface’ to <i>Emile or Education</i>, tr. Allan Bloom (Penguin, 1991) 2) William Wordsworth, ‘Preface to Lyrical Ballads’, in <i>Romantic Prose and Poetry</i>, ed. Harold Bloom and Lionel Trilling (New York: OUP, 1973) pp. 594–611. 3) John Keats, <i>Poems of 1820 And, The Fall of Hyperion</i> (University of California, 1969) 4) Percy Bysshe Shelley <i>Poems</i> (Harvard University, 1887) 5) Abrams, M.H. <i>Romantic Theory and the Critical Tradition</i> (Oxford University Press, 1953)	

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Anik Sarkar Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Course Description

Course Code	24ENGMAJ506
Course Title	19th Century – I
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	2
Intended Level	PG
Issue(s)	
Course Offered to	English
Regulation	2024
Course Objectives	• This paper would offer a study of the novel and drama from Victorian England. • Students would learn about the evolution of the novel form through a study of major novelists from the period like Emily Bronte, George Eliot, and Thomas Hardy, and they would also engage with drama from the period through a study of Oscar Wilde's play.
Course Outcomes	A student will be able to: • Learn about the rise of the novel form, understand the links between industrialization and print capitalism, • Establish connections between the British Empire and literature from the Victorian era.
Course Content	
1	Emily Bronte: Wuthering Heights
2	George Eliot: Middlemarch
3	Thomas Hardy: The Return of the Native
4	Oscar Wilde: The Importance of Being Earnest

Learning Resources:

Suggested Readings –

- 1) Karl Marx and Friedrich Engels, 'Mode of Production: The Basis of Social Life', 'The Social Nature of Consciousness', and 'Classes and Ideology', in A Reader in Marxist Philosophy, ed. Howard Selsam and Harry Martel (International Publishers, 1963)
- 2) Charles Darwin, 'Natural Selection and Sexual Selection', in The Norton Anthology of English Literature John Stuart Mill, 'The Subjection of Women' in The Norton Anthology of English Literature Watts, Ian. The Rise of the Novel (University of California Press, 1957)
- 3) Gilbert, Sandra, and Susan Gubar. The Madwoman in the Attic (Yale University Press, 1979)

Assessment:**i. Formative Assessment: 50 Marks.**

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Anik Sarkar	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

Course Description

Course Code	24ENGMAJ507
Course Title	19th Century – II
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	2
Intended Level	PG
Issue(s)	
Course Offered to	English
Regulation	2024
Course Objectives	• This paper would offer a variety of poets from the Victorian era from Browning and Tennyson to Arnold, Hopkins and Christina Rossetti, or the writers of Nonsense verse. • The aim would be to enable the students to know about different poetic forms, concerns, themes and issues, as brought forth through a study of poetry from the Victorian era.
Course Outcomes	A student will be able to: • Gain valuable insight into the major poets and poetic forms from the Victorian era. • Learn about the relationship between poetry and other arts, like the visual arts and so on.
Course Content	
1	Tennyson: The Princess, The Palace of Art, In Memoriam (11,14,16,41,45), Morte D'Arthur, The Lotos-Eaters (including the Choric Song)
2	Browning: Rabbi Ben Ezra, Porphyria's Lover, Childe Roland to the Dark Tower Came, OneWord More
3	Arnold: Dover Beach, Growing Old, Memorial Verses
4	Christina Rossetti: A Royal Princess, The Prince's Progress, Maude Clare, Cousin Kate / Hopkins: The Windhover, The Wreck of the Deutschland, Pied Beauty / Nonsense Verse: Selected poems by Edward Lear and Lewis Carroll

Learning Resources:

Suggested Readings –

- 1) Ruskin- “Of the Pathetic Fallacy” (The Renaissance Studies in Art and Poetry) Pater- ‘Style’ (Appreciations), ‘Conclusion’, (The Renaissance Studies in Art and Poetry)
- 2) Arnold- “Sweetness and Light”, “Study of Poetry” from Culture and Anarchy Richard Cronin, ed.- A Companion to Victorian Poetry. Blackwell

Assessment:**i. Formative Assessment: 50 Marks.**

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Anik Sarkar Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

(CHOOSE ANY ONE OF THE FOLLOWING COURSES)

Course Description

Course Code	24ENGMAJ508B
Course Title	Film Studies 2
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major

Semester	2
Intended Level	PG
Issue(s)	
Course Offered to	English
Regulation	2024
Course Objectives	• The activity-based course attempts to discuss the language of film and cinematic techniques to acquaint students more with the craft of filmmaking. • It also exposes students to writing film reviews and screenplays as an applied method of film analysis. The lectures and discussions on this course complement the activity-based engagements of the students.
Course Outcomes	A student will be able: • To locate and understand various technical and aesthetic aspects of cinema while watching a film. • To form a basic idea of writing film reviews and screenplays, and they can apply the technical knowledge into creative projects
Course Content	
1	Lectures and Discussions: Film Language, Film Techniques, Film Analysis, Writing Reviews and Scripts
2	Student Activities Class / Group / Individual Projects (including making short films, writing screenplays and film reviews, conducting surveys and interviews)
Learning Resources: Suggested Readings – 1) Edgar, Robert, et al., The Language of Film. Bloomsbury, 2015. 2) Kawin, Bruce. How Movies Work. University of California Press, 1992. 3) Piper, Jim. Making Short Films. Allworth Press, 2006. 4) Moritz, Charlie. Scriptwriting for the Screen. Taylor & Francis, 2013.	

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each

b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each

c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Anik Sarkar Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Course Description

Course Code	24ENGMAJ508B
Course Title	Environment & Literature 2
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	2
Intended Level	PG
Issue(s)	Environment
Course Offered to	English
Regulation	2024
Course Objectives	- To expose the students to the nature and extent of environmental degradation that India is facing currently. - To help the students understand the root cause of these problems and identify different cultural and ecological practices in India that help in the preservation of nature. - To learn about the importance of traditional wisdom and indigenous practices.
Course Outcomes	A student will be able: - To get acquainted to several ecological problems that our country is facing. - To develop an eco-consciousness which is necessary for our survival - To gain an overall understanding of the environmental activism, ecojustice and indigenous knowledges. - To gain to tools necessary to carry forward original research work in this field of study.
Course Content	

1	Pundalik Naik: <i>Acchev</i> (The Upheaval), trans. Vidya Pai/ Anita Agnihotri: <i>The Sickie</i> , trans. Arunava Sinha.
2	Na. D’Souza: Dweepa-Island / Sarnath Banerjee: All Quiet in Vikaspuri
3	Sarah Besky: “The Land in Gorkhaland: On the Edges of Belonging in Darjeeling, India”.
4	Amitava Ghosh: The Great Derangement
Learning Resources: Suggested Readings – 1) Watch about Kalimpong, https://www.youtube.com/watch?v=4ArvGdhFzf0 2) Watch - <i>Rising Water Ebbing Life</i>, https://www.youtube.com/watch?v=s5ULAHq9jDs 3) Ghosh, Amitav. <i>The Great Derangement</i>. 4) Nixon, Rob. <i>Slow Violence</i>. 5) Sainath, P: <i>Everybody Loves a Good Drought: Stories from India’s Poorest Districts</i> (Penguin, 2000) 6) Shiva, Vandana. <i>The Vandana Shiva Reader</i>.	

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)

Name: Peter Minj	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

Course Description

Course Code	24ENGMAJ508B
Course Title	Himalayan Studies 2
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	2
Intended Level	PG
Issue(s)	
Course Offered to	English
Regulation	2024
Course Objectives	• To acquaint the students with the nature of colonial encounter as this took a unique shape in the Himalayas, different from the dominant South Asian narratives regarding the same. • To engage with first-hand colonial records and travel narratives that would allow the students to think about the idea of place making. • To write a project on these various concerns, which would enable them to conduct interdisciplinary studies in the true sense • To learn about the formation of hill towns, the transition from colonial era to recent ideas of tourism, plantation economy through a field trip, as it would allow the students to engage with archival histories actively and critically.
Course Outcomes	A student will be able: • To learn about colonial history from the perspective of the places that they inhabit, and they would also be acquainted with key theories on cultural geography. • The gain an ability to conduct interdisciplinary research that would enhance their job prospects in various fields.
Course Content	
1	<i>Lost Horizon</i> - James Hilton (1933)/ <i>Seven years in Tibet</i> - Henrich Harrer/ <i>Wonders of the Himalayas</i> – Francis Younghusband
2	Selections from <i>The Himalayan Journal</i> by Joseph Hooker (1817-1911)

3	<i>Touching my Father's Soul-</i> Jamling Norgay/ <i>Beyond Possible-</i> Nimsdai Purja/ <i>14 Peaks-</i> Torquil Jones
4	Field Trips/ Dissertations
Learning Resources: Suggested Readings – 1) Viehbeck, Markus, editor. <i>Transcultural Encounters in the Himalayan Borderlands: Kalimpong as a 'Contact Zone.'</i> Heidelberg University Press, 2017	

Assessment:

i. Formative Assessment: 50 Marks.

As per assessment and evaluation framework document of Salesian College.

ii. Summative Assessment: 50 Marks.

- a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Peter Minj Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Programme Matrix

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
III	23ENGMAJ601A 23ENGMAJ601A	Major	The Moderns I Or The Moderns II	5	5+0+0	75	100
	23ENGMAJ602	Major	Literary And Cultural Theory	5	5+0+0	75	100
	23ENGMAJ603A 23ENGMAJ603A	Major	Environment and Literature Or Himalayan Literature	5	5+0+0	75	100
	23ENGMAJ604A 23ENGMAJ604A	Major	Film Studies Or Short Stories	5	5+0+0	75	75
IV	23ENGMAJ605 23ENGMAJ605	Major	American Literature Or Latin American Literature	5	5+0+0	75	100
	23ENGMAJ606 23ENGMAJ606	Major	Indian English Literature Or African and Caribbean Literature	5	5+0+0	75	100
	23ENGMAJ607	Major	Research Methodology	5	5+0+0	75	100

	23ENGMAJ608B 23ENGMAJ608B 23ENGMAJ608B	Major	Film Studies Or Environm ent and Literature Or Himalaya n Literature	5	5+0+0	75	75

COURSE DETAILS:
SEMESTER III

1. 23ENGMAJ601: The Moderns I or 23ENGMAJ601: The Moderns II
2. 23ENGMAJ602: Literary and Cultural Theory
3. 23ENGMAJ603A: Environment and Literature or 23ENGMAJ603A: Himalayan Literature
4. 23ENGMAJ604A: Film Studies or 23ENGMAJ604A: Short Stories

Course Description

Course Code	23ENGMAJ601
Course Title	Moderns I
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	III
Intended Level	PG
Issue(s) Addressed	NA
Course Offered to	English
Regulation	2023

Course Objectives	- To familiarise the students with the literary trends/movements that evolved in the course of the Twentieth Century - To equip the students with the theoretical tools that enable them to analyse texts and narratives against the grain.
Course Outcomes	A student will be able: - To familiarise herself with the literary trends/movements that evolved in the course of the Twentieth Century - To equip herself with the theoretical tools that enable her to analyse texts and narratives against the grain.
	Course Content
1	James Joyce: <i>A Portrait of an Artist as a Young Man</i> /Jean Paul Sartre: <i>Nausea</i> / Franz Kafka: <i>The Trial</i>
2	W.B. Yeats: “Adam’s Curse,” “Easter 1916,” “A Dialogue of the Self and Soul,” “Lapis Lazuli”
3	T.S. Eliot: “Tradition and the Individual Talent,” <i>The Waste Land</i>
4	Harold Pinter: <i>The Caretaker</i> / Bertolt Brecht: <i>Mother Courage and Her Children</i>
Learning Resources: Suggested Readings – - Freud, Sigmund. ‘Theory of Dreams,’ ‘The Structure of the Unconscious,’ in <i>The Modern Tradition</i>, ed. Richard Ellman (OUP, 1965). - Raymond Williams, ‘Introduction,’ in <i>The English Novel from Dickens to Lawrence</i>, Hogarth Press. - Benjamin, Walter. “The Storyteller,” (arl.human.cornell.edu). - Camus, Albert. <i>The Myth of Sisyphus and other Essays</i>, Vintage International, 1991. - Brecht, Bertolt. 1949. “A Short Organum for the Theatre.” Trans. John Willett in <i>Brecht</i>. - MacPhee, Graham. <i>Postwar British Literature and Postcolonial Studies</i>. Edinburgh OUP.	

Assessment:

- Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- Summative Assessment: 50 Marks.**
- Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)

Name: Mimansa Subedi	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

OR

Course Code	23ENGMAJ601
Course Title	Moderns II
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	III
Intended Level	PG
Issue(s) Addressed	NA
Course Offered to	English
Regulation	2023
Course Objectives	• To familiarise the students with the literary trends/movements that evolved in the course of the Twentieth Century • To equip the students with the theoretical tools that enable them to analyse texts and narratives against the grain.
Course Outcomes	A student will be able: • To familiarise herself with the literary trends/movements that evolved in the course of the Twentieth Century • To equip herself with the theoretical tools that enable them to analyse texts and narratives against the grain.
	Course Content
1	Joseph Conrad: <i>Lord Jim</i> /Virginia Woolf: <i>To the Lighthouse</i> / Katherine Mansfield: Selections from <i>A Garden Party</i>
2	W.H. Auden: "Funeral Blues," "Lullaby," "Musee de Beaux Arts," "September 1, 1939"/ Cecil Day-Lewis: "Address to the Mother," "Condemned," "Elegy Before Death," "Winter Night"/ Stephen Spender: "The Express," "The Truly Great," "Darkness and Light," "Ultima Ratio Regum"
3	Dylan Thomas: "Do not go gentle into that good night," "Love in the asylum," "The force that through the green fuse"/ Philip Larkin: "An Arundel Tomb," "Church Going," "Mr Bleaney," "Wants" Ted Hughes: "Hawk Roosting," "A Childish Prank," "The Thought-Fox," "The Jaguar"

4	Samuel Beckett: <i>Waiting for Godot</i>
Learning Resources: Suggested Readings – 1. Freud, Sigmund. ‘Theory of Dreams,’ ‘The Structure of the Unconscious,’ in <i>The Modern</i>. 2. <i>Tradition</i>, ed. Richard Ellman (OUP, 1965). 3. Raymond Williams, ‘Introduction,’ in <i>The English Novel from Dickens to Lawrence</i>. Hogarth Press. 4. Benjamin, Walter. “The Storyteller,” (arl.human.cornell.edu). 5. Camus, Albert. <i>The Myth of Sisyphus and other Essays</i>, Vintage International, 1991. 6. Brecht, Bertolt. 1949. “A Short Organum for the Theatre.” Trans. John Willett in <i>Brecht</i>. 7. MacPhee, Graham. <i>Postwar British Literature and Postcolonial Studies</i>. Edinburgh UP.	

Assessment:

- Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- Summative Assessment: 50 Marks.**
- Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mimansa Subedi Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Course Code	23ENGMAJ602
Course Title	Literary and Cultural Theory
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	3
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2023
Course Objectives	a) The course gives a student access to historical and emergent traditions of literature, culture and thought. b) Provides grounding in some of the major theoretical methodologies in literary studies. These may include post colonialism and postmodernism, psychoanalysis, feminism and queer theory, and historical and cultural materialist approaches to literary texts. c) The course will enable the students to understand the politics of language, representation, gender, history, ideology and psychology in a given text.
Course Outcomes	A student will a) Have access to historical and emergent traditions of literature, culture and thought. b) Have grounding in some of the major theoretical methodologies in literary studies. These may include post colonialism and postmodernism, psychoanalysis, feminism and queer theory, and historical and cultural materialist approaches to literary texts. c) understand the politics of language, representation, gender, history, ideology and psychology in a given text.
	Course Content
1	Foucault, 'What is an Author?'/ Roland Barthes, 'Death of an Author'/Jacques Derrida, 'Structure, Sign, and Play in the Discourses of the Human Sciences'
2	Simone de Beauvoir, Introduction to 'The Second Sex'/Toril Moi: 'Feminist, Female, Feminine'/ Judith Butler: Preface to <i>Gender Trouble</i>
3	Edward Said, Introduction to <i>Orientalism</i> / Gayatri Spivak: "Can the Subaltern Speak?"/ Homi Bhabha, "The Postcolonial and the Postmodern: The Question of Agency."
4	Sigmund Freud: "Beyond the Pleasure Principle"/ "Mourning and Melancholia" (From <i>Modern Classics Penguin Freud Reader</i>)/ Jacques Lacan: "The Mirror Stage"/Carl Jung: "On the concept of the Archetype"/ "The Role of the Unconscious"
5	Baudrillard: Selections from <i>Simulacra and Simulation</i> / Lyotard: "What is postmodern?"/ Frederic Jameson: "Postmodernism and Consumer Society"

Learning Resources:**Suggested Readings –**

1. Selden, Raman. Widdowson and Brooker., eds. *A Reader's Guide to Contemporary Literary Theory*. Longman.
2. Waugh, Patricia. *Literary Theory and Criticism: An Oxford Guide*, OUP, 2006.
3. Eagleton, Terry. *Literary Theory: An Introduction*. University of Minnesota Press, 1983.

Assessment:

- i. **Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- ii. **Summative Assessment: 50 Marks.**
- iii. Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- iv. Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- v. Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Pratibha Soni Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Course Code	23ENGMAJ603A
Course Title	Environment & Literature
Credits	5
Total Hours	75
Hours per Week	5
Course Type	DSE
Semester	3
Intended Level	PG

Issue(s) Addressed	Climate Change, Economic development and Environment, Rural-urban divide, Sustainable Development, Ecosystem, endangered species.
Course Offered to	English
Regulation	2023
Course Objectives	• This Course will enable the students to understand the scale of ecological crisis that our planet is facing. • The texts in the course will deal with nature-culture dualisms, Anthropocene, capitalocene debates, postcolonial ecocriticism, cli-fi, dystopia, speculative fiction, and environmental activism. This course will help students to develop a theoretical understanding in the area of environmental humanities and enable them to write research papers/ seminar presentations.
Course Outcomes	• The students will develop a critical outlook to make connections between past and present attitudes to human and non-human nature. • They will employ a range of critical methods, conceptual models, and theoretical approaches to the global environmental humanities. • They will Analyse and compare historical and contemporary ecological thought and its implications in literary and cultural studies
Course Content	
1	Selections from <i>The Ecocriticism Reader: Landmarks in Literary Ecology</i> , ed. Cheryll Glotfelty and Harold Fromm
2	Ralph Waldo Emerson: <i>Nature</i>
3	Yann Martel: <i>Life of Pi</i> /Barbara Kingslover: <i>Flight Behaviour</i> / Charlotte McConaghy: <i>Migrations</i>
4	Juliana Spahr: Selected poems from <i>That Winter the Wolf Came</i> / Craig Santos Perez: Selected poems from <i>Love in the Time of Climate Change</i>
Learning Resources: Recommended Reading: 1. Atwood, Margaret. "It's not climate change - It's everything change." 2015. 2. Chakrabarty, D. "The Climate of History: Four Theses." <i>Critical Inquiry</i> 35.2 (2002): 197-222. 3. Crutzen, P. and F. Stoermer. "Have we entered the Anthropocene?" <i>International Geosphere Biosphere Program Newsletter</i> 41 (2000). 4. Emmett, R. S., et al., <i>The Environmental Humanities. A Critical Introduction</i>. The MIT Press, 2017. 5. Goodbody, Axel and Adeline Johns Putra. "Introduction to Cli-fi" from <i>Cli-Fi: A Companion</i>, 2019. 6. Ruland, Richard and Malcolm Bradbury. <i>From Puritanism to Postmodernism: A History of American Literature</i>. Routledge, 1st edition, 2017.	

Assessment:

- i. **Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- ii. **Summative Assessment: 50 Marks.**
- iii. Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each

- iv. Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- v. Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mimansa Subedi Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Or

Course Code	23ENGMAJ603A
Course Title	Himalayan Studies: The Eastern Himalayas
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	3
Intended Level	PG
Issue(s) Addressed	
Course Offered to	English
Regulation	2023
Course Objectives	- To introduce the students to a variety of literary forms from the region known as the Eastern Himalayas. - To give the students a comprehensive view of the socio-political history of the region, through a selection of literary texts. - To allow them to engage with a variety of literary forms from novels and memoirs to poems and short stories, while gaining the skills to analyse them through the lens of indigenous and worldly traditions.
Course Outcomes	A student will be able: - To gain knowledge of the history and culture of the Himalayan belt that they inhabit. - To learn the ability to use theories from around the world, like studies on diaspora, border and borderland, memory, post memory, along with an engagement with comparative literature, that would find a resonance and aid the students in having a better understanding of texts from these regions
	Course Content

1	Temsula Ao - These Hills Called Home/ Kynpham Sing Nonkynrih: <i>Around the Hearth: Khasi Legends</i>
2	Bahadur Chettri: <i>Mountains Painted with Turmeric</i> /Shankar Deo Dhaka: <i>The Black Burden</i>
3	Desmond L Kharmawphlang – Selected poems/Robin Ngangom – Selected poems Nini Lungalam – Selected poems/ Mamang Dai -Selected poems
Learning Resources: Suggested Readings – 1. Selections from The Oxford Anthology of Writing from Northeast India- Poetry and Essays. 2. Islam, K M Baharul, editor. Literatures from Northeast India. Routledge, 2022. Lepcha, Charisma, and Uttaran Lal, eds. Communities, Institutions and Histories of India's Northeast. Routledge, 2021.	

Assessment:

- Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- Summative Assessment: 50 Marks.**
- Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mimansa Subedi Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Course Code	23ENGMAJ604A
Course Title	Film Studies
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	3
Intended Level	PG
Issue(s) Addressed	NA
Course Offered to	English
Regulation	2023
Course Objectives	• The Course attempts to discuss the ideas of a film maker as an ‘auteur’ – an artist with a unique style, approach, and thematic focus. • It attempts to understand cinema with the help of psychoanalytic and Marxist readings. • It attempts to trace the development of new cinematic consciousness through rational film movements/initiatives in post-WW Europe and in post-Independence India. • Finally, the course also attempts to understand the literature/film relationship with a theme-based discussion on film adaptations.
Course Outcomes	A student will be able: • To consider or appreciate the film maker as an artist. • To have a basic understanding of the medium from psychoanalytic and Marxist points of view. • To know about various film movements.
Course Content	
Unit I	
	“Notes on Auteur Theory” by Andrew Sarris in <i>Film Culture</i> “The Uncanny” by Sigmund Freud / “The Imaginary Signifier” by Christian Metz / Selections from <i>Understanding Film: Marxist Perspectives</i> ed., Mike Wayne
Unit II	Italian Neorealism/ Czech New Wave/ Indian New Wave
Unit III	Studying Film Adaptations Studying the Genre: Comedy/ Romance/ Musical
Learning Resources: Suggested Readings – 1. Deleuze, Gilles. <i>Cinema 1: The Movement-Image</i>. Trans. Tomlinson and Habberjam. Athlone, 2009. 2. Stewart, Garrett. <i>Framed Time: Towards a Postfilmic Cinema</i>. University of Chicago Press, 2007. 3. Sanders, Julie. <i>Adaptation and Appropriation</i>. Routledge, 2016. 4. Turner, Graeme. <i>Film as Social Practice</i>. 4th ed., Routledge, 2006.	

Assessment:

- i. **Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- ii. **Summative Assessment: 50 Marks.**
- iii. Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- iv. Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- v. Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jyotisma Sarkar Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Or

Course Code	23ENGMAJ604A
Course Title	Short Stories
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	3
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2023

Course Objectives	• This course will offer a concise knowledge of the famous American Short Story writers. • It will acquaint the students with the major thematic concerns and stylistic idiosyncrasies of the pioneers in this genre. • The students will be able to interpret the short stories in a nuanced manner and compare them with the short stories from the other periods.
Course Outcomes	A student will be able: • To equip herself with a well-rounded knowledge of the major American short story writers. • To review the texts against the background of their respective ages. • To appreciate the literary ethos of the era. • To gain the ability to employ their understanding to compose their own answers and envisage potential research areas in the field of American Short Stories.
	Course Content
1.	Edgar Allan Poe: “The Purloined Letter”
2.	O Henry: “After Twenty Years”
3.	Nathaniel Hawthorne: “The Haunted Mind”
4.	Kate Chopin: “The Awakening”
5.	James Baldwin: “Sonny’s Blues”
6.	Zora Neale Hurston: “The Country in the Woman”
Learning Resources: Recommended Readings 1. <i>Collected Stories of O. Henry</i>. New Delhi: Projapoti, 2015. 2. <i>The Complete Edgar Allann Poe</i>. New Delhi: Projapoti, 2015. 3. <i>Sonny’s Blues</i>. Penguin Books Ltd., 1995. 4. <i>The Nathaniel Hawthorne Short Story Collection</i>. Acheron Press, 2012. 5. <i>Zora Neale Hurston Complete Stories</i>. Harper Perennial Modern Classics, 2008.	

Assessment:

- Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- Summative Assessment: 50 Marks.**
- Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each

- v. Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jyotismita Sarkar Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

COURSE DETAILS:
SEMESTER IV

- | |
|--|
| 1. 23ENGMAJ605: American Literature Or 23ENGMAJ605: Latin American Literature
2. 23ENGMAJ606: Indian English Literature Or 23ENGMAJ606: African and Caribbean Literature
3. 23ENGMAJ607: Research Methodology
4. 23ENGMAJ608B: Film Studies Or 23ENGMAJ608B: Environment and Literature Or 23ENGMAJ608B: Himalayan Literature |
|--|

Course Description:

Course Code	23ENGMAJ605
Course Title	American Literature (A)
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	PG

Issue(s) Addressed	NA
Course Offered to	English
Regulation	2023
Course Objectives	To Critically read about American Literature. The texts focus on the emergence of nationhood and the contradictions between tradition and modernity in an independent nation. The drama pieces also focus on issues of genre, gender, caste and nationhood. This course will integrate the Masters' programme with the wider sphere of society, incorporating voices from both the centre and the periphery.
Course Outcomes	A student will be able: Critically read about American Literature. The texts focus on the emergence of nationhood and the contradictions between tradition and modernity in an independent nation. The drama pieces also focus on issues of genre, gender, caste and nationhood. This course will integrate the Masters' programme with the wider sphere of society, incorporating voices from both the centre and the periphery.
	Course Content
1	Henry Dvid Thoreau: <i>Walden</i> /Ralph Waldo Emerson: American Scholar, Over-Soul, Self-Reliance
2	Arthur Miller: <i>Death of a Salesman</i>
3	Robert Frost: "Provide Provide," "Birches," "Mending Wall," "Directive," "The Gift Outright," "Come In"/Langston Hughes: "The Weary Blues," "Dream Variations," "The Negro Speaks of Rivers," "Theme for English B, 50-50, Heaven," "Personal"/Sylvia Plath: "Point Shirley," "The Colossus," "Daddy," "Fever 103," "Ariel," "Purdah," "Lady Lazarus"
4	Ralph Ellison: <i>Invisible Man</i> /William Faulkner: <i>The Sound and the Fury</i> /Toni Morrison: <i>Beloved</i>
Learning Resources: Suggested Readings – - Hector St John Crevecoeur, 'What is an American', in <i>Letters from an American Farmer</i> (Penguin, 1982) Frederick Douglass, <i>A Narrative of the life of Frederick Douglass</i> (Harmondsworth: Penguin, 1982) - Katyal, et al. <i>This Unsettling Place: Readings in American Literature. A Critical Anthology.</i> Worldview Toni Morrison, 'Romancing the Shadow', in <i>Playing in the Dark: Whiteness and Literary Imagination</i> Hooks, Bell. <i>Ain't I a Woman</i> (South End Press, 1981)	

Assessment:

- i. **Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- ii. **Summative Assessment: 50 Marks.**

Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each

- a) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- b) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Peter Lepcha Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Or

Course Code	23ENGMAJ605
Course Title	Latin American Literature (B)
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2023
Course Objectives	To Critically read about Latin American Literature. The texts focus on the emergence of nationhood and the contradictions between tradition and modernity in an independent nation. The drama pieces also focus on issues of genre, gender, caste and nationhood. This course will integrate the Masters' programme with the wider sphere of society, incorporating voices from both the centre and the periphery.

Course Outcomes	A student will be able: ● Critically read about Latin American Literature. The texts focus on the emergence of nationhood and the contradictions between tradition and modernity in an independent nation. The drama pieces also focus on issues of genre, gender, caste and nationhood. This course will integrate the Masters' programme with the wider sphere of society, incorporating voices from both the centre and the periphery.
	Course Content
1	Gabriel Garcia Marquez: <i>One Hundred Years of Solitude</i> / <i>Love in the Time of Cholera</i>
2	Pablo Neruda: selected poems from <i>Poems of Americas</i> (ed. Ajanta Dutt, Worldview)
3	Jorge Luis Borges: selected pieces from <i>Selected Non-Fictions</i> , and from <i>Collected Fictions</i>
4	Literary Essays: Selected pieces from <i>Blackwell Companion to Latin American Literature and Culture</i> .
Learning Resources: Suggested Reading: 1. Gabriel Garcia Marquez, the Nobel Prize Acceptance Speech, in Gabriel Garcia Marquez: New Readings., ed. Bernard McGuirk and Richard Cardwell (CUP,1987). 2. Echevarría, Roberto Gonzalez, and Enrique Pupo-Walker eds., The Cambridge History of Latin American Literature, (CUP, 1996). 3. Castro-Klaren, Sarah. A Companion to Latin American Literature and Culture. (Blackwell, 2013).	

Assessment:

- Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- Summative Assessment: 50 Marks.**
- Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)

Name: Peter Lepcha	Name: Pratibha Soni	Name: Ravi Bhushan Singh
Signature:	Signature:	Signature:

Course Code	23ENGMAJ606
Course Title	Indian English Literature (A)
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2023
Course Objectives	To Critically read about Indian English Literature. The texts focus on the emergence of nationhood and the contradictions between tradition and modernity in an independent nation. The drama pieces also focus on issues of genre, gender, caste and nationhood. This course will integrate the Masters' programme with the wider sphere of society, incorporating voices from both the centre and the periphery.
Course Outcomes	A student will be able: ● Critically read about Indian English Literature. The texts focus on the emergence of nationhood and the contradictions between tradition and modernity in an independent nation. The drama pieces also focus on issues of genre, gender, caste and nationhood. This course will integrate the Masters' programme with the wider sphere of society, incorporating voices from both the centre and the periphery.
	Course Content
1	Raja Rao: <i>Kanthapura</i> / Rushdie: <i>Midnight's Children</i> /Amitav Ghosh: <i>The Hungry Tide</i>
2	Modern Indian English Poetry: Selections from Nissim Ezekiel, Kamala Das, and Jayanta Mahapatra

3	Girish Karnad: <i>The Fire and the Rain</i> /Mahesh Dattani: <i>Dance Like a Man</i> /Abhishek Mazumdar: <i>The Djinns of Eidgah</i>
4	Amit Chaudhuri: “Notes on the Novel after Globalization”, “Huge Baggy Monster: Mimetic Theories of the Indian Novel after Rushdie” from <i>Clearing the Space</i>
Learning Resources: Suggested Readings: 1. Salman Rushdie, <i>Imaginary Homelands: Essays and Criticism 1981-1991</i> (London: Granta, 1992) Aijaz Ahmad, in <i>Theory: Classes, Nations, Literatures</i> (London: Verso 1992). 2. Peter Morey, <i>Fictions of India. Narrative and Power</i> (Edinburgh: Edinburgh University Press 2005) Modern Indian Writing in English: A Multilingual Anthology, ed. D. Kapse (Worldview, 2018) Aijaz Ahmad, “Indian Literature’: Notes towards the Definition of a Category”, in <i>Theory: Classes, Nations, Literatures</i> (London: Verso, 1992) pp. 243-285.	

Assessment:

- i. **Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- ii. **Summative Assessment: 50 Marks.**
 - a) Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
 - b) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
 - c) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Peter Lepcha Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Or

Course Code	23ENGMAJ606
Course Title	African and Caribbean Literature (B)

Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2023
Course Objectives	To Critically read about African and Caribbean Literature. The texts focus on the emergence of nationhood and the contradictions between tradition and modernity in an independent nation. The drama pieces also focus on issues of genre, gender, caste and nationhood. This course will integrate the Masters' programme with the wider sphere of society, incorporating voices from both the centre and the periphery.
Course Outcomes	A student will be able: read about African and Caribbean Literature. The texts focus on the emergence of nationhood and the contradictions between tradition and modernity in an independent nation. The drama pieces also focus on issues of genre, gender, caste and nationhood. This course will integrate the Masters' programme with the wider sphere of society, incorporating voices from both the centre and the periphery.
	Course Content
1	Wole Soyinka: <i>The Strong Breed</i> / Ngugi wa Thiong'o: <i>Matigari</i>
2	VS Naipaul: <i>The Mimic Men</i> /Wilson Harris: <i>Palace of the Peacock</i>
3	Chimamanda Ngozi Adichie: <i>Half of a Yellow Sun</i> /Buchi Emecheta: <i>The Joys of Motherhood</i> / Ama Ata Aidoo: <i>Our Sister Killjoy</i>
4	Derek Walcott: <i>Pantomime</i> / <i>O Starry Starry Night</i>
Learning Resources: Suggested Readings – 1. Frantz Fanon, 'The Negro and Language', in <i>Black Skin, White Masks</i> , tr. Charles Markmann Ngugi wa Thiong'o, 'The Language of African Literature', in <i>Decolonising the Mind</i> . 2. Edward Said, 'The Scope of Orientalism 'in <i>Orientalism</i> (Harmondsworth: Penguin, 1978) pp.29–110. Seodial Deena, <i>Situating Caribbean Literature and Criticism in Multicultural and Postcolonial Studies</i> "Introduction: The Diasporic Imaginary", Vijay Mishra., in <i>Literature of the Indian Diaspora</i> . Routledge.	

Assessment:

- i. **Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- ii. **Summative Assessment: 50 Marks.**
Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
 - a) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
 - b) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Peter Lepcha Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Course Description

Course Code	23ENGMAJ607
Course Title	Research Methodology
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2023

Course Objectives	1) To familiarise students with the basic concepts of research on the postgraduate level before heading towards higher dimensions of research. 2) To enable students to understand various paradigms of research, its tools, ethics and challenges related to English studies and related fields and develop creative and academic skills in them.
Course Outcomes	A student will be able: 1) apply proper research methods pertinent to English studies and related fields 2) formulate their own research questions and write research papers.
	Course Content
1	What is literary research? (This unit incorporates following essays from Research Methods in English Studies: Gabriele Griffin) Textual Analysis as a Research Method (Catherine Belsey) Archival Methods (Carolyn Steedman) Discourse Analysis (Gabriele Griffin), Creative Writing as a Research Method (Jon Cook)
2	Introduction to research methodology (Research, Hypothesis. Analysis of data and interpretation) Research question Review of literature Data collection- Primary and Secondary Sources
3	Components and Requirements Research Proposal/ Synopsis Research Paper Thesis/Dissertation Research tools MLA Style Sheet (Latest Edition) Chicago Manual of Style (Latest Edition) Ethics in Research and Plagiarism
4	Workshop and Presentation 1 Workshop and Presentation 2 *The students will be divided into smaller groups for presentations
Learning Resources: Suggested Readings – 1. Research Methods in English Studies: Gabriele Griffin 2. Research Methodology: Methods and Techniques: C. R. Kothari 3. Research Methods in English: M.P. Sinha 4. Academic Writing 1: Paragraph: Alice Savage and Mausod Shafiei 5. Academic Writing: A Handbook for International Students: Stephen Bailey 6. MLA handbook for Writers of Research Papers: Latest edition 7. The Chicago Manual of Style: Latest edition 8. Quentin Skinner's "Motives, Intentions and Interpretation", Visions of Politics, 9. Volume 1 By Quentin Skinner) 10. Peter Winch's "Can we understand ourselves?", Philosophical Investigations 20: 3 July	

Assessment:

- a) Presentations / Research Proposals for internal assessment
- b) Term Paper for final evaluation

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Pratibha Soni Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

Course Description

Course Code	ENGMAJ608B
Course Title	Film Studies
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	4
Intended Level	PG
Issue(s)	NA
Course Offered to	English
Regulation	2023
Course Objectives	• The course attempts to find out how (and more importantly, why) gender and sexuality play an important role in reading films. • It also focuses on local and recent trends in film culture(s), and continues to explore more theme-based film adaptations and studies the remaining major film genres.

Course Outcomes	A student will be able: ● to engage in a feminist or a queer ‘reading’ of a film. ● to comprehend the complex relationship between literature and film, and also how different stylistic and thematic aspects ‘define’ a cinematic creation ● understand better the contemporary film culture(s) around them.
	Course Content
Unit I	“Visual Pleasure and Narrative Cinema” and “Afterthoughts” by Laura Mulvey in <i>Visual and Other Pleasures</i> / “Film and the Masquerade: Theorizing the Female Spectator” by Mary Ann Doane in <i>Screen 23(3-4)</i> / <i>Selections from Queer Cinema: The Film Reader</i>, eds., Benshoff & Griffin / <i>Selections from Out Takes: Essays on Queer Theory and Film</i>, ed. Ellis Hanson
Unit II	Bombay Cinema to Bollywood (rise of stardom and the ‘mass film’ in the 1970s and post-globalisation developments) / Bengali Cinema (reading films across popular melodrama and parallel/ new wave tendencies)
Unit III	● Studying Film Adaptations (Theme-based, i.e., identity, with representative films) ● Studying the Genre (with representative films): Sci-Fi / Fantasy / Non-Fiction
Learning Resources: Suggested Readings – Marks, Laura. <i>The Skin of the Film. Intercultural Cinema, Embodiment, and the Senses</i>. Duke UP, 1999. Iordanova, Dina et al., ed. <i>Cinema at the Periphery</i>. Detroit: Wayne State UP, 2010. Penley, Constance. <i>The Future of an Illusion: Film, Feminism and Psychoanalysis</i>. Routledge, 1989. Kuhn, Annette. <i>The Power of the Image: Essays on Representation and Sexuality</i>. Routledge, 1985.	

iii. **Formative Assessment: 50 Marks.**

As per assessment and evaluation framework document of Salesian College.

iv. **Summative Assessment: 50 Marks.**

Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each

- Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Jyotismita Sarkar Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

OR

Course Code	23ENGMAJ608B
Course Title	Environment & Literature
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	4
Intended Level	PG
Issue(s)	● Environmental concerns ● Indian Ecocriticism ● Sustainable development ● Climate change.
Course Offered to	English
Regulation	2023
Course Objectives	Course Objective: This course will introduce the students to novels, essays and films that deal with environmental concerns such as indigeneity, climate change, food and water scarcity, species extinction, and environmental activism and ecojustice. The course will enable the students to analyse the issues surrounding the environment and build a sustainable future.
Course Outcome.	After completion of this course a student will have a better understanding of the Indian Ecocriticism. Acquire knowledge of key theoretical and literary concepts and of relevant critical contexts within which to situate the set texts. Develop analytical and critical skills through close reading and discussion of the texts in the course. The students will employ a range of critical methods, conceptual models, and theoretical approaches to the Indian ecocritical texts

Course Content.	• Amitav Ghosh: The Gun Island • Pankaj Sekhsaria: The Last Wave/Orijit Sen: River of Stories. • Indra Sinha: Animal's People / Prayag Akbar: Leila • Amruta Patil: Aranyaka / Sauptik: Blood and Flowers
Recommended Reading: <i>The Bioregional Imagination: Literature, Ecology, and Place.</i> University of Georgia Press, 2012. Rangarajan, Swarnalatha. <i>Ecocriticism: Big Ideas and Practical Strategies.</i> Orient Blackswan, 2018.	

Assessment:

- v. **Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- vi. **Summative Assessment: 50 Marks.**
Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- c) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- d) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mimansa Subedi. Signature:	Name: Pratibha Soni. Signature:	Name: Ravi Bhushan Singh Signature:

OR

Course Code	23ENGMAJ608B
Course Title	Himalayan Literature
Credits	5
Total Hours	75
Hours per Week	5
Course Type	Major

Semester	4
Intended Level	PG
Issue(s)	Gender issues in the North East. Culture, identity and literature, Oral traditions from the North East.
Course Offered to	English
Regulation	2023
Course Objectives	The course will venture further out into the Eastern Himalayas to analyse texts from India's northeast that examine a range of issues from colonial encounter, to adopting indigenous oral traditions in writing and art, in forms as diverse as the short story, poetry and novels.
Course Outcomes	The students would be acquainted with a new area of study, as they would learn about the literary output from this part of Indian nation.
	Course Content
1	Aga Shahid Ali: <i>A Country without a Post Office/The Half Inch Himalayas</i> (poems)/ Suvir Kaul: <i>Of Gardens and Graves</i> (Essays and Poems)
2	<i>The Collaborator</i> – Mirza Wahid (Novel)/ Film Text
3	Ruskin Bond – Selected Short Stories
4	<i>Rumours of Spring</i> – A Girlhood in Kashmir – Farah Bashir (Memoir)
Learning Resources: Bhan, Mona. <i>Counterinsurgency, Democracy, and the Politics of Identity in India</i> . Routledge, 2013. Kabir, Ananya Jahanara. <i>Territory of Desire: Representing the Valley of Kashmir</i> . University of Minnesota Press, 2009.	

Assessment:

- vii. **Formative Assessment: 50 Marks.**
As per assessment and evaluation framework document of Salesian College.
- viii. **Summative Assessment: 50 Marks.**
Questions will be set from each unit with alternatives. Three questions are to be answered, choosing one from each unit. Marks allotted: 10 marks each
- e) Four short questions to be answered from six questions covering all texts. Marks allotted: 5 marks each
- f) Summative assessment time: 3 hours for written examinations.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mimansa Subedi Signature:	Name: Pratibha Soni Signature:	Name: Ravi Bhushan Singh Signature:

SCHEME FOR CBCS ENGLISH CORE PROGRAM

YEAR	SEMESTER	COURSES OFFERED	NAME OF THE COURSE/PAPER	CREDIT	FULL MARKS
1	Semester-I	CC Paper-I	English Language: Overview & Usage; Literary Types	6	(60+15)=75
		CC Paper-II	European Classical Literature	6	(60+15)=75
		Generic Elective (GE): Students of English Honours are to take 2 papers of Generic Elective from other disciplines. Honours students belonging to other disciplines may take the following GE paper:			
		GE Paper-I	Selections from Indian Literature	6	(60+15)=75
		AECC Paper-1	Environmental Science	2	(80+20)=100
	Total	4		20	325
	SEMESTER	COURSES OFFERED	NAME OF THE COURSE/PAPER	CREDIT	FULL MARKS
	Semester-II	CC Paper-III	Indian Classical Literature & Indian Writing in English	6	(60+15)=75
		CC Paper-IV	British Literature: Old English Period to 14th Century	6	(60+15)=75
		Generic Elective (GE): Students of English Honours are to take 2 papers of Generic Elective from other disciplines. Honours students belonging to other disciplines may take the following GE paper:			
		GE Paper-II	Selections from European Literature	6	(60+15)=75
		AECC Paper-II	English/ MIL	2	(35+15)=50
	Total	4		20	275

YEAR	SEMESTER	COURSES OFFERED	NAME OF THE COURSE/PAPER	CREDIT	FULL MARKS
2	Semester-III	CC Paper-V	American Literature	6	(60+15)=75
		CC Paper-VI	British Poetry & Drama: 14th to 17th Centuries	6	(60+15)=75
		CC Paper-VII	British Poetry & Drama: 17th and 18th Centuries	6	(60+15)=75
		Generic Elective (GE):			
		GE Paper-III	To be opted from other subjects	6	(60+15)=75
		SEC Paper-I	[Any 1 out of the 4] 1. Text Comprehension & Editing 2. Creative Writing 3. Business Communication 4. Technical Writing	2	(60+15)=75
	Total	5		26	375
	SEMESTER	COURSES OFFERED	NAME OF THE COURSE/PAPER	CREDIT	FULL MARKS
	Semester-IV	CC Paper-VIII	British Literature: 18th Century	6	(60+15)=75
		CC Paper IX	British Romantic Literature	6	(60+15)=75
		CC Paper-X	British Literature: 19th Century	6	(60+15)=75
		Generic Elective (GE):			
		GE Paper - IV	to be opted from other subjects	6	(60+15)=75
		SEC Paper-II	[Any 1 out of the 4 provided] 1. Text Comprehension & Editing 2. Creative Writing 3. Business Communication 4. Technical Writing	2	(60+15)=75

	Total	5		26	375
YEAR	SEMESTER	COURSES OFFERED	NAME OF THE COURSE/PAPER	CREDIT	FULL MARKS
3	Semester-V	CC Paper-XI	Women's Writing	6	(60+15)=75
		CC Paper-XII	British Literature: The Early 20th Century	6	(60+15)=75
		DSE Paper I	Any 1 to be opted	6	(60+15)=75
		DSE Paper II	Any 1 to be opted	6	(60+15)=75
	Total	5		24	300
	SEMESTER	COURSES OFFERED	NAME OF THE COURSE/PAPER	CREDIT	FULL MARKS
	Semester-VI	CC Paper-XIII	Modern European Drama	6	(60+15)=75
		CC Paper-XIV	Postcolonial Literatures	6	(60+15)=75
		DSE Paper III	Any 1 to be opted	6	(60+15)=75
		DSE Paper IV	Any 1 to be opted	6	(60+15)=75
	Total	5		24	300
Grand Total = 1950					

Scheme for CBCS in B.A. PROGRAMME COURSE

Year	Semester	Discipline specific Core Course (DSC)	Language Core Course (LCC 1)	Language Core Course (LCC 2)	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Discipline Specific Elective Course (DSE)	Generic Elective Course (GE)
1	1	Discipline Specific Core 1 (Paper-1)	Bengali /Sanskrit/ Nepali/Hindi Alternative English (Paper-1)		AECC-1 EVS			
		Discipline Specific Core 2 (Paper-1)						
	2	Discipline Specific Core 1 (Paper-2)		English(compulsory) (Paper-1)	AECC-2 Mil/Commun English			
		Discipline Specific Core 2 (Paper-2)						
2	3	Discipline Specific Core 1 (Paper-3)	Bengali / Sanskrit/ Nepali/Hindi/ Alternative English (Paper-2)			SEC 1 Paper-1		
		Discipline Specific Core 2 (Paper-3)						

3	4	Discipline Specific Core 1 (Paper-4)		English (Paper-2)		SEC 1 Paper-2		
		Discipline Specific Core 2 (Paper-4)						
	5					SEC 2 Paper-1	DSE 1 Paper 1	GE-1 (Paper-1)
3	6						DSE 2 Paper 1	
						SEC 2 Paper-2	DSE 1 Paper 2	GE-1 (Paper-2)
							DSE 2 Paper 2	

- SEC and DSE Courses will be the same as CC/DSC Course.
- GE Courses must be different from CC/DSC Course.

CBCS SYLLABUS FOR ENGLISH B.A.HONOURS AND PROGRAMME COURSES

University of North Bengal

- *Effective from the Academic Session 2018-2019*
- *Up to 50% of the questions set in any year may be repeated in the following year.*
- *Word-limit for answering the questions are as follow: (NOT EXCEEDING) 150 words for 05 marks, 200 for 06 marks, 250 for 08 marks, 350 for 10 marks, 450 for 12 marks, 650 for 15 marks.*

B.A. HONOURS IN ENGLISH UNDER CBCS

CORE COURSE

1. English Language: Overview & Usage; Literary Types
2. European Classical Literature
3. Indian Classical Literature & Indian Writing in English
4. British Literature: Old English Period to 14th Century
5. American Literature
6. British Poetry & Drama: 14th to 17th Centuries
7. British Poetry & Drama: 17th and 18th Centuries
8. British Literature: 18th Century
9. British Romantic Literature
10. British Literature: 19th Century
11. Women's Writing
12. British Literature: The Early 20th Century
13. Modern European Drama
14. Postcolonial Literatures

AECC2: COMPULSORY ENGLISH

- English Communication

SEC: SKILL ENHANCEMENT COURSES[Any 2]

- ♦ Any one of the following subject-areas to be chosen as PAPER 1 for 3rd Semester

A. Text Comprehension & Editing

B. Creative Writing

- ♦ Any one of the following subject-areas to be chosen as PAPER 2 for 4th Semester

C. Business Communication

D. Technical Writing

DSE: DISCIPLINE SPECIFIC ELECTIVES

- ♦ Any two of the following topics are to be opted for the 5th semester as DSE 1 & DSE 2 papers

A. Literary Theory & Criticism

B. Popular Literature

C. Literature of the Indian Diaspora

- ♦ Any two of the following topics are to be opted for the 6th semester as DSE 3 & DSE 4 papers

D. Indian Literature in English Translation

E. Partition Literature

F. Science Fiction and Detective Literature

GE: GENERIC ELECTIVES

PAPER 1: Selections from Indian Literature

PAPER 2: Selections from European Literature

B.A. PROGRAMME IN ENGLISH UNDER CBCS

DSC: DISCIPLINE SPECIFIC CORE COURSES

PAPER 1: Individual & Society

PAPER 2: Modern Indian Literature

PAPER 3: British Literature

PAPER 4: Literary Cross Currents

LANGUAGE CORE COURSE₁ [LCC₁]: ALTERNATIVE ENGLISH

PAPER 1: Text Comprehension, Editing and Writing Skill

PAPER 2: Literary Perceptions

Language Core Course₂ [LCC₂]: ENGLISH LANGUAGE CORE

PAPER 1: Technical Writing Skill

PAPER 2: Professional Writing Skill

AECC₂: COMPULSORY ENGLISH

- English Communication

SEC: SKILL ENHANCEMENT COURSES

[Any 2 to be opted out of the following 4 choices]

- ♦ Any one of the following subject-areas to be chosen as PAPER 1 for the 3rd Semester

A. Text Comprehension & Editing

B. Creative Writing

- ♦ Any one of the following subject-areas to be chosen as PAPER 2 for the 4th Semester

C. Business Communication

D. Technical Writing

DSE: DISCIPLINE SPECIFIC ELECTIVES

- ♦ Any one of the following topics is to be opted for the 5th semester as DSE paper 1

A. Literary Theory & Criticism

B. Popular Literature

C. Literature of the Indian Diaspora

- ♦ Any one of the following topics is to be opted for the 6th semester as DSE paper 2

D. Indian Literature in English Translation

E. Partition Literature

F. Science Fiction and Detective Literature

GE: GENERIC ELECTIVES

PAPER 1: Selections from Indian Literature

PAPER 2: Selections from European Literature

B.A. Honours in English under CBCS Detailed Syllabus

SEMESTER: 1

Core Course 1

English Language: Overview & Usage; Literary Types

- Three questions to be answered from five questions asked serially from Unit 1 and Unit 3 combined. [10x3=30]
- Two short questions to be answered from five questions asked serially from Unit 1. [5x2=10]

Unit I: History of the English Language

Topics:

1. General Features of English
2. Influence of Christianity
3. Scandinavian Elements
4. French Elements
5. Classical (Latin and Greek) Elements

Unit II: Rhetoric and Prosody [12+8=20]

Unit III: Literary Types: Tragedy, Comedy, The Lyric & its variants

Suggested Topics and Background Prose Readings for Class Presentation:

- Language and English Society
- Usage of English
- Foreign Influence on English Language

Reading:

1. Otto Jespersen, *Growth and Structure of English Language* (Charleston: Nabu Press, 2010)
2. Albert C. Baugh, *A History of English Language* (London: Routledge, 2002)
3. Randolph Quirk, *English in Use* (London: Longman 1990)
4. David Crystal, *The English Language: A Guide Tour of the Language* (London : Penguin 2002)

5. Jonathan Culpeper, *History of English* (London: Routledge, 2005)
6. J.A.Cuddon & M.A.R Habib, *The Penguin Dictionary of Literary Terms and Literary Theory: Fifth Edition* (London: Penguin, 2015)
7. Bose & Sterling: *Elements of English Rhetoric and Prosody* (Calcutta: Chuckerverty, Chatterjee & Co. Ltd, 1960)

Core Course2: **European Classical Literature**

- Four questions to be answered from six questions asked serially from the four texts. [10x4=40]
- Four short questions to be answered from eight questions asked serially from the four texts. [5x4=20]

1. Homer: *The Iliad*
2. Sophocles: *Oedipus the King*
3. Plautus: *Pot of Gold*
4. Aeschylus: *Agamemnon*

Suggested Topics and Background Prose Readings for Class Presentation:

- The Epic
- Comedy and Tragedy in Classical Drama
- The Athenian City State
- Catharsis and Mimesis
- Satire
- Literary Cultures in Augustan Rome

Readings:

1. Otto Jespersen, *Growth and Structure of English Language* (Charleston: Nabu Press, 2010)
2. Albert C. Baugh, *A History of English Language* (London: Routledge, 2002)
3. Randolph Quirk, *English in Use* (London: Longman 1990)
4. David Crystal, *The English Language: A Guide Tour of the Language* (London : Penguin 2002)
5. Jonathan Culpeper, *History of English* (London: Routledge, 2005)
6. J. A. Cuddon & M.A.R Habib, *The Penguin Dictionary of Literary Terms and Literary Theory: Fifth Edition* (London: Penguin, 2015)
7. Bose & Sterling: *Elements of English Rhetoric and Prosody* (Calcutta: Chuckerverty, Chatterjee & Co. Ltd, 1960)

SEMESTER:2

Core Course 3

Indian Classical Literature & Indian Writing in English

- One question to be answered from three questions set with alternatives from the three writers in Unit 1. [10x1=10]
- One question to be answered from two questions set with alternatives from the two texts in Unit 2. [10x1=10]
- Two short questions to be answered from six questions asked serially covering all the texts in Units 1 and 2 combined.[5x2=10]

UNIT I:

1. Kalidasa: *AbhijnanaShakuntalam*, tr. Chandra Rajan, in *Kalidasa: The Loom of Time* (New Delhi: Penguin,1989)
2. Vyasa: 'The Dicing' and 'The Sequel to Dicing,' 'The Book of Assembly Hall', 'The Temptation of Karna', 'Book V' 'The Book of Effort', in *The Mahabharata* tr. Ed. J. A. B. Van Buitenen (Chicago:Brill,1975) pp.106-69
3. Sudraka: *Mrcchakatika*, tr. M. M. Ramachandra Kale (New Delhi: Motilal Banarasidas,1962)

UNIT II:

1. R.K. Narayan: *Swami and Friends*
 2. Anita Desai: *In Custody*
- One question to be answered from four questions asked serially from the four poets in unit 3. [10x1=10]
 - One question to be answered from four questions asked serially from the four texts in unit 4. [10x1=10]
 - Two short questions to be answered from eight questions asked serially covering all the authors in Units 3 and 4 combined. [5x2=10]

UNIT III:

1. Henry Louis Vivian Derozio : "Freedom to the Slave" , "The Orphan Girl"
2. Kamala Das : "An Introduction" , "My Grandmother's House"
3. Nissim Ezekiel : "The Night of the Scorpion" ; "Enterprise"
4. JayantaMahapatra: "Dawn at Puri", "Hunger"

UNIT IV:

1. Mulk Raj Anand: 'Two Lady Rams'
2. Salman Rushdie: 'The Free Radio'
3. Rohinton Mistry: 'Swimming Lesson'
4. Shashi Deshpande: 'The Intrusion'

Suggested Topics and Background Prose Readings for Class Presentation:

- The Indian Epic Tradition: Themes and Conventions
- Classical Indian Drama: Theory and Practice
- *Alankara* and *Rasa*
- Themes and Contexts of the Indian English Novel
- The Aesthetics of Indian English Poetry
- Modernism in Indian English Literature

Reading:

1. Bharata, *Natyashastra*, tr. Manomohan Ghosh, vol. I, 2nd edn. (Calcutta: Granthalaya, 1967) chap. 6: 'Sentiments', pp.100–18.
2. *The Mrichchhakatika of Sudraka*. Trans by M R Kale Edited by Kuljeet Singh (Delhi: Motilal and Worldview, 2016).
3. Anand Prakash (ed.). *Interventions: Indian Writing in English* (Delhi: Worldview, 2014).
4. Iravati Karve, 'Draupadi', in *Yuganta: The End of an Epoch* (Hyderabad: Disha, 1991) pp.79–105.
5. Vinay Dharwadkar, 'Orientalism and the Study of Indian Literature', in *Orientalism and the Postcolonial Predicament: Perspectives on South Asia*, ed. Carol A. Breckenridge and Peter van der Veer (New Delhi: OUP, 1994) pp.158–95.
6. Raja Rao, Foreword to *Kanthapura* (New Delhi: OUP, 1989) pp.v–vi.
7. Salman Rushdie, 'Commonwealth Literature does not exist', in *Imaginary Homelands* (London: Granta Books, 1991) pp.61–70.
8. Meenakshi Mukherjee, 'Divided by a Common Language', in *The Perishable Empire* (New Delhi: OUP, 2000) pp.187–203.
9. Bruce King, 'Introduction', in *Modern Indian Poetry in English* (New Delhi: OUP, 2nd edn, 2005) pp.1–10.

Core Course 4

British Literature: Old English Period to 14th Century

Unit I:

- One question to be answered from three questions asked serially from the following topics. [15x1=15]
- 1. Heroic Poetry
- 2. Christian Poetry
- 3. Alliterative Poems
- 4. Beginning of Prose
- 5. Beginning of Drama
- Three questions to be answered from six questions asked serially and covering all the writers equally from Units 2 and 3 combined. [10x3=30]
- Three short questions to be answered from six questions asked serially and covering all the writers equally from Units 2 and 3 combined. [5x3=15]

Unit II:

Beowulf (First 3000lines)

Unit III:

1. Geoffrey Chaucer: 'Prologue' to *the Canterbury Tales*, 'Prologue' to *The Wife of Bath's Tale*
2. William Langland: *Piers the Ploughman*

Suggested Topics and Background Prose Readings for Class Presentation:

- Cultural and Historical background of Old English Period
- Religious Traditions in Old English Period
- Church and Drama

Readings:

1. *A Readable Beowulf*. The Old Epic Newly Translated. Trans and Edited by Stanley G. Greenfield. With an Introduction by Alain Renior.(Delhi: Worldview, 2019).
2. Peter Baker. *Introduction to Old English*, 3rdedn. (Chichester: Wiley-Blackwell, 2012)
3. Geoffrey Chaucer. *The General Prologue to the Canterbury Tales*. Edited by Harriet Raghunathan.(Delhi: Worldview Critical Edition, 2010).

4. Geoffrey Chaucer. *The Wife of Bath's Prologue and Tale*. Edited by Harriet Raghunathan. Delhi: Worldview Critical Edition, 2000).
5. Hugh Magennis. *The Cambridge Introduction to Anglo-Saxon Literature* (Cambridge: Cambridge University Press, 2011)
6. William Langland. *Piers Plowman. A Modern Verse Translation*. Trans by Peter Sutton (Delhi: Worldview, 2019).
7. John Blair. *The Anglo-Saxon Age: A Very Short Introduction* (Oxford: OUP, 2000).

SEMESTER:3

Core Course 5

American Literature

Unit I:

- Two questions to be answered from four questions asked serially and covering both the writers equally. [10x2=20]

1. Tennessee Williams: *The Glass Menagerie*

2. Ernest Hemingway: *A Farewell to Arms*

Unit II:

- One question to be answered from three questions set with alternatives from the three texts. [10x1=10]

1. Edgar Allan Poe: 'The Purloined Letter'

2. F. Scott Fitzgerald: 'The Crack-up'

3. William Faulkner: 'Dry September'

Unit III:

- Two questions to be answered from questions set with alternatives from the three poets. [10x2=20]

- Two short questions to be answered from six questions asked serially and covering the three poets.
[5x2=10]

1. Anne Bradstreet: "The Prologue"
2. Walt Whitman: Selection from *Leaves of Grass*: "O Captain, My Captain"; "I Sit and Look Out"
3. Robert Frost: "The Road Not Taken"; "Stopping by Woods on a Snowy Evening"

Suggested Topics and Background Prose Readings for Class Presentation:

- The American Dream
- Social Realism and the American Novel
- Folklore and the American Novel
- Black Women's Writing
- Questions of Form in American Poetry

Reading:

1. Hector St John Crevecoeur, 'What is an American', (Letter III) in *Letters from an American Farmer* (Harmondsworth: Penguin, 1982) pp.66–105.
2. Frederick Douglass, *A Narrative of the life of Frederick Douglass* (Harmondsworth: Penguin, 1982) chaps. 1–7, pp.47–87.
3. Henry David Thoreau, 'Battle of the Ants' excerpt from 'Brute Neighbours', in *Walden* (Oxford: OUP, 1997) chap. 12.
4. Ralph Waldo Emerson, 'Self Reliance', in *The Selected Writings of Ralph Waldo Emerson*, ed. with a biographical introduction by Brooks Atkinson (New York: The Modern Library, 1964).
5. A. Katyal, A. Dasgupta, *This Unsettling Place: Readings in American Literature. A Critical Anthology*. (Delhi: Worldview Critical Edition, 2015).
6. Toni Morrison, 'Romancing the Shadow', in *Playing in the Dark: Whiteness and Literary Imagination* (London: Picador, 1993) pp.29–39.
7. Krishna Sen & A. Sengupta Eds. *A Short History of American Literature*,

Orient Blackswan.

Core Course 6: British Poetry & Drama: 14th to 17th Centuries

Unit I:

- Two questions to be answered from three questions set with alternatives from the three poets. [10x2=20]
 - Two short questions to be answered from six questions asked serially covering the three poets [5x2=10]
1. Sonnet selection from Spenser's Amoretti: No: LXVII –“Like as a Huntsman,” LVII—“Sweet Warrior,” LXXV—“One day I Wrote Her Name”
 2. William Shakespeare: Sonnet Nos. 18, 65, 137
 3. John Donne: “The Sunne Rising”; “The Good Morrow”; “A Valediction: Forbidding Mourning”

Unit II:

- Two questions to be answered from three questions set with alternatives from the three texts. [10x2=20]
 - Two short questions to be answered from six questions asked serially covering the three texts. [5x2=10]
1. William Shakespeare: *Macbeth*, *Twelfth Night*
 2. Christopher Marlowe: *Edward II*

Suggested Topics and Background Prose Readings for Class Presentation:

- Renaissance Humanism,
- Religious and Political Thought
- Ideas of Love and Marriage
- The Stage, Court and City

Reading:

1. Pico Della Mirandola, excerpts from the *Oration on the Dignity of Man*, in *The Portable Renaissance Reader*, ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books, 1953) pp.476–9.

2. John Calvin, 'Predestination and Free Will', in *The Portable Renaissance Reader*, ed. James Bruce Ross and Mary Martin McLaughlin (New York: Penguin Books, 1953) pp.704–11.
3. Baldassare Castiglione, 'Longing for Beauty' and 'Invocation of Love', in Book 4 of *The Courtier*, 'Love and Beauty', tr. George Bull (Harmondsworth: Penguin, rpt. 1983) pp. 324–8, 330–5.
4. Philip Sidney, *An Apology for Poetry*, ed. Forrest G. Robinson (Indianapolis: Bobbs-Merrill, 1970) pp.13–18.

Core Course 7

British Poetry & Drama: 17th and 18th Centuries

Unit I:

- Two questions to be answered from two questions set with alternatives from the two texts. [10x2=20]
- Two short questions to be answered from six questions asked serially and covering the two texts. [5x2=10]

1. John Milton: *Paradise Lost*, Book I
2. Alexander Pope: *The Rape of the Lock*

Unit II:

- Two questions to be answered from four questions asked serially covering both the texts equally. [10x2=20]
- Two short questions to be answered from six questions asked serially covering the two texts. [5x2=10]

1. John Webster: *Duchess of Malfi*
2. Richard Brinsley Sheridan: *The Rivals*

Suggested Topics and Background Prose Readings for Class Presentation:

- Religious and Secular Thoughts in the 17th century

- The Stage, the State and the Market`
- The Mock Epic and Satire
- Women in the 17th century
- The Comedy of Manners

Reading:

1. *The Holy Bible, Genesis*, chaps. 1–4, *The Gospel according to St. Luke*, chaps. 1–7 and 22–4.
2. Niccolo Machiavelli, *The Prince*, ed. and tr. Robert M. Adams (New York: Norton, 1992) chaps. 15, 16, 18, and 25.
3. Thomas Hobbes, *Selections from The Leviathan*, pt. I (New York: Norton, 2006) chaps. 8, 11, and 13.
4. John Dryden, ‘A Discourse Concerning the Origin and Progress of Satire’, in *The Norton Anthology of English Literature*, vol. 1, 9th edn, ed. Stephen Greenblatt (New York: Norton 2012) pp. 1767–8.

SEMESTER : 4

Core course 8:

British Literature: 18th Century

- Three questions to be answered from six questions asked serially covering all the writers equally from Unit 1. [10x3=30]
- Two questions to be answered from four questions asked serially covering the two texts equally from Unit 2. [10x2=20]
- Two short questions to be answered from six questions asked serially covering all the texts from Units 1 and 2 combined. [5x2=10]

Unit I:

1. William Congreve: *The Way of the World*
2. Jonathan Swift: *Gulliver's Travels* (Books: III & IV)
3. Daniel Defoe: *Robinson Crusoe*

Unit II:

1. Samuel Johnson: “London”
2. Thomas Gray: “Elegy Written in a Country Churchyard.”

Suggested Topics and Background Prose Readings for Class Presentation:

- The Enlightenment and Neo-classicism
- Restoration Comedy
- The Country and the City
- The Novel and the Periodical Press

Reading:

1. Jeremy Collier, *A Short View of the Immorality and Profaneness of the English Stage* (London: Routledge, 1996).
2. Daniel Defoe, 'The Complete English Tradesman' (Letter XXII), 'The Great Law of Subordination Considered' (Letter IV), and 'The Complete English Gentleman', in *Literature and Social Order in Eighteenth-Century England*, ed. Stephen Copley (London: Croom Helm, 1984).
3. Jonathan Swift. *Gulliver's Travels*. Edited by Louis A. Landa (Delhi: Book Land, 2001).
4. Samuel Johnson, 'Essay 156', in *The Rambler*, in *Selected Writings: Samuel Johnson*, ed. Peter Martin (Cambridge, Mass.: Harvard University Press, 2009) pp. 194–7; *Rasselas* Chapter 10; 'Pope's Intellectual Character: Pope and Dryden Compared', from *The Life of Pope*, in *The Norton Anthology of English Literature*, vol. 1, ed. Stephen Greenblatt, 8th edn. (New York: Norton, 2006) pp. 2693–4, 2774–7.

Core Course 9: British Romantic Literature

- Four questions to be answered from ten questions asked serially and covering all the poets from Units 1, 2 and 3 combined. [10x4=40]
- Two short questions to be answered from six questions asked serially covering all the poets from Units 1, 2 and 3 combined. [5x2=10]

Unit I:

1. William Blake - *Introduction to the Songs of Innocence* : "The Lamb," "The Chimney Sweeper"

Songs of Experience: "Tyger," "The Chimney Sweeper"

Unit II:

1. William Wordsworth – "Tintern Abbey," "Ode on the Intimations of Immortality"

2. Samuel Taylor Coleridge –“Kubla Khan ,”“Dejection: An Ode”

Unit III:

1. Lord George Gordon Noel Byron - *Childe Harold*- Canto III, verses 36-45 (Lines: 316 to 405); “On the Castle of Chillon”
2. Percy Bysshe Shelley –“Ode to the West Wind”;“Ozymandias”; “Hymn to Intellectual Beauty”
3. John Keats –“Ode to a Nightingale”;“Ode to Autumn”;“On First Looking into Chapman’s Homer”

Unit IV:

- One question to be answered from two questions asked serially. [10x1=10]
Mary Shelley: *Frankenstein*

Suggested Topics and Background Prose Readings for Class Presentation

- Literature and French Revolution
- Conception of Nature
- Reason and Romantic Imagination
- The Gothic

Reading:

1. William Wordsworth, ‘Preface to Lyrical Ballads’, in *Romantic Prose and Poetry*, ed. Harold Bloom and Lionel Trilling (New York: OUP, 1973) pp.594–611.
2. John Keats, ‘Letter to George and Thomas Keats, 21 December 1817’, and ‘Letter to Richard Woodhouse, 27 October, 1818’, in *Romantic Prose and Poetry*, ed. Harold Bloom and Lionel Trilling (New York: OUP, 1973) pp. 766–68, 777–8.
3. Jean-Jacques Rousseau, ‘Preface’ to *Emile or Education*, tr. Allan Bloom (Harmondsworth: Penguin, 1991).
4. Samuel Taylor Coleridge, *Biographia Literaria*, ed. George Watson (London: Everyman, 1993) chap. XIII, pp. 161–66.

Core Course 10: British Literature: 19th Century

- Two questions to be answered from three questions set with alternatives from the three texts in Unit 1. [10x2=20]
- Two questions to be answered from three questions set with alternatives from the three poets in Unit 2. [10x2=20]
- Four short questions to be answered from ten questions asked serially covering all the texts from Units 1 and 2 combined. [5x4=20]

Unit I:

1. Jane Austen: *Pride and Prejudice*
2. Charlotte Bronte: *Jane Eyre*
3. Charles Dickens: *A Tale of Two Cities*

Unit II:

1. Alfred Tennyson : “The Lady of Shalott”; “Ulysses”
2. Robert Browning: “My Last Duchess”; “The Last Ride Together”
3. Christina Rossetti: “The Goblin Market”

Suggested Topics and Background Prose Readings for Class Presentation

- Utilitarianism ,
- The 19th Century Novel
- Marriage and Sexuality
- The Writer and Society
- Faith and Doubt
- The Dramatic Monologue

Reading:

1. Karl Marx and Friedrich Engels, ‘Mode of Production: The Basis of Social Life’, ‘The Social Nature of Consciousness’, and ‘Classes and Ideology’, in *A Reader in Marxist Philosophy*, ed. Howard Selsam and Harry Martel (New York: International Publishers, 1963) pp. 186–8, 190–1, 199–201.
2. Charles Darwin, ‘Natural Selection and Sexual Selection’, in *The Descent of Man in The Norton Anthology of English Literature*, 8th edn, vol. 2, ed. Stephen Greenblatt (New York: Norton, 2006) pp. 1545–9.
3. John Stuart Mill, *The Subjection of Women* in *Norton Anthology of English Literature*, 8th edn, vol. 2, ed. Stephen Greenblatt (New York: Norton, 2006) chap. 1, pp. 1061–9.

SEMESTER : 5

Core Course 11 Women's Writing

- One question to be answered from three questions set with alternatives from the three poets in unit 1. [10x1=10]
- One question to be answered from two questions asked serially from unit 2. [10x1=10]
- Four short questions to be answered from ten questions asked serially covering all the texts from Units 1 and 2 combined. [5x4=20]

Unit I:

1. Emily Dickinson: "I Cannot Live with You", "I'm Wife"; "I've finished that"
2. Sylvia Plath: "Daddy", "Lady Lazarus"
3. Eunice De Souza: "Advice to Women"; "Bequest"

Unit II:

Alice Walker: *The Colour Purple*

Unit III:

- One question to be answered from three questions set with alternatives from the three texts. [10x1=10]
1. Charlotte Perkins Gilman: 'The Yellow Wallpaper'
 2. Katherine Mansfield: 'Bliss'
 3. Mahasweta Devi: 'Draupadi', tr. Gayatri Chakravorty Spivak (Calcutta: Seagull, 2002)

Unit IV:

- One question to be answered from three questions set with alternatives from the three texts. [10x1=10]
1. Mary Wollstonecraft: *A Vindication of the Rights of Woman* (New York: Norton, 1988) Chap.1, pp.11-19; Chap.2, pp.19-38
 2. Ramabai Ranade: 'A Testimony of our Inexhaustible Treasures' in *Pandita Ramabai Through her Own Words: Selected Works*, tr. Meera Kosambi (New Delhi: OUP, 2000) pp.295-324
 3. Rasasundari Debi: Excerpts from *Amar Jibon* in Susie Tharu and K. Lalita, eds. *Women's Writing in India*, Vol: 1 (New Delhi: OUP, 1989) pp: 192-202

Suggested Topics and Background Prose Readings for Class Presentation

- The confessional mode in women's writing
- Sexual Politics
- Age, Caste and Gender
- Social Reform and Women's Rights

Reading:

1. Virginia Woolf, *A Room of One's Own* (New York: Harcourt, 1957) chaps. 1 and 6.
2. Simone de Beauvoir, 'Introduction', in *The Second Sex*, tr. Constance Borde and Shiela Malovany-Chevallier (London: Vintage, 2010) pp.3–18.
3. Kumkum Sangari and Sudesh Vaid, eds., 'Introduction', in *Recasting Women: Essays in Colonial History* (New Delhi: Kali for Women, 1989) pp.1–25.
4. *Representing Self, Critiquing Society*. Selected Lifewritings by Women. Edited by Meenakshi Malhotra. (Delhi: Worldview, 2016).
5. Chandra Talapade Mohanty, 'Under Western Eyes: Feminist Scholarship and Colonial Discourses', in *Contemporary Postcolonial Theory: A Reader*, ed. Padmini Mongia (New York: Arnold, 1996) pp.172–97.

Core Course 12: British Literature: The Early 20th Century

Unit I:

- Two questions to be answered from three questions set with alternatives from the three texts. [10x2=20]
 1. Joseph Conrad: *Heart of Darkness*
 2. D.H. Lawrence: *Sons and Lovers*
 3. Virginia Woolf: *Mrs Dalloway*
- One question to be answered from two questions asked serially from unit 2. [10x1=10]
- Two questions to be answered from four questions asked serially covering both the poets equally from unit 3. [10x2=20]

- Two short questions to be answered from six questions asked serially covering all the writersequally from Units 2 and 3 combined. [5x2=10]

Unit II:

George Bernard Shaw: *Arms and the Man*

Unit III:

1. W.B. Yeats: “Leda and the Swan”; “The Second Coming”; “Sailing to Byzantium”
2. T.S. Eliot :”The Hollow Men”, “The Love Song of J. Alfred Prufrock”, “Marina”

Suggested Topics and Background Prose Readings for Class Presentation

- Modernism, Postmodernism and Non-European Cultures
- The Women’s Movement in the early 20th Century
- Psychoanalysis and the Stream of Consciousness
- The Uses of Myth
- The *Avant Garde*

Reading:

1. Sigmund Freud, ‘Theory of Dreams’, ‘Oedipus Complex’, and ‘The Structure of the Unconscious’, in *The Modern Tradition*, ed. Richard Ellmann (Oxford: OUP, 1965) pp. 571, 578–80, 559–63.
2. T.S. Eliot, ‘Tradition and the Individual Talent’, in *Norton Anthology of English Literature*, 8th edn, vol. 2, ed. Stephen Greenblatt (New York: Norton, 2006) pp. 2319–25.
3. Raymond Williams, ‘Introduction’, in *The English Novel from Dickens to Lawrence* (London: Hogarth Press, 1984) pp. 9–27.

SEMESTER: 6

Core Course 13 Modern European Drama

- Four questions to be answered from six questions asked serially from the four texts. [10x4=40]
- Four short questions to be answered from eight questions asked serially from the four texts covering them equally. [5x4=20]

1. Henrik Ibsen: *Ghosts*
2. Bertolt Brecht: *The Good Woman of Setzuan*
3. August Strindberg: *Miss Julie*
4. Eugene Ionesco: *Rhinoceros*

Suggested Topics and Background Prose Readings for Class Presentation

- Politics, Social Change and the Stage
- Text and Performance
- European Drama: Realism and Beyond
- Tragedy and Heroism in Modern European Drama
- The Theatre of the Absurd

Reading:

1. Constantine Stanislavski, *An Actor Prepares*, chap. 8, 'Faith and the Sense of Truth', tr. Elizabeth Reynolds Hapgood (Harmondsworth: Penguin, 1967) sections 1, 2, 7, 8, 9, pp. 121–5, 137–46.
2. Bertolt Brecht, 'The Street Scene', 'Theatre for Pleasure or Theatre for Instruction', and 'Dramatic Theatre vs Epic Theatre', in *Brecht on Theatre: The Development of an Aesthetic*, ed. and tr. John Willet (London: Methuen, 1992) pp. 68–76, 121–8.
3. George Steiner, 'On Modern Tragedy', in *The Death of Tragedy* (London: Faber, 1995) pp. 303–24.

Core Course14

Postcolonial Literatures

- One question to be answered from two questions set with alternatives from the two texts in unit 1. [10x1=10]
- One question to be answered from three questions set with alternatives from the three texts in unit 2. [10x1=10]
- Two short questions to be answered from six questions asked serially covering all the writers from Units 1 and 2 combined. [5x2=10]

Unit I:

1. Chinua Achebe: *Things fall Apart*
2. Gabriel Garcia Marquez: *Chronicle of a Death Foretold*

Unit II:

1. Bessie Head: 'The Collector of Treasures'
2. Ama Ata Aidoo : 'The Girl who can'
3. Grace Emily Ogot: 'The Green Leaves'

Unit III:

- Two questions to be answered from four questions set with alternatives from the four poets. [10x2=20]
 - Two short questions to be answered from six questions asked serially covering all the poets. [5x2=10]
1. Pablo Neruda: "Tonight I can Write"; "The Way Spain was"
 2. Derek Walcott: "A Far Cry from Africa"; "Names"
 3. David Malouf: "Revolving Days"; "Wild Lemons"
 4. Mamang Dai: "Small Towns and the River"; "The Voice of the Mountain"

Suggested Topics and Background Prose Readings for Class Presentation

- Decolonization, Globalization and Literature
- Literature and Identity Politics
- Writing for the New World Audience
- Region, Race and Gender
- Postcolonial Literature and Questions of Form

Reading:

1. Franz Fanon, 'The Negro and Language', in *Black Skin, White Masks*, tr. Charles Lam Markmann (London: Pluto Press, 2008) pp.8–27.
2. NgugiwaThiong'o, 'The Language of African Literature', in *Decolonising theMind*(London: James Curry, 1986) chap. 1, sections 4–6.
3. *A Warble to Postcolonial Voices Vol I. Short Stories*. BessieHead, Ama Ata Aidoo, Grace Ogot.Edited by Someshwar Sati (Delhi: Worldview Critical Edition, 2016).
4. Gabriel Garcia Marquez, the Nobel Prize Acceptance Speech, in *Gabriel Garcia Marquez:NewReadings*,ed.BernardMcGuirkandRichardCardwell(Cambridge: Cambridge University Press,1987).

CBCS B.A. PROGRAMME & ELECTIVE COURSES IN ENGLISH

Detailed Syllabus

DSE [Discipline Specific Elective Courses]

TOPIC A: Literary Theory & Criticism

- Four questions to be answered from six questions asked serially from the four topics as elucidated in the corresponding essays [10x4=40]
- Four short questions to be answered from eight questions asked serially from the four topics as elucidated in the corresponding essays covering them equally[5x4=20]

1. Modernism

- a) Walter Benjamin: *The Work of Art In The Age of Mechanical Reproduction* (London: Penguin,2008)
- b) Stephen Spender, 'Moderns and Contemporaries' in *The Struggle of the Modern* by Stephen Spender (Berkeley: University of California Press, 1965)pp.71-78

2. Postmodernism

- c) Jean-Francois Lyotard, 'Answering the Question: 'What is Postmodernism?''In*Modernism /Postmodernism*, ed. Peter Brooker (London:Longman,19) pp.139-150
- d) Fredric Jameson, 'Postmodernism and Consumer Society' In *Modernism/ Postmodernism*, ed. Peter Brooker (London:Longman,1992)pp.163-179

3. Feminism

- e) Elaine Showalter, 'Twenty Years on: *A Literature of Their Own* Revisited', in *A Literature of Their Own: British Women Novelists from Bronte to Lessing* (1977. Rpt. London: Virago, 2003) pp. xi-xxxiii.
- f) Susan Heckman: 'Feminism' in Routledge Companion to Critical Theory, ed. Simon Malpas and Paul Wake (London,2006)pp.91-101

4. Postcolonialism

- g) Edward Said, 'The Scope of Orientalism' in *Orientalism* (Harmondsworth: Penguin, 1978) pp.29-110.
- h) Aijaz Ahmad, " 'Indian Literature': Notes towards the Definition of a Category", in *In Theory: Classes, Nations, Literatures* (London: Verso, 1992) pp. 243-285.

Reading:

1. Raman Selden, Peter Widdowson and Peter Brooker,*A Reader's Guide to Contemporary Literary Theory*: (London:Longman; 5 edition 2005)
2. Peter Barry, *Beginning Theory: An Introduction to Literary and Cultural Theory*:4thEdn. (New Delhi: Viva Books Private Limited ,2018)

TOPIC B: Popular Literature

- Four questions to be answered from six questions asked serially from the four texts.
[10x4=40]

- Four short questions to be answered from eight questions asked serially from the four texts covering them equally. [5x4=20]

1. Anne Frank: *The Diary of a Young Girl*
2. Richard Bach: *Jonathan Livingston Seagull: The Complete Edition*
3. Paulo Coelho: *The Alchemist*
4. I. B. Rai (Tr. By Manjushree Thapa): *There's a Carnival Today*

Suggested Topics and background Prose Reading:

1. Theme of suspense and crime—detective novels
2. Romance and horror
3. Fantasy and science fiction

Reading:

1. Ken Gelder, *Popular Fiction: The Logics and Practices of a Literary Field*; (Oxon:Routledge,2004)
2. Peter Swirski, *From Lowbrow to Nobrow*, (Montreal: McGill-Queen's University Press,2005)
3. David Johnson(Ed). *The Popular and the Canonical: Debating Twentieth-Century Literature 1940–2000* (Routledge)

TOPIC C: Literature of the Indian Diaspora

- Four questions to be answered from six questions asked serially from the four texts. [10x4=40]
- Four short questions to be answered from eight questions asked serially from the four texts covering them equally. [5x4=20]

1. M.G. Vassanji: *The Book of Secrets*
2. RohintonMistry : *A Fine Balance*
3. MeeraSanyal: *Anita and Me*
4. JhumpaLahiri: *The Namesake*

Suggested Topics and background Prose Reading

1. The Diaspora

2. Nostalgia
3. The New Medium
4. Alienation

Reading:

1. “Introduction: The diasporic imaginary” in Mishra V. *Literature of the Indian Diaspora*, London: Routledge, 2008.
2. “Cultural Configurations of Diaspora”, in J. Hutynuk, V. S. Kalra, and R. Kaur, eds., London: Sage Publications, 2005.
3. “The New Empire within Britain”, in Rushdie, S. *Imaginary Homelands*, London: Granta Books, 1991.

TOPIC D: Indian Literature in English Translation

- One question to be answered from two questions set with alternatives from the two poets in unit 1. [10x1=10]
- Two questions to be answered from four questions asked serially covering both the writers equally from Units 2 and 3 combined. [10x2=20]
- Four short questions to be answered from eight questions asked serially covering all the writers equally from Units 1, 2 and 3 combined. [5x4=20]

Unit I:

1. Rabindranath Tagore : “The Golden Boat”, “Conch”, “Arrival”
2. Jibanananda Das : “I Shall Return to this Bengal”, “Banalata Sen”

Unit II:

Girish Karnad: *Hayavadana*

Unit III:

Mahasweta Devi: *Mother of 1084*

Unit IV:

- One question to be answered from two questions set with alternatives from the two texts. [10x1=10]

1. Premchand: 'The Shroud', in *Penguin Book of Classic Urdu Stories*, ed. M. Assaduddin (New Delhi: Penguin/Viking 2006).
2. Sarat Chandra Chattopadhyay : 'Mahesh' (*Drought and other Stories*, SahityaAkademi Edition)

Reading:

1. Salman Rushdie, *Imaginary Homelands: Essays and Criticism* 1981-1991 (London: Granta, 1992)
2. Aijaz Ahmad, *In Theory: Classes, Nations, Literatures* (London: Verso 1992)
3. Peter Morey, *Fictions of India. Narrative and Power* (Edinburgh: Edinburgh University Press 2005)
4. *Modern Indian Writing in English: A Multilingual Anthology* edited by D.Kapse (Delhi: Worldview, 2018)

TOPIC E: Partition Literature

- Four questions to be answered from six questions asked serially from the four texts. [10x4=40]
- Four short questions to be answered from eight questions asked serially from the four texts covering these equally. [5x4=20]

1. Bapsi Sidhwa: *Ice Candy Man*
2. Dibyendu Palit : *Alam's Own House*
3. Khushwant Singh : *Train To Pakistan*
4. Bhisham Sahni: *Tamas*

Suggested Topics and background Prose Reading:

1. Colonialism , Nationalism and Partition
2. Colonialism and Violence
3. Homelessness and Exile
4. Women in the Partition

Reading:

1. Ritu Menon and Kamala Vasin, 'Introduction', in *Borders and Boundaries* (New Delhi: Kali for Women, 1998)
2. *Partition Literature: An Anthology* edited by Debjani Sengupta (Delhi: Worldview, 2018).

3. Sukrita P. Kumar, *Narrating Partition* (Delhi: Indialog, 2004)
4. Urvashi Butalia, *The Other Side of Silence: Voices from the Partition of India* (Delhi: Kali for Women, 2000)
5. Sigmund Freud, 'Mourning and Melancholia' in *The Complete Psychological Works of Sigmund Freud*, tr. James Strachey (London: Hogarth Press, 1953) pp.3041-53

Films:

1. GaramHawa (dir. M.S.Sathyu, 1974)
2. Khamosh Paani: *Silent Waters* (dir. Sabina Kumar, 2003)
3. Subarnarekha (dir. Ritwik Ghatak, 1965)

TOPIC F: Science Fiction and Detective Literature

- Four questions to be answered from six questions asked serially from the four texts. [10x4=40]
 - Four short questions to be answered from eight questions asked serially from the four texts covering them equally. [5x4=20]
1. Satyajit Ray – 'Professor Shonku and the UFO' (From *Incredible Adventures of Professor Shonku*)
 2. Arthur Conan Doyle – *The Hound of the Baskervilles*
 3. Raymond Chandler- *The Big Sleep*
 4. H. R. F. Keating – *Inspector Ghote Goes by Train*

Suggested Topics and background Prose Reading

1. Crime across Media
2. Construction of Criminal Identity
3. Cultural Stereotypes in Crime Fiction
4. Crime Fiction and Cultural Nostalgia
5. Crime Fiction and Ethics
6. Crime and Censorship

Reading:

1. J. Edmund Wilson, 'Who Cares Who Killed Roger Ackroyd?', *The New Yorker*, 20 June 1945
2. W.H. Auden, *The Guilty Vicarage*, available at <https://harpers.org/archive/1948/05/the-guilty-vicarage/>

3. Raymond Chandler, 'The Simple Art of Murder', Atlantic Monthly, December 1944, available at :<http://www.en.utexas.edu/Classes/Bremen/e316k/316kprivate/scans/chandlerart.html>
4. Satyajit Ray: *Incredible Adventures of Professor Shonku*, Penguin

Books, 1994, New Delhi

ABILITY ENHANCEMENT ELECTIVE COURSES

Skill Enhancement Course (SEC)

SUBJECT A: Text Comprehension & Editing

- Comprehension of a Prose piece—a text followed by eight questions bearing 02 marks each [2x8=16]
 - Comprehension of a piece of Poetry—a text followed by eight questions bearing 02 marks each [2x8=16]
 - One question on Summary writing of a Prose or a Verse piece to be answered [10x1=10]
 - One question to be answered from three questions asked from topic 4 (Editing) [6x1=6]
 - Proofreading of one prose piece to be done (in reference to the correct version of that paragraph) bearing 12 marks—02 marks each for the correct application of 6 proof reading symbols to be applied. [12x1=12]
1. Comprehension of a Text (Poetry)
A text followed by questions
 2. Comprehension of a Text (Prose)
A text followed by questions
 3. Summary Writing of a Prose or Verse Piece

4. Copy Editing and Academic Editing
5. Style sheet Practice and proofreading

Recommended Reading:

1. John Russell, *Strategic Copy Editing*, (New York: New Guilford Books, 2004)
2. Elsie Myers Stainton, *The Fine Art of Copy Editing*, (New York: Columbia University Press, 2002)
3. William Critchley, *The Pocket Book of Proofreading: A Guide to Freelance Proofreading* (UK: First English Books, 2007)
4. Stephen Bailey, *Academic Writing: A Handbook for International Students Paperback* –Student Edition, (New York : Routledge, 2014)

SUBJECT B: Creative Writing

- Four questions to be answered from eight questions asked serially from the five topics below. [10x4=40]
 - Four short questions to be answered from eight questions asked serially from the five topics below. [5x4=20]
1. What is Creative Writing
 2. The Art of Creative Writing
 3. Modes of Creative Writing
 4. Writing for the Media
 5. Preparing for Publication

Recommended book:

1. AnjanaNeiraDev and Others, *Creative writing: A Beginner's Manual*, (Delhi:Pearson, 2009)
2. Liz Ham, *Study Writing: A Course in Writing Skills for Academic Purpose* (London:Cambridge University Press,2006)
3. IlonaLeki, *Academic Writing: Exploring Process and strategies*, 2nd Edition(New York: Cambridge University Press)

SUBJECT C: Business Communication

- One question to be answered from three questions asked serially from topic 1. [12x1=12]
- Six questions to be answered from twelve questions asked serially from the rest of the topics combined covering them equally. [8x6=48]

1. Introduction to the essentials of Business Communication: Theory and Practice
2. Citing references, and using bibliographical and research tools
3. Writing a project report
4. Writing reports on field work/visits to industries, business concerns etc. /business negotiations.
5. Summarizing annual report of companies
6. Writing minutes of meetings
7. E-correspondence

Suggested Readings:

1. ScotOber, *Contemporary Business Communication*. (Houghton Mifflin,2008)
2. Lesikar, R.V. &Flatley, M.E.; *Basic Business Communication Skills for Empowering the Internet Generation*, (NewDelhi:Tata McGraw Hill Publishing Company Ltd., 2004)
3. Ron Ludlow& Panton, F. *The Essence of Effective Communications*, (NewDelhi:PrenticeHalof India Pvt. Ltd., 1992)
4. R. C. Bhatia, *Business Communication*, (NewDelhi:Ane Books Pvt Ltd., 2009)
5. Varinder Kumar & Bodh Raj, *Business Communication* (Delhi:Kalyani Publisher,2014)

SUBJECT D: Technical Writing

- Four questions to be answered from nine questions asked serially from all the three units combined covering them equally. [10x4=40]
- Four short questions to be answered from nine questions asked serially from all the three units combined covering them equally. [5x4=20]

Unit 1: Communication: Language and communication, differences between speech and writing, distinct features of speech, distinct features of writing.

Unit 2: Writing Skills; Selection of topic, thesis statement, developing the thesis introductory, developmental, transitional and concluding paragraphs, linguistic unity, coherence and cohesion, descriptive, narrative, expository and argumentative writing.

Unit 3: Technical Writing: Scientific and technical subjects; formal and informal writings; formal writings/reports, handbooks, manuals, letters, memorandum, notices, agenda, minutes; common errors to be avoided.

Suggested Reading:

1. Liz Hamp-Lyons and B. Heasley: *Study Writing; A course in written English. For academic and professional purposes*, (New York: Cambridge University Press, 2006)
2. Randolph. Quirk, S. Greenbaum, G. Leech and J. Svartik: *A comprehensive grammar of the English language*, (New Delhi: Dorling Kindersley, 2010)
3. Kalyani Samantray, *Academic and Research Writing*, (New Delhi : Orient Blackswan, 2017)
4. Savitha Chilakamarri, *English for Technical Communication*, (New Delhi: Cambridge English, 2017)
5. Daniel G. Riordan, *Technical Report Writing Today*, 10th Edition (Boston: Wadsworth, 2014)

GENERIC ELECTIVE (GE)

Paper 1: Selections from Indian Literature

- Three questions to be answered from four questions set with alternatives equally covering the four writers in units 1 and 3 combined. [10x3=30]
- Four short questions to be answered from eight questions asked serially and equally covering the four writers in units 1 and 3 combined. [5x4=20]

Unit I:

1. Rabindranath Tagore: "The Golden Boat", "The Conch", "The Arrival" [From *Rabindranath Tagore: Selected Poems*, trans. William Radice, Penguin]
2. Kamala Das: "An Introduction", "Smoke in Colombo" [From *Only the Soul Knows How to Sing*, D. C. Books, Kerala]

Unit II:

- One question to be answered from two questions set with alternatives from the two texts. [10x1=10]
1. Anita Desai: *In Custody*
 2. Mulk Raj Anand: *Coolie*

Unit III:

1. Vijay Tendulkar: *Silence! The Court is in Session*
2. Girish Karnad: *Nagamandala*

Suggested Reading:

1. Sisir Kumar Das, *History of Indian Literature* (New Delhi: Sahitya Akademi, 2005)
2. Rossella Ciocca & Neelam Srivatsava, (ed) *Indian Literature and the World* (New York: Springer, 2017)
3. A. Ramakrishna Rao, *Comparative Perspectives on Indian literature* (New Delhi: Prestige Books, 1992)

Paper 2: Selections from European Literature

- Two questions to be answered from three questions set with alternatives from the three poets in unit 1. [10x2=20]
- One question to be answered from two questions set with alternatives from the two texts in unit 3. [10x1=10]
- Two short questions to be answered from six questions asked serially and covering all the writers from Units 1 and 3 combined. [5x2=10]

Unit I:

1. William Shakespeare: Sonnetnos: 18,64,65,73
2. William Wordsworth: “Daffodils”, “Lucy Poems”
3. W. H. Auden: “The Unknown Citizen”, “Autumn Song”

Unit II:

- Two questions to be answered from four questions set with alternatives from the four texts. [10x2=20]
1. V. Woolf: ‘The Duchess and the Jeweller’
 2. George Orwell: ‘Shooting an Elephant’
 3. H. G. Wells: ‘The Magic Shop’
 4. H. Munro: ‘Open Window’

Unit III:

William Shakespeare:

1. *Macbeth*
2. *Twelfth Night*

Reading:

1. Ernst Robert Curtius, translated by Michael Kowal, *Essays on European Literature* (New Jersey:Princeton Legacy Library, 1973)
2. Menka Ahlawat et al.*Selections from British Literature: Poems and Short Stories* (Delhi: Worldview, 2019).
3. Malcolm Bradbury, James McFarlane, *Modernism: A Guide to European Literature 1890-1930* (London: Penguin, 1991)

LANGUAGE CORE COURSE₁ [LCC₁]: ALTERNATIVE ENGLISH SEMESTER I

PAPER 1: Text Comprehension, Editing & Writing Skill

- Comprehension of a Prose piece—a text followed by seven questions bearing 02 marks each [2x7=14]
 - One question on Summary writing of Prose or Verse piece to be answered [12x1=12]
 - One question to be answered from three questions asked serially from topic 3 (Essay Writing) [10x1=10]
 - One question to be answered from three questions asked serially from topic 4 (Letter Writing) [10x1=10]
 - Proofreading of one prose piece to be done (in reference to the correct version of that paragraph) bearing 14 marks—02 marks each for the correct application of 07 proofreading symbols to be applied. [2x7=14]
1. Comprehension of a Text (Prose)
A text followed by questions
 2. Summary Writing of a Prose or Verse Piece
 3. Essay Writing
 4. Formal and informal letter Writing
 5. Style sheet Practice and proofreading

Reading:

1. John Russial, *Strategic Copy Editing*, (New York: New Guilford Books, 2004)
2. Elsie Myers Stainton, *The Fine Art of Copyediting*, (New York: Columbia University Press, 2002)
3. William Critchley, *The Pocket Book of Proofreading: A Guide to Freelance Proofreading* (UK: First English Books, 2007)
4. Stephen Bailey, *Academic Writing: A Handbook for International Students Paperback*—Student Edition, (New York: Routledge, 2014)
5. Robert W Bly, *Webster's New World Letter Writing Handbook* (Wiley Publishing House, Indianapolis, 2004)

SEMESTER III

PAPER 2: Literary Perceptions

- Four questions to be answered from eight questions asked serially from the four texts covering these equally. [10x4=40]
- Four short questions to be answered from eight questions asked serially from the four texts covering them equally. [5x4=20]

1. J. M. Synge: *Riders to the Sea*
2. Edward Fitzgerald: *The Great Gatsby*
3. R. K. Narayan: *The Man-Eater of Malgudi*
4. Mahesh Dattani: *Tara*

Reading:

1. B. Chakraborti, *A Talent for the Particular*(Delhi: Worldview, 2012)
2. VinayDharwadkar, 'Orientalism and the Study of Indian Literature', in *Orientalism and the Postcolonial Predicament: Perspectives on South Asia*, ed. Carol A. Breckenridge and Peter van der Veer (New Delhi: OUP, 1994) pp.158–95.

LANGUAGE CORE COURSE [LCC₂]: ENGLISH LANGUAGE CORE

SEMESTER II

PAPER 1: Technical Writing Skill

Six questions to be answered from twelve questions asked serially from these topics. [10x6=60]

1. Paragraph Writing
2. Essay Writing
3. Summary Writing
4. Formal and informal Letter Writing
5. Dialogue Writing

Reading:

2. Marcella Frank, *Writing as Thinking: A Guided Processed Approach* (London:Pearson College Division, 1989)
3. Liz Hamp-Lyons & B. Heasley: *Study Writing: A Course in written English for Academic & Professional Purposes* (New York: Cambridge University Press, 1987)
4. Daniel G. Riordan, *Technical Report Writing Today*, 10th Edition (Boston:Wadsworth, 2014)

SEMESTER IV

PAPER 2: Professional Writing Skill

Six questions to be answered from twelve questions asked serially from the following topics.

[10x6=60]

1. Editorial Writing
2. Notice Writing
3. Advertising Copy Writing
4. Report Writing
5. CV/Resume Writing

Reading:

1. Edward L. Smith, Stephen A. Bernhardt. *Writing At Work: Professional Writing Skills for People on the Job* (New York: McGraw Hill Professional, 1997)
2. Shirley Wilson Logan, Wayne H. Slater (eds.), *Academic and Professional Writing in an Age of Accountability* (Carbondale: Southern Illinois University Press, 2010)
3. John Caples & Fred E. Hahn, *Tested Advertising Methods* (New Jersey: Prentice Hall, 1997)
4. Deborah Perlmutter Bloch, *How to Write a Winning Resume* (Illinois: VGM Career Books, 1998)

ABILITY ENHANCEMENT COMPULSORY COURSE (AECC)

Compulsory English:

- Comprehension of a Prose piece—a text followed by five questions bearing 02 marks each [2x5=10]
- One question to be answered from four questions asked serially from topic 2 and 3. [10x1=10]
- Three questions to be answered from ten questions asked serially from the rest of the topics combined. [5x3=15]

English Communication:

1. Comprehension
2. Formal and informal letter Writing
3. Essay Writing
4. CV, Resume Writing
5. Summary Writing
6. Dialogue Writing
7. Notice Writing
8. Interview

Reading:

1. Deborah Perlmutter Bloch, *How to Write a Winning Resume* (Illinois:VGM Career Books,1998)
2. Robert W Bly, *Webster's New World Letter Writing Handbook* (Wiley Publishing House, Indianapolis, 2004)
3. Sanjay Kumar & PushpLata, *Communication Skills: A Workbook* (New Delhi:OUP,2018)
4. Interact: A Course in Communicative English, Cambridge University

DETAILED SYLLABUS OF B.A PROGRAMME IN ENGLISH UNDER CBCS

Discipline Specific Core

PAPER 1: Individual & Society

Five questions to be answered from eight questions asked with alternatives from the five Units equally covering all the eight writers. [12x5=60]

- ♦ Selections from 'The Individual and Society', *Essays, Stories and Poems*, Pearson Longman: 2004

Unit I:

Caste/Class:

- Omprakash Valmiki : 'Joothan'
- Ismat Chughtai: 'Kallu'

Unit II:

Gender:

- Virginia Woolf: 'Shakespeare's Sister'
- Rabindranath Tagore: 'The Exercise Book'

Unit III:

Race:

- Mary Angelou: "Still I Rise"

Unit IV:

Violence and War

- Bertolt Brecht: 'General, Your tank is a Powerful Vehicle'
- Amitav Ghosh: 'Ghosts of Mrs. Gandhi'

Unit V:

Globalised World

- Naomi Klein: 'The Brand Expands'

PAPER 2:Modern Indian Literature

- Five questions to be answered from twelve questions set serially equally covering all the texts. [10x5=50]
 - Two short questions to be answered from six questions asked serially equally covering all the texts. [5x2=10]
- ❖ Selections from *Modern Indian Literature: Poems & Short Stories*, ed. Department of English, Delhi, OUP, 1999

Short Stories:

1. Premchand: 'The Holy Panchayat'
2. R.K. Narayan: 'The M.C.C'
3. Vaikom Muhammad Basheer: 'The Card Sharper's Daughter'
4. Saadat Hasan Manto: 'Toba Tek Singh'
5. Ambai: 'Squirrel'
6. Ismat Chughtai: 'Lihaaf'

PAPER 3:British Literature

Unit I:

- Two questions to be answered from four questions asked serially equally covering the two texts. [10x2=20]
 1. Charles Dickens: *Oliver Twist*
 2. William Shakespeare: *The Merchant of Venice*

Unit II:

- Two questions to be answered from five questions asked with alternatives equally covering the poets. [10x2=20]
- Four short questions to be answered from ten questions asked serially equally covering the poets. [5x4=20]

- ❖ Selections From *Living Literatures: An Anthology of Prose & Poetry*, Editorial Board, Department of English, University of Delhi, Orient Longman, 2007

Poems: The Renaissance (Sonnets and Love Lyrics): Six Poems.

1. Sir Thomas Wyatt: "Whoso List to Hunt".

2. Edmund Spenser: Amoretti LXXV: “*One day I wrote her name*”.
3. William Shakespeare: Sonnet LXV (65): “*Since Brass*”; Sonnet CXXX (130): “*My mistress’s eyes*”
4. John Donne: “*The Sunne Rising*”
5. John Milton: Sonnet XVI: “*On His Blindness*”

PAPER4:Literary Cross Currents

Unit I:

- Two questions to be answered from four questions asked serially covering the two texts equally. [10x2=20]
1. Vijay Tendulkar: *Silence! The Court is in Session*
 2. Mulk Raj Anand: *Coolie*

Unit II:

- Two questions to be answered from five questions asked with alternatives equally covering the poets. [10x2=20]
 - Four short questions to be answered from ten questions asked serially equally covering the poets. [5x4=20]
- ❖ Selections From *Living Literatures: An Anthology of Prose & Poetry*, Editorial Board, Department of English, University of Delhi, Orient Longman, 2007.

Poems: The Eighteenth Century and the Romantic Age: Seven Poems

1. Jonathan Swift: “*A Beautiful Young Nymph Going to Bed.*”
2. William Blake: “*The Garden of Love*,” “*London.*”
3. William Wordsworth: “*Composed upon Westminster Bridge,*” “*It is a Beauteous Evening.*”
4. Samuel Taylor Coleridge: “*Frost at Midnight.*”
5. John Keats: “*To Autumn.*”

SCHEME FOR CBCS IN B.A./B.SC/B.COM HONS PROGRAM

Year	Semester	Core Course (CC)	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Discipline Specific Elective Course (DSE)	Generic Elective Course (GE)
1	1	Paper - 1	AECC-1 (ENVS)			GE - 1
		Paper - 2				Paper 1
	2	Paper - 3	AECC-2 (MIL)			GE - 1
		Paper - 4				Paper - 2
2	3	Paper - 5		SEC Paper - 1		GE - 2
		Paper - 6				Paper - 1
		Paper - 7				
	4	Paper - 8		SEC Paper - 2		GE - 2
		Paper - 9				Paper - 2
		Paper - 10				
3	5	Paper - 11			DSE Paper - 1	
		Paper - 12			DSE Paper - 2	
	6	Paper - 13			DSE Paper - 3	
		Paper - 14			DSE Paper - 4	

ii) Scheme for CBCS in B.A./ B.Com Programme Course

		Discipline specific Core Course (DSC)	Language Core Course (LCC 1)	Language Core Course (LCC 2)	Ability Enhancement Compulsory Course (AECC)	Skill Enhancement Course (SEC)	Discipline Specific Elective Course (DSE)	Generic Elective Course (GE)
1	1	Discipline Specific Core 1 (Paper-1)	Bengali /Alt English/Sanskrit/		AECC-1			
		Discipline Specific Core 2 (Paper-1)	Nepali/Hindi		ENVS			
	2	Discipline Specific Core 1 (Paper-2)		English (Paper-1)	AECC-2 Bengali / English/Sanskrit/ Nepali/Hindi			
		Discipline Specific Core 2 (Paper-2)						
2	3	Discipline Specific Core 1 (Paper-3)	Bengali /Alt English/ Sanskrit/			SEC 1 Paper-1		
		Discipline Specific Core 2 (Paper-3)	Nepali/Hindi					
	4	Discipline Specific Core 1 (Paper-4)		English (Paper-2)		SEC 1 Paper-2		
		Discipline Specific Core 2						

		(Paper-4)						
3	5					SEC 2 Paper-1	DSE 1 Paper 1	GE-1 (Paper-1)
							DSE 2 Paper 1	
	6					SEC 2 Paper-2	DSE 1 Paper 2	GE-1 (Paper-2)
							DSE 2 Paper 2	

- SEC and DSE Courses will be the same as CC/DSC Course.
- GE Courses must be different from CC/DSC Course.



Salesian College

(Autonomous)

Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Physical Education (Non-Major Papers)

Department of Physical Education

Curriculum Document

2023 – 2024

Vision

To prepare Physical Education leaders of high academic calibre with a holistic development of body, mind and spirit nurtured with a strong commitment to serve humanity.

Mission

To give all students opportunities and experiences that lead to the achievement of total wellness and result in a longer and healthier life.

To develop a quality physical education program that emphasizes enjoyable participation in physical activities; to help students develop the knowledge, attitude, motor skills, social skills and confidence needed to begin and maintain a healthy physically active lifestyle for the rest of their life.

1. Programme Overview

Bachelor of Arts is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

1. The curriculum would enable the pass out to select the inherited talented children for various sports activities.
2. The pass out shall be able to orient children in schools with the fundamental skills of selected sports as per their inherited potential.
3. The pass out shall be able to devise training program for athletes engaged in different sports activities
4. The curriculum shall enable them to officiate, supervise various sports tournaments and orient them in organizing sports events at all levels.
5. The curriculum would enable the pass out students to be entrepreneur (to start their own fitness centre, gym, spa etc) and device appropriate fitness program for different genders and age groups of people.
6. The curriculum would enable the pass out to devise training program for physically challenged peoples

After completion of the programme, a student will be able to:	
Knowledge	PO01: Grasp the theories of Physical Education philosophy, sociology, and psychology.
	PO02: Acquaint him/herself with the history of the Indian Physical Education system, its educational policies, commissions and committees.
	PO03: Relate his/her understanding of guidance and counselling, peace and value education in various classroom situations and societal experiences.
	PO04: Gain awareness about the various contemporary issues in Physical Education.
Skills	PO05: Demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes.
	PO06: Construct instructional designs, scholastic & co-scholastic curriculum designs.
	PO07: Integrate and apply ICT in learning process
	PO08: Acquaint him/herself with the diverse current Physical education problems and other related issues like SSA, Inclusive education, unemployment, population explosion, poverty, and national disintegration.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical knowledge of education subject and statistical techniques and pedagogical analysis.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as education is a lifelong process for empowering the student to face all challenges in his/her future endeavours.
	PO11: Develop concern for the society, nation as well as promote the feeling of internationalism by comparing our Physical Education system with that of other developed countries.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops a clear idea about the subject Physical Education and Sports, like nature, scope and aim of Physical Education, factors, different agencies of Physical Education and Sports.
	PSO2: A student gathers knowledge about Physical Education and Sports Psychology, its theories, and their implication in the field of education and education system.
	PSO3: A student develops knowledge about the detailed history of the Indian Physical Education system.
	PSO4: A student internalises the basics of Anatomy, Physiology and Exercise Physiology, relation between Anatomy and Physiology and importance of scientific analysis in the field of Physical Education.
	PSO5: A student develops knowledge about basic of Indian Sports as well as Western Sports.
	PSO6: A student develops the concept of coaching and training, various types of training and basic skills necessary for coaching.
	PSO7: A student develops the concept of research and statistics to develop skill in analysing descriptive measures, concept of Learning Curve and its uses in Physical Education, measures of relationship and organize relevant data and to represent data through graphs and to develop skill in analysing and displaying data.
	PSO8: S/he also develops knowledge about the importance of different types of sports in the field of Physical Education.
Skills	PSO1: A student will develop a clear idea about the subject Physical Education, like nature, scope and aim of Physical Education, factors, different agencies of Physical Education and Sports.
	PSO2: A student will execute the educational implications of the theories of Sports Psychology.
	PSO3: A student will construct Physical Education and Sports Instructional Designs, Scholastic and Co-Scholastic Curriculum designs.
	PSO4: A student will develop an understanding of Sports Technology, ICT and e-learning.
	PSO5: A student will advocate the importance of Coaching and Training.
	PSO6: A student will develop the skill of using computer in Physical Education and Sports, ICT & e-learning.
	PSO7: A learner will exhibit an excellent communication skill, Skill for Democratic Citizenship and related theories, teaching skills, life skill education, peace, and value education.
Competence	PSO1: A learner demonstrates competencies required to use computers in Physical Education and Sports, communication, ICT & e-learning for implementing instructional techniques and different models of teaching.
	PSO2: A student will analyse the detailed history of Indian Physical Education system.
	PSO3: A student will develop a positive attitude towards developing one's own potentials (both biological & cultural) and talents.
	PSO4: A student will be capable of self-paced and self-directed learning aimed at personal development.
	PSO5: A student will envision a society where people from all walks of life enjoy equal and equitable rights and opportunities.
	PSO6: A student will compute statistical analysis in the field of Physical Education research.
	PSO7: A student will analyse the contemporary trends in Physical Education.

4. Programme Matrix

Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
Semester 1						
23PEDMIN101	Minor	Introduction of Physical Education and Sports	4	3+0+1	75	100
23PEDMDC101	MDC	Fitness, Recreation and Sports Management	3	3+0+0	45	100
23PEDVAC5	VAC	Sports for Life	1	0+0+1	30	100
23PEDVAC01	VAC	Organization and Management in Sports	1	0+1+0	30	100
Total			9	6+1+2	180	400
Semester 2						
23PEDMIN102	Minor	Management of Physical Education and Sports	4	3+0+1	75	100
23PEDMDC102	MDC	Health and Fitness Education	3	3+0+0	45	100
23PEDVAC7	VAC	Sports for Life	1	0+0+1	30	100
23PEDVAC02	VAC	Contemporary Issues in Sports	1	0+1+0	30	100
Total			9	6+1+2	180	400

1. Course Description

Course Code	23PEDMIN101	
Course Title	Introduction of Physical Education and Sports	
Credits	4	
Total Hours	75	
Hours per Week	5	
Course Type	Minor	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Human Values	
Course Offered to	Physical Education	
Regulation	2023	
Course Overview	This course: 1. Covers the basic concepts of Physical Education. 2. Gives an exposure on the Sociological and Philosophical Foundations of Physical Education. 3. Makes the students understand the history and importance of Physical Education.	
Prerequisite	Basic knowledge on Physical Education and Sports.	
Course Objectives	A student will be able to: 1. State the meaning, definition and scope of Physical Education and Sports. 2. Illustrate the modern concept, misconceptions, need and importance of Physical Education. 3. Discuss the Sociological and Philosophical Foundations of Physical Education. 4. Analyse the role of games and sports in National and International integration. 5. Summarise the History of Physical Education and Sports in India. 6. Support the contribution of Akhadas, Vyayamshalas and National Institutes of Physical Education in India. 7. Discuss the Olympic Movement and the historical background of the Asian Games.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	State the meaning, definition and scope of Physical Education and Sports.	R
CO2	Discuss the historical development of Physical Education and Sports in India	U
CO3	Apply the sociological and philosophical principles of Physical Education and Sports	A1
CO4	Research on the contribution of Eminent Physical Educationists.	A2
CO5	Discriminate between Ancient and Modern Olympics.	E

CO6	Plan Yoga and Prayanama activity session.	C		
CO7	Replicate proper techniques of Yoga and Prayanama.	I		
CO8	Perform correct techniques of Yoga and Prayanama	M		
CO9	Demonstrate correct techniques of Yoga and Prayanama	P		
C010	Teach correct techniques of Yoga and Prayanama	A		
CO11	Design correct techniques of Yoga and Prayanama	N		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	INTRODUCTION a. Meaning, Definition & Scope of Physical Education and Sports. b. Aim, Objectives, Need & Importance of Physical Education and Sports. c. Misconceptions and Modern concept of Physical Education. d. Career Opportunities of Physical Education & Sports.	15	CO1	R U A1 A2 E C
Unit II	HISTORICAL DEVELOPMENT a. Historical Development of Physical Education and Sports in India - Pre and Post Independence periods - Contribution of Akhadas, Vyayamshalas and National Institutes of Physical Education in India b. Historical background and concept of Ancient & Modern Olympic Games, Asian Games and Commonwealth Games. c. Contribution of Eminent Physical Educationists. d. National Sports Awards- Arjuna Award, Dronacharya Award & Dhyanchand Award.	15	CO2 CO4 CO5	R U A1 A2 E C
Unit III	FOUNDATIONS OF PHYSICAL EDUCATION & SPORTS a. Sociological Foundation- Meaning and definition of Sociology, Society and Socialization. b. Biological Foundation: Growth & Development c. Philosophical Foundations- naturalism, pragmatism, realism, idealism	15	CO3	R U A1 A2 E C

	d. Role of games and sports in National and International integration, Ethics of Sports.			
Unit IV	FIELD PRACTICAL a. Yoga Asana: Standing position, Sitting Position, Supine Position, Prone Position, Inverted Position (Compulsory one asana in each position) b. Prayanama: Kapalbhati, Bhramari, Anulom Vilom (Any 2)	30	CO6 CO7 CO8 CO9 CO10 CO11	I M P A N

LEARNING RESOURCES:

1. Kamlesh, M. L. & Singh, M. K. (2006) Foundation of Physical Education (Naveen Publications).
2. Singh, A. et al. (2000) Essentials of Physical Education, Kalyani Publishers, Ludhiana, Punjab.
3. Jain, D., (2005) Principles of Physical Education, Khel Sahitya Kendra, New Delhi, India.
4. Deshmukh, S.V., (2012) Philosophical, Sociological, Historical and Recreational Basis of Physical Education and Sports, Sports Publication, New Delhi.
5. Srinivasan, M.V., (2013) Handbook of Physical Education, Swastik Publication, Nai Sarak, Delhi.
6. Prasad, Y.V.R.K., (2017) Methods of Teaching Physical Education, Discovery Publishing House, Ansari Road, Darya Ganj, New Delhi.
7. Bhunia, B., (2016) Modern Physical Education Sports and Globalization, SB Enterprises, Bangalore, India.

SUGGESTED READING:

1. Graham, G. (2001) Teaching Children Physical Education: Becoming a Master Teacher. Human Kinetics, Champaign, Illinois, USA.
2. Lau, S.K. (1999), Great Indian players, New Delhi, Sports Publication
3. Lumpkin, A. (2007) Introduction to Physical Education, Exercise Science and Sports Studies, McGraw Hill, New York, U.S.A.
4. Siedentop, D. (2004) Introduction to Physical Education, Fitness and Sport, McGraw Hill Companies Inc., New York, USA.
5. Shaffer, D.R. (2002) Developmental Psychology: Childhood and Adolescence. Thomson, Sydney, Australia
6. Shukla, (2000) Mother on Education, National Council of Teacher Education, New Delhi.
7. Wuest, D.A. & C.A. Bucher (2006) Foundations of Physical Education, Exercise Science, and Sports. McGraw Hill Companies, Inc., New York, USA.
8. Sharma, N.P., (2009), Sports History, KSK Publisher & Distributors, New Delhi – 110002.
9. Bhattacharyya, A.K. (2012), Dimensions of Physical Education: Principles, Foundations Interpretations, Classique Books, Kolkata-12

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks (25 Marks Theory + 25 Marks Practical)
Theory (50 Marks Exam to be converted to 25 Marks):
a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)

- b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
Summative Assessment Time: 2 Hours for pen and paper test

Practical (50 Marks Exam to be converted to 25 Marks):

SL. No.		
1	Lab. Note Book	10
2	Viva-voce	10
3	Practical	30
TOTAL		50

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDMDC101	
Course Title	Fitness, Recreation and Sports Management	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Human Values	
Course Offered to	Physical Education	
Regulation	2023	
Course Overview	This course: 1. Covers the basic concepts of Fitness, Recreation & Sports Management. 2. Gives an exposure on the components of Physical Fitness. 3. Discusses the types of recreational activities for different age group.	
Prerequisite	Basic knowledge on Sports, Fitness and Recreation.	
Course Objectives	A student will be able to: 1. Summarize the concepts of fitness, Recreation and Sports Management. 2. Express the components of Physical Fitness and factors affecting them. 3. Discuss the assessment and maintenance methods of Fitness components. 4. Design recreational activities for different age groups 5. Support the therapeutic aspects of recreational activities. 6. Explain the principles, functions, and purpose of Sports Management. 7. Analyse the scope of Management in Physical Education and Sports.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define the concept, types, and components of fitness.	R
CO2	Discuss the various assessment and maintenance techniques of components of fitness.	U
CO3	Construct various types of recreational activities for different age groups	A1
CO4	Analyse the therapeutic aspects of recreational activities.	A2
CO5	Rate the factors affecting fitness	E
CO6	Develop management skills in Physical Education and Sports.	C

Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	INTRODUCTION TO FITNESS a. Meaning, Definition, Importance of fitness. b. Components of Skill and health related physical fitness, factors affecting fitness. c. Measurement of fitness through different tools and techniques.	15	CO1 CO2 CO5	R U A1 A2 E C
Unit II	RECREATION AND RECREATIONAL ACTIVITIES a. Meaning, Definition, and Importance of Recreation. b. Types of recreational activities for different age groups. c. Therapeutic aspects of recreational activities.	15	CO3 CO4	R U A1 A2 E C
Unit III	INTRODUCTION TO SPORTS MANAGEMENT a. Meaning, Definition, Scope, and principles of Sports Management. b. Management of Events, Equipment and Play Fields in Physical Education and Sports. c. Budget- meaning, source of income, expenditure, and preparation of budget.	15	CO6	R U A1 A2 E C
LEARNING RESOURCES: - Nathial, M.S., (2009) Sports, Health and Physical Education, Khel Sahitya Kendra, New Delhi. - Restak, R.M.D., (2014) The Bony: A Complete User's Guide, National Geographic Publishers, Washington, D.C., US. - Singh, Y., (2005) Sports Management, Sports Publication, New Delhi. - Chelladurai, P & Kerwin, S., (2017) Human Resource Management in Sport and Recreation, Human Kinetics, US. - Arora, S, Agarwal, M & Gupta, B., (2019) A Textbook on Physical Education and Health Education: Fitness, Wellness and Nutrition, Khel Sahitya Kendra Publishers and Distributors, New Delhi. - Govindarajulu, N., (2005) Management of Physical Education and Sports Programme, Friends Publications, India. - Miller, D.K. & Allen T.E., (1 September, 1989) Fitness: A Lifetime Commitment, Macmillan Publishers, USA. SUGGESTED READING: - Jensen C. and Naylor J. (2005). "Opportunities in Recreation and Leisure Sports" McGraw Hill. Publishers. New York. U.S.A. - V.V. Hunt, "Recreation for the Handicapped" Prentice Hall inc., 1974 - Chelladurai. P (1999) "Human Resource Management in sport and Recreation", Human kinetics. K. Chandrashekar "Sports Administration" Vinek Thani Khel Sahitya Kendra pub., (2004)				

5. Willgoose, C.E. (1979). "Curriculum in Physical Education" 3rd Ed. Englewood Cliffs.: N.J. Prentice Hall, Inc
6. "Greenbelt Recreation Activity Guide-Fall 2018" (Aug 17, 2018), City of Greenbelt
7. Mood Dale, Frank Musker, Judith Rink, (February 23, 2011), "Sports and Recreational Activities" McGraw-Hill Education; 15 edition, ISBN-10: 0078022487
8. Nanda, S.M. Sports Management, Friend Publications, New Delhi.
9. Paul, A. Sarirsikshay Management, Classic Publishers, Kolkata.
10. Bucher, C. A. Administration of Physical Education and Athletic Programme. St. Louis: The C.V. Mosby Co.
11. Broyles, F. J. & Robert, H. D. Administration of Sports, Athletic Programme: A Managerial Approach. New York: Prentice Hall Inc

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks
 - c) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - d) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
 Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDVAC5				
Course Title	Sports for Life				
Credits	1				
Total Hours	30				
Hours per Week	3				
Course Type	Value Added Course				
Semester	I				
Intended Level	Certificate				
Issue(s) Addressed	Human Values				
Course Offered to	Physical Education				
Regulation	2023				
Course Overview	This course: a. Covers the Fundamental skills and rules of the Selected Sport. b. Gives an exposure of match practice with the application of rules of the various games.				
Prerequisite	Basic knowledge on Sports.				
Course Objectives	A student will be able to: 1. Analyse the significance of sports to promote health, fitness, and wellness in life. 2. Relate the values of teamwork, tolerance, goal-setting, and decision making. 3. Design the strategies and tactical moves while playing a sport. 4. Evaluate the importance of physical activity in reference to 3S: strength, speed, and suppleness.				
Course Outcomes based on RBT and Cognitive Level Mapping					
At the end of this course, a student will be able to:					
COs	Statements		Cognitive Level Mapping		
CO1	Recall the History of the Game		R		
CO2	Explain the rules and their interpretation of the Game		U		
CO3	Demonstrate the Fundamental Skills of the Game.		A1		
CO4	Examine the duties of the Officials		A2		
CO5	Rate the execution of fundamental skills of the Game.		E		
CO6	Construct the various playfields with correct markings.		C		
CO7	Replicate the basic skills of the game		I		
CO8	Re-create the fundamental skills of the game.		M		
CO9	Demonstrate the fundamental skills during the game.		P		
CO10	Teach the fundamental skills of the game		A		
CO11	Design the fundamental skills of the game.		N		
Course Content					
Units	Content		Lecture Hours	COs	RBT

Unit I	FOOTBALL A. <u>Session 1</u> - History of the Game B. . <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C. . <u>Session 6-8</u> Rules and their interpretation and duties of officials. D. . <u>Session 9-14</u> Fundamental Skills: • Kicking: Kicking the ball with inside of the foot, kicking the ball with Full Instep of the foot, kicking the ball with Inner Instep of the foot, kicking the ball with Outer Instep of the foot and Lofted Kick. • Trapping: Trapping- the Rolling ball, and the Bouncing ball with sole of the foot. • Dribbling: Dribbling the ball with Instep of the foot, dribbling the ball with Inner and Outer Instep of the foot. • Heading: In standing, running, and jumping condition. • Throw-in: Standing throw-in and Running throw-in. • Feinting: With the lower limb and upper part of the body. • Tackling: Simple Tackling, Slide Tackling. • Goal Keeping: Collection of Ball, Ball clearance- kicking, throwing, and deflecting. E. <u>Session 15:</u> Game practice with application of Rules and Regulations.	30	CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9	R U A1 A2 E C I M P A N P
Unit II	BASKETBALL A. <u>Session 1</u> - History of the Game B. . <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C. . <u>Session 6-8</u> Rules and their interpretation and duties of officials. D. Fundamental Skills:	30	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C I

	• Passing: Two hand Chest Pass, two hands Bounce Pass, One hand Baseball Pass, Side arm Pass, Overhead Pass, Hook Pass. • Receiving: Two hand receiving, one hand receiving, receiving in stationary position, receiving while Jumping and Receiving while Running. • Dribbling: How to start dribble, drop dribble, High Dribble, Low Dribble, Reverse Dribble, Rolling Dribble. • Shooting: Lay-up shot and its variations, One hand set shot, Two hands jump shot, Hook shot, Free Throw. • Rebounding: Defensive rebound and Offensive rebound. • Individual Defence: Guarding the player with the ball and without the ball, Pivoting. E. Session 15: Game practice with application of Rules and Regulations		CO6 CO7 CO8	M P A N
Unit III	ATHLETICS A. Session 1 - History of the Game B. . Session 2-5 Playfield Technology – Marking and Construction of the playfields C. . Session 6-8 Rules and their interpretation and duties of officials. D. . Basic skills and techniques of Athletic Events: (Any One) • Running Events: sprint races, middle- and long-distance races, hurdles races • Jumping Events- long jump, Triple Jump and High Jump. • Throwing Events- Shot put, Discus throw. E. Session 15: Game practice with application of Rules and Regulations	30	CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9	R U A1 A2 E C I M P A N P
LEARNING RESOURCES: 1. Sharma, N.P., (2005) Fundamental of Track and Field, Khel Sahitya Kendra, New Delhi, India. 2. Striano, P & DC., (2013) Anatomy of Running: A Guide to Running Right, Hinkler Publishers, UK. 3. Kaur, B., (2020) Officiating and Coaching, Sports Publication, New Delhi.				

4. Jain, R., (2012) Play and Learn Track and Field, Khel Sahitya Kendra, New Delhi.
5. Mitra, S., Das, P.K & Bandyopadhyay, N., (2022) Basics of Basketball for Teaching and Coaching Courses, Akansha Publishing House, Darya Ganj, Delhi.
6. Srivastava, A.K., (2010) Book of Rules of Games and Sports, Sports Publication, New Delhi.
7. Jange, H.S. & Pasodi, M.S., (1 January 2018) Officiating and Coaching in Physical Education and Sports, Khel Sahitya Kendra, New Delhi.
8. Hohenstein, M., (1 February, 2000) Games, Bethany House Publishers, a division of Baker Publishing Group, Minnesota, US.

SUGGESTED READING:

- 1) Mahaboobjan, A., and Viswejan, U. (2021) Rules and Measurements in sports and games, Sports Publication (First Edition), New Delhi.
- 2) Bain, R., (2019) Rule Book of Games: Football, Alpha Editions.
- 3) Hawkins, V., (2018) Rule Book of Games: Basketball, Alpha Edition.
- 4) Singh, A.K., (2022) Basketball- Complete Guide Book – (First Edition), Sport Publication, New Delhi.
- 5) Amateur Athletic Union of the United States, (2010), Official Athletic Rules and Official Handbook, Nabu Press.
- 6) Pluff, G.E., (1 January, 2013) The A-Z Basketball Book: What Every Player Needs to Know to be Great at the Game, Zaccheus Entertainment.

Singh, L., (2021) Track & Field Rules and Regulations, Khel Sahitya Kendra, New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment:

Log Books to be maintained and recorded for individual students for formative assessment.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara	Name: Mr. Wilson Bara	Name: Mr Ravi Bhushan Singh
Signature:	Signature:	Signature:

1. Course Description

Course Code	23PEDVAC02			
Course Title	ORGANISATION AND MANAGEMENT IN SPORTS			
Credits	1			
Total Hours	30			
Hours per Week	2			
Course Type	VAC			
Semester	I			
Intended Level	Certificate			
Issue(s) Addressed	Professional Ethics			
Course Offered to	Sports Management			
Regulation	2023			
Course Overview	This course: a. Covers the basic concepts of Organisation Behaviour. b. Clear the concepts of sports management. c. Inbuilt the quality of sports Leadership d. Marking the International standard (400 m) running Track			
Prerequisite	Basic knowledge on Organisation and Behaviour.			
Course Objectives	A student will be able to: 1. Quote the meaning, definitions of Organisation Behaviour. 2. Outline the need of Physical Education in modern living. 3. Explain the concept of management in sports. 4. Outline the quality, role, responsibility, and personality of leaders. 5. Design the international standard Athletic track.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe the concepts of Organisation Behaviour and Individual Behaviour	R		
CO2	Discuss the various styles and theories of Leadership.	U		
CO3	Apply the principles of Sports Management	A1		
CO4	Examine the need of Physical Education in modern living.	A2		
CO5	Evaluate the correct measurements of Athletic Track Marking.	E		
CO6	Manage Sports tournaments and events in Schools and Colleges.	C		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Session 1	Organization Behaviour meaning and its concepts.	2	CO1	R U A1 A2

				E C
Session 2	Organisation Behaviour meaning and its concepts.	2	CO1	R U A1 A2 E C
Session 3	Individual behaviour – Ability, Learning, Values, Attitudes, Personality.	2	CO1	R U A1 A2 E C
Session 4	Individual behaviour – Ability, Learning, Values, Attitudes, Personality.	2	CO1	R U A1 A2 E C
Session 5	Trait Theories of Leadership.	2	CO2	R U A1 A2 E C
Session 6	Leadership Styles and Situational theories of Leadership.	2	CO2	R U A1 A2 E C
Session 7	Concept of Sports Management.	2	CO3	R U A1 A2 E C
Session 8	Management in Physical Education and Sports.	2	CO3	R U A1 A2 E C

Session 9	Management in Physical Education and Sports.	2	CO3	R U A1 A2 E C
Session 10	Types of tournaments, preparing fixture of different types of tournaments.	2	CO6	R U A1 A2 E C
Session 11	Physical Education in our daily life.	2	CO4	R U A1 A2 E C
Session 12	Need of Physical Education in Modern living.	2	CO4	R U A1 A2 E C
Session 13	Method of Calculation of Athletic track (practical).	2	CO5	R U A1 A2 E C
Session 14	Track Marking	2	CO5	R U A1 A2 E C
Session 15	Track Marking	2	CO5	R U A1 A2 E C

LEARNING RESOURCES:

1. Govindarajulu, N., (2005) Management of Physical Education and Sports Programme, Friends Publications, India.
2. Thour, M., (2006) Camping Management in Physical Education, Friends Publications, India.
3. Singh, Y., (2005) Sports Management, Sports Publication, New Delhi.

4. Chelladurai, P & Kerwin, S., (2017) Human Resource Management in Sport and Recreation, Human Kinetics, US.

SUGGESTED READINGS:

1. Andin Carment Tabije “Organization and Management of Physical education and Sports” Rex book store, Philippines
2. Barnhill.R. Christopher., Smith.l. Natalie.& Oja.D. Brent. “Organizational Behavior in sports management” 2021.
3. Dr. Rathore Vishan, “ Administration & Organisation in physical education” khel sahitya Kendra 2013.
4. Mishra.S.C “Organization in physical education” khel sahitya Kendra 2005.

2. Assessment:

Log Books to be maintained and recorded for individual students for formative assessment.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rakesh Saibo Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDMIN102	
Course Title	Management of Physical Education and Sports	
Credits	4	
Total Hours	75	
Hours per Week	5	
Course Type	Minor	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Professional Ethics	
Course Offered to	Physical Education	
Regulation	2023	
Course Overview	This course: 1. Know sports management and employ principles of strategic planning, and financial and human resource management. 2. Develop overall traits of leadership and personality. 3. Develop critical thinking in analysing sport management issues and in managerial planning and decision making. 4. Gives to keen observation about the budget. 5. Able to organize events and sports tournaments.	
Prerequisite	Basic knowledge of Event management and Sports.	
Course Objectives	A student will be able to: 1. Quote the meaning, definitions, principles, and scope of Sports Management. 2. Analyse the concepts of Leadership and Personality in Sports Management. 3. Apply the principles of strategic planning, and financial and human resource management. 4. Examine the importance of management and planning in sports. 5. Critique the sport management issues and managerial planning and decision making in Sports.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Write the importance, Scope, Principles and Management of Physical Education and Sports Programs	R
CO2	Explain the concept of Leadership in Physical Education and Sports	U
CO3	Apply the management principles in Physical Education programs and Games & Sports meets.	A1
CO4	Organise physical Education programs and Games & Sports meets in School, College, and University	A2

CO5	Discriminate between various forms of Leadership	E		
CO6	Formulate a report on visit or participation to standard tournaments, competitions, and Adventure Sports.	C		
CO7	Replicate the techniques of Racket Sports	I		
CO8	Perform correct skills of Racket Sports.	M		
CO9	Demonstrate correct Racket Sports techniques.	P		
CO10	Teach correct skills and techniques of Racket Sports.	A		
CO11	Design proper technical sessions of Racket Sports.	N		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	INTRODUCTION a. Meaning, Definition, Scope, and Principles of Management in Physical Education and Sports. b. Intramural and Extramural competitions – Aims and Objective c. Management of Events, Equipment and Play Fields in Physical Education and Sports.	15	CO1	R U A1 A2 E C
Unit II	LEADERSHIP IN PHYSICAL EDUCATION AND SPORTS a. Meaning, Definition, importance, and principles of Leadership. b. Forms of Leadership (Autocratic, Laissez-faire, Democratic, Benevolent Dictator c. Qualities of good leader.	15	CO2 CO5	R U A1 A2 E C
Unit III	ORGANISATION OF TOURNAMENTS AND SPORTS PROGRAM a. Meaning, Definition, Importance, and types of Tournaments. b. Procedure of Drawing Fixture, merits, and demerits of Knock-out, League and Combination Tournaments. c. Management and Planning of Games & Sports meets in School, College, and University.	15	CO3 CO4	R U A1 A2 E C
Unit IV	FIELD PRACTICAL a. Racket Sports i. Badminton - Fundamental Skills - Playfield Technology – Marking and Construction of the playfields	30	CO6 CO7 CO8 CO9 CO10	I M P A

	Rules and their interpretations and duties of the officials OR		CO11	N
	ii. Table Tennis - Fundamental Skills - Playfield Technology – Marking and Construction of the playfield - Rules and their interpretations and duties of the officials		CO6 CO7 CO8 CO9 CO10 CO11	I M P A N
	b. Project: Organise a standard tournament or competition. Record Book to be maintained.		CO6	C

LEARNING RESOURCES:

- Govindarajulu, N., (2005) Management of Physical Education and Sports Programme, Friends Publications, India.
- Thour, M., (2006) Camping Management in Physical Education, Friends Publications, India.
- Singh, Y., (2005) Sports Management, Sports Publication, New Delhi.
- Chelladurai, P & Kerwin, S., (2017) Human Resource Management in Sport and Recreation, Human Kinetics, US.
- Kaur, B., (2020) Officiating and Coaching, Sports Publication, New Delhi.
- Srivastava, A.K., (2010) Book of Rules of Games and Sports, Sports Publication, New Delhi.
- Jange, H.S. & Pasodi, M.S., (1 January 2018) Officiating and Coaching in Physical Education and Sports, Khel Sahitya Kendra, New Delhi.
- Hohenstein, M., (1 February, 2000) Games, Bethany House Publishers, a division of Baker Publishing Group, Minnesota, US.

SUGGESTED READING:

- Nanda, S.M. Sports Management, Friend Publications, New Delhi.
- Paul, A. Sarirsikshay Management, Classic Publishers, Kolkata.
- Bucher, C. A. Administration of Physical Education and Athletic Programme. St. Louis: The C.V. Mosby Co.
- Broyles, F. J. & Robert, H. D. Administration of Sports, Athletic Programme: A Managerial Approach. New York: Prentice Hall Inc
- Pandy, L.K. (1977). Methods in Physical Education. Delhe: Metropolitan Book Depo.
- Sharma, V.M. & Tiwari, R.H.: (1979). Teaching Methods in Physical Education. Amaravati: Shakti Publication
- Kar, S. & Santra, D.C. (2018): Santak Sarirsiksha Porichaya (Vol.-1), Santra Publication, Kolkata.
- Kamlesh, M.L., (2016) Management Concepts in Physical Education and Sports, Khel Sahitya Kendra, New Delhi.
- Northouse, P.G., (2021) Leadership: Theory and Practice, (ninth edition), Sage Pubns.
- Martenik, T., & Hellison, D., (2015) Youth Leadership in Sports and Physical Education, (first edition), Palgrave Macmillan, New York.
- Mahaboobjan, A., and Viswejan, U. (2021) Rules and Measurements in sports and games, Sports Publication (First Edition), New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks (25 Marks Theory + 25 Marks Practical)
Theory (50 Marks Exam to be converted to 25 Marks):
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).Summative Assessment Time: 2 Hours for pen and paper test

Practical (50 Marks Exam to be converted to 25 Marks):

SL. No.		
1	Lab. Note Book	10
2	Viva-voce	10
3	Practical	30
TOTAL		50

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDMDC102	
Course Title	Health and Fitness Education	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed	Human Values	
Course Offered to	Physical Education	
Regulation	2023	
Course Overview	This course: - Covers the basic concepts of Health Education and Test & Measurements in Physical Education. - Discusses the nutritional requirements for daily living and balanced diet. - Gives an exposure to the concepts and management of Sports Injuries. - Studies the various methods of Measurement of Body Composition and Fitness.	
Prerequisite	Basic knowledge on Sports, Fitness and Recreation.	
Course Objectives	A student will be able to: - Describe the concepts and principles of Health and Health Education. - Indicate the Nutritional requirements for daily living of an individual. - Apply the principles of First Aid and Management of Sports Injuries. - Discuss the different types of Postural Deformities. - Examine the concepts of Body Composition Assessments and Fitness Tests. - Analyse the Body Composition and Fitness Levels of different individuals.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the concept and principles of Health and Health Education	R
CO2	Restate the nutritional requirements for daily living and health disorders due to its deficiencies.	U
CO3	Show the techniques of measurement of Body Compositions and Somatotype Assessment	A1
CO4	Examine the various types of Sports Injuries and Postural Deformities.	A2
CO5	Evaluate various components of Physical Fitness using scientific Fitness Tests	E
CO6	Plan a Balanced Diet Chart.	C
Course Content		

Units	Content	Lecture Hours	COs	RBT
Unit I	INTRODUCTION a. Concept, definition, and dimension of Health. b. Definition, aim, objectives and principles of Health Education. c. Nutrition- Nutritional requirements for daily living. d. Balance Diet. Health disorders due to deficiencies of Vitamins and Minerals.	12	CO1 CO2 CO6	R U A1 A2 E C
Unit II	HEALTH AND FIRST-AID MANagements a. First aid- Meaning, definition, importance. b. Management of sports injuries- Sprain, Strain, Fracture and Dislocation. c. Postural deformities- Causes and corrective exercise of Kyphosis, Lordosis, Scoliosis, Knock Knees, and Flat Foot.	12	CO4	R U A1 A2 E C
Unit III	MEASUREMENT OF BODY COMPOSITIONS AND SOMATOTYPE ASSESSMENT a. Body Mass Index (BMI)- Concept and method of measurement. b. Body Fat and Lean Body Mass (LBM) - Concept and method of measurement. c. Somatotype – Concept and meaning.	12	CO3	R U A1 A2 E C
Unit IV	FITNESS TEST (Any 2) a. Yo-Yo Fitness Test b. AAHPER Youth Fitness Test c. Harvard Step Test d. Queen's College Step Test	12	CO5	R U A1 A2 E

LEARNING RESOURCES:

1. Nathial, M.S., (2009) Sports, Health and Physical Education, Khel Sahitya Kendra, New Delhi.
2. Bijlani, R., (2015) Back to Health Through Yoga, Rupa & Co; First Edition, New Delhi.
3. Kansal, D.K., (2012) Practical Approach to Test, Measurement and Evaluation, SSS Publication, Bengaluru, Karnataka.
4. Arora, S., Agarwal M & Gupta B., (2019) Fitness, Wellness and Nutrition, KSK Publishers & Distributors, New Delhi.
5. Charless, H.M., (2004) Tests and Measurement in Health in Physical Education, Friends Publications, India.
6. Miller, D.K., & Allen T.E., (1990) Fitness: A Lifetime Commitment, Macmillan Publishers, New York, US.
7. Daniels, P., & Restak R.MD., (2014) The Body: A Complete User's Guide, National Geographic Publisher, Washington, DC.

SUGGESTED READING:

1. Wasuja, M., (2017) Health Education and Sports Nutrition, Friends Publications (India).

2. Punnya, L.I., (2017) Physical Fitness and Wellness (First Edition), Khel Sahitya Kendra, New Delhi.
3. Thakare, A.P., (2018) Test, Measurement and Evaluation in Physical Education, Sports Publication, New Delhi.
4. Sharma, S.K., (2018) Test, Measurement and Evaluation in Physical Education, Friends Publications, India.
5. Srilakshmi, B., Suganthi, V. & Ashok, C.K., (2016) Exercise Physiology Fitness and Sports Nutrition, (First Edition) New Age International Private Limited.
6. Sangangouda, K., Allaudin, M. & Pasodi, M.S., (2018) Sports Nutrition, Khel Sahitya Kendra, New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
 - ii. **Summative Assessment:** 50 marks
 - c) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - d) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDVAC7			
Course Title	Sports for Life			
Credits	1			
Total Hours	30			
Hours per Week	3			
Course Type	Value Added Course			
Semester	I			
Intended Level	Certificate			
Issue(s) Addressed	Human Values			
Course Offered to	Physical Education			
Regulation	2023			
Course Overview	This course: a. Covers the Fundamental skills and rules of the Selected Sport. b. Gives an exposure of match practice with the application of rules of the various games.			
Prerequisite	Basic knowledge on Sports.			
Course Objectives	A student will be able to: 1. Analyse the significance of sports to promote health, fitness, and wellness in life. 2. Relate the values of teamwork, tolerance, goal-setting, and decision making. 3. Design the strategies and tactical moves while playing a sport. 4. Evaluate the importance of physical activity in reference to 3S: strength, speed, and suppleness.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Recall the History of the Game	R		
CO2	Explain the rules and their interpretation of the Game	U		
CO3	Demonstrate the Fundamental Skills of the Game.	A1		
CO4	Examine the duties of the Officials	A2		
CO5	Rate the execution of fundamental skills of the Game.	E		
CO6	Construct the various playfields with correct markings.	C		
CO7	Replicate the basic skills of the game	I		
CO8	Re-create the fundamental skills of the game.	M		
CO9	Demonstrate the fundamental skills during the game.	P		
CO10	Teach the fundamental skills of the game	A		
CO11	Design the fundamental skills of the game.	N		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit I	HANDBALL	30		R

	A. <u>Session 1</u> - History of the Game B. <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C. <u>Session 6-8</u> Rules and their interpretation and duties of officials. D. <u>Session 9-14</u> Fundamental Skills: • Catching, Throwing and Ball control • Goal Throws: Jump shot, Centre shot, Dive shot, Reverse shot. • Dribbling: High and low. • Attack and counter attack, simple counter attack, counter attack from two wings and center. • Blocking, Goalkeeping and Defensive skills. E. Session 15 Game practice with application of Rules and Regulations.		CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9 CO10 CO11	U A1 A2 E C I M P A N P
Unit II	VOLLEYBALL A) <u>Session 1</u> - History of the Game B) <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C) <u>Session 6-8</u> Rules and their interpretation and duties of officials. D) <u>Session 9-14</u> Fundamental skills: • Service: Under arm service, Side arm service, Tennis service, Floating service. • Pass: Under arm pass, Overhead pass. • Spiking and Blocking. F. Game practice with application of Rules and Regulations.	30	CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9 CO10 CO11	R U A1 A2 E C I M P A N P
Unit III	INDOOR GAMES: Badminton A) <u>Session 1</u> - History of the Game B) <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C) <u>Session 6-8</u> Rules and their	30	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

	interpretation and duties of officials. D) Fundamental Skills • Basic Knowledge: Various parts of the Racket and Grip • Service: Short Service, Long Service, Long-high Service. • Shots: Over Head Shot, Defensive Clear Shot, Attacking Clear Shot, Drop Shot, Net Shot, Smash. E) Game Practice with applications of Rules and regulations OR Table Tennis A) <u>Session 1</u> - History of the Game B) <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C) <u>Session 6-8</u> Rules and their interpretation and duties of officials. D) <u>Session 9-14</u> Fundamental Skills • Basic Knowledge: various parts of the Racket and Grip (Shake Hand & Pen Hold Grip) • Stance: Alternate & Parallel • Push and Service: Backhand & Forehand • Chop: Backhand & Forehand • Receive: Push and Chop with both Backhand & Forehand E) Game Practice with applications of Rules and regulations.		CO7 CO8 CO9 CO10 CO11 CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9 CO10 CO11	I M P A N P R U A1 A2 E C I M P A N P

LEARNING RESOURCES:

SUGGESTED READING:

2. Bain, R., (2019) Rule Book of Games: Football, Alpha Editions.
3. Hawkins, V., (2018) Rule Book of Games: Volleyball, Alpha Edition.
4. Singh, A.K., (2022) Volleyball- Complete Guide Book – (First Edition), Sport Publication, New Delhi.
5. Tyson, P & Turman J., (1987) The Handball Book, Human Kinetics Publishers, Canada.
6. McAfee, R.E., (2009) Table Tennis; Steps to Success, Human Kinetics Publishers, Canada.
7. Rai G., (2016) The Art of Table Tennis, Sports Publications, New Delhi.
8. Weatherford, L., (2018) Rule Book of Games: Badminton, Alpha Editions, Ansari Road, New Delhi.
9. Srivastava, A.K., (2009) Badminton Rule Book, Sports Publication, New Delhi.
10. Singh, A.K., (2022) Volleyball: A Complete Guide Book, Sports Publication, New Delhi.
11. Thani, L., (2007) Skills & Tactics; Football Book, Sports Publication, New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment:

Log Books to be maintained and recorded for individual students for formative assessment.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDVAC02	
Course Title	CONTEMPORARY ISSUES IN SPORTS	
Credits	1	
Total Hours	30	
Hours per Week	2	
Course Type	VAC	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed	Professional Ethics	
Course Offered to	Sports Management	
Regulation	2023	
Course Overview	This course: a. Covers the Psychological aspect of sports. b. Gives an exposure of Anatomical body structure of sports persons. c. Gives knowledge about different type of sports training.	
Prerequisite	Basic knowledge on contemporary issues in Sports.	
Course Objectives	A student will be able to: 1. Identify the psychological aspects of Sports Training. 2. Discuss the Anatomical and Physiological functions and structure of sports person. 3. Distinguish between the Anatomical and Physiological characteristics of male & female. 4. Apply the concepts and principles of different type of sports training 5. Restate the specific major games’ rules and their interpretation and duties of officials	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the meaning and concepts of Sports Psychology, Anatomy and Physiology	R
CO2	Discuss the need and importance of Psychology in Sports	U
CO3	Apply the concept and principles of Sports Training	A1
CO4	Differentiate between the anatomical and physiological features of Male & Female	A2
CO5	Evaluate the various training methods	E
CO6	Design training programs for developing the various components of fitness.	C
CO7	Replicate the basic skills of the game	I
CO8	Re-create the fundamental skills of the game.	M
CO9	Demonstrate the fundamental skills during the game.	P
CO10	Teach the fundamental skills of the game	A
CO11	Design the fundamental skills of the game.	N

Course Content				
Units	Content	Lecture Hours	Cos	RBT
Session 1	Sports psychology.	2	CO1	R U A1 A2 E C
Session 2	Need and importance of Psychology in sports.	2	CO2	R U A1 A2 E C
Session 3	Attention and Interest	2	CO3	R U A1 A2 E C
Session 4	Anatomy and Physiology in Sports.	2	CO4	R U A1 A2 E C
Session 5	Human Skeleton System.	2	CO1	R U A1 A2 E C
Session 6	Anatomical sex difference.	2	CO5	R U A1 A2 E C
Session 7	Muscular System and the Nervous System.	2	CO1	R U A1 A2 E C

Session 8	Central and Autonomic Nervous System.	2	CO1	R U A1 A2 E C
Session 9	Concepts and Principles of Sports Training.	2	CO5	R U A1 A2 E C
Session 10	Motor fitness and its components.	2	CO6	R U A1 A2 E C
Session 11	Different exercises for developing the various components.	2	CO5 CO6	R U A1 A2 E C
Session 12	Different types of training method (Fartlek training, Interval training, Circuit training).	2	CO5 CO6	R U A1 A2 E C
Session 13	Major Specific Game (Practical).	2	CO7 CO8 CO9 CO10 C11	I M P A N
Session 14	Major Specific Game (Practical).	2	CO7 CO8 CO9 CO10 C11	I M P A N

Session 15	Major Specific Game (Practical).	2	CO7 CO8 CO9 CO10 C11	I M P A N
LEARNING RESOURCES: 1. Srivastava, A.K., (2010) Book of Rules of Games and Sports, Sports Publication, New Delhi. 2. Daniels, P., & Restak R.MD., (2014) The Body: A Complete User's Guide, National Geographic Publisher, Washington, DC. 3. Jackson, L. Jr., (2014) Racket Wars: Guide Book to all the World's Racket Sports, First Edition, BookBaby Publishers. SUGGESTED READINGS: 1. Brar Mandeep kaur "Sports Psychology", Punjab education board 2018. 2. Dr. Dagar R.K.S & Dr. Chauhan Shiv Kumar "sports psychology & sociology", Friends publication India 2020. 3. Perry John, "Sports Psychology a complete introduction" Hachette UK 2016. 4. Dr. uppal A.k "Principles of Sports Training", friends publication.2020. 5. Dr. nathial Mandeep Singh "Anatomy and Physiology of physical education" friends publication.2020. 6. Dr. Mishra sharad Chandra "Physiology in sports" sports publication India 2006. 7. Dr. Lega Sushil, "Anatomy & Physiology" sports publication, India 2020				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment:

Log Books to be maintained and recorded for individual students for formative assessment.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rakesh Saibo Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:



Salesian College

(Autonomous)

Sonada - Siliguri

National Education Policy (NEP) 2020 Curriculum Framework

For

Physical Education (Non-Major Papers)

Department of Physical Education

Curriculum Document

2023 – 2024

Vision

To prepare Physical Education leaders of high academic calibre with a holistic development of body, mind and spirit nurtured with a strong commitment to serve humanity.

Mission

To give all students opportunities and experiences that lead to the achievement of total wellness and result in a longer and healthier life.

To develop a quality physical education program that emphasizes enjoyable participation in physical activities to help students develop the knowledge, attitude, motor skills, social skills and confidence needed to begin and maintain a healthy physically active lifestyle for the rest of their life.

1. Programme Overview

Bachelor of Arts is a four-year degree programme with the possibility of completing the fourth year with research if a particular student secures 75% CGPA in the previous exams.

2. Programme Objectives and Outcomes (POs)

1. The curriculum would enable the pass out to select the inherited talented children for various sports activities.
2. The pass out shall be able to orient children in schools with the fundamental skills of selected sports as per their inherited potential.
3. The pass out shall be able to devise training program for athletes engaged in different sports activities
4. The curriculum shall enable them to officiate, supervise various sports tournaments and orient them in organizing sports events at all levels.
5. The curriculum would enable the pass out students to be entrepreneur (to start their own fitness centre, gym, spa etc) and device appropriate fitness program for different genders and age groups of people.
6. The curriculum would enable the pass out to devise training program for physically challenged peoples

After completion of the programme, a student will be able to:	
Knowledge	PO01: Grasp the theories of Physical Education philosophy, sociology, and psychology.
	PO02: Acquaint him/herself with the history of the Indian Physical Education system, its educational policies, commissions and committees.
	PO03: Relate his/her understanding of guidance and counselling, peace and value education in various classroom situations and societal experiences.
	PO04: Gain awareness about the various contemporary issues in Physical Education.
Skills	PO05: Demonstrate his/her communication skills through paper presentation on subject as well as various interdisciplinary themes.
	PO06: Construct instructional designs, scholastic & co-scholastic curriculum designs.
	PO07: Integrate and apply ICT in learning process
	PO08: Acquaint him/herself with the diverse current Physical education problems and other related issues like SSA, Inclusive education, unemployment, population explosion, poverty, and national disintegration.
Competence	PO09: Explore new ideas and thoughts through the application of theoretical knowledge of education subject and statistical techniques and pedagogical analysis.
	PO10: Initiate self-sufficiency, sincerity, independent thinking as education is a lifelong process for empowering the student to face all challenges in his/her future endeavours.
	PO11: Develop concern for the society, nation as well as promote the feeling of internationalism by comparing our Physical Education system with that of other developed countries.

3. Programme Specific Objectives & Outcomes (PSOs)

Knowledge	PSO1: A student develops a clear idea about the subject Physical Education and Sports, like nature, scope and aim of Physical Education, factors, different agencies of Physical Education and Sports.
	PSO2: A student gathers knowledge about Physical Education and Sports Psychology, its theories, and their implication in the field of education and education system.
	PSO3: A student develops knowledge about the detailed history of the Indian Physical Education system.
	PSO4: A student internalises the basics of Anatomy, Physiology and Exercise Physiology, relation between Anatomy and Physiology and importance of scientific analysis in the field of Physical Education.
	PSO5: A student develops knowledge about basic of Indian Sports as well as Western Sports.
	PSO6: A student develops the concept of coaching and training, various types of training and basic skills necessary for coaching.
	PSO7: A student develops the concept of research and statistics to develop skill in analysing descriptive measures, concept of Learning Curve and its uses in Physical Education, measures of relationship and organize relevant data and to represent data through graphs and to develop skill in analysing and displaying data.
	PSO8: S/he also develops knowledge about the importance of different types of sports in the field of Physical Education.
Skills	PSO1: A student will develop a clear idea about the subject Physical Education, like nature, scope and aim of Physical Education, factors, different agencies of Physical Education and Sports.
	PSO2: A student will execute the educational implications of the theories of Sports Psychology.
	PSO3: A student will construct Physical Education and Sports Instructional Designs, Scholastic, and Co-Scholastic Curriculum designs.
	PSO4: A student will develop an understanding of Sports Technology, ICT and e-learning.
	PSO5: A student will advocate the importance of Coaching and Training.
	PSO6: A student will develop the skill of using computer in Physical Education and Sports, ICT & e-learning.
	PSO7: A learner will exhibit an excellent communication skill, Skill for Democratic Citizenship and related theories, teaching skills, life skill education, peace, and value education.
Competence	PSO1: A learner demonstrates competencies required to use computers in Physical Education and Sports, communication, ICT & e-learning for implementing instructional techniques and different models of teaching.
	PSO2: A student will analyse the detailed history of Indian Physical Education system.
	PSO3: A student will develop a positive attitude towards developing one's own potentials (both biological & cultural) and talents.
	PSO4: A student will be capable of self-paced and self-directed learning aimed at personal development.
	PSO5: A student will envision a society where people from all walks of life enjoy equal and equitable rights and opportunities.
	PSO6: A student will compute statistical analysis in the field of Physical Education research.
	PSO7: A student will analyse the contemporary trends in Physical Education.

4. Programme Matrix

Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
Semester 3						
23PEDMIN201	Minor	Management of Physical Education and Sports	4	3+0+1	75	100
23PEDMDC201	MDC	Yoga Education	3	2+0+1	45	100
23PEDVAC201	VAC	Sports for Life - III	1	0+0+1	30	100
23SMVAC201	VAC	Ethics in Sports & History of Olympics	1	0+1+0	30	100
Total			9	5+1+3	180	400
Semester 4						
23PEDMIN201	Minor	Management of Physical Education and Sports	4	3+0+1	75	100
23PEDVAC202	VAC	Sports for Life - IV	1	0+0+1	30	100
23SMVAC202	VAC	Planning & Management of Sports Facilities	1	0+1+0	30	100
Total			6	3+1+2	135	300

1. Course Description

Course Code	23PEDMIN102	
Course Title	Management of Physical Education and Sports	
Credits	4	
Total Hours	75	
Hours per Week	4	
Course Type	Minor	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Professional Ethics	
Course Offered to	Physical Education	
Regulation	2023	
Course Overview	This course: 1. Know sports management and employ principles of strategic planning, and financial and human resource management. 2. Develop overall traits of leadership and personality. 3. Develop critical thinking in analysing sport management issues and in managerial planning and decision making. 4. Gives to keen observation about the budget. 5. Able to organize events and sports tournaments.	
Prerequisite	Basic knowledge of Event management and Sports.	
Course Objectives	A student will be able to: 1. Quote the meaning, definitions, principles, and scope of Sports Management. 2. Analyse the concepts of Leadership and Personality in Sports Management. 3. Apply the principles of strategic planning, and financial and human resource management. 4. Examine the importance of management and planning in sports. 5. Critique the sport management issues and managerial planning and decision making in Sports.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Write the importance, Scope, Principles and Management of Physical Education and Sports Programs	R
CO2	Explain the concept of Leadership in Physical Education and Sports	U
CO3	Apply the management principles in Physical Education programs and Games & Sports meets.	A1
CO4	Organise physical Education programs and Games & Sports meets in School, College, and University	A2

CO5	Discriminate between various forms of Leadership	E		
CO6	Formulate a report on visit or participation to standard tournaments, competitions, and Adventure Sports.	C		
CO7	Replicate the techniques of Racket Sports	I		
CO8	Perform correct skills of Racket Sports.	M		
CO9	Demonstrate correct Racket Sports techniques.	P		
CO10	Teach correct skills and techniques of Racket Sports.	A		
CO11	Design proper technical sessions of Racket Sports.	N		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	INTRODUCTION a. Meaning, Definition, Scope, and Principles of Management in Physical Education and Sports. b. Intramural and Extramural competitions – Aims and Objective c. Management of Events, Equipment and Play Fields in Physical Education and Sports.	15	CO1	R U A1 A2 E C
Unit II	LEADERSHIP IN PHYSICAL EDUCATION AND SPORTS a. Meaning, Definition, importance, and principles of Leadership. b. Forms of Leadership (Autocratic, Laisser-faire, Democratic, Benevolent Dictator c. Qualities of good leader.	15	CO2 CO5	R U A1 A2 E C
Unit III	ORGANISATION OF TOURNAMENTS AND SPORTS PROGRAM a. Meaning, Definition, Importance, and types of Tournaments. b. Procedure of Drawing Fixture, merits, and demerits of Knock-out, League and Combination Tournaments. c. Management and Planning of Games & Sports meets in School, College, and University.	15	CO3 CO4	R U A1 A2 E C
Unit IV	FIELD PRACTICAL a. Racket Sports i. Badminton - Fundamental Skills - Playfield Technology – Marking and Construction of the playfields	30	CO6 CO7 CO8 CO9 CO10	I M P A

	Rules and their interpretations and duties of the officials OR		CO11	N
	ii. Table Tennis - Fundamental Skills - Playfield Technology – Marking and Construction of the playfield - Rules and their interpretations and duties of the officials		CO6 CO7 CO8 CO9 CO10 CO11	I M P A N
	b. Project: Organise a standard tournament or competition. Record Book to be maintained.		CO6	C

LEARNING RESOURCES:

- Govindarajulu, N., (2005) Management of Physical Education and Sports Programme, Friends Publications, India.
- Thour, M., (2006) Camping Management in Physical Education, Friends Publications, India.
- Singh, Y., (2005) Sports Management, Sports Publication, New Delhi.
- Chelladurai, P & Kerwin, S., (2017) Human Resource Management in Sport and Recreation, Human Kinetics, US.
- Kaur, B., (2020) Officiating and Coaching, Sports Publication, New Delhi.
- Srivastava, A.K., (2010) Book of Rules of Games and Sports, Sports Publication, New Delhi.
- Jange, H.S. & Pasodi, M.S., (1 January 2018) Officiating and Coaching in Physical Education and Sports, Khel Sahitya Kendra, New Delhi.
- Hohenstein, M., (1 February, 2000) Games, Bethany House Publishers, a division of Baker Publishing Group, Minnesota, US.

SUGGESTED READING:

- Nanda, S.M. Sports Management, Friend Publications, New Delhi.
- Paul, A. Sarirsikshay Management, Classic Publishers, Kolkata.
- Bucher, C. A. Administration of Physical Education and Athletic Programme. St. Louis: The C.V. Mosby Co.
- Broyles, F. J. & Robert, H. D. Administration of Sports, Athletic Programme: A Managerial Approach. New York: Prentice Hall Inc
- Pandy, L.K. (1977). Methods in Physical Education. Delhe: Metropolitan Book Depo.
- Sharma, V.M. & Tiwari, R.H.: (1979). Teaching Methods in Physical Education. Amaravati: Shakti Publication
- Kar, S. & Santra, D.C. (2018): Santak Sarirsiksha Porichaya (Vol.-1), Santra Publication, Kolkata.
- Kamlesh, M.L., (2016) Management Concepts in Physical Education and Sports, Khel Sahitya Kendra, New Delhi.
- Northouse, P.G., (2021) Leadership: Theory and Practice, (ninth edition), Sage Pubns.
- Martenik, T., & Hellison, D., (2015) Youth Leadership in Sports and Physical Education, (first edition), Palgrave Macmillan, New York.
- Mahaboobjan, A., and Viswejan, U. (2021) Rules and Measurements in sports and games, Sports Publication (First Edition), New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
 I: Imitation, M: Manipulation, P: Precision, A: Articulation, N: Naturalisation

2. Assessment:

- i. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- ii. **Summative Assessment:** 50 marks (25 Marks Theory + 25 Marks Practical)
Theory (50 Marks Exam to be converted to 25 Marks):
 - a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).Summative Assessment Time: 2 Hours for pen and paper test

Practical (50 Marks Exam to be converted to 25 Marks):

SL. No.		
1	Lab. Note Book	10
2	Viva-voce	10
3	Practical	30
TOTAL		50

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDMDC201	
Course Title	Yoga Education	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed	Human Values	
Course Offered to	Physical Education	
Regulation	2023	
Course Overview	This course: 1. Covers the basic concepts of Yoga Education. 2. Gives an exposure on the components of Physical Fitness. 3. Discusses the types of recreational activities for different age group.	
Prerequisite	Basic knowledge on Sports, Fitness and Recreation.	
Course Objectives	A student will be able to: 1. understand the concept and nature of yoga along with its historical background. 2. gain knowledge regarding the application of yoga to Physical Education and Sports 3. understand the anatomy and Physiology of Asana and Pranayama 4. Gain knowledge regarding the effect of yogic practices on health aspects	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	State the meaning, definition, importance, aims & objectives of Yoga	R
CO2	Discuss the types, historical & philosophical aspects of Yoga.	U
CO3	Apply the principles of Astanga Yoga	A1
CO4	Research on the ministry of Ayush.	A2
CO5	Evaluate the effects of Asana and Pranayama on human body and mind.	E
CO6	Plan Yoga activity sessions.	C
CO7	Replicate proper techniques of Yoga & Prayanama.	I
CO8	Perform correct techniques of Yoga & Prayanama.	M

CO9	Demonstrate correct techniques of Yoga & Prayanama	P		
C10	Teach correct techniques of Yoga & Prayanama	A		
C11	Design correct techniques of Yoga & Prayanama.	N		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	INTRODUCTION OF YOGA a. Meaning and Definition of Yoga. b. Aims and Objectives of Yoga c. Need and Importance of Yoga in Modern Society. d. Effect of Asanas and Pranayama on human body and mind.	15	CO1 CO2 CO5	R U A 1 A 2 E C
Unit II	FOUNDATION OF YOGA a. History and Philosophical Aspects of Yoga. b. Mission and Vision of AYUSH c. Yoga in the Bhagavadgita - Karma Yoga, Raj Yoga, Jnana Yoga and Bhakti Yoga d. The Astanga Yoga: Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi	15	CO3 CO4	R U A 1 A 2 E C
Unit III	FIELD PRACTICAL a. Surya Namaskar b. Yoga Asana: Standing position, Sitting Position, Supine Position, Prone Position, Inverted Position (Compulsory one asana in each position) c. Prayanama: Kapalbhathi, Bhramari, Anulom Vilom (Any 1)	15	CO6 CO7 CO8 CO9 CO10 CO11	I M P A N

LEARNING RESOURCES:

1. Ramaswamy B, (2017) Yoga Education: An Indian Perspective, Kanishka Publishers, Distributors, Daryaganj, New Delhi.
2. Chaudhuri, Haridas (1981) Integral Yoga, Theosophical Publishing House, Wheaton, America.
3. Sinha, Phulgenda, (2002), Yoga: Meaning, Values and Practice, Jaico Publishing House 121, M.G Road Mumbai.
4. Vineeth, V.F (1995), Yoga of Spirituality: Christian Initiation into Indian Spiritual Traditions, Vidya Vanam Publications, Bangalore, India
5. Pal, S & Aggarwal, D.D (1996), Yogasanas and Sadhana, Family Books Pvt. Ltd., Daryaganj, New Delhi.
6. Bijlani, Ramesh (2008), Back to Health through Yoga, Rupa Publications India Pvt. Ltd, New Delhi.

SUGGESTED READING:

1. Yadav, Y.P Yadav, R (1998) Art of Yoga, Friends Publication.
2. Vivekananda Swami (2019) The Complete Book of Yoga: Karma Yoga, Bhakti Yoga, Raja Yoga, Jnana Yoga, Fingerprint Publishing, India.
3. Swanson, Ann, (2019), Science of Yoga: Understand the Anatomy and Physiology to perfect your practice, DK Publication.
4. C.K Shashirekha (2017) Yoga Body Anatomy: Insight to Muscular Movements

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
I: Imitation, M: Manipulation, P: Precision, A: Articulation, N: Naturalisation

2. Assessment:

- Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- Summative Assessment:** 50 marks
 - Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
 Summative Assessment Time: 2 Hours for pen and paper test

Practical (50 Marks Exam to be converted to 25 Marks):

SL. No.		
1	Lab. Note Book	10
2	Viva-voce	10
3	Practical	30
TOTAL		50

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDVAC201			
Course Title	Sports for Life			
Credits	1			
Total Hours	30			
Hours per Week	3			
Course Type	Value Added Course			
Semester	I			
Intended Level	Certificate			
Issue(s) Addressed	Human Values			
Course Offered to	Physical Education			
Regulation	2023			
Course Overview	This course: a. Covers the Fundamental skills and rules of the Selected Sport. b. Gives an exposure of match practice with the application of rules of the various games.			
Prerequisite	Basic knowledge on Sports.			
Course Objectives	A student will be able to: 1. Analyse the significance of sports to promote health, fitness, and wellness in life. 2. Relate the values of teamwork, tolerance, goal-setting, and decision making. 3. Design the strategies and tactical moves while playing a sport. 4. Evaluate the importance of physical activity in reference to 3S: strength, speed, and suppleness.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Recall the History of the Game	R		
CO2	Explain the rules and their interpretation of the Game	U		
CO3	Demonstrate the Fundamental Skills of the Game.	A1		
CO4	Examine the duties of the Officials	A2		
CO5	Rate the execution of fundamental skills of the Game.	E		
CO6	Construct the various playfields with correct markings.	C		
CO7	Replicate the basic skills of the game	I		
CO8	Re-create the fundamental skills of the game.	M		
CO9	Demonstrate the fundamental skills during the game.	P		
CO10	Teach the fundamental skills of the game	A		
CO11	Design the fundamental skills of the game.	N		
Course Content				
Units	Content Any 1 Unit	Lecture Hours	COs	RBT

Unit I	FOOTBALL A. <u>Session 1</u> - History of the Game B. . <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C. . <u>Session 6-8</u> Rules and their interpretation and duties of officials. D. . <u>Session 9-14</u> Fundamental Skills: • Kicking: Kicking the ball with inside of the foot, kicking the ball with Full Instep of the foot, kicking the ball with Inner Instep of the foot, kicking the ball with Outer Instep of the foot and Lofted Kick. • Trapping: Trapping- the Rolling ball, and the Bouncing ball with sole of the foot. • Dribbling: Dribbling the ball with Instep of the foot, dribbling the ball with Inner and Outer Instep of the foot. • Heading: In standing, running, and jumping condition. • Throw-in: Standing throw-in and Running throw-in. • Feinting: With the lower limb and upper part of the body. • Tackling: Simple Tackling, Slide Tackling. • Goal Keeping: Collection of Ball, Ball clearance- kicking, throwing, and deflecting. E. <u>Session 15:</u> Game practice with application of Rules and Regulations.	30	CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9	R U A1 A2 E C I M P A N P
Unit II	BASKETBALL A. <u>Session 1</u> - History of the Game B. . <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C. . <u>Session 6-8</u> Rules and their interpretation and duties of officials. D. Fundamental Skills:	30	CO1 CO2 CO3 CO4 CO5	R U A1 A2 E C I

	• Passing: Two hand Chest Pass, two hands Bounce Pass, One hand Baseball Pass, Side arm Pass, Overhead Pass, Hook Pass. • Receiving: Two hand receiving, one hand receiving, receiving in stationary position, receiving while Jumping and Receiving while Running. • Dribbling: How to start dribble, drop dribble, High Dribble, Low Dribble, Reverse Dribble, Rolling Dribble. • Shooting: Lay-up shot and its variations, One hand set shot, Two hands jump shot, Hook shot, Free Throw. • Rebounding: Defensive rebound and Offensive rebound. • Individual Defence: Guarding the player with the ball and without the ball, Pivoting. E. Session 15: Game practice with application of Rules and Regulations		CO6 CO7 CO8	M P A N
Unit III	ATHLETICS A. Session 1 - History of the Game B. . Session 2-5 Playfield Technology – Marking and Construction of the playfields C. . Session 6-8 Rules and their interpretation and duties of officials. D. . Basic skills and techniques of Athletic Events: (Any One) • Running Events: sprint races, middle- and long-distance races, hurdles races • Jumping Events- long jump, Triple Jump and High Jump. • Throwing Events- Shot put, Discus throw. E. Session 15: Game practice with application of Rules and Regulations	30	CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9	R U A1 A2 E C I M P A N P
LEARNING RESOURCES: 1. Sharma, N.P., (2005) Fundamental of Track and Field, Khel Sahitya Kendra, New Delhi, India. 2. Striano, P & DC., (2013) Anatomy of Running: A Guide to Running Right, Hinkler Publishers, UK. 4. Kaur, B., (2020) Officiating and Coaching, Sports Publication, New Delhi. 5. Jain, R., (2012) Play and Learn Track and Field, Khel Sahitya Kendra, New Delhi. 6. Mitra, S., Das, P.K & Bandyopadhyay, N., (2022) Basics of Basketball for Teaching and Coaching Courses, Akansha Publishing House, Darya Ganj, Delhi. 7. Srivastava, A.K., (2010) Book of Rules of Games and Sports, Sports Publication,				

New Delhi

8. Jange, H.S. & Pasodi, M.S., (1 January 2018) Officiating and Coaching in Physical Education and Sports, Khel Sahitya Kendra, New Delhi.
9. Hohenstein, M., (1 February, 2000) Games, Bethany House Publishers, a division of Baker Publishing Group, Minnesota, US.

SUGGESTED READING:

- 1) Mahaboobjan, A., and Viswejan, U. (2021) Rules and Measurements in sports and games, Sports Publication (First Edition), New Delhi.
- 2) Bain, R., (2019) Rule Book of Games: Football, Alpha Editions.
- 3) Hawkins, V., (2018) Rule Book of Games: Basketball, Alpha Edition.
- 4) Singh, A.K., (2022) Basketball- Complete Guide Book – (First Edition), Sport Publication, New Delhi.
- 5) Amateur Athletic Union of the United States, (2010), Official Athletic Rules and Official Handbook, Nabu Press.
- 6) Pluff, G.E., (1 January, 2013) The A-Z Basketball Book: What Every Player Needs to Know to be Great at the Game, Zaccheus Entertainment.

Singh, L., (2021) Track & Field Rules and Regulations, Khel Sahitya Kendra, New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
I: Imitation, M: Manipulation, P: Precision, A: Articulation, N: Naturalisation

2. Assessment:

Log Books to be maintained and recorded for individual students for formative assessment.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23SMVAC201			
Course Title	ETHICS IN SPORTS AND HISTORY OF OLYMPICS			
Credits	1			
Total Hours	30			
Hours per Week	2			
Course Type	Value Added Course			
Semester	III			
Intended Level	Diploma			
Issue(s) Addressed	Professional Ethics			
Course Offered to	Sports Management			
Regulation	2023			
Course Overview	This course: 1. Covers needs and importance of Ethical values of sports. 2. Gives an exposure about Doping and other Substance in sports. 3. Gives knowledge about History of Ancient and Modern Olympic.			
Prerequisite	Basic knowledge on Sports Ethics.			
Course Objectives	A student will be able to: 1. Understand about various ethical values in sports. 2. Build brotherhood in sports. 3. Understand true meaning of Doping and other substance. 4. Understand and learn rules & regulation and ground marking. 5. Learn importance of Indian Games (Kho Kho/kabaddi)			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe the concept of ethics in sports.	R		
CO2	Discuss the need of ethical practice in the field of Sports.	U		
CO3	Apply the principles of ethical values in sports	A1		
CO4	Examine the ethical practice in the field of sports	A2		
CO5	Evaluate the rules and regulation of Kho Kho /Kabaddi	E		
CO6	Manage to teach students fundamental skills of Kho Kho & Kabaddi	C		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Session 1	Ethics in sports.	2	CO1	R U A1 A2

				E C
Session 2	Need of Ethical Practice in the field of Sports.	2	CO1	R U A1 A2 E C
Session 3	Violence in Sports – Causes & Types	2	CO1	R U A1 A2 E C
Session 4	Effect of Sports Violence in Society	2	CO1	R U A1 A2 E C
Session 5	Sports code of conduct.	2	CO2	R U A1 A2 E C
Session 6	Doping & Corruption in Sports.	2	CO2	R U A1 A2 E C
Session 7	Olympic Movement – Ideas & Objectives	2	CO3	R U A1 A2 E C
Session 8	History of Ancient Olympic games.	2	CO3	R U A1 A2 E C

Session 9	IOC – Structure and Functions	2	CO3	R U A1 A2 E C
Session 10	History of Modern Olympic games.	2	CO6	R U A1 A2 E C
Session 11	Olympic Motto, Torch, Flame, Flag, Rings & Mascot.	2	CO4	R U A1 A2 E C
Session 12	Rules & regulations of Indigenous Games (Kho Kho / Kabaddi).	2	CO4	R U A1 A2 E C
Session 13	Ground (Court) measurements.	2	CO5	R U A1 A2 E C
Session 14	Game Practice	2	CO5	R U A1 A2 E C
Session 15	Game Practice	2	CO5	R U A1 A2 E C

LEARNING RESOURCES:

1. Morgan, William J. “Ethics in Sport” Third edition, November 2017.
2. Walter T. Champion jr, Richard T. Karcher, Lawrence S. Ruddell “Sports Ethics for Sports Management Professionals” 2nd April 2019.
3. TREASURES OF THE OLYMPIC GAMES: Faster, Higher, Stronger (The History of the Olympic Games: Faster, Higher, Stronger) Hardcover – Import, 27 May 2021.
4. Goldblatt David “The Games” (A Global History of the Olympics) Pitzer College New York.

SUGGESTED READINGS:

1. Morgan, William J. "Ethics in Sport" Third edition, November 2017.
2. Walter T. Champion jr, Richard T. Karcher, Lawrence S. Ruddell "Sports Ethics for Sports Management Professionals" 2nd April 2019.
3. Treasures Of the Olympic Games: Faster, Higher, Stronger (The History of the Olympic Games: Faster, Higher, Stronger) Hardcover – Import, 27 May 2021.
4. Goldblatt David "The Games" (A Global History of the Olympics) Pitzer College New York.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
I: Imitation, M: Manipulation, P: Precision, A: Articulation, N: Naturalisation

2. Assessment:

Log Books to be maintained and recorded for individual students for formative assessment.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rakesh Saibo Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

3. Course Description

Course Code	23PEDMIN102	
Course Title	Management of Physical Education and Sports	
Credits	4	
Total Hours	75	
Hours per Week	5	
Course Type	Minor	
Semester	IV	
Intended Level	Certificate	
Issue(s) Addressed	Professional Ethics	
Course Offered to	Physical Education	
Regulation	2023	
Course Overview	This course: 1. Know sports management and employ principles of strategic planning, and financial and human resource management. 2. Develop overall traits of leadership and personality. 3. Develop critical thinking in analysing sport management issues and in managerial planning and decision making. 4. Gives to keen observation about the budget. 5. Able to organize events and sports tournaments.	
Prerequisite	Basic knowledge of Event management and Sports.	
Course Objectives	A student will be able to: 1. Quote the meaning, definitions, principles, and scope of Sports Management. 2. Analyse the concepts of Leadership and Personality in Sports Management. 3. Apply the principles of strategic planning, and financial and human resource management. 4. Examine the importance of management and planning in sports. 5. Critique the sport management issues and managerial planning and decision making in Sports.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Write the importance, Scope, Principles and Management of Physical Education and Sports Programs	R
CO2	Explain the concept of Leadership in Physical Education and Sports	U
CO3	Apply the management principles in Physical Education programs and Games & Sports meets.	A1
CO4	Organise physical Education programs and Games & Sports meets in School, College, and University	A2

CO5	Discriminate between various forms of Leadership	E		
CO6	Formulate a report on visit or participation to standard tournaments, competitions, and Adventure Sports.	C		
CO7	Replicate the techniques of Racket Sports	I		
CO8	Perform correct skills of Racket Sports.	M		
CO9	Demonstrate correct Racket Sports techniques.	P		
CO10	Teach correct skills and techniques of Racket Sports.	A		
CO11	Design proper technical sessions of Racket Sports.	N		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	INTRODUCTION a. Meaning, Definition, Scope, and Principles of Management in Physical Education and Sports. b. Intramural and Extramural competitions – Aims and Objective c. Management of Events, Equipment and Play Fields in Physical Education and Sports.	15	CO1	R U A1 A2 E C
Unit II	LEADERSHIP IN PHYSICAL EDUCATION AND SPORTS a. Meaning, Definition, importance, and principles of Leadership. b. Forms of Leadership (Autocratic, Laissez-faire, Democratic, Benevolent Dictator c. Qualities of good leader.	15	CO2 CO5	R U A1 A2 E C
Unit III	ORGANISATION OF TOURNAMENTS AND SPORTS PROGRAM a. Meaning, Definition, Importance, and types of Tournaments. b. Procedure of Drawing Fixture, merits, and demerits of Knock-out, League and Combination Tournaments. c. Management and Planning of Games & Sports meets in School, College, and University.	15	CO3 CO4	R U A1 A2 E C
Unit IV	FIELD PRACTICAL b. Racket Sports i. Badminton - Fundamental Skills - Playfield Technology – Marking and Construction of the playfields	30	CO6 CO7 CO8 CO9 CO10	I M P A

	Rules and their interpretations and duties of the officials OR		CO11	N
	iii. Table Tennis - Fundamental Skills - Playfield Technology – Marking and Construction of the playfield - Rules and their interpretations and duties of the officials		CO6 CO7 CO8 CO9 CO10 CO11	I M P A N
	b. Project: Organise a standard tournament or competition. Record Book to be maintained.		CO6	C

LEARNING RESOURCES:

- Govindarajulu, N., (2005) Management of Physical Education and Sports Programme, Friends Publications, India.
- Thour, M., (2006) Camping Management in Physical Education, Friends Publications, India.
- Singh, Y., (2005) Sports Management, Sports Publication, New Delhi.
- Chelladurai, P & Kerwin, S., (2017) Human Resource Management in Sport and Recreation, Human Kinetics, US.
- Kaur, B., (2020) Officiating and Coaching, Sports Publication, New Delhi.
- Srivastava, A.K., (2010) Book of Rules of Games and Sports, Sports Publication, New Delhi.
- Jange, H.S. & Pasodi, M.S., (1 January 2018) Officiating and Coaching in Physical Education and Sports, Khel Sahitya Kendra, New Delhi.
- Hohenstein, M., (1 February, 2000) Games, Bethany House Publishers, a division of Baker Publishing Group, Minnesota, US.

SUGGESTED READING:

- Nanda, S.M. Sports Management, Friend Publications, New Delhi.
- Paul, A. Sarirsikshay Management, Classic Publishers, Kolkata.
- Bucher, C. A. Administration of Physical Education and Athletic Programme. St. Louis: The C.V. Mosby Co.
- Broyles, F. J. & Robert, H. D. Administration of Sports, Athletic Programme: A Managerial Approach. New York: Prentice Hall Inc
- Pandy, L.K. (1977). Methods in Physical Education. Delhe: Metropolitan Book Depo.
- Sharma, V.M. & Tiwari, R.H.: (1979). Teaching Methods in Physical Education. Amaravati: Shakti Publication
- Kar, S. & Santra, D.C. (2018): Santak Sarirsiksha Porichaya (Vol.-1), Santra Publication, Kolkata.
- Kamlesh, M.L., (2016) Management Concepts in Physical Education and Sports, Khel Sahitya Kendra, New Delhi.
- Northouse, P.G., (2021) Leadership: Theory and Practice, (ninth edition), Sage Pubns.
- Martenik, T., & Hellison, D., (2015) Youth Leadership in Sports and Physical Education, (first edition), Palgrave Macmillan, New York.
- Mahaboobjan, A., and Viswejan, U. (2021) Rules and Measurements in sports and games, Sports Publication (First Edition), New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
I: Imitation, M: Manipulation, P: Precision, A: Articulation, N: Naturalisation

4. Assessment:

- iii. **Formative Assessment:** 50 marks as per Assessment & Evaluation Framework Document of Salesian College
- iv. **Summative Assessment:** 50 marks (25 Marks Theory + 25 Marks Practical)
Theory (50 Marks Exam to be converted to 25 Marks):
- a) Four Short Questions to be answered out of eight given from lower order of RBT – (20 Marks)
 - b) Three Long Questions to be answered out of six set from higher order of RBT – (30 Marks).
- Summative Assessment Time: 2 Hours for pen and paper test

Practical (50 Marks Exam to be converted to 25 Marks):

SL. No.		
1	Lab. Note Book	10
2	Viva-voce	10
3	Practical	30
TOTAL		50

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23PEDVAC202			
Course Title	Sports for Life			
Credits	1			
Total Hours	30			
Hours per Week	3			
Course Type	Value Added Course			
Semester	IV			
Intended Level	Certificate			
Issue(s) Addressed	Human Values			
Course Offered to	Physical Education			
Regulation	2023			
Course Overview	This course: a. Covers the Fundamental skills and rules of the Selected Sport. b. Gives an exposure of match practice with the application of rules of the various games.			
Prerequisite	Basic knowledge on Sports.			
Course Objectives	A student will be able to: 1. Analyse the significance of sports to promote health, fitness, and wellness in life. 2. Relate the values of teamwork, tolerance, goal-setting, and decision making. 3. Design the strategies and tactical moves while playing a sport. 4. Evaluate the importance of physical activity in reference to 3S: strength, speed, and suppleness.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Recall the History of the Game	R		
CO2	Explain the rules and their interpretation of the Game	U		
CO3	Demonstrate the Fundamental Skills of the Game.	A1		
CO4	Examine the duties of the Officials	A2		
CO5	Rate the execution of fundamental skills of the Game.	E		
CO6	Construct the various playfields with correct markings.	C		
CO7	Replicate the basic skills of the game	I		
CO8	Re-create the fundamental skills of the game.	M		
CO9	Demonstrate the fundamental skills during the game.	P		
CO10	Teach the fundamental skills of the game	A		
CO11	Design the fundamental skills of the game.	N		
Course Content				
Units	Content	Lecture Hours	Cos	RBT
Unit I	HANDBALL	30		R

	A. <u>Session 1</u> - History of the Game B. . <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C. . <u>Session 6-8</u> Rules and their interpretation and duties of officials. D. . <u>Session 9-14</u> Fundamental Skills: • Catching, Throwing and Ball control • Goal Throws: Jump shot, Centre shot, Dive shot, Reverse shot. • Dribbling: High and low. • Attack and counter attack, simple counter attack, counter attack from two wings and center. • Blocking, Goalkeeping and Defensive skills. E. Session 15 Game practice with application of Rules and Regulations.		CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9 CO10 CO11	U A1 A2 E C I M P A N P
Unit II	VOLLEYBALL A) <u>Session 1</u> - History of the Game B)) <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C)) <u>Session 6-8</u> Rules and their interpretation and duties of officials. D)) Fundamental skills: • Service: Under arm service, Side arm service, Tennis service, Floating service. • Pass: Under arm pass, Overhead pass. • Spiking and Blocking. F. Game practice with application of Rules and Regulations.	30	CO1 CO2 CO3 CO4 CO5 CO6 CO7 CO8 CO9 CO10 CO11	R U A1 A2 E C I M P A N P
Unit III	INDOOR GAMES: Badminton A) <u>Session 1</u> - History of the Game B)) <u>Session 2-5</u> Playfield Technology – Marking and Construction of the playfields C)) <u>Session 6-8</u> Rules and their	30	CO1 CO2 CO3 CO4 CO5 CO6	R U A1 A2 E C

2. Bain, R., (2019) Rule Book of Games: Football, Alpha Editions.
3. Hawkins, V., (2018) Rule Book of Games: Volleyball, Alpha Edition.
4. Singh, A.K., (2022) Volleyball- Complete Guide Book – (First Edition), Sport Publication, New Delhi.
5. Tyson, P & Turman J., (1987) The Handball Book, Human Kinetics Publishers, Canada.
6. McAfee, R.E., (2009) Table Tennis; Steps to Success, Human Kinetics Publishers, Canada.
7. Rai G., (2016) The Art of Table Tennis, Sports Publications, New Delhi.
8. Weatherford, L., (2018) Rule Book of Games: Badminton, Alpha Editions, Ansari Road, New Delhi.
9. Srivastava, A.K., (2009) Badminton Rule Book, Sports Publication, New Delhi.
10. Singh, A.K., (2022) Volleyball: A Complete Guide Book, Sports Publication, New Delhi.
11. Thani, L., (2007) Skills & Tactics; Football Book, Sports Publication, New Delhi.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
I: Imitation, M: Manipulation, P: Precision, A: Articulation, N: Naturalisation

2. Assessment:

Log Books to be maintained and recorded for individual students for formative assessment.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Wilson Bara Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:

1. Course Description

Course Code	23SMVAC202	
Course Title	PLANNING & MANAGEMENT OF SPORTS FACILITIES	
Credits	1	
Total Hours	30	
Hours per Week	2	
Course Type	Value Added Course	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed	Professional Ethics	
Course Offered to	Sports Management	
Regulation	2023	
Course Overview	This course: 1. Covers Management of infrastructure Facilities. 2. Gives emergency arrangement and treatment of sports Injuries. 3. Gives knowledge about First Aid.	
Prerequisite	Basic knowledge on contemporary issues in Sports.	
Course Objectives	A student will be able to: 1. Understand about Planning and Management in Sports. 2. Do First Aid. 3. Understand about Developments & maintenance of sports Arena. 4. Understand and learn rules & regulation and skills of Judo and Karate. 5. Learn Combat sports (Judo Karate).	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Discuss the various way to manage Infrastructure Facilities.	R
CO2	Describe the concepts about Planning and Management of Infrastructure Facilities.	U
CO3	Discuss the various type of First-Aid.	A1
CO4	Examine the need of Facility Administration.	A2
CO5	Evaluate Finance and Budgeting.	E
CO6	Manage to teach students fundamental skills of Judo & Karate	C
CO7	Replicate the basic skills of the game	I
CO8	Re-create the fundamental skills of the game.	M
CO9	Demonstrate the fundamental skills during the game.	P
CO10	Teach the fundamental skills of the game	A
CO11	Design the fundamental skills of the game.	N

Course Content				
Units	Content	Lecture Hours	Cos	RBT
Session 1	Program Planning – Meaning & Importance of Program Planning in Physical Education & Sports.	2	CO1	R U A1 A2 E C
Session 2	Facilities Management – Outdoor & Indoor Facilities	2	CO2	R U A1 A2 E C
Session 3	Care & Maintenance – Gymnasium, Swimming Pool, Playfield, Playground etc	2	CO3	R U A1 A2 E C
Session 4	Equipment Management – Need & Importance	2	CO4	R U A1 A2 E C
Session 5	Equipment Management – Purchase & Maintenance.	2	CO1	R U A1 A2 E C
Session 6	Sports Marketing & Sports Sponsorship	2	CO5	R U A1 A2 E C
Session 7	Budget – Meaning, Importance & Criteria of a Good Budget	2	CO1	R U A1 A2 E C

Session 8	Budgeting – Income, Expenditure & Preparation of Budget.	2	CO1	R U A1 A2 E C
Session 9	Time Table Management – Need, Importance & Factors affecting Time Table	2	CO5	R U A1 A2 E C
Session 10	Record & Register – Maintenance of Attendance register & Stock Register	2	CO6	R U A1 A2 E C
Session 11	Athletic Meet – Planning, Structure & Organisation in School, College & Universities.	2	CO5 CO6	R U A1 A2 E C
Session 12	Indoor Games (Badminton/Table Tennis)	2	CO5 CO6	R U A1 A2 E C
Session 13	Indoor Games (Badminton/Table Tennis)	2	CO7 CO8 CO9 CO10 C11	I M P A N
Session 14	Indoor Games (Badminton/Table Tennis)	2	CO7 CO8 CO9 CO10 C11	I M P A N

Session 15	Indoor Games (Badminton/Table Tennis)	2	CO7 CO8 CO9 CO10 C11	I M P A N
LEARNING RESOURCES: 1. Srivastava, A.K., (2010) Book of Rules of Games and Sports, Sports Publication, New Delhi. 2. Daniels, P., & Restak R.MD., (2014) The Body: A Complete User's Guide, National Geographic Publisher, Washington, DC. 3. Jackson, L. Jr., (2014) Racket Wars: Guide Book to all the World's Racket Sports, First Edition, BookBaby Publishers. SUGGESTED READINGS: 1. Farmer J. Petert, Mulrooney L. Aaron, Robin Ammon Jr "Sport Facility Planning and Management" Fitness Information Technology, Inc, U.S 2. Gil B. Fried, JD "Managing Sport Facilities" 4th Edition 2021. 3. DK "First Aid Manual" 11th edition (5 August 2021) 4. Gupta LC "Manual of First Aid: Management of General Injuries, Sports Injuries and Common Ailments" 2023 5. Richard. L. Irwin, William. Anthony. Sutton, Larry. M. McCarthy "Sports promotion and sales Management" Human Kinetics, 2008				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating
I: Imitation, M: Manipulation, P: Precision, A: Articulation, N: Naturalisation

2. Assessment:

Log Books to be maintained and recorded for individual students for formative assessment.

Course Faculty (Prepared by)	Head of the Department (Checked and verified by)	Dean (Approved by)
Name: Mr. Rakesh Saibo Signature:	Name: Mr. Wilson Bara Signature:	Name: Mr Ravi Bhushan Singh Signature:



Salesian College, Siliguri
(Autonomous)

National Education Policy (NEP) 2020 Curriculum Framework
For
Bachelor of Science in Physics
with
Dual Major
(Regulation 2024)

Offered by the

Department of Physics
Deanery of Sciences
Salesian College (Autonomous), Siliguri

NAAC Accredited A Grade (3rd cycle) and twice UGC certified College with Potential for Excellence (CPE)

Affiliated to the University of North Bengal
Siliguri - 734001
West Bengal

Vision

The vision of the Department of Physics is to build the rudiments for excellence and motivate the students to discover their latent talents through theoretical and practical physics and apply them to contribute to the betterment of self and of society and the nation at large.

Mission

The mission of the Department of Physics is to strive to attain high standards of excellence in generating and propagating knowledge in physics. The faculty members are committed to providing education that combines rigorous academics with the joy of discovery through nurturing a vibrant academic ambience conducive to study, creation, and dissemination of knowledge.

Exit Options:

Qualification	Exit Stage
Certificate in Physics	After successful completion of semesters I and II with 44 credits
Diploma in Physics	After successful completion of semesters I to IV with 85 credits
B.Sc. in Physics	After successful completion of semesters I to VI with 127 credits
B.Sc. in Physics and {Second Major}	After successful completion of semesters I to VI with 135 credits
B.Sc. (Hons.) in Physics	After successful completion of semesters I to VIII with 167 credits
B.Sc. (Hons. with Research) in Physics	After successful completion of semesters I to VIII with 167 credits, including 12 research credits
B.Sc. (Hons.) in Physics and B.Sc. in {Second Major}	After successful completion of semesters I to VIII with 175 credits
B.Sc. (Hons. with Research) in Physics and B.Sc. in {Second Major}	After successful completion of semesters I to VIII with 175 credits, including 12 research credits

Proposed Courses offered by the Department of Physics
4 Year Bachelors Course for Single and Dual Majors

Note: Papers listed in italics are not framed/offered by the Department of Physics, but are a part of the undergraduate course framework.

Semester	Paper Code	Paper	Credits (Theory)	Credits (Lab)	Teaching Hours
I	24PHYMAJ101	Mechanics and Properties of Matter	3	1	3 + 2
	<i>Major B1</i>	<i>Syllabus framed outside Department</i>	4		-
	24PHYSEC101	Practical Electricity	2	1	2 + 2
	24PHYMDC101	Astronomy and Cosmology for the Curious	3	0	3
	<i>24ENGAEC101</i>	<i>Compulsory English I</i>	2		-
	<i>24GEOAEC101</i>	<i>Environmental Studies I</i>	2		-
	24PHYVAC101	Mathematical Review for Physics	2	0	2
		Total	20		14
II	24PHYMAJ102	Calculus and Intro to Linear Analysis	4	0	4
	24PHYMAJ103	Electricity and Magnetism	3	1	3 + 2
	<i>Major B2</i>	<i>Syllabus framed outside Department</i>	4		-
	<i>Major B3</i>	<i>Syllabus framed outside Department</i>	4		-
	24PHYSEC101	Practical Electricity	2	1	2 + 2
	24PHYMDC102	Quantum Physics for the Curious	3	0	3
	<i>24SCSVED101/ 24VACBIB101</i>	<i>Value Education I OR Bible Studies I</i>	2		-
		Total	24		16
III	24PHYMAJ201	Waves and Optics	3	1	3 + 2
	<i>Major B4</i>	<i>Syllabus framed outside Department</i>	4		-
	24PHYSEC201	Introduction to Computers & Programming	0	3	6
	24PHYMDC201	Physics of Sports	3	0	3
	<i>24ENGAEC102</i>	<i>Compulsory English II</i>	2		-

Semes ter	Paper Code	Paper	Credits (Theory)	Credits (Lab)	Teaching Hours
	24GEOAEC102	Environmental Studies II	2		-
	24PHYVAC201	Mathematical Physics	2	0	2
		Total	20		16
IV	24PHYMAJ202	Differential Equations and Analysis	4	0	4
	24PHYMAJ203	Special Relativity and Modern Physics	3	1	3 + 2
	Major B5	Syllabus framed outside Department	4		-
	Major B6	Syllabus framed outside Department	4		-
	24PHYSEC201	Introduction to Computers & Programming	0	3	6
	24SCSVED102/ 24VACBIB102	Value Education II OR Bible Studies II	2		-
		Total	21		15
V	Both Single Major and Dual Major				
	24PHYMAJ301	Digital Electronics	3	1	3 + 2
	24PHYMAJ302	Thermal Physics	3	1	3 + 2
	24PHYMAJ303	Quantum Mechanics	4	0	4
		Summer Internship/Fellowship	2		-
	Single Major only				
	24PHYMAJ304	Special Topics in Mathematical Physics	4	0	4
	24PHYMAJ305	Numerical Methods using Computation	0	4	8
		Total	22		26
	Dual Major only				
	Major B7	Syllabus framed outside Department	4		-
	Major B8	Syllabus framed outside Department	4		-
	Major B9	Syllabus framed outside Department	4		-

Semes ter	Paper Code	Paper	Credits (Theory)	Credits (Lab)	Teaching Hours	
		Total	26		14	
VI	Both Single Major and Dual Major					
	24PHYMAJ306	Analog Electronics	3	1	3 + 2	
	24PHYMAJ307	Solid State Physics	3	1	3 + 2	
	24PHYMAJ308	Nuclear and Particle Physics	4	0	4	
	Single Major only					
	24PHYMAJ309	Physics of Sustainable Energy	4	0	4	
	24PHYMAJ310	Practices in Physics Pedagogy	0	4	8	
		Total	20		26	
	Dual Major only					
	Major B12	Syllabus framed outside Department	4		-	
	Major B13	Syllabus framed outside Department	4		-	
	Major B14	Syllabus framed outside Department	4		-	
		Total	24		14	
	VII	24PHYMAJ401	Advanced Mathematical Physics	4	0	4
		24PHYMAJ402	Analytical Mechanics	4	0	4
24PHYMAJ403		Statistical Mechanics	4	0	4	
24PHYMAJ404		Statistical Techniques in Physics	3	1	3+2	
		OR				
24PHYMAJ405		Research	4		4	
Single Major only						
Major B7		Syllabus framed outside Department	4		-	
		Total	20		17 or 18	
Dual Major only						
24PHYMAJ406		Atomic and Molecular Physics	4	0	4	

Semes ter	Paper Code	Paper	Credits (Theory)	Credits (Lab)	Teaching Hours
		Total	20		21 or 22
VIII	24PHYMAJ406	Advanced Quantum Mechanics	4	0	4
	24PHYMAJ407	Advanced Electrodynamics	3	1	3 + 2
	24PHYMAJ408	Introduction to Nanophysics	4	0	4
	24PHYMAJ409	Advanced Solid State Physics	4	0	4
		OR			
	24PHYMAJ410	Research	8		8
	Single Major only				
	Major B12	Syllabus framed outside Department	4		-
		Total	20		17
	Dual Major only				
	24PHYMAJ411	Astronomy and Astrophysics	4	0	4
		Total	20		21
Grand Total		Single Major	167		147 or 148
		Dual Major	175		131 or 132

1. Programme Matrix of Courses offered by the Department of Physics (1st Year)

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	24PHYMAJ101	Major	Mechanics and Properties of Matter	4	3+0+1	75	100
	24PHYSEC101	SEC	Practical Electricity	3	2+0+1	60	100
	24PHYMDC101	MDC	Astronomy and Cosmology for the Curious	3	3+0+0	45	100

	24PHYVAC101	VAC	Mathematical Review for Physics	2	1+1+0	30	50
	Total			12		210	
II	24PHYMAJ102	Major	Calculus and Intro to Linear Analysis	4	3+1+0	60	100
	24PHYMAJ103	Major	Electricity and Magnetism	4	3+0+1	75	100
	24PHYSEC101	SEC	Practical Electricity	3	2+0+1	60	100
	24PHYMDC102	MDC	Quantum Physics for the Curious	3	3+0+0	45	100
	Total			14		240	

Students' Progression Mapping			
RBT - Cognitive Level Mapping		Dave's Psychomotor Mapping	
Symbols	Meaning	Symbols	Meaning
R	Remembering	I	Imitation
U	Understanding	M	Manipulation
A1	Applying	P	Precision
A2	Analysing	A	Articulation
E	Evaluating	N	Naturalization
C	Creating		

SEMESTER - I**24PHYMAJ101 - Mechanics and Properties of Matter****Course Description**

Course Code	24PHYMAJ101
Course Title	Mechanics and Properties of Matter
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2024
Course Overview	This course: - Aims to train the students in the basic knowledge of Physics, and the laws governing it. - Helps to introduce the students to conservation laws and their utility in understanding the behaviour of physical systems. - Focuses on the motion of rigid bodies about any fixed point and any arbitrary axis passing through this point. - Helps the students understand the elastic properties of materials and the Physics behind the characteristics of liquids. - Helps the students develop knowledge of the central force and its characteristics, including gravitation. - Teaches the basics of harmonic motion and its characteristics. It will help the students understand the periodic motions in Nature.
Prerequisite	Students must have an introductory knowledge of kinematics in 1 and 2D, linear and rotational motion, energy, elasticity, Newtonian gravitation, and oscillations. Must take PHYVAC101 concurrently.
Course Objectives	A student will be able to:

	i. Acquire preliminary knowledge of the laws of motion, the concept of Galilean invariance, the system of particles, and collisions. ii. Demonstrate the concepts of conservative and non-conservative forces, fictitious forces, translational and rotational dynamics and the ability to calculate the moment of inertia of various rigid bodies. iii. Describe the general properties of matter and the principles of elasticity, fluid flow, viscosity, and surface tension. iv. Analyse the laws of gravitation and central force motion and derive Kepler’s law to demonstrate the motion of planets. v. Explain the phenomenon of simple harmonic motion and the properties of the systems executing it.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define and identify the fundamental laws of motion and associated concepts such as collisions	R		
CO2	Distinguish between inertial and non-inertial reference frames and interpret the physical consequences arising from them.	U		
CO3	Apply the motion of a particle under central force motion to demonstrate the properties and characteristics of gravitation.	A1		
CO4	Examine and investigate the general properties of matter and various physical constants.	A2		
CO5	Evaluate the differential equation of simple harmonic motion and assess the nature of oscillations.	E		
CO6	Construct the motion of a rigid body including translational & rotational motion.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Fundamentals of Dynamics and Non-Inertial Systems	13	1, 2	R U

	Laws of motion, Galilean transformation, Conservation laws, System of particles and Centre of Mass. Elastic and Inelastic collisions, Laboratory and Centre of Mass frames. Conservative and non-conservative forces, Potential Energy. Potential energy curves and equilibrium. Work done by non-conservative forces. Law of Conservation of Energy. Non-inertial frames and fictitious forces. Uniformly rotating frame. Rotating coordinate systems. Centrifugal force. Coriolis force.			A1 A2 E C
Unit II	Rotational Dynamics: Angular momentum of a particle and system of particles, Torque, Conservation of angular momentum, Rotation about a fixed axis, Rotational energy Moment of Inertia, Theorem of perpendicular axis and Theorem of parallel axes. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies.	7	1, 6	R U A1 A2 E C
Unit III	Properties of Matter Elasticity: Stress-Strain diagram, Young's modulus, Bulk's modulus and modulus of rigidity, Poisson's ratio, Relation between Elastic constants (no derivation). Work done in stretching and in twisting a wire, twisting torque on a cylinder or wire. Viscosity: Streamline and Turbulent flow, Equation of Continuity, Coefficient of Viscosity by Poiseuille's method and Stoke's method. Surface Tension: Relation between surface tension and surface energy, pressure difference across curved surface, excess pressure inside spherical liquid drop. Angle of	9	4	R U A1 A2 E C

	Contact and capillary ascent. Measurement of surface tension.			
Unit IV	Gravitation and Central Force Motion Law of Gravitation. Gravitational potential energy, potential, and field intensity. Motion of a particle under a central force field. Two-body problem, its reduction to a one-body problem, and its solution. The energy equation and energy diagram. Kepler's Laws. Satellites in circular orbits and escape velocity.	10	3	R U A1 A2 E C
Unit V	Oscillations Simple Harmonic Motion, its differential equation and solution. Vertical oscillations of the light loaded spring, expression for force constant and determination of acceleration due to gravity. Energy and their time-average values. Damped oscillations. Forced oscillations (qualitative discussions).	6	5	R U A1 A2 E C

Learning Resources:

Text Books

1. Mathur, D.S. (2000). *Mechanics*. S. Chand & Co.
2. Lal B. & Subrahmanyam N. (2002). *Properties of matter*. S. Chand & Co
3. Murugesan R. (2010). *Elements of properties of matter*. S. Chand & Co.
4. Chatterjee, H. & Sengupta, R. (2010). *A treatise on general properties of matter* (7th rev. ed.). New Central Book Agency (P) Limited

Suggested readings

1. Kittel, K., Knight, W. D., Ruderman, M. A., Helmholz, A. C., & Moyer, B. J. (2011). *Mechanics*. Tata McGraw-Hill
2. Halliday, D., Resnick, R., & Walker, J. (2007) *Fundamentals of physics*. John Wiley & Sons
3. Kleppner, D. & Kolenkow, R. J. (2017) *An introduction to mechanics*. McGraw Hill Education

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Practicals

Course Code	24PHYMAJ101
Course Title	Mechanics and Properties of Matter
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2024
Course Overview	This course: - Helps introduce students to different measuring instruments and their applications and significance. - Emphasises the need to have hands-on experience with the measurement of physical quantities and understand the theoretical concepts through practical means. - Aims to help in estimating the physical properties of rigid bodies and the elastic and mechanical properties of different materials using scientific instruments. - Aims to help in assessing the properties of liquids through simple experiments.
Prerequisite	Students must have an introductory knowledge of kinematics in 1 and 2D, linear and rotational motion, energy, elasticity, Newtonian gravitation, and oscillations. Must take PHYVAC101 concurrently
Course Objectives	A student will be able to: - Identify, choose, and calibrate appropriate measuring instruments for a particular experiment. - Record experimental data in a systematic manner and compute the results using the right physical or mathematical procedures. - Interpret and communicate their results in an appropriate manner using written reports with the necessary data visualizations. - Check the credibility of theoretical claims from experiments. - Nurture their scientific temperament and encourage them to build upon their experience gained from conducting experiments.

Course Outcomes based on Dave's Psychomotor Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of mechanical and elastic properties.	I		
CO2	Recreate any previously imitated experiment on the study of mechanical and elastic properties.	M		
CO3	Demonstrate skilled use of common measuring instruments such as callipers, gauges, measuring telescopes, etc.	P		
CO4	Be proficient in the setup and use of experimental apparatus used for the study of mechanical and elastic properties.	P		
CO5	Adapt or modify previously imitated experiments to analyze new mechanical and elastic properties.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. Measurements of dimensions of a physical object using vernier calliper, screw gauge and travelling microscope 2. Determination of g and velocity of freely falling body using digital timing technique 3. To study the motion of a spring and calculate: (a) it's spring constant, (b) modulus of rigidity of the spring material and (c) value of g . 4. To measure the radius of curvature of a spherical surface using a spherometer	30	1, 2, 3,4,5	I M P A

	5. To determine the value of g using a bar pendulum 6. To determine the surface tension of a liquid by capillary tube method 7. To determine the modulus of rigidity of the material of a wire by dynamical method 8. To determine the modulus of rigidity of the material of a wire by static method 9. To determine the modulus of rigidity of the material of a wire by Maxwell's needle 10. To determine the Young's modulus of the material of a wire by optical lever method 11. To determine the moment of inertia of a flywheel <i>A minimum of EIGHT (8) experiments is to be performed</i>			
Learning Resources: Text Books 1. Chattopadhyay, D. & Rakshit, P. C. (2011). <i>An advanced course in practical physics</i>. New Central Book Agency (P) Limited 2. Raychaudhuri, D. P. (n.d.). <i>Manual of practical physics</i>. Allied Book Agency 3. Dasgupta, C.R. (1985). <i>A handbook of practical physics</i>. Book Syndicate Private Limited 4. Singh, H. & Hemne, P.S. (2022). <i>B.Sc. practical physics</i>. S. Chand & Co. 5. Chandra, B. (2023). <i>PHY MAJ102P:Mechanics - Lab guidebook for practicals</i>. (n.p.)				

Prepared by:	Checked and verified by:	Approved by:
(Signature) Mr. Mayukh Mazumdar (Signature) Dr. Prajwal Chettri	(Signature) Dr. Prajwal Chettri Vice-Chairperson	(Signature) Mr. Subhajit Paul Chairperson

24PHYSEC101 - Practical Electricity**Course Description**

Course Code	24PHYSEC101
Course Title	Practical Electricity
Credits	3
Total Hours	60
Hours per Week	4
Course Type	Skill Enhancement Course
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2024
Course Overview	This course: - Teaches a student the basic concepts and laws of electrical circuits. - Familiarizes a student to the concepts of transients in electrical circuits (CR, LR, LCR) and resonance. - Provides a working knowledge for the analysis of DC and AC circuits. - Introduces a student to active and passive electrical components.. - Acquaints the student on the principle and working of motors, generators, and transformers.
Prerequisite	Students must have an introductory knowledge of electromagnetic theory and electric circuits.
Course Objectives	A student will be able to: - Understand the basic concepts and laws of electrical circuits, such as voltage, current, resistance, Ohm's Law, etc., and their applications. - Develop techniques to analyze and solve electrical circuits using Kirchhoff's laws, nodal analysis, and mesh analysis. - Identify and understand the characteristics of active and passive electrical components as well as analyze the transient and steady-state responses of circuits.

	iv. Construct equivalent electrical circuits using various network simplification theorems. v. Understand the principles of electrical power generation, transmission, and distribution along with different types of electrical systems, such as single-phase and three-phase systems.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Identify and recall the basic concepts and laws of electrical circuits.	R		
CO2	Summarize the principles of electrical power generation, transmission, and distribution along with different types of electrical systems.	U		
CO3	Apply techniques of analysis such as Kirchhoff's laws, nodal analysis, mesh analysis, etc., to calculate electrical circuit parameters.	A1		
CO4	Analyze various active and passive electrical components and investigate their characteristics and behaviour in electric circuits.	A2		
CO5	Judge and evaluate the transient response, steady state response and phenomenon of resonance in electrical circuits.	E		
CO6	Use the principles of DC and AC circuit analysis to formulate the solution to different electrical circuit problems.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Basic Electricity Principles Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel combinations. Ammeters, voltmeters, galvanometers and conversion of galvanometer to either instrument. AC Electricity and DC Electricity. Ideal	6	1, 4	R U A1 A2 E C

	Constant-voltage and Constant-current Sources.			
Unit II	Electrical Circuits AC Circuits: Kirchhoff's laws for AC circuits. Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC and AC sources. DC circuit theory: Kirchhoff's laws for DC circuits, voltage division, current division, Y (Wye)-delta transformations. RC and RL in DC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit	9	1, 3, 4	R U A1 A2 E C
Unit III	Network theorems Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits.	8	3	R U A1 A2 E C
Unit IV	Generators, Motors and Transformers DC Power sources. AC/DC generators. Single-phase, three-phase & DC motors. Basic design. Speed & power of ac motor Operation of transformers.	7	1,6	R U A1 A2 E C

Learning Resources:

Text Books

1. Mahajan, S., & Choudhury, S. R. (2017). *Electricity, magnetism and electromagnetic theory*. Tata McGraw-Hill
2. Yarwood, J. (1973). *Electricity and magnetism*. University Tutorial Press.
<https://archive.org/details/electricitymagne0000yarw/page/n7/mode/2up>
3. Say, M. G. (2002). *Performance and design of alternating current machines* (3rd ed.). CBS Publishers and Distributors.
4. Theraja, B. L., Theraja, A. K., & Tarnekar, S. G. (2019). *A textbook of electrical technology: Basic electrical engineering* (Volume 1) (23rd rev. ed.). S Chand & Co.
5. Theraja, B. L., Theraja, A. K., & Tarnekar, S. G. (2019). *A textbook of electrical technology: AC & DC machines* (Volume 2) (23rd rev. ed.). S Chand & Co.
6. Purcell, E. M., & Morin, D. J. (2013) *Electricity and magnetism* (3rd ed.). Cambridge University Press

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Practicals

Course Code	24PHYSEC101
Course Title	Practical Electricity
Credits	3
Total Hours	60
Hours per Week	4
Course Type	Skill Enhancement Course
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2024
Course Overview	This course: - Acquaints the student with different circuit components and circuit laws. - Provides hands-on experience with the measurement of physical quantities and understanding theoretical concepts through experiments. - Teaches a student important properties related to transient phenomena of electricity through experiments. - Trains a student to analyze an electrical circuit using Kirchhoff's laws and network simplification theorems.
Prerequisite	Students must have an introductory knowledge of electromagnetic theory and electric circuits.
Course Objectives	A student will be able to: - Explain the transient characteristics of an electrical circuit. - Verify the network theorems experimentally. - Understand and analyze the characteristics of series and parallel resonant LCR circuits. - Construct a single phase DC motor and find the average power generated by the motor. - Understand the working principle of potentiometer and its application in calibration of voltmeter and ammeter.
Course Outcomes based on Dave's Psychomotor Mapping	

At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Replicate the steps required to familiarise themselves with experiments and instruments related to the study of electric circuits.	I		
CO2	Recreate any previously imitated experiment on the study of electric circuits.	M		
CO3	Demonstrate skilled use of common electrical instruments such as multimeters, potentiometer, bread boards, etc.	P		
CO4	Be proficient in the setup and use of experimental apparatus used for the study of electric circuits.	P		
CO5	Adapt or modify previously imitated experiments to analyze new properties from electric circuits.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. To study the characteristics of a series RC Circuit. 2. To verify the Thevenin theorem. 3. To verify the Norton theorem. 4. To verify the Superposition, and Maximum power transfer theorems. 5. To study the response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width. 6. To study the response curve of a parallel LCR circuit and determine its (a) Anti- resonant frequency and (b) Quality factor Q.	30	1, 2, 3,4,5	I M P A

	7. To construct a single phase DC motor and to find the average power generated by the motor. 8. To calibrate voltmeter and ammeter using potentiometer.			

Learning Resources:

Text Books

1. Chattopadhyay, D., & Rakshit, P. C. (2011). *An advanced course in practical physics*. New Central Book Agency (P) Limited
2. Raychaudhuri, D. P. (n.d.). *Manual of practical physics*. Allied Book Agency
3. Dasgupta, C.R. (1985). *A handbook of practical physics*. Book Syndicate Private Limited
4. Singh, H., & Hemne, P.S. (2022). *B.Sc. practical physics*. S. Chand & Co.

Prepared by:	Checked and verified by:	Approved by:
(Signature) Dr. Digvijay Kharga	(Signature) Dr. Prajwal Chettri Vice-Chairperson	(Signature) Mr. Subhajit Paul Chairperson

24PHYMDC101 - Astronomy and Cosmology for the Curious

Course Description

Course Code	24PHYMDC101
Course Title	Astronomy and Cosmology for the Curious
Credits	3
Total Hours	45
Hours per Week	3
Course Type	Multi-Disciplinary Course
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	All Students (except students who have studied Physics in high school)
Regulation	2024
Course Overview	This course: - Introduces a student to the large scale structure of the Universe at a qualitative level without any mathematical or technical prerequisites. - Introduces the student to the history of astronomy in India and abroad until the discovery of universal gravitation. - Gives the student an overview of the Solar System and its major components, stars and galaxies. - Introduces the student to the Lambda-CDM Standard Model of cosmology in simple terms. - Briefly acquaints the student with the biggest open problems in modern day cosmology.
Prerequisite	Students must have graduated from higher secondary school. Students cannot have studied physics in classes 11 & 12.
Course Objectives	A student will be able to: - Understand and appreciate the history of astronomy in India and abroad until the discovery of universal gravitation. - Identify and summarise the important properties of all major bodies in the Solar System. - Summarize the processes of the creation and evolution of stars, how they radiate energy, and how they form galaxies.

	iv. Understand the arguments for Big Bang cosmology, summarise the evolution of the Universe, and discuss open problems in cosmology.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Recall the history of astronomy in India and abroad until the discovery of universal gravitation.	R		
CO2	Distinguish between the different major bodies within the Solar System and summarise their properties.	U		
CO3	Apply qualitative physical arguments for the acceptance of the Big Bang and the current Standard Model of cosmology.	A1		
CO4	Categorize and outline different open problems in cosmology like dark matter, dark energy, the fate of the Universe, etc.	A2		
CO5	Critique important space agencies and significant space missions and probes.	E		
CO6	Propose how the gravitational forces and fusion process within stars lead to their evolution as a singular entity and as a group in galaxies.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	A Brief History of Astronomy till 1700 CE <i>Astronomy in India:</i> Astronomy in the <i>Vedas</i> , Important Indian astronomers and their contributions <i>Birth of modern astronomy:</i> Astronomy before Copernicus, Heliocentric model of Copernicus; Kepler's laws; Galileo's arguments; Newton and universal gravitation; Basic principles of telescopes	7	1	R U A1 A2 E C

Unit II	The Solar System <i>The Sun:</i> Structure and properties, Solar phenomena, Solar cycle and its effects on Earth <i>The Earth and Moon:</i> Earth: Rotation and revolution, The seasons; Moon: Craters, Tides, Phases, Solar and lunar eclipses, Theories of lunar origin <i>The planets:</i> The terrestrial planets, Gas giants, Ice giants; Great Red Spot, Saturn's Rings and their origin, Axial tilt of Uranus, Important moons <i>Dwarf planets and the outer regions:</i> The asteroid belt, Meteors and meteorites, Comets, Dwarf planets, The Oort cloud, Exoplanets	10	2	R U A1 A2 E C
Unit III	Stars and Galaxies <i>Setting the stage:</i> Einstein's energy-mass equivalence, Overview of nuclear fusion <i>The birth and evolution of a star:</i> Protostars, Brown dwarfs, Main sequence stars, Stellar fusion processes, White dwarfs, Red giants <i>The "death" of a star:</i> Supergiants, Supernovae, Neutron stars and pulsars, Black holes and wormholes, The origin and fate of the Solar System <i>Deciphering objects far away:</i> Measuring cosmological distances, Morphological types of galaxies <i>The galactic Universe:</i> Evolution of galaxies, Clusters and groups, Superclusters, Filaments, Overview of the Milky Way (<i>Aakash Ganga</i>) and the Local Group	13	6	R U A1 A2 E C
Unit IV	Cosmology <i>Setting the stage:</i> Spacetime, Overview of	7	3, 4	R U A1

	Einstein's special and general relativity <i>The Universe in motion:</i> Discovery of the expanding Universe, The Big Bang; The formation of matter; The Dark Ages; The first stars and galaxies; The present state of the Universe (qualitative discussion of topics)			A2 E C
Unit V	Cosmic Mysteries <i>What can we detect but not see?</i> Dark matter and dark energy in the Universe <i>How will all things "end"?</i> The fate of the Universe: Big Crunch, eternal expansion, Big Rip scenarios <i>Search for extraterrestrial intelligence:</i> The Drake equation, Astrobiology and biosignatures, The Goldilocks zone, Possibility of life and human colonization in the Solar System, The Fermi paradox	8	5	R U A1 A2 E C
Learning Resources: Text Books - Chandra, B. (2024). <i>Astronomy and cosmology for the curious</i> (2nd Ed., Lecture notes). Suggested readings - Ruggles, C.L.N. (Ed.). <i>Handbook of archaeoastronomy and ethnoastronomy</i>. Springer Reference. - Holton, G. & Brush, S.G. (2005). <i>Physics, the human adventure: From Copernicus to Einstein and beyond</i>. Rutgers University Press. - Chaisson, E., & McMillan, S. (2018). <i>Astronomy today</i> (9th ed.). Pearson. - Griffiths, D. J. (2012). <i>Revolutions in Twentieth-century physics</i>. Cambridge University Press				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

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24PHYVAC101 - Mathematical Review for Physics

Course Description

Course Code	24PHYVAC101
Course Title	Mathematical Review for Physics
Credits	2
Total Hours	30
Hours per Week	2
Course Type	Value Added Course
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2024
Course Overview	This course: - Aims to recapitulate the concepts of vector algebra. - Teaches the fundamentals and basic operations of matrices. - Helps to explore the concepts and applications of single variable differential calculus. - Helps to explore the concepts and applications of single variable integral (antiderivative) calculus. - Aims to recapitulate basic understanding of complex numbers and their geometrical meaning.
Prerequisite	Students must be majoring in Physics. Students must have studied mathematics till Class 10.
Course Objectives	A student will be able to: - Explain and depict the scalar and vector products of vectors. - Develop skills in finding determinants and inverse of matrices, and applying them to solve mathematical problems. - Develop skills in the computation of derivatives and their applications to physics based problems. - Demonstrate the concepts of integral calculus and its applications. - Identify and apply different methods of integration to a given problem on integration. - Introduce the concepts of complex numbers.

Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe the concepts of vector algebra and matrices.	R		
CO2	Explain the importance of vector quantities in physics-based problems.	U		
CO3	Calculate the root, power and logarithm of complex numbers.	A1		
CO4	Analyze the derivatives and integrals of functions of single variables.	A2		
CO5	Discriminate between invertible and non-invertible matrices, and evaluate the Taylor series expansion of different functions.	E		
CO6	Construct and compose appropriate methods for given problems on integration and differentiation.	C		
Course Content				
Session Number	Content	Total Hours	COs	RBT
Unit I	Vector Algebra and Matrices Review of scalars and vectors; components of vectors; scalar product; vector product and interpretation as area; scalar triple product and interpretation as volume; vector triple product. Basic matrix algebra, Transpose, Trace, Determinant, Inverse, Special matrices: diagonal, triangular, symmetric and antisymmetric, orthogonal, Hermitian and anti-Hermitian, unitary (definitions only).	7		R U A1 A2 E
Unit II	Differential Calculus Functions of a single variable: the derivative; chain rule; higher order derivatives; derivatives of trigonometric, exponential, logarithmic and inverse trigonometric functions; implicit differentiation; maxima and minima; Taylor series approximation.	8		R U A1 A2 E

Unit III	Integral Calculus Indefinite integrals; integrals by substitution; integration by parts; integrals involving trigonometric, exponential, logarithmic and inverse trigonometric functions, definite integrals; area under curves; special techniques of integration: trigonometric substitution, partial fractions, completing the square, polar coordinates, etc., common integral identities.	10		R U A1 A2 E
Unit IV	Complex Numbers Complex numbers; Argand plane; Euler's formula; De Moivre's theorem; powers, roots, and logarithms of complex numbers.	5		R U A1 A2 E
Learning Resources: Textbooks 1. National Council of Educational Research and Training. (2022). <i>Mathematics: Textbook for Class XII Part I</i> (Rev ed.). NCERT 2. National Council of Educational Research and Training. (2023). <i>Mathematics: Textbook for Class XII Part II</i> (Rev ed.). NCERT 3. Riley, K.F., Hobson, M.P., & Bence, S.J. (2018). <i>Mathematical methods for physics and engineering</i> (3rd ed.). Cambridge University Press 4. Simmons, G. F. (1995). <i>Calculus with Analytic Geometry</i> (2nd ed.). McGraw-Hill Suggested Readings 1. Spiegel, M., Lipschutz, S., & Spellman, D. (2009). <i>Schaum's outlines: Vector analysis</i> (2nd ed.). McGraw-Hill Education 2. Anton, H., Bivens, I., & Davis Stephens. (2015). <i>Calculus</i> (10th ed.). Wiley				

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SEMESTER – II**24PHYMAJ102 - Calculus and Intro to Linear Analysis****Course Description**

Course Code	24PHYMAJ102
Course Title	Calculus and Intro to Linear Analysis
Credits	4
Total Hours	60
Hours per Week	4
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2024
Course Overview	This course: - Aims to recapitulate basic understanding of matrices. - Helps to explore the application of calculus in physics based problems. - Helps to understand and apply the concept of vectors. - Teaches the basic operations of vectors.
Prerequisite	Students must have introductory knowledge of matrices, vectors and calculus OR students should have completed PHYVAC101.
Course Objectives	A student will be able to: - Develop skills in finding eigen values and eigen vectors of matrices and applying them to solve problems encountered in physics. - Develop skills in solving multivariable integrals and applying them to cases involving areas, volumes, and accumulation. - Understand the basic properties of vectors and their manipulation using addition, subtraction, scalar multiplication, and dot & cross products. - Understand vector equations and their applications in solving problems related to lines, planes, and curves.

	v. Introduce the concepts of vector differentiation and integration and their applications.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe the concepts of eigen values and eigen vectors using matrices in relation to the various physical and mathematical contexts.	R		
CO2	Explain the importance of vector quantities in physics-based problems and restate the operation of vector quantities.	U		
CO3	Classify and solve different kinds of derivatives, such as total, partial, exact and inexact derivatives, and apply them to physics-based problems.	A1		
CO4	Analyze the concept and properties of special functions such as Gamma function, Beta function, Dirac Delta function, etc., and apply them to solve numerical problems of physical interest.	A2		
CO5	Evaluate the different orthogonal coordinate systems and select the appropriate vector operations.	E		
CO6	Construct solutions for real-life physics-based problems using vector differentiation & vector integration.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Special Integrals The Gaussian integral; the Dirac delta function: representation as a limit of Gaussian and rectangular functions; basic properties Beta and Gamma functions and their properties; relation between beta and gamma	8	1, 2	R U A1 A2 E C

	functions; reduction of integrals to Gamma functions.			
Unit II	Multivariable Calculus Orthogonal Coordinate Systems: Cartesian, spherical polar, and cylindrical polar coordinates, Conversions between coordinate systems. Partial derivatives and total derivatives; exact and inexact differentials; chain rule for partial derivatives; directional derivatives and the gradient; constrained maximization using Lagrange multipliers	10	4	R U A1 A2 E C
Unit III	Matrices and Eigen Value Problem Review of determinants and special matrices; Eigen values and eigen vectors of a matrix; Properties of special matrices; Similarity transforms and diagonalization; Cayley-Hamilton theorem; Functions of matrices	12	3	R U A1 A2 E C
Unit IV	Vector Differentiation Curves, surfaces, scalar and vector fields; time derivatives of a vector function Directional and normal derivatives; gradient of a scalar field; divergence and curl of a vector field; the Laplacian operator; product rules and second derivatives of the del operator; gradient, divergence, curl and Laplacian in Cartesian, spherical and cylindrical coordinates	15	2, 5, 6	R U A1 A2 E C
Unit V	Vector Integration Parametric integrals of vector curves; infinitesimal line elements; line integrals and Green's theorem in a plane Multiple integrals and the Jacobian; infinitesimal surface and volume elements; surface integrals; areas of surfaces of revolution; volume integrals and determination of volumes; parameterization and coordinate conversions for integration	15	2, 5, 6	R U A1 A2 E C

	Flux of a vector field; Gauss' divergence theorem; Stoke's theorem; applications			
Learning Resources: Textbooks 1. Dass, H.K. & Verma, R. (2019). <i>Mathematical physics</i> (8th ed.). S. Chand Publishing 2. Gupta, B.D. (2022). <i>Mathematical physics</i> (4th ed.). S. Chand Publishing 3. Riley, K.F., Hobson, M.P., & Bence, S.J. (2018). <i>Mathematical methods for physics and engineering</i> (3rd ed.). Cambridge University Press 4. Nearing, J. (2010). <i>Mathematical tools for physicists</i>. Dover Publications. http://www-mdp.eng.cam.ac.uk/web/library/enginfo/textbooks_dvd_only/nearing/math_methods.pdf 5. Thomas, G., Hass, J., Heil, C., & Weir, M. (2018). <i>Thomas' calculus</i> (14th ed.). Pearson Education 6. Spiegel, M., Lipschutz, S., & Spellman, D. (2009). <i>Schaum's outlines: Vector analysis</i> (2nd ed.). McGraw-Hill Education Suggested Readings 1. Spiegel, M. (2009). <i>Schaum's outline of advanced mathematics for engineers and scientists</i>. McGraw-Hill Education 2. Anton, H., Bivens, I., & Davis Stephens. (2015). <i>Calculus</i> (10th ed.). Wiley 3. Kreyszig, E. (2017). <i>Advanced engineering mathematics</i> (10th ed.). Wiley 4. McMullen, C. (2018). <i>Essential calculus skills practice workbook with full solutions</i>. Zishka Publishing 5. Fleisch, D.A. (2012). <i>A student's guide to vectors and tensors</i>. Cambridge University Press				

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24PHYMAJ103 - Electricity and Magnetism**Course Description**

Course Code	24PHYMAJ103
Course Title	Electricity and Magnetism
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2024
Course Overview	This course: - Introduces a student to the basic mathematical concepts related to electromagnetic vector fields. - Teaches a student the fundamentals of electrostatics, energy density and their applications. - Acquaints the student with conductors, dielectrics and polarization. - Teaches a student the fundamentals of magnetostatics, steady current, magnetic flux, magnetic vector potential and their applications. - Gives the student an overview of magnetization and magnetic properties of materials - Teaches a student the basics of electromagnetic induction and introduces them to the electric and magnetic fields in an electromagnetic wave.
Prerequisite	Students must have an introductory knowledge of electrostatics, magnetostatics, and electromagnetic induction. Students must be taking PHYMAJ102 concurrently.
Course Objectives	A student will be able to: Understand the basic properties of static electricity and apply their concepts and mathematical techniques to different cases.

	ii. Apply the principles of electrostatics in conductors, dielectrics, bounds value problems and electric energy density, and their practical uses. iii. Demonstrate the principles of magnetostatics, magnetic vector potential and their applications. iv. Categorise the magnetic properties to matter in terms susceptibility, permeability, etc. v. Identify the connection between electricity & magnetism and allied phenomena such as electromagnetic induction. vi. Examine the electromagnetic theory using Maxwell’s equations and apply it to electromagnetic waves in different media.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe and define the basic concepts of electrostatics, magnetostatics and electromagnetic field vectors.	R		
CO2	Explain the fundamental concepts of electric potential, magnetic vector potential, electromagnetic induction, etc.	U		
CO3	Calculate the magnetic field, magnetic vector potential and energy stored for various steady-current carrying systems.	A1		
CO4	Examine the wave equations from Maxwell's equations for different media.	A2		
CO5	Discriminate between different types of magnetic properties of materials, such as dia-, para-, and ferro-magnetism.	E		
CO6	Formulate the electric field, electric potential, and energy stored for discrete and continuous charge systems using suitable methods.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT

Unit I	Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Coulomb's law. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry. Conservative nature of Electrostatic Field. Electrostatic Potential. Electrostatic boundary conditions. Laplace's and Poisson equations. Uniqueness theorem. Method of images.	12	1	R U A1 A2 E C
Unit II	Electrostatics in Conductors and Dielectrics: Conductors and Dielectrics, Electric Dipole, Dielectric Polarization, Gauss's law in Dielectric medium, Boundary Conditions. Electrostatic energy of a system of charged conductors, capacitors and their combinations, energy stored in a charged capacitor.	10	6	R U A1 A2 E C
Unit III	Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment. Ampere's Circuital Law and its application to (1) infinite straight wire, (2) Infinite planar surface current and (3) Solenoid. Properties of B: curl and divergence. Axial vector property of B and its consequences. Magnetic Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field.	8	2	R U A1 A2 E C
Unit IV	Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity (H). Magnetic Susceptibility and permeability. Relation between B, H, M. Comparison of Dia-, Para- and Ferromagnetism. B-H curve and hysteresis loss.	5	3	R U A1 A2 E C
Unit V	Electromagnetic Induction: Faraday's law. Self-Inductance and Mutual Inductance. Neumann's Formula. Energy stored in a Magnetic Field.	10	4, 5	R U A1 A2

	Electromagnetic Theory: Maxwell's equations, Poynting's vector and Poynting's theorem. Electromagnetic wave propagation (qualitative treatment). Polarization of plane electromagnetic waves (qualitative treatment), Methods of producing plane polarized light: simple reflection, double refraction and dichroism, Malus law.			E C
Learning Resources: Text Books 1. Ghosh, B. (2008). <i>Foundations of electricity and magnetism</i> (3rd rev. ed.). Books & Allied (P) Limited 2. Murugesan, R. (2019). <i>Electricity and magnetism</i> (10th ed.). S. Chand & Co. 3. Griffiths, D. J. (2015). <i>Introduction to electrodynamics</i> (4th ed.). Cambridge University Press 4. Sadiku, M. N. O. (2018). <i>Elements of electromagnetics</i> (7th ed.). Oxford University Press 5. Subrahmanyam, N., Lal, B., & Avadhanulu, M. N. (2006). <i>A textbook of optics</i> (23rd rev. ed.). S. Chand & Co. 6. Gupta, A. B. (2013). <i>Modern optics</i> (3rd ed.). Books & Allied (P) Limited Suggested readings 1. Purcell, E. M., & Morin, D. J. (2013). <i>Electricity and magnetism</i> (3rd ed.). Cambridge University Press 2. Manohara, S. R., & Shubha A. (2018). <i>Electricity, magnetism and electromagnetic theory</i>. S. Chand & Co.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Practicals

Course Code	24PHYMAJ103
Course Title	Electricity and Magnetism
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	II

Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2024	
Course Overview	This course: a. Trains a student to measure various physical quantities through a scientific approach. b. Aims to help the student in estimating various electric and magnetic properties of materials using scientific apparatus. c. Trains a student in the use of precision measurements, calibration, and error analysis.	
Prerequisite	Students must have an introductory knowledge of electrostatics, magnetostatics, and electromagnetic induction. Students must be taking PHYMAJ102 concurrently.	
Course Objectives	A student will be able to: i. Determine the unknown resistances by applying the principles of the potentiometer and Carey Foster’s bridge. ii. Determine the energy losses in B-H hysteresis and compute magnetic field strength and its gradient. iii. Produce and detect plane polarized light and graphically construct patterns to verify polarization laws. iv. Analyze plane polarized light and map it graphically. v. Understand the working principle of potentiometer and determine the internal resistance and emf of a cell. vi. Record experimental data in a systematic manner and hence construct the experiment report on paper. vii. Compute experimental results from the working formulae and graphs and interpret the results.	
Course Outcomes based on Dave’s Psychomotor Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of electricity and magnetism.	I
CO2	Recreate any previously imitated experiment on the study of electricity and magnetism.	M
CO3	Demonstrate skilled use of common measuring instruments such as	P

	galvanometers, Wheatstone bridges, polarizers, etc.			
CO4	Be proficient in the setup and use of experimental apparatus used for the study of electricity and magnetism.	P		
CO5	Adapt or modify previously imitated experiments to analyze new properties from electricity and magnetism.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. To determine an unknown Low Resistance using Potentiometer. 2. To determine an unknown Low Resistance using Carey Foster's Bridge. 3. Measurement of field strength B and its variation in a solenoid (determine dB/dx) 4. To determine self-inductance of a coil by Anderson's bridge. 5. To study polarization of light by reflection and determine the polarizing angle for air-glass interface. 6. To verify Malus law for plane polarized light. 7. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis. 8. To verify Malus law using plane glass plate and a polaroid. 9. To determine internal resistance of a cell using (a) potentiometer and (b) voltmeter & ammeter. 10. To measure large EMF by means of a potentiometer.	30	1, 2, 3,4,5	IMP A

	<i>A minimum of EIGHT (8) experiments is to be performed</i>			
Learning Resources: Text Books 1. Chattopadhyay, D., & Rakshit, P. C. (2011). <i>An advanced course in practical physics</i>. New Central Book Agency (P) Limited 2. Raychaudhuri, D. P. (n.d.). <i>Manual of practical physics</i>. Allied Book Agency 3. Dasgupta, C.R. (1985). <i>A handbook of practical physics</i>. Book Syndicate Private Limited 4. Singh, H., & Hemne, P.S. (2022). <i>B.Sc. practical physics</i>. S. Chand & Co.				

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24PHYSEC101 - Practical Electricity*

***Course contents will be same as offered in Sem I (for Major B students)**

Department of Physics, Salesian College (Autonomous)

24PHYMDC102 - Quantum Physics for the Curious

Course Description

Course Code	24PHYMDC102
Course Title	Quantum Physics for the Curious
Credits	3
Total Hours	45
Hours per Week	3
Course Type	Multi-Disciplinary Course
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	All Students (except students who have studied Physics)
Regulation	2024
Course Overview	This course: - Introduce a student to the physics of the very small at a qualitative level without any mathematical or technical prerequisites. - Introduce the student to the history of the development of quantum theory and its effect on physics - Give the student a qualitative overview of the Standard Model of particle physics and the experimental apparatus required. - Briefly acquaint the student with the practical applications of quantum theory. - Give the student an overview of the modern fields of quantum computing and quantum cryptography.
Prerequisite	Students must have graduated from higher secondary school. Students cannot have studied physics in classes 11 & 12.
Course Objectives	A student will be able to: - Understanding the history and reasons for the development of quantum theory. - Identifying the main ideas and developments in old quantum theory. - Identifying the main ideas and developments during the first quantum revolution and its impact on the foundations of physics.

	iv. Outlining the basic principles of the Standard Model of Particle Physics and its major components, and identifying the major experiments devoted to the field, e.g., CERN. v. Outlining the important practical applications of quantum theory in electronics, chemistry, telecommunications, and imaging. vi. Familiarizing themselves with the ideas of quantum entanglement and its extension into the modern fields of quantum cryptography and quantum computing.			
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe the history and identify the reasons for the development of quantum theory.	R		
CO2	Discuss the basic principles of the Standard Model of particle physics and summarize the major experiments devoted to the field.	U		
CO3	Qualitatively present the ideas of quantum entanglement and its applications.	A1		
CO4	Appraise the main ideas and developments during the first quantum revolution and analyze its impact on the foundations of physics.	A2		
CO5	Critique the main ideas and developments in old quantum theory and the first quantum revolution.	E		
CO6	Generate the important practical applications of quantum theory in electronics, chemistry, telecommunications, and imaging.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Old Quantum Theory <i>Background information:</i> The nature of waves; Einstein’s special theory of relativity;	12	1,5	R U A1 A2 E C

	The spectral lines of hydrogen; the ultraviolet catastrophe <i>Physics becomes confusing:</i> The introduction of quanta and the photon; early atomic models; the wave-particle duality of light.			
Unit II	The First Quantum Revolution <i>The birth of quantum mechanics:</i> Matter waves; Schrodinger's equation; Heisenberg's uncertainty principle; the two pictures of quantum mechanics <i>The death of classical physics:</i> the Copenhagen Interpretation; opposition to the Interpretation <i>A philosophical interlude:</i> The measurement problem (qualitative only); the Many-World's interpretation	11	4,5	R U A1 A2 E C
Unit III	The Standard Model of Particle Physics <i>The most fundamental of all things:</i> Spin; Antimatter; Discoveries of the electron, proton and neutron; Overview of the current Standard Model; Particle accelerators and current prospects (qualitative)	8	2	R U A1 A2 E C
Unit IV	Applications of Quantum Mechanics <i>Revolutions in technology:</i> Semiconductors and transistors; Lasers; MRIs; advanced microscopes; superconductivity (brief overview)	7	6	R U A1 A2 E C
Unit V	The Second Quantum Revolution <i>Quantum entanglement is weird:</i> EPR paradox; Bell's theorem (qualitative discussion of all topics)	7	3	R U A1 A2 E C

	Present day revolutions: Qubits; overview of quantum cryptography and quantum computing			
Learning Resources: Text Books 1. Chandra, B. (2023). <i>Quantum physics for the curious</i> (Lecture notes). Suggested readings 1. Ghirardi, G. (2007). <i>Sneaking a look at God's cards: Unravelling the mysteries of quantum mechanics</i> (Rev ed.). Princeton University Press. 2. Gamov, G. & Stannard, R. (2001). <i>The new world of Mr Tompkins</i> (3rd rev. ed.). Cambridge University Press 3. Helrich, C.S. (2021). <i>The quantum theory - origins and ideas: A historical primer for physics students</i> . Springer. 4. Crease, R.P. & Mann, C.C. (1996). <i>The second creation: Makers of the revolution in twentieth-century physics</i> (Rev ed.). Rutgers University Press. 5. Felder, G.N. & Felder, K. M. (2023). <i>Modern physics</i> . Cambridge University Press 6. Raymer, M.G. (2017). <i>Quantum physics: What everyone needs to know</i> . Oxford University Press 7. Jammer, M. (1989). <i>The conceptual development of quantum mechanics</i> . Tomash Publishers. 8. Kragh, H. (1999). <i>Quantum generations: A history of physics in the twentieth century</i> . Princeton University Press. 9. Zukav, G. (2009). <i>The dancing Wu Li masters</i> . HarperOne 10. Purrington, R.D. (2018). <i>The heroic age: The creation of quantum mechanics, 1925-1940</i> . Oxford University Press.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

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Syllabus



ENLIGHTENMENT TO PERFECTION

B.Sc. Honours Program in Physics Choice Based Credit System University of North Bengal

(Introduced from 2018-19 session)

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1. Scheme for CBCS Curriculum

1.1. Credit Distribution across Courses

		Credits	
Course Type	Total Papers	Theory + Practical	Theory*
Core Courses	14	14*4 =56 14*2 =28	14*5 =70 14*1=14
Discipline Specific Electives	4	4*4=16 4*2=8	4*5=20 4*1=4
Generic Electives	4	4*4=16 4*2=8	4*5=20 4*1=4
Ability Enhancement Language Courses	2	2*2=4	2*2=4
Skill Enhancement Courses	2	2*2=4	2*2=4

*Tutorials of 1 Credit will be conducted in case there is no practical component

1.2. Scheme for CBCS Curriculum:

Details of Semester wise distribution of courses

Semester	Course Name	Course Detail	Credits
I	Ability Enhancement Compulsory Course-I (AECC -I)	English communication / Environmental Science	2
	Core course-I	Mathematical Physics-I	4
	Core course-I Practical	Mathematical Physics-I Lab	2
	Core course-II	Mechanics	4
	Core course-II Practical	Mechanics Lab	2
	Generic Elective-1	Mechanics/Thermal Physics and Statistical Mechanics (Any one)	4
	Generic Elective-1 Practical	Mechanics Lab/Thermal Physics and Statistical Mechanics Lab (Any one)	2

II	Ability Enhancement Compulsory Course-II (AECC -II)	English communication / Environmental Science	2
	Core course-III	Electricity and Magnetism	4
	Core course-III Practical	Electricity and Magnetism Lab	2
	Core course-IV	Waves and Optics	4
	Core course-IV Practical	Waves and Optics Lab	2
	Generic Elective-2	Electricity and Magnetism/Wave optics (Any one)	4
	Generic Elective-2 Practical	Electricity and Magnetism Lab/Wave optics Lab (Any one)	2
III	Core course-V	Mathematical Physics-II	4
	Core course-V Practical	Mathematical Physics-II Lab	2
	Core course-VI	Thermal Physics	4
	Core course – VI Practical	Thermal Physics Lab	2
	Core course-VII	Digital Systems and Applications	4
	Core course-VII Practical	Digital Systems and Applications Lab	2
	Skill Enhancement Course-1	Computational Physics/Electrical circuits and Network (Any one)	2
	Generic Elective-3	Thermal Physics and Statistical Mechanics/Mechanics (Any one)	4
	Generic Elective-3 Practical	Thermal Physics and Statistical Mechanics Lab/Mechanics Lab (Any one)	2
IV	Core course-VIII	Mathematical Physics III	4
	Core course-VIII Practical	Mathematical Physics-III Lab	2
	Core course-IX	Elements of Modern Physics	4
	Core course-IX Practical	Elements of Modern Physics Lab	2
	Core course-X	Analog Systems and Applications	4
	Core course-X Practical	Analog Systems & Applications Lab	2
	Skill Enhancement Course-2	Basic Instrumentation Skills/ Renewable energy and Energy harvesting (Any one)	2
	Generic Elective-4	Wave optics/Electricity and Magnetism (Any one)	4
	Generic Elective-4 Practical	Wave optics Lab/Electricity and Magnetism Lab (Any one)	2

V	Core course–XI	Quantum Mechanics and Applications	4
	Core course–XI Practical	Quantum Mechanics and Applications Lab	2
	Core course–XII	Solid State Physics	4
	Core course–XII Practical	Solid State Physics Lab	2
	Discipline Specific Elective–1	Nano-materials and Applications/ Advanced Mathematical Physics I/ Classical dynamics (any two)	4
	Discipline Specific Elective– 1Practical	Nano-materials and Applications Lab/Advanced Mathematical Physics I Lab/Classical dynamics Lab (any two)	2
	Discipline Specific Elective–2	Nano-materials and Applications/ Advanced Mathematical Physics I/ Classical dynamics (any two)	4
	Discipline Specific Elective– 2Practical	Nano-materials and Applications Lab/Advanced Mathematical Physics I Lab/Classical dynamics Lab (any two)	2
VI	Core course–XIII	Electromagnetic Theory	4
	Core course–XIII Practical	Electromagnetic Theory Lab	2
	Core course–XIV	Statistical Mechanics	4
	Core course–XIV Practical	Statistical Mechanics Lab	2
	Discipline Specific Elective–3	Astrophysics and Astronomy/ Advanced Mathematical Physics II/ Nuclear and Particle Physics (any two)	5
	Discipline Specific Elective– 3 Practical	Astrophysics and Astronomy Tutorial/Advanced Mathematical Physics II Tutorial/Nuclear and Particle Physics Tutorial (any two)	1
	Discipline Specific Elective–4	Astrophysics and Astronomy/ Advanced Mathematical Physics II/ Nuclear and Particle Physics (any two)	5
	Discipline Specific Elective– 4 Practical	Astrophysics and Astronomy Tutorial/Advanced Mathematical Physics II Tutorial/Nuclear and Particle Physics Tutorial (any two)	1
Total Credits			140

1 credit= 1 hr/week for theory; 2 hrs/week for practical

1.3. Mode of Continuing Evaluation and Practicals

a. **Components of Continuing Evaluation** (Refer Regulation 15 ix & 15 xxiv)

Any two of the following components are to be followed for any particular paper:

Class Test/Projects/Seminar Presentations/term paper/reports

b. **Mode of Continuing Evaluation**

To be evaluated by the concerned paper teachers. If a paper is taught by a single teacher it should be evaluated by the teacher concerned **and another teacher nominated by the HOD/DIC of Physics Department of the college.**

c. **Practical Examination**

For Core papers:

Centre: Concerned College

Examiners: One internal examiner to be nominated by the concerned college and one external examiner to be nominated by the UGBOS, both the examiners are to be appointed by the Controller of Examinations. If the external examiner fails to perform the duty due to unavoidable circumstances it has to be substantiated by documentary evidence through proper channel. In absence of the external examiner, the Controller of Examinations in consultation with the Chairman, UGBOS will appoint the external examiner.

Distribution of marks: Lab Note Book – 2	Working Formula – 2	Experiment – 10
Results and Accuracy – 2	Viva-voce – 4	Total – 20

For all papers except the Core papers:

Centre: Concerned College

Examiners: Two internal examiners to be appointed by the Controller of Examinations being nominated by the concerned college.

Distribution of marks: Lab Note Book – 2	Working Formula – 2	Experiment – 10
Results and Accuracy – 2	Viva-voce – 4	Total – 20

Detailed syllabus

2. Core Subjects Syllabus

2.1. Core T1 – Mathematical Physics

Mathematical Physics

4 Credits

Calculus

Recapitulation: Limits, continuity, average and instantaneous quantities, differentiation. Plotting functions. Intuitive ideas of continuous, differentiable, etc. functions and plotting of curves. Approximation: Taylor and binomial series (statements only).

First Order and Second Order Differential equations: First Order Differential Equations and Integrating Factor. Homogeneous Equations with constant coefficients. Wronskian and general solution. Statement of existence and Uniqueness Theorem for Initial Value Problems. Particular Integral.

Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers.

Vector Calculus

Recapitulation of vectors: Properties of vectors under rotations. Scalar product and its invariance under rotations. Vector product, Scalar triple product and their interpretation in terms of area and volume respectively. Scalar and Vector fields.

Vector Differentiation: Directional derivatives and normal derivative. Gradient of a scalar field and its geometrical interpretation. Divergence and curl of a vector field. Del and Laplacian operators. Vector identities.

Vector Integration: Ordinary Integrals of Vectors. Multiple integrals, Jacobian. Notion of infinitesimal line, surface and volume elements. Line, surface and volume integrals of Vector fields. Flux of a vector field. Gauss' divergence theorem, Green's and Stokes Theorems and their applications (no rigorous proofs).

Orthogonal Curvilinear Coordinates

Orthogonal Curvilinear Coordinates. Derivation of Gradient, Divergence, Curl and Laplacian in Cartesian, Spherical and Cylindrical Coordinate Systems.

Introduction to probability

Independent random variables: Probability distribution functions; binomial, Gaussian, and Poisson, with examples. Mean and variance.

Dependent events: Conditional Probability. Bayes' Theorem and the idea of hypothesis testing.

Dirac Delta function and its properties

Definition of Dirac delta function. Representation as limit of a Gaussian function and rectangular function.

Properties of Dirac delta function.

Reference Books

- Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, F.E. Harris, 2013, 7th Edn., Elsevier.
- An introduction to ordinary differential equations, E.A. Coddington, 2009, PHI learning
- Differential Equations, George F. Simmons, 2007, McGraw Hill.
- Mathematical Tools for Physics, James Nearing, 2010, Dover Publications.
- Mathematical methods for Scientists and Engineers, D.A. McQuarrie, 2003, Viva Book
- Advanced Engineering Mathematics, D.G. Zill and W.S. Wright, 5 Ed., 2012, Jones and Bartlett Learning
- Mathematical Physics, Goswami, 1st edition, Cengage Learning
- Engineering Mathematics, S.Pal and S.C. Bhunia, 2015, Oxford University Press
- Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India.
- Essential Mathematical Methods, K.F.Riley & M.P.Hobson, 2011, Cambridge Univ. Press
- Mathematical methods in the Physical Sciences, M. L. Boas, 2005, Wiley.

2.2. Core P1 – Mathematical Physics Lab

Mathematical Physics

2 credits

Introduction and Overview

Computer architecture and organization, memory and Input/output devices

Basics of scientific computing

Binary and decimal arithmetic, Floating point numbers, algorithms, Sequence, Selection and Repetition, single and double precision arithmetic, underflow & overflow- emphasize the importance of making equations in terms of dimensionless variables, Iterative methods

Errors and error Analysis

Truncation and round off errors, Absolute and relative errors, Floating point computations.

Introduction to plotting graphs with Gnuplot

Basic 2D and 3D graph plotting - plotting functions and data files, fitting data using gnuplot's fit function, polar and parametric plots, modifying the appearance of graphs, Surface and contour plots, exporting plots.

Introduction to programming in Python/Fortran/C/C++:

Introduction to programming, constants, variables and data types, dynamical typing, operators and expressions, modules, I/O statements, iterables, compound statements, indentation in python, the if-elif-else block, for and while loops, nested compound statements, lists, tuples, dictionaries and strings, basic ideas of object oriented programming.

Programs

Sum & average of a list of numbers, largest of a given list of numbers and its location in the list, sorting of numbers in ascending descending order, Binary search

Random number generation

Area of circle, area of square, volume of sphere, value of pi (π)

Solution of Algebraic and Transcendental equations by Bisection, Newton Raphson and Secant methods

Solution in optics. Of linear and quadratic equation, solving

Interpolation by Newton Gregory Forward and Backward difference formula, Error estimation of linear interpolation

Evaluation of trigonometric functions e.g. $\sin \theta$, $\cos \theta$, $\tan \theta$, etc.

Numerical differentiation (Forward and Backward difference formula) and Integration (Trapezoidal and Simpson rules), Monte Carlo method

Given Position with equidistant time data to calculate velocity and acceleration and vice versa. Find the area of B-H Hysteresis loop

Solution of Ordinary Differential Equations (ODE) First order Differential equation Euler, modified Euler and Runge-Kutta (RK) second and fourth order methods

First order differential equation

- Radioactive decay
- Current in RC, LC circuits with DC source
- Newton's law of cooling
- Classical equations of motion

Attempt following problems using RK 4 order method

$$I = I_2 \left(\frac{\sin \alpha}{\alpha} \right)$$

Solve the coupled differential equations

$$\frac{dy}{dx} = y + x - \frac{x^3}{3}, \quad \frac{dy}{dx} = -x$$

$$\frac{dx}{dt} = y + x - \frac{x^3}{3}; \frac{dy}{dx} = -x$$

For four initial conditions $x(0) = 0$, $y(0) = -1, -2, -3, -4$.

Plot x vs y for each of the four initial conditions on the same screen for $0 \leq t \leq 15$

The differential equation describing the motion of a pendulum is $\frac{d^2\theta}{dt^2} = -\sin\theta$. The pendulum is released from rest at an angular displacement, i. e. $\theta(0) = \alpha$, and $\dot{\theta}(0) = 0$. Solve the equation for $\alpha = 0.1, 0.5$ & 1.0 and plot θ as a function of time in the range $0 \leq t \leq 8\pi$. Also plot the analytic solution valid for small θ $\sin\theta \approx \theta$.

Reference Books

- Introduction to Numerical Analysis, S.S. Sastry, 5th Edn. , 2012, PHI Learning Pvt. Ltd.
- Learning with Python-how to think like a computer scientist, J. Elkner, C. Meyer, and A. Downey, 2015, Dreamtech Press.
- Introduction to computation and programming using Python, J. Guttag, 2013, Prentice Hall India.
- Effective Computation in Physics- Field guide to research with Python, A. Scopatz and K.D. Huff, 2015, O’Rielly
- A first course in Numerical Methods, U.M. Ascher & C. Greif, 2012, PHI Learning.
- Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn . , 2007, Wiley India Edition.
- Numerical Methods for Scientists & Engineers, R.W. Hamming, 1973, Courier Dover Pub.
- An Introduction to computational Physics, T.Pang, 2nd Edn., 2006,Cambridge Univ. Press
- Computational Physics, Darren Walker, 1st Edn., 2015, Scientific International Pvt. Ltd.

2.3. Core T2 – Mechanics

Mechanics

4 Credits

Fundamentals of Dynamics

Reference frames. Inertial frames; Review of Newton’s Laws of Motion. Galilean transformations; Galilean invariance. Momentum of variable- mass system: motion of rocket. Motion of a projectile in Uniform gravitational field Dynamics of a system of particles. Centre of Mass. Principle of conservation of momentum. Impulse.

Work and Energy

Work and Kinetic Energy Theorem. Conservative and non- conservative forces. Potential Energy. Qualitative study of one dimensional motion from potential energy curves. Stable and unstable equilibrium. Elastic potential energy. Force as gradient of potential energy. Work & Potential energy. Work done by non- conservative forces. Law of conservation of Energy.

Collisions

Elastic and inelastic collisions between particles. Centre of Mass and Laboratory frames.

Rotational Dynamics

Angular momentum of a particle and system of particles. Torque. Principle of conservation of angular momentum. Rotation about a fixed axis. Moment of Inertia. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation.

Elasticity

Relation between Elastic constants. Twisting torque on a Cylinder or Wire.

Fluid Motion

Kinematics of Moving Fluids: Poiseuille's Equation for Flow of a Liquid through a Capillary Tube.

Gravitation and Central Force Motion

Law of gravitation. Gravitational potential energy. Inertial and gravitational mass. Potential and field due to spherical shell and solid sphere.

Motion of a particle under a central force field. Two-body problem and its reduction to one-body problem and its solution. The energy equation and energy diagram. Kepler's Laws. Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS).

Oscillations

SHM: Simple Harmonic Oscillations. Differential equation of SHM and its solution. Kinetic energy, potential energy, total energy and their time-average values. Damped oscillation. Forced oscillations: Transient and steady states; Resonance, sharpness of resonance; power dissipation and Quality Factor.

Non-Inertial Systems:

Non-inertial frames and fictitious forces. Uniformly rotating frame. Laws of Physics in rotating coordinate systems. Centrifugal force. Coriolis force and its applications. Components of Velocity and Acceleration in Cylindrical and Spherical Coordinate Systems.

Special Theory of Relativity

Michelson-Morley Experiment and its outcome. Postulates of Special Theory of Relativity. Lorentz Transformations. Simultaneity and order of events. Lorentz contraction. Time dilation. Relativistic transformation of velocity, frequency and wave number. Relativistic addition of velocities. Variation of mass with velocity. Massless Particles. Mass-energy Equivalence. Relativistic Doppler effect. Relativistic Kinematics. Transformation of Energy and Momentum.

Reference Books

- An introduction to mechanics, D. Kleppner, R.J. Kolenkow, 1973, McGraw-Hill.
- Mechanics, Berkeley Physics, vol.1, C.Kittel, W.Knight, et.al. 2007, Tata McGraw-Hill.
- Physics, Resnick, Halliday and Walker 8/e. 2008, Wiley.
- Analytical Mechanics, G.R. Fowles and G.L. Cassiday. 2005, Cengage Learning.
- Feynman Lectures, Vol. I, R.P.Feynman, R.B.Leighton, M.Sands, 2008, Pearson Education
- Introduction to Special Relativity, R. Resnick, 2005, John Wiley and Sons.
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

Additional Books for Reference

- Mechanics, D.S. Mathur, S. Chand and Company Limited, 2000
- University Physics. F.W Sears, M.W Zemansky, H.D Young 13/e, 1986, Addison Wesley
- Physics for scientists and Engineers with Modern Phys., J.W. Jewett, R.A. Serway, 2010, Cengage Learning
- Theoretical Mechanics, M.R. Spiegel, 2006, Tata McGraw Hill.

2.4. Core P2 – Mechanics Lab

Mechanics

2 Credits

General Topic

Discussion on random errors in observations.

List of Practical

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
2. To study the random error in observations.
3. To determine the height of a building using a Sextant.
4. To study the Motion of Spring and calculate, (a) Spring constant, (b) g and (c) Modulus of rigidity.
5. To determine the Moment of Inertia of a Flywheel.
6. To determine g and velocity for a freely falling body using Digital Timing Technique
7. To determine Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
8. To determine the Young's Modulus of a Wire by Optical Lever Method.
9. To determine the Modulus of Rigidity of a Wire by Maxwell's needle.
10. To determine the elastic Constants of a wire by Searle's method.
11. To determine the value of g using Bar Pendulum.
12. To determine the value of ' g ' using Kater's Pendulum.

Note: Some of these experiments may be too expensive to set up in all colleges. In particular, the digital timing technique is usually too costly, unless use is made of comparatively cheap solutions like the expeyes system developed by IUAC. It may be more feasible to leave the universities some freedom in choosing experiments that are similar in spirit, but more in keeping with equipment that may be already available in the labs.

Reference Books

- Advanced Practical Physics for students, B. L. Flint, H.T. Workshop, 1971, Asia Publishing House
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal
- Engineering Practical Physics, S. Panigrahi & B. Mallick, 2015, Cengage Learning India Pvt. Ltd.
- Practical Physics, G.L. Squires, 2015, 4th Edition, Cambridge University Press.

2.5. Core T3 - Electricity and Magnetism

Electricity and Magnetism Credits

4

Electric Field and Electric Potential

Electric field: Electric field lines. Electric flux. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry.

Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. The Uniqueness Theorem. Potential and Electric Field of a dipole. Force and Torque on a dipole.

Electrostatic energy of system of charges. Electrostatic energy of a charged sphere. Conductors in an electrostatic Field. Surface charge and force on a conductor. Capacitance of a system of charged conductors. Parallel-plate capacitor. Capacitance of an isolated conductor. Uniqueness theorem (statement). Method of Images and its application to: (1) Plane Infinite Sheet and (2) Sphere.

Dielectric Properties of Matter

Electric Field in matter. Polarization, Polarization Charges. Electrical Susceptibility and Dielectric Constant. Capacitor (parallel plate, spherical, cylindrical) filled with dielectric. Displacement vector D . Relations between E , P and D . Gauss' Law in dielectrics.

Magnetic Field

Magnetic force between current elements and definition of Magnetic Field B . Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole).

Ampere's Circuital Law and its application to (1) infinite straight wire, (2) Infinite planar surface current, and (3) Solenoid. Properties of B : curl and divergence. Axial vector property of B and its consequences. Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field.

Magnetic Properties of Matter

Magnetization vector (M). Magnetic Intensity (H). Magnetic Susceptibility and permeability. Relation between B , H , M . Ferromagnetism. B - H curve and hysteresis.

Electromagnetic Induction

Faraday's Law. Lenz's Law. Self-Inductance and Mutual Inductance. Reciprocity Theorem. Energy stored in a Magnetic Field. Introduction to Maxwell's Equations. Charge Conservation and Displacement current

Electrical Circuits

AC Circuits: Kirchhoff's laws for AC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit

Network theorems

Ideal Constant-voltage and Constant-current Sources. Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits

Note: For the sake of brevity, details of ballistic galvanometer may be omitted from the theory course. Some part of the theory may be needed for the experiments, but this can be covered as part of Practical.

Reference Books

- Electricity, Magnetism & Electromagnetic Theory, S. Mahajan and Choudhury, 2012, Tata McGraw
- Electricity and Magnetism, Edward M. Purcell, 1986 McGraw-Hill Education
- Introduction to Electrodynamics, D.J. Griffiths, 3rd Edn., 1998, Benjamin Cummings.
- Feynman Lectures Vol.2, R.P.Feynman, R.B.Leighton, M. Sands, 2008, Pearson Education
- Elements of Electromagnetics, M.N.O. Sadiku, 2010, Oxford University Press.
- Electricity and Magnetism, J.H.Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press.

2.6. Core P3 – Electricity and Magnetism Lab

Electricity and Magnetism

2 Credits

General topic

Use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, (d) Capacitances, and (e) Checking electrical fuses.

List of Practicals

1. To study the characteristics of a series RC Circuit.
2. To determine an unknown Low Resistance using Potentiometer.
3. To determine an unknown Low Resistance using Carey Foster's Bridge.
4. To determine the resistance of a galvanometer using Thomson's method.
5. Measurement of field strength B and its variation in a solenoid (determine dB/dx)
6. To verify the Thevenin and Norton theorems.
7. To verify the Superposition, and Maximum power transfer theorems.
8. To determine self-inductance of a coil by Anderson's bridge.
9. To study response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width.
10. To study the response curve of a parallel LCR circuit and determine its (a) Anti- resonant frequency and (b) Quality factor Q.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- Engineering Practical Physics, S.Panigrahi and B.Mallick, 2015, Cengage Learning.
- A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

2.7. Core T4 - Waves and Optics

Waves and Optics

4 Credits

Superposition of Collinear Harmonic oscillations

Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats).

Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences.

Superposition of two perpendicular Harmonic Oscillations

Graphical and Analytical Methods. Lissajous Figures with equal and unequal frequency and their uses.

Wave Motion

Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves

Velocity of Waves

Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction.

Superposition of Two Harmonic Waves

Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves.

Wave Optics

Electromagnetic nature of light. Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence.

Interference

Division of amplitude and wavefront. Young's double slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: Measurement of wavelength and refractive index.

Interferometer

Michelson Interferometer-(1) Idea of form of fringes (No theory required), (2) Determination of Wavelength, (3) Wavelength Difference, (4) Refractive Index, and (5) Visibility of Fringes. Fabry-Perot interferometer.

Diffraction and Holography

Kirchhoff's Integral Theorem, Fresnel-Kirchhoff's Integral formula. (Qualitative discussion only)

Fraunhofer diffraction: Single slit. Circular aperture, Resolving Power of a telescope. Double slit. Multiple slits. Diffraction grating. Resolving power of grating.

Fresnel Diffraction: Fresnel's Assumptions. Fresnel's Half-Period Zones for Plane Wave. Explanation of Rectilinear Propagation of Light. Theory of a Zone Plate: Multiple Foci of a Zone Plate. Fresnel's Integral, Fresnel diffraction pattern of a straight edge, a slit and a wire.

Holography: Principle of Holography. Recording and Reconstruction Method. Theory of Holography as Interference between two Plane Waves. Point source holograms.

Reference Books

- Waves: Berkeley Physics Course, vol. 3, Francis Crawford, 2007, Tata McGraw-Hill.
- Fundamentals of Optics, F.A. Jenkins and H.E. White, 1981, McGraw-Hill
- Principles of Optics, Max Born and Emil Wolf, 7th Edn., 1999, Pergamon Press.
- Optics, Ajoy Ghatak, 2008, Tata McGraw Hill
- The Physics of Vibrations and Waves, H. J. Pain, 2013, John Wiley and Sons.
- The Physics of Waves and Oscillations, N.K. Bajaj, 1998, Tata McGraw Hill.
- Fundamental of Optics, A. Kumar, H.R. Gulati and D.R. Khanna, 2011, R. Chand Publications.

2.8. Core P4 – Wave and Optics Lab

Wave and Optics

2 Credits

List of Practical

1. To determine the frequency of an electric tuning fork by Melde's experiment and verify $\lambda^2 - T$ law.
2. To investigate the motion of coupled oscillators.
3. To study Lissajous Figures.
4. Familiarization with: Schuster's focusing; determination of angle of prism.
5. To determine refractive index of the Material of a prism using sodium source.
6. To determine the dispersive power and Cauchy constants of the material of a prism using mercury source.
7. To determine the wavelength of sodium source using Michelson's interferometer.
8. To determine wavelength of sodium light using Fresnel Biprism.
9. To determine wavelength of sodium light using Newton's Rings.
10. To determine the thickness of a thin paper by measuring the width of the interference fringes produced by a wedge-shaped Film.
11. To determine wavelength of (1) Na source and (2) spectral lines of Hg source using plane diffraction grating.
12. To determine dispersive power and resolving power of a plane diffraction grating.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Laboratory Manual of Physics for undergraduate classes, D.P.Khandelwal, 1985, Vani Pub.

2.9. Core T5 - Mathematical Physics-II

Mathematical Physics – II

4 Credits

Fourier Series

Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series. Term-by-Term differentiation and integration of Fourier Series. Parseval Identity.

Frobenius Method and Special Functions

Singular Points of Second Order Linear Differential Equations and their importance. Frobenius method and its applications to differential equations. Legendre, Bessel, Hermite and Laguerre Differential Equations. Properties of Legendre Polynomials: Rodrigues Formula, Generating Function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre Polynomials. Bessel Functions of the First Kind: Generating Function, simple recurrence relations. Zeros of Bessel Functions ($J_0(x)$ and $J_1(x)$) and Orthogonality.

Some Special Integrals

Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral).

Variational calculus in physics

Functionals. Basic ideas of functionals. Extremization of action as a basic principle in mechanics. Lagrangian formulation. Euler's equations of motion for simple systems: harmonics oscillators, simple pendulum, spherical pendulum, coupled oscillators. Cyclic coordinates. Symmetries and conservation laws. Legendre transformations and the Hamiltonian formulation of mechanics. Canonical equations of motion. Applications to simple systems.

Partial Differential Equations

Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. Wave equation and its solution for vibrational modes of a stretched string, rectangular and circular membranes. Diffusion Equation.

Reference Books

- Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
- Fourier Analysis by M.R. Spiegel, 2004, Tata McGraw-Hill.
- Mathematics for Physicists, Susan M. Lea, 2004, Thomson Brooks/Cole.
- Differential Equations, George F. Simmons, 2006, Tata McGraw-Hill.
- Partial Differential Equations for Scientists & Engineers, S.J. Farlow, 1993, Dover Pub.
- Engineering Mathematics, S.Pal and S.C. Bhunia, 2015, Oxford University Press
- Mathematical methods for Scientists & Engineers, D.A. McQuarrie, 2003, Viva Books
- Mathematical Physics, P. K. Chattopadhyay, 2014, New Academic Science.

2.10. Core P5 – Mathematical Physics II Lab

Mathematical Physics II

2 Credits

Introduction to Numerical computation using numpy and scipy

Introduction to the python numpy module. Arrays in numpy, array operations, array item selection, slicing, shaping arrays. Basic linear algebra using the linalg submodule. Introduction to online graph plotting using matplotlib. Introduction to the scipy module. Uses in optimization and solution of differential equations.

Introduction to OCTAVE(if time permits)

Curve fitting, Least square fit, Goodness of fit, standard deviation

Ohms law to calculate R, Hooke's law to calculate spring constant

Solution of Linear system of equations by Gauss elimination method and Gauss Seidal method.

Diagonalization of matrices, Inverse of a matrix, Eigen vectors, eigen values problems

Solution of mesh equations of electric circuits (3 meshes) Solution of coupled spring mass systems (3 masses)

Generation of Special functions using User defined functions

Generating and plotting Legendre Polynomials Generating and plotting Bessel function

Solution of ODE First Order Differential equation Euler, modified Euler and Runge-Kutta second order methods Second order differential equation Fixed difference method

First order differential equation

1. Radioactive decay
2. Current in RC, LC circuits with DC source

3. Newton's law of cooling
4. Classical equations of motion Second order Differential Equation
5. Harmonic oscillator (no friction)
6. Damped Harmonic oscillator
7. Over damped
8. Critical damped
9. Oscillatory
10. Forced Harmonic oscillator
11. Transient and
12. Steady state solution
13. Apply above to LCR circuits also
14. Solve $x^2 \frac{d^2 y}{dx^2} - 4x(1+x) \frac{dy}{dx} + 2(1+x)y - x^3$ with the boundary condition at $x=1$,
15. $y = \frac{1}{2}e^x, \frac{dy}{dx} = \frac{-8}{2}e^x - 0.5$, in the range $1 \leq x \leq 3$. Plot y and $\frac{dy}{dx}$ against x in the given range in the same graph.

Partial differential equations

1. Wave equation
2. Heat equation
3. Poisson equation
4. Laplace equation

Reference Books

- Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
- Complex Variables, A.S. Fokas & M.J. Ablowitz, 8th Ed., 2011, Cambridge Univ. Press
- Numpy beginners guide, Idris Alba, 2015, Packt Publishing
- Computational Physics, D.Walker, 1st Edn., 2015, Scientific International Pvt. Ltd.
- Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB: Scientific and
- Engineering Applications: A.V. Wouwer, P. Saucez, C.V. Fernández. 2014 Springer

2.11. Core T6 - Thermal Physics

Thermal Physics

4 Credits

Introduction to Thermodynamics

Zeroth and First Law of Thermodynamics: Extensive and intensive Thermodynamic Variables, Thermodynamic Equilibrium, Zeroth Law of Thermodynamics & Concept of Temperature, Concept of Work & Heat, State Functions, First Law of Thermodynamics and its differential form, Internal Energy, First Law & various processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Co-efficient.

Second Law of Thermodynamics: Reversible and Irreversible process with examples. Conversion of Work into Heat and Heat into Work. Heat Engines. Carnot's Cycle, Carnot engine & efficiency. Refrigerator & coefficient of performance, 2nd Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence.

Carnot's Theorem. Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale.

Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Universe. Entropy Changes in Reversible and Irreversible Processes. Principle of Increase of Entropy. Temperature–Entropy diagrams for Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero.

Thermodynamic Potentials

Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Their Definitions, Properties and Applications. Surface Films and Variation of Surface Tension with Temperature. Magnetic Work, Cooling due to adiabatic demagnetization, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations

Maxwell's Thermodynamic Relations

Derivations and applications of Maxwell's Relations, Maxwell's Relations: (1) Clausius Clapeyron equation, (2) Values of C_p - C_v , (3) TdS Equations, (4) Joule-Kelvin coefficient for Ideal and Van der Waal Gases, (5) Energy equations, (6) Change of Temperature during Adiabatic Process.

Kinetic Theory of Gases

Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Doppler Broadening of Spectral Lines and Stern's Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases.

Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: (1) Viscosity, (2) Thermal Conductivity and (3) Diffusion. Brownian Motion and its Significance.

Real Gases: Behavior of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO₂ Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waal's Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. P-V Diagrams. Joule's Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule- Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule- Thomson Cooling.

Reference Books

- Heat and Thermodynamics, M.W. Zemansky, Richard Dittman, 1981, McGraw-Hill.
- Thermal Physics, S. Garg, R. Bansal and Ghosh, 2nd Edition, 1993, Tata McGraw-Hill
- Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer.
- Thermodynamics, Kinetic Theory & Statistical Thermodynamics, Sears & Salinger. 1988, Narosa.
- Concepts in Thermal Physics, S.J. Blundell and K.M. Blundell, 2nd Ed., 2012, Oxford University Press
- Thermodynamics and an introduction to thermostatistics, H. B. Callen, 1985, Wiley.
- Thermal Physics, A. Kumar and S.P. Taneja, 2014, R. Chand Publications.

2.12. Core P6 – Thermal Physics Lab

Thermal Physics

2 Credits

List of Practical

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barne's constant flow method.
2. To determine the Coefficient of Thermal Conductivity of Cu by Searle's Apparatus.
3. To determine the Coefficient of Thermal Conductivity of Cu by Angstrom's Method.
4. To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charlton's disc method.
5. To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT).
6. To study the variation of Thermo-Emf of a Thermocouple with Difference of Temperature of its Two Junctions.
7. To calibrate a thermocouple to measure temperature in a specified Range using (1) Null Method, (2) Direct measurement using Op-Amp difference amplifier and to determine Neutral Temperature

Reference Books

- Advanced Practical Physics for students, B. L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Laboratory Manual of Physics for undergraduate classes, D. P. Khandelwal, 1985, Vani Pub.

2.13. Core T7 - Digital Systems and Applications

Digital Systems and Applications

4 Credits

Integrated Circuits

Active & Passive components. Discrete components. Wafer. Chip. Advantages and drawbacks of ICs. Scale of integration: SSI, MSI, LSI and VLSI (basic idea and definitions only). Classification of ICs. Examples of Linear and Digital ICs.

Digital Circuits

Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion. BCD, Octal and Hexadecimal numbers. AND, OR and NOT Gates (realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates and application as Parity Checkers.

Boolean algebra

De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Idea of Minterms and Maxterms. Conversion of a Truth table into Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map.

Data processing circuits

Basic idea of Multiplexers, De-multiplexers, Decoders, Encoders.

Circuits

Arithmetic Circuits: Binary Addition. Binary Subtraction using 2's Complement. Half and Full Adders. Half &

Full Subtractors, 4-bit binary Adder/Subtractor.

Sequential Circuits: SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop. M/S JK Flip-Flop.

Timers

IC 555: block diagram and applications: Astable multivibrator and Monostable multivibrator.

Shift registers

Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

Counters (4 bits)

Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter.

Computer Organization

Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.

Reference Books

- Digital Principles and Applications, A.P. Malvino, D. P. Leach and Saha, 7th Ed., 2011, Tata McGraw
- Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
- Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
- Digital Electronics G K Kharate ,2010, Oxford University Press
- Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning
- Logic circuit design, Shimon P. Vingron, 2012, Springer.
- Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
- Digital Electronics, S.K. Mandal, 2010, 1st edition, McGraw Hill
- Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.

2.14. Core P7 – Digital Systems and Applications Lab

Digital Systems and Applications

2 Credits

List of Practical

1. To measure (a) Voltage, and (b) Time period of a periodic waveform using CRO.
2. To test a Diode and Transistor using a Multimeter.
3. To design a switch (NOT gate) using a transistor.
4. To verify and design AND, OR, NOT and XOR gates using NAND gates.
5. To design a combinational logic system for a specified Truth Table.
6. To convert a Boolean expression into logic circuit and design it using logic gate ICs.
7. To minimize a given logic circuit.
8. Half Adder, Full Adder and 4-bit binary Adder.
9. Half Subtractor, Full Subtractor, Adder-Subtractor using Full Adder I.C.
10. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.

11. To build JK Master-slave flip-flop using Flip-Flop ICs
12. To build a 4-bit Counter using D-type/JK Flip-Flop ICs and study timing diagram.
13. To make a 4-bit Shift Register (serial and parallel) using D-type/JK Flip-Flop ICs.
14. To design an astable multivibrator of given specifications using 555 Timer.
15. To design a monostable multivibrator of given specifications using 555 Timer.

Reference Books

- Modern Digital Electronics, R.P. Jain, 4th Edition, 2010, Tata McGraw Hill.
- Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.

2.15. Core T₈ - Mathematical Physics III

Mathematical Physics III

4 Credits

Complex Analysis

Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's Integral formula. Simply and multiply connected region. Laurent and Taylor's expansion. Residues and Residue Theorem. Application in solving Definite Integrals.

Integrals Transforms

Fourier Transforms: Fourier Integral theorem. Fourier Transform. Examples. Fourier transform of trigonometric, Gaussian, finite wave train & other functions. Representation of Dirac delta function as a Fourier Integral. Fourier transform of derivatives, Inverse Fourier transform, Convolution theorem. Properties of Fourier transforms (translation, change of scale, complex conjugation, etc.). Three dimensional Fourier transforms with examples. Application of Fourier Transforms to differential equations: One dimensional Wave and Diffusion/Heat Flow Equations.

Matrices

Addition and Multiplication of Matrices. Null Matrices. Diagonal, Scalar and Unit Matrices. Upper- Triangular and Lower-Triangular Matrices. Transpose of a Matrix. Symmetric and Skew-Symmetric Matrices. Conjugate of a Matrix. Hermitian and Skew-Hermitian Matrices. Singular and Non-Singular matrices. Orthogonal and Unitary Matrices. Trace of a Matrix. Inner Product

Eigen-values and Eigenvectors

Cayley- Hamilton Theorem. Diagonalization of Matrices. Solutions of Coupled Linear Ordinary Differential Equations. Functions of a Matrix.

Reference Books

- Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
- Mathematics for Physicists, P. Dennery and A.Krzywicki, 1967, Dover Publications
- Complex Variables, A.S.Fokas & M.J.Ablowitz, 8th Ed., 2011, Cambridge Univ. Press
- Complex Variables, A.K. Kapoor, 2014, Cambridge Univ. Press
- Complex Variables and Applications, J.W. Brown & R.V. Churchill, 7th Ed. 2003, Tata McGraw- Hill
- First course in complex analysis with applications, D.G. Zill and P.D. Shanahan, 1940, Jones & Bartlett

2.16. Core P8 – Mathematical Physics III Lab

Mathematical Physics III

2 Credits

List of Practical

1. Solve differential equations:

$$\frac{dy}{dx} = e^{-x} \text{ with } y = 0 \text{ for } x = 0$$

$$\frac{dy}{dx} + e^{-x} = x^2$$

$$\frac{d^2y}{dt^2} + 2\frac{dy}{dt} = -y$$

$$\frac{d^2y}{dt^2} + e^{-t}\frac{dy}{dt} = -y$$

2. Dirac Delta Function:

3. Evaluate $\frac{1}{\sqrt{2\pi}\sigma} \int e^{-\frac{(x-\mu)^2}{2\sigma^2}} (x+3) dx$, for $\sigma=1, .1, .01$ and show it tends to 5

4. Fourier Series Program to sum $\sum_{n=1}^{\infty} (.2)^n$ Evaluate the Fourier coefficients of a given periodic function (square wave)

5. Frobenius method and Special functions:

6. Show recursion relation

$$\int_{-1}^{+1} P_n(u)P_m(u)du = \delta_{n,m}$$

Plot $P_n(x)$, $J_\nu(x)$

7. Calculation of error for each data point of observations recorded in experiments done in previous semesters (choose any two).
8. Calculation of least square fitting manually without giving weightage to error. Confirmation of least square fitting of data through computer program.
9. Evaluation of trigonometric functions e.g. $\sin \theta$, Given Bessel's function at N points find its value at an intermediate point. Complex analysis: Integrate $1/(x^2+2)$ numerically and check with computer integration
10. Compute the nth roots of unity for $n = 2, 3$, and 4.
11. Find the two square roots of $-5+12j$.
12. Integral transform: FFT of e^{-x^2} .

Reference Books

- Mathematical Methods for Physics and Engineers, K.F Riley, M.P. Hobson and S. J. Bence, 3rd ed., 2006, Cambridge University Press
- Mathematics for Physicists, P. Dennery and A. Krzywicki, 1967, Dover Publications
- Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernández. 2014 Springer ISBN: 978-3319067896
- A Guide to MATLAB, B.R. Hunt, R.L. Lipsman, J.M. Rosenberg, 2014, 3rd Edn., Cambridge University Press
- https://web.stanford.edu/~boyd/ee102/laplace_ckts.pdf
- <https://ocw.nthu.edu.tw/ocw/upload/12/244/12handout.pdf>

2.17. Core T9 - Elements of Modern Physics

Elements of Modern Physics

4 Credits

Unit 1

Planck's quantum, Planck's constant and light as a collection of photons; Blackbody Radiation: Quantum theory of Light; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment. Wave description of particles by wave packets. Group and Phase velocities and relation between them. Two-Slit experiment with electrons. Probability. Wave amplitude and wave functions.

Unit 2

Position measurement- gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle (Uncertainty relations involving Canonical pair of variables); Derivation from Wave Packets impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle- application to virtual particles and range of an interaction.

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of a wave function, probabilities and normalization; Probability and probability current densities in one dimension.

Unit 3

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as example; Quantum mechanical scattering and tunnelling in one dimension-across a step potential & rectangular potential barrier.

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, Liquid Drop model: semi-empirical mass formula and binding energy, Nuclear Shell Model and magic numbers.

Unit 4

Radioactivity: stability of the nucleus; Law of radioactive decay; Mean life and half-life; Alpha decay; Beta decay- energy released, spectrum and Pauli's prediction of neutrino; Gamma ray emission, energy-momentum conservation: electron-positron pair creation by gamma photons in the vicinity of a nucleus.

Fission and fusion- mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions driving stellar energy (brief qualitative discussions).

Lasers: Einstein's A and B coefficients. Metastable states. Spontaneous and Stimulated emissions. Optical Pumping and Population Inversion. Three-Level and Four-Level Lasers. Ruby Laser and He-Ne Laser. Basic lasing.

Reference Books

- Concepts of Modern Physics, Arthur Beiser, 2002, McGraw-Hill.
- Introduction to Modern Physics, Rich Meyer, Kennard, Coop, 2002, Tata McGraw Hill
- Introduction to Quantum Mechanics, David J. Griffith, 2005, Pearson Education.
- Physics for scientists and Engineers with Modern Physics, Jewett and Serway, 2010, Cengage Learning.
- Modern Physics, G.Kaur and G.R. Pickrell, 2014, McGraw Hill
- Quantum Mechanics: Theory & Applications, A.K.Ghatak & S.Lokanathan, 2004, Macmillan

Additional Books for Reference

- Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2004, PHI Learning.
- Theory and Problems of Modern Physics, Schaum's outline, R. Gautreau and W. Savin, 2nd Edn, Tata McGraw-Hill Publishing Co. Ltd.
- Quantum Physics, Berkeley Physics, Vol.4. E.H.Wichman, 1971, Tata McGraw-Hill Co.
- Basic ideas and concepts in Nuclear Physics, K.Heyde, 3rd Edn., Institute of Physics Pub.
- Six Ideas that Shaped Physics: Particle Behave like Waves, T.A.Moore, 2003, McGraw Hill

2.18. Core P9 – Elements of Modern Physics Lab

Elements of Modern Physics

2 Credits

List of Practical

1. Measurement of Planck's constant using black body radiation and photo-detector
2. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
3. To determine work function of material of filament of directly heated vacuum diode.
4. To determine the Planck's constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the ionization potential of mercury.
7. To determine the absorption lines in the rotational spectrum of Iodine vapour.
8. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
9. To setup the Millikan oil drop apparatus and determine the charge of an electron.
10. To show the tunneling effect in tunnel diode using I-V characteristics.
11. To determine the wavelength of laser source using diffraction of single slit.
12. To determine the wavelength of laser source using diffraction of double slits.
13. To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating
Note: Many of these experiments may be too expensive to set up in some colleges.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Edn, 2011, Kitab Mahal

2.19. Core T10 - Analog Systems and Applications

Analog Systems and Applications

4 Credits

Semiconductor Diodes

P and N type semiconductors. Energy Level Diagram. Conductivity and Mobility, Concept of Drift velocity. PN Junction Fabrication (Simple Idea). Barrier Formation in PN Junction Diode. Static and Dynamic Resistance. Current Flow Mechanism in Forward and Reverse Biased Diode. Drift Velocity. Derivation for Barrier Potential, Barrier Width and Current for Step Junction. Current Flow Mechanism in Forward and Reverse Biased Diode.

Two-terminal Devices and their Applications

Rectifier Diode: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers, Calculation of Ripple Factor and Rectification Efficiency, C-filter

Zener Diode and Voltage Regulation. Principle and structure of (1) LEDs, (2) Photodiode and (3) Solar Cell.

Bipolar Junction transistors

n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Current gains α and β Relations between α and β . Load Line analysis of Transistors. DC Load line and Q-point. Physical Mechanism of Current

Flow. Active, Cutoff and Saturation Regions.

Field Effect transistors

Basic principle of operations only.

Amplifiers

Amplifiers: Transistor Biasing and Stabilization Circuits. Fixed Bias and Voltage Divider Bias. Transistor as 2-port Network. h-parameters, Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Classification of Class A, B & C Amplifiers. Frequency response of a CE amplifier.

Coupled Amplifier: Two stage RC-coupled amplifier.

Feedback in Amplifiers: Effects of Positive and Negative Feedback on Input Impedance, Output Impedance, Gain, Stability, Distortion and Noise.

Sinusoidal Oscillators: Barkhausen's Criterion for self-sustained oscillations. RC Phase shift oscillator, determination of Frequency. Hartley & Colpitts oscillators.

Operational Amplifiers (Black Box approach): Characteristics of an Ideal and Practical Op-Amp. (IC 741) Open-loop and Closed-loop Gain. Frequency Response. CMRR. Slew Rate and concept of Virtual ground.

Applications of Op-Amps: Linear - (1) Inverting and non-inverting amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator, (6) Log amplifier, (7) Zero crossing detector (8) Wein bridge oscillator. Non-linear – (1) inverting and non-inverting comparators, (2) Schmidt triggers.

Conversion: Resistive network (Weighted and R-2R Ladder). Accuracy and Resolution. A/D Conversion (successive approximation)

Reference Books

- Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
- Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
- Solid State Electronic Devices, B.G. Streetman & S.K. Banerjee, 6th Edn., 2009, PHI Learning
- Electronic Devices & circuits, S. Salivahanan & N.S. Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill
- OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall
- Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.
- Electronic circuits: Handbook of design & applications, U. Tietze, C. Schenk, 2008, Springer
- Semiconductor Devices: Physics and Technology, S.M. Sze, 2nd Ed., 2002, Wiley India
- Microelectronic Circuits, M.H. Rashid, 2nd Edition, Cengage Learning
- Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India

2.20. Core P10 – Analog Systems and Applications Lab

Analog Systems and Applications

2 Credits

List of Practical

1. To study V-I characteristics of PN junction diode, and Light emitting diode.
2. To study the V-I characteristics of a Zener diode and its use as voltage regulator.
3. Study of V-I & power curves of solar cells, and find maximum power point & efficiency.
4. To study the characteristics of a Bipolar Junction Transistor in CE configuration.

5. To study the various biasing configurations of BJT for normal class A operation.
6. To design a CE transistor amplifier of a given gain (mid-gain) using voltage divider bias.
7. To study the frequency response of voltage gain of a RC-coupled transistor amplifier.
8. To design a Wien bridge oscillator for given frequency using an op-amp.
9. To design a phase shift oscillator of given specifications using BJT.
10. To study the Colpitt's oscillator.
11. To design a digital to analog converter (DAC) of given specifications.
12. To study the analog to digital convertor (ADC) IC.
13. To design an inverting amplifier using Op-amp (741,351) for dc voltage of given gain
14. To design inverting amplifier using Op-amp (741,351) and study its frequency response
15. To design non-inverting amplifier using Op-amp (741,351) & study its frequency response
16. To study the zero-crossing detector and comparator
17. To add two dc voltages using Op-amp in inverting and non-inverting mode
18. To design a precision Differential amplifier of given I/O specification using Op-amp.
19. To investigate the use of an op-amp as an Integrator.
20. To investigate the use of an op-amp as a Differentiator.
21. To design a circuit to simulate the solution of a 1st/2nd order differential equation.

Reference Books

- Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
- OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
- Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.
- Electronic Devices & circuit Theory, R.L. Boylestad & L.D. Nashelsky, 2009, Pearson

2.21. Core T11 - Quantum Mechanics and Applications

Quantum Mechanics and Applications

4 Credits

Schrodinger Equation

Time dependent Schrodinger equation: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Eigen-values and Eigen-functions. Position, momentum and Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle.

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigen-values; expansion of an arbitrary wave-function as a linear combination of energy eigen-functions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to spread of Gaussian wave-packet for a free particle in one dimension; wave packets, Fourier transforms and momentum space wave-function; Position-momentum uncertainty principle.

General discussion of bound states in an arbitrary potential

continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem-square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigen-functions using Frobenius method; Hermite polynomials; ground state, zero point energy & uncertainty principle.

Quantum theory of hydrogen-like atoms

Time independent Schrodinger equation in spherical polar coordinates; separation of variables for second order partial differential equation; angular momentum operator & quantum numbers; Radial wave-functions from Frobenius method; shapes of the probability densities for ground & first excited states; Orbital angular momentum quantum numbers l and m ; s, p, d shells.

Atoms in Electric & Magnetic Fields

Electron angular momentum. Space quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton.

Atoms in External Magnetic Fields

Normal and Anomalous Zeeman Effect. Paschen Back and Stark Effect (Qualitative Discussion only).

Many electron atoms

Pauli's Exclusion Principle. Symmetric & Antisymmetric Wave Functions. Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total angular momentum. Vector Model. Spin- orbit coupling in atoms- L-S and J-J couplings. Hund's Rule. Term symbols. Spectra of Hydrogen and Alkali Atoms (Na etc.).

Reference Books

- A Text book of Quantum Mechanics, P.M.Mathews and K.Venkatesan, 2nd Ed., 2010, McGraw Hill
- Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
- Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.
- Quantum Mechanics, G. Aruldas, 2nd Edn. 2002, PHI Learning of India.
- Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning.
- Quantum Mechanics: Foundations & Applications, Arno Bohm, 3rd Edn., 1993, Springer
- Quantum Mechanics for Scientists & Engineers, D.A.B. Miller, 2008, Cambridge University Press

Additional Books for Reference

- Quantum Mechanics, Eugen Merzbacher, 2004, John Wiley and Sons, Inc.
- Introduction to Quantum Mechanics, D.J. Griffith, 2nd Ed. 2005, Pearson Education
- Quantum Mechanics, Walter Greiner, 4th Edn., 2001, Springer

2.22. Core P11 – Quantum Mechanics and Applications Lab

Quantum Mechanics and Applications

2 Credits

List of Practical

1. Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom:

$$\frac{d^2y}{dr^2} = A(r)u(r), A(r) = \frac{2m}{\hbar^2} [V(r) - E] \text{ where } V(r) = -\frac{e^2}{r}$$

Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is -13.6 eV. Take $e = 3.795 \text{ (eV}\text{\AA})^{1/2}$, $\hbar c = 1973 \text{ (eV}\text{\AA})$ and $m = 0.511 \times 10^6 \text{ eV}/c^2$.

2. Solve the s-wave radial Schrodinger equation for an atom:

$$\frac{d^2y}{dr^2} = A(r)u(r), A(r) = \frac{2\mu}{\hbar^2} [V(r) - E]$$

Where μ is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential

$$V(r) = -\frac{e^2}{r} e^{-r/a}$$

Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wave function. Take $e = 3.795 \text{ (eV}\text{\AA})^{1/2}$, $m = 0.511 \times 10^6 \text{ eV}/c^2$, and $a = 3 \text{ \AA}, 5 \text{ \AA}, 7 \text{ \AA}$. In these units $\hbar c = 1973 \text{ (eV}\text{\AA})$. The ground state energy is expected to be above -12 eV in all three cases.

3. Solve the s-wave radial Schrodinger equation for a particle of mass m :

$$\frac{d^2y}{dr^2} = A(r)u(r), A(r) = \frac{2m}{\hbar^2} [V(r) - E]$$

For the an-harmonic oscillator potential

$$V(r) = \frac{1}{2} k r^2 + \frac{1}{3} b r^3$$

for the ground state energy (in MeV) of particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose $m = 940 \text{ MeV}/c^2$, $k = 100 \text{ MeV fm}^{-2}$, $b = 0, 10, 30 \text{ MeV fm}^{-3}$. In these units, $\hbar c = 197.3 \text{ MeV fm}$. The ground state energy is expected to lie between 90 and 110 MeV for all three cases.

4. Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule:

$$\frac{d^2y}{dr^2} = A(r)u(r), A(r) = \frac{2m}{\hbar^2} [V(r) - E] \text{ where } V(r) = -\frac{e^2}{r}$$

Where μ is the reduced mass of the two-atom system for the Morse potential

$$V(r) = D(e^{-2\alpha r'} - e^{-\alpha r'}), \quad r' = \frac{r - r_0}{r}$$

Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function. Take: $m = 940 \times 10^6 \text{ eV}/c^2$, $D = 0.755501 \text{ eV}$, $\alpha = 1.44$, $r_0 = 0.131349 \text{ \AA}$

Laboratory Based Equipments:

3. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency
4. Study of Zeeman effect: with external magnetic field; Hyperfine splitting
5. To show the tunneling effect in tunnel diode using I-V characteristics.
6. Quantum efficiency of CCDs

$$\frac{d^2y}{dr^2} = A(r)u(r), A(r) = \frac{2m}{\hbar^2} [V(r) - E]$$

Reference Books

- An introduction to computational Physics, T.Pang, 2nd Edn.,2006,
- Cambridge Univ.Press Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB: Scientific & Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernández.2014 Springer.

2.23. Core T12 - Solid State Physics

Solid State Physics

4 Credits

Crystal Structure

Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis – Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor.

Elementary Lattice Dynamics

Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids, T^3 law

Magnetic Properties of Matter

Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia- and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss.

Dielectric Properties of Materials

Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeier relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons, TO modes.

Ferroelectric Properties of Materials

Structural phase transition, Classification of crystals, Piezoelectric effect, Pyroelectric effect, Ferroelectric effect, Electrostrictive effect, Curie-Weiss Law, Ferroelectric domains, PE hysteresis loop.

Elementary band theory

Kronig Penny model. Band Gap. Conductor, Semiconductor (P and N type) and insulator. Conductivity of Semiconductor, mobility, Hall Effect. Measurement of conductivity (04 probe method) & Hall coefficient.

Superconductivity

Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect. Idea of BCS theory (No derivation)

Reference Books

- Introduction to Solid State Physics, Charles Kittel, 8th Edition, 2004, Wiley India Pvt. Ltd.
- Elements of Solid State Physics, J.P. Srivastava, 4th Edition, 2015, Prentice-Hall of India
- Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
- Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
- Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
- Solid State Physics, Rita John, 2014, McGraw Hill
- Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
- Solid State Physics, M.A. Wahab, 2011, Narosa Publications

2.24. Core P12 – Solid State Physics Lab

Solid State Physics

2 Credits

List of Practical

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)

6. To determine the refractive index of a dielectric layer using SPR
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis.
9. To measure the resistivity of a semiconductor (Ge) with temperature by four-probe method (room temperature to 150⁰ C) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India.

2.25. Core T13 - Electromagnetic Theory

Electromagnetic Theory

4 Credits

Maxwell Equations

Maxwell's equations. Displacement Current. Vector and Scalar Potentials. Gauge Transformations: Lorentz and Coulomb Gauge. Boundary Conditions at Interface between Different Media. Wave Equations. Plane Waves in Dielectric Media. Poynting Theorem and Poynting Vector. Electromagnetic (EM) Energy Density. Physical Concept of Electromagnetic Field Energy Density, Momentum Density and Angular Momentum Density.

EM Wave Propagation in Unbounded Media

Plane EM waves through vacuum and isotropic dielectric medium, transverse nature of plane EM waves, refractive index and dielectric constant, wave impedance. Propagation through conducting media, relaxation time, skin depth. Wave propagation through dilute plasma, electrical conductivity of ionized gases, plasma frequency, refractive index, skin depth, application to propagation through ionosphere.

EM Wave in Bounded Media

Boundary conditions at a plane interface between two media. Reflection & Refraction of plane waves at plane interface between two dielectric media-Laws of Reflection & Refraction. Fresnel's Formulae for perpendicular & parallel polarization cases, Brewster's law. Reflection & Transmission coefficients. Total internal reflection, evanescent waves. Metallic reflection (normal Incidence)

Polarization of Electromagnetic Waves

Description of Linear, Circular and Elliptical Polarization. Propagation of E.M. Waves in Anisotropic Media. Symmetric Nature of Dielectric Tensor. Fresnel's Formula. Uniaxial and Biaxial Crystals. Light Propagation in Uniaxial Crystal. Double Refraction. Polarization by Double Refraction. Nicol Prism. Ordinary & extraordinary refractive indices. Production & detection of Plane, Circularly and Elliptically Polarized Light. Phase Retardation Plates: Quarter-Wave and Half-Wave Plates. Babinet Compensator and its Uses. Analysis of Polarized Light

Rotatory Polarization: Optical Rotation. Biot's Laws for Rotatory Polarization. Fresnel's Theory of optical rotation. Calculation of angle of rotation. Experimental verification of Fresnel's theory. Specific rotation. Laurent's half-shade polarimeter.

Wave guides

Planar optical wave guides. Planar dielectric wave guide. Condition of continuity at interface. Phase shift on total reflection. Eigenvalue equations. Phase and group velocity of guided waves. Field energy and Power transmission.

Optical Fibres

Numerical Aperture. Step and Graded Indices (Definitions Only). Single and Multiple Mode Fibres (Concept and Definition Only).

Reference Books

- Introduction to Electrodynamics, D.J. Griffiths, 3rd Ed., 1998, Benjamin Cummings.
- Optics, E. Hecht, 2016, Pearson.
- Elements of Electromagnetics, M.N.O. Sadiku, 2001, Oxford University Press.
- Introduction to Electromagnetic Theory, T.L. Chow, 2006, Jones & Bartlett Learning
- Fundamentals of Electromagnetics, M.A.W. Miah, 1982, Tata McGraw Hill
- Electromagnetic field Theory, R.S. Kshetrimayun, 2012, Cengage Learning
- Engineering Electromagnetic, William H. Hayt, 8th Edition, 2012, McGraw Hill.
- Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer Additional Books for Reference
- Electromagnetic Fields & Waves, P.Lorrain & D.Corson, 1970, W.H.Freeman & Co.
- Electromagnetics, J.A. Edminster, Schaum Series, 2006, Tata McGraw Hill.
- Electromagnetic field theory fundamentals, B. Guru and H. Hiziroglu, 2004, Cambridge University Press

2.26. Core P13 – Electromagnetic Theory Lab

Electromagnetic Theory

2 Credits

List of Practical

1. To verify the law of Malus for plane polarized light.
2. To determine the specific rotation of sugar solution using Polarimeter.
3. To analyze elliptically polarized Light by using a Babinet's compensator.
4. To study dependence of radiation on angle for a simple Dipole antenna.
5. To determine the wavelength and velocity of ultrasonic waves in a liquid (Kerosene Oil, Xylene, etc.) by studying the diffraction through ultrasonic grating.
6. To study the reflection, refraction of microwaves
7. To study Polarization and double slit interference in microwaves.
8. To determine the refractive index of liquid by total internal reflection using Wollaston's air- film.
9. To determine the refractive Index of (1) glass and (2) a liquid by total internal reflection using a Gaussian eyepiece.
10. To study the polarization of light by reflection and determine the polarizing angle for air-glass interface.
11. To verify the Stefan's law of radiation and to determine Stefan's constant.
12. To determine the Boltzmann constant using V-I characteristics of PN junction diode.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers

- A Text Book of Practical Physics, I. Prakash & Ramakrishna, 11th Ed., 2011, Kitab Mahal
- Electromagnetic Field Theory for Engineers & Physicists, G. Lehner, 2010, Springer

2.27. Core T14 – Statistical Mechanics

Statistical Mechanics

4 Credits

Classical Statistical Mechanics

Macrostate & Microstate, Elementary Concept of Ensemble, Microcanonical ensemble, Phase Space, Entropy and Thermodynamic Probability, Canonical ensemble, Partition Function, Thermodynamic Functions of an Ideal Gas, Classical Entropy Expression, Gibbs Paradox, Sackur Tetrode equation, Law of Equipartition of Energy (with proof) – Applications to Specific Heat and its Limitations, Thermodynamic Functions of a Two-Energy Levels System, Negative Temperature. Grand canonical ensemble and chemical potential.

Classical Theory of Radiation

Properties of Thermal Radiation. Blackbody Radiation. Pure temperature dependence. Kirchhoff's law. Stefan-Boltzmann law: Thermodynamic proof. Radiation Pressure. Wien's Displacement law. Wien's Distribution Law. Saha's Ionization Formula. Rayleigh-Jean's Law. Ultraviolet Catastrophe.

Quantum Theory of Radiation

Spectral Distribution of Black Body Radiation. Planck's Quantum Postulates. Planck's Law of Blackbody Radiation: Experimental Verification. Deduction of (1) Wien's Distribution Law, (2) Rayleigh-Jeans Law, (3) Stefan-Boltzmann Law, (4) Wien's Displacement law from Planck's law.

Bose-Einstein Statistics:

B-E distribution law, Thermodynamic functions of a strongly Degenerate Bose Gas, Bose Einstein condensation, properties of liquid He (qualitative description), Radiation as a photon gas and Thermodynamic functions of photon gas. Bose derivation of Planck's law.

Fermi-Dirac Statistics:

Fermi-Dirac Distribution Law, Thermodynamic functions of a Completely and strongly Degenerate Fermi Gas, Fermi Energy, Electron gas in a Metal, Specific Heat of Metals, Relativistic Fermi gas, White Dwarf Stars, Chandrasekhar Mass Limit.

Reference Books

- Statistical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Ed., 1996, Oxford University Press.
- Statistical Physics, Berkeley Physics Course, F. Reif, 2008, Tata McGraw-Hill
- Statistical and Thermal Physics, S. Lokanathan and R.S. Gambhir. 1991, Prentice Hall
- Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
- Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
- An Introduction to Statistical Mechanics & Thermodynamics, R.H. Swendsen, 2012, Oxford Press
- Statistical Mechanics – an elementary outline, A. Lahiri, 2008, Universities Press

2.28. Core P14 – Statistical Mechanics Lab

Statistical Mechanics

2 Credits

List of Practical

1. Computational analysis of the behaviour of a collection of particles in a box that satisfy Newtonian mechanics and interact via the Lennard-Jones potential, varying the total number of particles N and the initial conditions:
 - a. Study of local number density in the equilibrium state (i) average; (ii) fluctuations
 - b. Study of transient behaviour of the system (approach to equilibrium)
 - c. Relationship of large N and the arrow of time
 - d. Computation of the velocity distribution of particles for the system and comparison with the Maxwell velocity distribution
 - e. Computation and study of mean molecular speed and its dependence on particle mass
 - f. Computation of fraction of molecules in an ideal gas having speed near the most probable speed
2. Computation of the partition function $Z(\beta)$ for examples of systems with a finite number of single particle levels (e.g., 2 level, 3 level, etc.) and a finite number of non-interacting particles N under Maxwell-Boltzmann, Fermi-Dirac and Bose-Einstein statistics:
 - a. Study of how $Z_N(V, T)$, average energy $\langle E \rangle$, energy fluctuation ΔE , specific heat at constant volume C_v , depend upon the temperature T , total number of particles N and the spectrum of single particle states.
 - b. Ratios of occupation numbers of various states for the systems considered above
 - c. Computation of physical quantities at large and small temperature T and comparison of various statistics at large and small temperature T .
3. Plot Planck's law for Black Body radiation and compare it with Raleigh-Jeans Law at high temperature and low temperature.
4. Plot Specific Heat of Solids (a) Dulong-Petit law, (b) Einstein distribution function, (c) Debye distribution function for high temperature and low temperature and compare them for these two cases.
5. Plot the following functions with energy at different temperatures
 - a. Maxwell-Boltzmann distribution
 - b. Fermi-Dirac distribution
 - c. Bose-Einstein distribution

Reference Books

- Elementary Numerical Analysis, K.E. Atkinson, 3rd Edn. 2007, Wiley India Edition
- Statistical Mechanics, R.K. Pathria, Butterworth Heinemann: 2nd Ed., 1996, Oxford University Press.
- Introduction to Modern Statistical Mechanics, D. Chandler, Oxford University Press, 1987
- Thermodynamics, Kinetic Theory and Statistical Thermodynamics, Francis W. Sears and Gerhard L. Salinger, 1986, Narosa.
- Modern Thermodynamics with Statistical Mechanics, Carl S. Helrich, 2009, Springer
- Statistical and Thermal Physics with computer applications, Harvey Gould and Jan Tobochnik, Princeton University Press, 2010.
- Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernández. 2014 Springer ISBN: 978-3319067896

Department Specific Electives Subjects Syllabus

2.29. DSE T1 - Advanced Mathematical Physics I

Advanced Mathematical Physics

4 Credits

Laplace Transform

Laplace Transform (LT) of Elementary functions. Properties of LTs: Change of Scale Theorem, Shifting Theorem. LTs of 1st and 2nd order Derivatives and Integrals of Functions, Derivatives and Integrals of LTs. LT of Unit Step function, Dirac Delta function, Periodic Functions. Convolution Theorem. Inverse LT. Application of Laplace Transforms to 2nd order Differential Equations: Damped Harmonic Oscillator, Simple Electrical Circuits, Coupled differential equations of 1st order. Solution of heat flow along infinite bar using Laplace transform.

Linear Vector Spaces

Abstract Systems. Binary Operations and Relations. Introduction to Groups and Fields. Vector Spaces and Subspaces. Linear Independence and Dependence of Vectors. Basis and Dimensions of a Vector Space. Change of basis. Homomorphism and Isomorphism of Vector Spaces. Linear Transformations. Algebra of Linear Transformations. Non-singular Transformations. Representation of Linear Transformations by Matrices.

Inner products. Gram-Schmidt orthogonalization. Orthogonal and unitary transformations and their matrix representations.

Cartesian Tensors

Transformation of Co-ordinates. Einstein's Summation Convention. Relation between Direction Cosines. Tensors. Algebra of Tensors. Sum, Difference and Product of Two Tensors. Contraction. Quotient Law of Tensors. Symmetric and Anti-symmetric Tensors. Invariant Tensors: Kronecker and Alternating Tensors. Association of Antisymmetric Tensor of Order Two and Vectors. Vector Algebra and Calculus using Cartesian Tensors: Scalar and Vector Products, Scalar and Vector Triple Products. Differentiation. Gradient, Divergence and Curl of Tensor Fields. Vector Identities. Tensorial Formulation of Analytical Solid Geometry: Equation of a Line. Angle Between Lines. Projection of a Line on another Line. Condition for Two Lines to be Coplanar. Foot of the Perpendicular from a Point on a Line. Rotation Tensor (No

Derivation). Isotropic Tensors. Tensorial Character of Physical Quantities. Moment of Inertia Tensor. Stress and Strain Tensors: Symmetric Nature. Elasticity Tensor. Generalized Hooke's Law.

General Tensors

Transformation of Co-ordinates. Minkowski Space. Contravariant & Covariant Vectors. Contravariant, Covariant and Mixed Tensors. Kronecker Delta and Permutation Tensors. Algebra of Tensors. Sum, Difference & Product of Two Tensors. Contraction. Quotient Law of Tensors. Symmetric and Anti-symmetric Tensors. Metric Tensor.

Reference Books

- Mathematical Tools for Physics, James Nearing, 2010, Dover Publications
- Mathematical Methods for Physicists, G.B. Arfken, H.J. Weber, and F.E. Harris, 1970, Elsevier.
- Modern Mathematical Methods for Physicists and Engineers, C.D. Cantrell, 2011, Cambridge University Press
- Introduction to Matrices and Linear Transformations, D.T. Finkbeiner, 1978, Dover Pub.
- Linear Algebra, W. Cheney, E.W.Cheney & D.R.Kincaid, 2012, Jones & Bartlett Learning
- Mathematics for Physicists, Susan M. Lea, 2004, Thomson Brooks/Cole
- Mathematical Methods for Physics & Engineers, K.F.Riley, M.P.Hobson, S.J.Bence, 3rd Ed., 2006, Cambridge University Press

2.30. DSE P1 – Advanced Mathematical Physics I Lab

Advanced Mathematical Physics I

2 Credits

List of Practical

1. Linear algebra:
2. Multiplication of two 3 x 3 matrices.
3. Eigenvalue and eigenvectors of

$$\begin{pmatrix} 2 & 1 & 1 \\ 1 & 3 & 2 \\ 3 & 1 & 4 \end{pmatrix} \quad \begin{pmatrix} 1 & -i & 3+4i \\ +i & 2 & 4 \\ 3-4i & 4 & 3 \end{pmatrix} \quad \begin{pmatrix} 2 & -i & 2i \\ +i & 4 & 3 \\ -2i & 3 & 5 \end{pmatrix}$$

4. Orthogonal polynomials as eigen-functions of Hermitian differential operators.
5. Determination of the principal axes of moment of inertia through diagonalization.
6. Vector space of wave functions in Quantum Mechanics: Position and momentum differential operators and their commutator, wave functions for stationary states as eigen-functions of Hermitian differential operator.
7. Lagrangian formulation in Classical Mechanics with constraints.
8. Study of geodesics in Euclidean and other spaces (surface of a sphere, etc).
9. Estimation of ground state energy and wave function of a quantum system.

Reference Books

- Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernández. 2014 Springer ISBN: 978-3319067896

2.31. DSE T2 - Advanced Mathematical Physics II

Advanced Mathematical Physics II

6 Credits

Calculus of Variations:

Variational Calculus: Recapitulation of the Variational Principle, Euler-Lagrange's Equations of Motion Euler angles, spherical top and symmetric top. Symmetry and conservation laws. Canonical Pair of Variables. Definition of Generalized Force: Definition of Hamiltonian (Legendre Transformation). Hamilton's Principle. Poisson Brackets and their properties. Canonical transformations. Action-angle variables for simple systems.

Group Theory

Review of sets, Mapping and Binary Operations, Relation, Types of Relations.

Groups: Elementary properties of groups, uniqueness of solution, Subgroup, Centre of a group, Co-sets of a subgroup, cyclic group, Permutation/Transformation. Homomorphism and Isomorphism of group. Normal and conjugate subgroups, Completeness and Kernel.

Some special groups with operators. Matrix Representations: Reducible and Irreducible representations. Schur's lemma. Orthogonality theorems. Character tables and their uses. Application to small vibrations.

Advanced Probability Theory:

Fundamental Probability Theorems. Conditional Probability, Bayes' Theorem, Repeated Trials, Binomial and Multinomial expansions. Random Variables and probability distributions, Expectation and Variance, Special Probability distributions: The binomial distribution, The poisson distribution, Continuous distribution: The Gaussian (or normal) distribution, The principle of least squares.

Reference Books

- Mathematical Methods for Physicists: Weber and Arfken, 2005, Academic Press.
- Mathematical Methods for Physicists: A Concise Introduction: Tai L. Chow, 2000, Cambridge Univ. Press.
- Elements of Group Theory for Physicists by A. W. Joshi, 1997, John Wiley.
- Group Theory and its Applications to Physical Problems by Morton Hamermesh, 1989, Dover
- Introduction to Mathematical Physics: Methods & Concepts: Chun Wa Wong, 2012, Oxford University Press
- Introduction to Mathematical Probability, J. V. Uspensky, 1937, Mc Graw-Hill.

2.32. DSE T3 - Classical Dynamics

Classical Dynamics

6 Credits

Classical Mechanics of Point Particles

Review of Newtonian Mechanics; Application to the motion of a charge particle in external electric and magnetic fields- motion in uniform electric field, magnetic field- gyroradius and gyrofrequency, motion in crossed electric and magnetic fields. Generalized coordinates and velocities,

Recap of Lagrangian and Hamiltonian mechanics. Applications: Hamiltonian for a harmonic oscillator, solution of Hamilton's equation for Simple Harmonic Oscillations; particle in a central force field- conservation of angular momentum and energy. Effective potential. The Laplace-Runge-Lenz vector.

Small Amplitude Oscillations

Minima of potential energy and points of stable equilibrium, expansion of the potential energy around a minimum, small amplitude oscillations about the minimum, normal modes of oscillations example of N identical masses connected in a linear fashion to $(N - 1)$ - identical springs.

Special Theory of Relativity

Postulates of Special Theory of Relativity. Lorentz Transformations. Minkowski space. The invariant interval, light cone and world lines. Space-time diagrams. Time-dilation, length contraction and twin paradox. Four-vectors: space-like, time-like and light-like. Four-velocity and acceleration. Metric and alternating tensors. Four-momentum and energy-momentum relation. Doppler effect from a four-vector perspective. Concept of four-force. Conservation of four-momentum. Relativistic kinematics. Application to two-body decay of an unstable particle.

Fluid Dynamics

Density ρ and pressure P in a fluid, an element of fluid and its velocity, continuity equation and mass conservation, stream-lined motion, laminar flow, Poiseuille's equation for flow of a liquid through a pipe, Navier-Stokes equation, qualitative description of turbulence, Reynolds number.

Reference Books

- Classical Mechanics, H. Goldstein, C.P. Poole, J.L. Safko, 3rd Edn. 2002, Pearson Education.
- Mechanics, L. D. Landau and E. M. Lifshitz, 1976, Pergamon.
- Classical Electrodynamics, J.D. Jackson, 3rd Edn., 1998, Wiley.
- The Classical Theory of Fields, L.D Landau, E.M Lifshitz, 4th Edn., 2003, Elsevier.
- Introduction to Electrodynamics, D.J. Griffiths, 2012, Pearson Education.
- Classical Mechanics, P.S. Joag, N.C. Rana, 1st Edn., McGraw Hall.
- Classical Mechanics, R. Douglas Gregory, 2015, Cambridge University Press.
- Classical Mechanics: An introduction, Dieter Strauch, 2009, Springer.
- Solved Problems in classical Mechanics, O.L. Delange and J. Pierrus, 2010, Oxford Press

2.33. DSE T5 - Nuclear and Particle Physics

Nuclear and Particle Physics

6 Credits

General Properties of Nuclei

Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excited states.

Nuclear Models

Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force.

Radioactivity decay

(a) Alpha decay: basics of α -decay processes, theory of α - emission, Gamow factor, Geiger Nuttall law, α - decay spectroscopy. (b) β -decay: energy kinematics for β -decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion.

Nuclear Reactions

Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct Reaction, resonance reaction, Coulomb scattering (Rutherford scattering).

Interaction of Nuclear Radiation with matter

Energy loss due to ionization (Bethe- Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter.

Detector for Nuclear Radiations

Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter.

Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector.

Particle Accelerators

Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons.

Particle physics

Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, colour quantum number and gluons.

Reference Books

- Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
- Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
- Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004).
- Introduction to High Energy Physics, D.H. Perkins, Cambridge Univ. Press
- Introduction to Elementary Particles, D. Griffith, John Wiley & Sons
- Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi
- Basic ideas and concepts in Nuclear Physics - An Introductory Approach by
- K. Heyde (IOP- Institute of Physics Publishing, 2004).
- Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
- Physics and Engineering of Radiation Detection, Syed Naeem Ahmed (Acad. Press, Elsevier, 2007).
- Theoretical Nuclear Physics, J.M. Blatt & V.F. Weisskopf (Dover Pub.Inc., 1991)

2.34. DSE T6 - Astrophysics and Astronomy

Astronomy and Astrophysics

6 Credits

Astronomical Scales

Astronomical Distance, Mass and Time, Scales, Brightness, Radiant Flux and Luminosity, Measurement of Astronomical Quantities Astronomical Distances, Stellar Radii, Masses of Stars, Stellar Temperature. Basic concepts of positional astronomy: Celestial Sphere, Geometry of a Sphere, Spherical

Triangle, Astronomical Coordinate Systems, Geographical Coordinate Systems, Horizon System, Equatorial System, Diurnal Motion of the Stars, Conversion of Coordinates. Measurement of Time, Sidereal Time, Apparent Solar Time, Mean Solar Time, Equation of Time, Calendar. Basic Parameters of Stars: Determination of Distance by Parallax Method; Brightness, Radiant Flux and Luminosity, Apparent and Absolute magnitude scale, Distance Modulus; Determination of Temperature and Radius of a star; Determination of Masses from Binary orbits; Stellar Spectral Classification, Hertzsprung-Russell Diagram.

Astronomical techniques

Basic Optical Definitions for Astronomy (Magnification Light Gathering Power, Resolving Power and Diffraction Limit, Atmospheric Windows), Optical Telescopes (Types of Reflecting Telescopes, Telescope Mountings, Space Telescopes, Detectors and Their Use with Telescopes (Types of Detectors, detection Limits with Telescopes)

Physical principles

Gravitation in Astrophysics (Virial Theorem, Newton versus Einstein), Systems in Thermodynamic Equilibrium.

The sun and solar family

The sun (Solar Parameters, Solar Photosphere, Solar Atmosphere, Chromosphere. Corona, Solar Activity, Basics of Solar Magneto-hydrodynamics. Helioseismology). The solar family (Solar System: Facts and Figures, Origin of the Solar System: The Nebular Model, Tidal Forces and Planetary Rings, Extra-Solar Planets.

Stellar spectra and classification Structure (Atomic Spectra Revisited, Stellar Spectra, Spectral Types and Their Temperature Dependence, Black Body Approximation, H R Diagram, Luminosity Classification)

The milky way

Basic Structure and Properties of the Milky Way, Nature of Rotation of the Milky Way (Differential Rotation of the Galaxy and Oort Constant, Rotation Curve of the Galaxy and the Dark Matter, Nature of the Spiral Arms), Stars and Star Clusters of the Milky Way, Properties of and around the Galactic Nucleus.

Galaxies

Galaxy Morphology, Hubble's Classification of Galaxies, Elliptical Galaxies (The Intrinsic Shapes of Elliptical, de Vaucouleurs Law, Stars and Gas). Spiral and Lenticular Galaxies (Bulges, Disks, Galactic Halo) The Milky Way Galaxy, Gas and Dust in the Galaxy, Spiral Arms

Large scale structure & expanding universe

Cosmic Distance Ladder (An Example from Terrestrial Physics, Distance Measurement using Cepheid Variables), Hubble's Law (Distance- Velocity Relation), Clusters of Galaxies (Virial theorem and Dark Matter).

Reference Books

- Modern Astrophysics, B.W. Carroll & D.A. Ostlie, Addison-Wesley Publishing Co.
- Introductory Astronomy and Astrophysics, M. Zeilik and S.A. Gregory, 4th Edition, Saunders College Publishing.
- The physical universe: An introduction to astronomy, F. Shu, Mill Valley: University Science Books.
- Fundamental of Astronomy (Fourth Edition), H. Karttunen et al. Springer
- K.S. Krishnasamy, 'Astro Physics a modern perspective,' New Age Int. (p) Ltd, New Delhi, 2002.
- Baidyanath Basu, 'An introduction to Astro physics', Second printing, Prentice -Hall of India Private limited, New Delhi, 2001.
- Textbook of Astronomy and Astrophysics with elements of cosmology, V.B. Bhatia, Narosa Publ.

2.35. DSE T10 – Nano-materials and Applications

Nano Materials and Applications

4 Credits

Nanoscale Systems

Length scales in physics, Nanostructures: 1D, 2D and 3D nanostructures (nanodots, thin films, nanowires, nanorods), Band structure and density of states of materials at nanoscale, Size Effects in nano systems, Quantum confinement: Applications of Schrodinger equation- Infinite potential well, potential step, potential box, quantum confinement of carriers in 3D, 2D, 1D nanostructures and its consequences.

Synthesis of Nano structured Materials

Top down and Bottom up approach, Photolithography. Ball milling. Gas phase condensation. Vacuum deposition. Physical vapour deposition (PVD): Thermal evaporation, E-beam evaporation, Pulsed Laser deposition. Chemical vapour deposition (CVD). Sol-Gel. Electro deposition. Spray pyrolysis. Hydrothermal synthesis. Preparation through colloidal methods. MBE growth of quantum dots.

Characterization

X-Ray Diffraction. Optical Microscopy. Scanning Electron Microscopy. Transmission Electron Microscopy. Atomic Force Microscopy. Scanning Tunneling Microscopy.

Optical Properties

Coulomb interaction in nanostructures. Concept of dielectric constant for nanostructures and charging of nanostructure. Quasi-particles and excitons. Excitons in direct and indirect band gap semiconductor nanocrystals. Quantitative treatment of quasi-particles and excitons, charging effects. Radiative processes: General formalization-absorption, emission and luminescence. Optical properties of heterostructures and nanostructures.

Electron Transport

Carrier transport in nanostructures. Coulomb blockade effect, thermionic emission, tunneling and hopping conductivity. Defects and impurities: Deep level and surface defects.

Applications

Applications of nanoparticles, quantum dots, nanowires and thin films for photonic devices (LED, solar cells). Single electron transfer devices (no derivation). CNT based transistors. Nanomaterial Devices:

Quantum dots heterostructure lasers, optical switching and optical data storage. Magnetic quantum well; magnetic dots -magnetic data storage. Micro Electromechanical Systems (MEMS), Nano Electromechanical Systems (NEMS).

Reference Books

- C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).
- S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company)
- K.K. Chattopadhyay and A. N. Banerjee, Introduction to Nanoscience and Technology (PHI Learning Private Limited).
- Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).
- M. Hosokawa, K. Nogi, M. Naita, T. Yokoyama, Nanoparticle Technology Handbook (Elsevier, 2007).
- Introduction to Nanoelectronics, V.V. Mitin, V.A. Kochelap and M.A. Strosio, 2011, Cambridge University Press.
- Bharat Bhushan, Springer Handbook of Nanotechnology (Springer-Verlag, Berlin, 2004).

2.36. DSE P10 - Nano Materials and Applications Lab

Nano Materials and Applications

2 Credits

List of practical

1. Synthesis of metal nano particles by chemical route.
2. Synthesis of semiconductor nanoparticles.
3. Surface Plasmon study of metal nanoparticles by UV-Visible spectrophotometer.
4. XRD pattern of nanomaterials and estimation of particle size.
5. To study the effect of size on color of nanomaterials.
6. To prepare composite of CNTs with other materials.
7. Growth of quantum dots by thermal evaporation.
8. Prepare a disc of ceramic of a compound using ball milling, pressing and sintering, and study its XRD.
9. Fabricate a thin film of nanoparticles by spin coating (or chemical route) and study transmittance spectra in UV-Visible region.
10. Prepare a thin film capacitor and measure capacitance as a function of temperature or frequency.
11. Fabricate a PN diode by diffusing Al over the surface of N-type Si and study its V-I characteristic.

Reference Books

- C.P. Poole, Jr. Frank J. Owens, Introduction to Nanotechnology (Wiley India Pvt. Ltd.).
- S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publishing Company).
- K.K. Chattopadhyay and A.N. Banerjee, Introduction to Nanoscience & Technology (PHI Learning Private Limited).
- Richard Booker, Earl Boysen, Nanotechnology (John Wiley and Sons).

2.37. DSE T11 – Physics of Devices and Communication

Communication Electronics

4 Credits

Electronic communication

Introduction to communication – means and modes. Need for modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio.

Analogue Modulation

Amplitude Modulation, modulation index and frequency spectrum. Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver

Analogue Pulse Modulation

Channel capacity, Sampling theorem, Basic Principles- PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing.

Digital Pulse Modulation

Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding, Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Binary Phase Shift Keying (BPSK).

Introduction to Communication and Navigation systems:

Satellite Communication– Introduction, need, Geosynchronous satellite orbits geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

Mobile Telephony System – Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitative only).

GPS navigation system (qualitative idea only)

Reference Books

- Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
- Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
- Electronic Communication systems, G. Kennedy, 3rd Edn, 1999, Tata McGraw Hill.
- Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
- Communication Systems, S. Haykin, 2006, Wiley India
- Electronic Communication system, Blake, Cengage, 5th edition.
- Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

2.38. DSE P11 – Physics of Devices and Communication Lab

Communication Electronics Lab

2 Credits

List of Practical

1. To design an Amplitude Modulator using Transistor
2. To study envelope detector for demodulation of AM signal
3. To study FM - Generator and Detector circuit
4. To study AM Transmitter and Receiver
5. To study FM Transmitter and Receiver
6. To study Time Division Multiplexing (TDM)
7. To study Pulse Amplitude Modulation (PAM)
8. To study Pulse Width Modulation (PWM)
9. To study Pulse Position Modulation (PPM)
10. To study ASK, PSK and FSK modulators

Reference Books

- Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
- Electronic Communication system, Blake, Cengage, 5th edition.

Skill Enhancement Course

2.39. SEC T1 - Computational Physics

Computational Physics

2 Credits

Introduction

Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. Algorithms and Flowcharts: Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of two matrices, Sum and Product of a finite series, calculation of $\sin(x)$ as a series, algorithm for plotting (1) lissajous figures and (2) trajectory of a projectile thrown at an angle with the horizontal.

Scientific Programming

Some fundamental Linux Commands (Internal and External commands). Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators. Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of Fortran Program, Format of writing Program and concept of coding, Initialization and Replacement Logic. Examples from physics problems.

Control Statements

Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder statements), Looping Statements (DO- CONTINUE, DO-ENDDO, DO- WHILE, Implied and Nested DO Loops), Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Subscripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL, COMMON and EQUIVALENCE Statements), Structure, Disk I/O Statements, open a file, writing in a file, reading from a file. Examples from physics problems.

Programming

1. Exercises on syntax on usage of FORTRAN
2. Usage of GUI Windows, Linux Commands, familiarity with DOS commands and working in an editor to write sources codes in FORTRAN.
3. To print out all natural even/ odd numbers between given limits.
4. To find maximum, minimum and range of a given set of numbers.
5. Calculating Euler number using $\exp(x)$ series evaluated at $x=1$

Scientific word processing: Introduction to LaTeX

TeX/LaTeX word processor, preparing a basic LaTeX file, Document classes, Preparing an input file for LaTeX, Compiling LaTeX File, LaTeX tags for creating different environments, Defining LaTeX commands and environments, Changing the type style, Symbols from other languages. Equation representation: Formulae and equations, Figures and other floating bodies, Lining in columns- Tabbing and tabular environment, Generating table of contents, bibliography and citation, Making an index and glossary, List making environments, Fonts, Picture environment and colors, errors.

Visualization

Introduction to graphical analysis and its limitations. Introduction to Gnuplot. importance of visualization of computational and computational data, basic Gnuplot commands: simple plots, plotting data from a file, saving and exporting, multiple data sets per file, physics with Gnuplot (equations, building functions, user defined variables and functions), Understanding data with Gnuplot

Hands on exercises

1. To compile a frequency distribution and evaluate mean, standard deviation etc.

2. To evaluate sum of finite series and the area under a curve.
3. To find the product of two matrices
4. To find a set of prime numbers and Fibonacci series.
5. To write program to open a file and generate data for plotting using Gnuplot.
6. Plotting trajectory of a projectile projected horizontally.
7. Plotting trajectory of a projectile projected making an angle with the horizontally.
8. Creating an input Gnuplot file for plotting a data and saving the output for seeing on the screen. Saving it as an eps file and as a pdf file.
9. To find the roots of a quadratic equation.
10. Motion of a projectile using simulation and plot the output for visualization.
11. Numerical solution of equation of motion of simple harmonic oscillator and plot the outputs for visualization.
12. Motion of particle in a central force field and plot the output for visualization.

Reference Books

- Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
- Computer Programming in Fortran 77". V. Rajaraman (Publisher: PHI).
- LaTeX–A Document Preparation System", Leslie Lamport (Second Edition, Addison-Wesley, 1994).
- Gnuplot in action: understanding data with graphs, Philip K Janert, (Manning 2010)
- Schaum's Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.
- Computational Physics: An Introduction, R.C. Verma, et al. New Age International Publishers, New Delhi(1999)
- A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning
- Elementary Numerical Analysis, K.E. Atkinson, 3 rd Edn., 2007, Wiley India Edition.

2.40. SEC T2 – Electrical Circuits and Networks

Electrical Circuits and Network Skills

2 Credits

Basic Electricity Principles

Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with multimeter, voltmeter and ammeter.

Understanding Electrical Circuits

Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources. Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money.

Electrical Drawing and Symbols

Drawing symbols. Blueprints. Reading Schematics. Ladder diagrams. Electrical Schematics. Power circuits. Control circuits. Reading of circuit schematics. Tracking the connections of elements and identify current flow and voltage drop.

Generators and Transformers

DC Power sources. AC/DC generators. Inductance, capacitance, and impedance. Operation of transformers.

Electric Motors

Single-phase, three-phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motor

Solid-State Devices

Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources

Electrical Protection

Relays. Fuses and disconnect switches. Circuit breakers. Overload devices. Ground-fault protection. Grounding and isolating. Phase reversal. Surge protection. Interfacing DC or AC sources to control elements (relay protection device)

Electrical Wiring

Different types of conductors and cables. Basics of wiring-Star and delta connection. Voltage drop and losses across cables and conductors. Instruments to measure current, voltage, power in DC and AC circuits. Insulation. Solid and stranded cable. Conduit. Cable trays. Splices: wirenuts, crimps, terminal blocks, split bolts, and solder. Preparation of extension board.

Reference Books

- A text book in Electrical Technology - B L Theraja - S Chand & Co.
- A text book of Electrical Technology - A K Theraja
- Performance and design of AC machines - M G Say ELBS Edn.

2.41. SEC T3 - Basic Instrumentation Skills

Basic of Measurement

2 Credits

Basic of Measurement

Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. Multimeter: Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance.

Electronic Voltmeter

Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance. AC millivoltmeter: Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance.

Cathode Ray Oscilloscope

Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only– no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance.

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working.

Signal Generators and Analysis Instruments

Block diagram, explanation and specifications of low frequency signal generators. Pulse generator, and function

generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis.

Impedance Bridges & Q-Meters

Block diagram of bridge: working principles of basic (balancing type) RLC bridge. Specifications of RLC bridge. Block diagram & working principles of a Q- Meter. Digital LCR bridges.

Digital Instruments

Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter.

Digital Multimeter

Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution.

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment,
4. Use of Digital multimeter/VTVM for measuring voltages
5. Circuit tracing of Laboratory electronic equipment,
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit
9. Balancing of bridges

Laboratory Exercises

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments

1. Using a Dual Trace Oscilloscope
2. Converting the range of a given measuring instrument (voltmeter, ammeter)

Reference Books

- A text book in Electrical Technology - B L Theraja - S Chand and Co.
- Performance and design of AC machines - M G Say ELBS Edn.
- Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
- Logic circuit design, Shimon P. Vingron, 2012, Springer.
- Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
- Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-GrawHill
- Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer
- Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India

2.42. SEC T4 – Renewable Energy and Energy Harvesting

Renewable Energy and Energy Harvesting

2 Credits

Fossil fuels and Alternate Sources of energy

Fossil fuels and nuclear energy, their limitation, need of renewable energy, non- conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy system s, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, bio gas generation, geothermal energy tidal energy, Hydroelectricity.

Solar energy

Solar energy, its importance, storage of solar energy, solar pond, non-convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems.

Wind Energy harvesting

Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies.

Ocean Energy

Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices.

Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass.

Geothermal Energy

Geothermal Resources, Geothermal Technologies

Hydro Energy

Hydropower resources, hydropower technologies, environmental impact of hydro power sources.

Piezoelectric Energy harvesting

Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power

Electromagnetic Energy Harvesting

1. Linear generators, physics mathematical models, recent applications
2. Carbon captured technologies, cell, batteries, power consumption
3. Environmental issues and Renewable sources of energy, sustainability.

Demonstrations and Experiments

1. Demonstration of Training modules on Solar energy, wind energy, etc.
2. Conversion of vibration to voltage using piezoelectric materials
3. Conversion of thermal energy into voltage using thermoelectric modules.

Reference Books

- Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
- Solar energy - M P Agarwal - S Chand and Co. Ltd.
- Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
- Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004, Oxford University Press, in association with The Open University.
- Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009
- J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
- http://en.wikipedia.org/wiki/Renewable_energy

2.43. SEC T5 – Weather Forecasting

Weather Forecasting

2 Credits

Introduction to atmosphere

Elementary idea of atmosphere: physical structure and composition; compositional layering of the atmosphere; variation of pressure and temperature with height; air temperature; requirements to measure air temperature; temperature sensors: types; atmospheric pressure: its measurement; cyclones and anticyclones: its characteristics.

Measuring the weather

Wind; forces acting to produce wind; wind speed direction: units, its direction; measuring wind speed and direction; humidity, clouds and rainfall, radiation: absorption, emission and scattering in atmosphere; radiation laws

Weather systems

Global wind systems; air masses and fronts: classifications; jet streams; local thunderstorms; tropical cyclones: classification; tornadoes; hurricanes.

Climate and Climate Change

Climate: its classification; causes of climate change; global warming and its outcomes; air pollution; aerosols, ozone depletion, acid rain, environmental issues related to climate

Basics of weather forecasting

Weather forecasting: analysis and its historical background; need of measuring weather; types of weather forecasting; weather forecasting methods; criteria of choosing weather station; basics of choosing site and exposure; satellites observations in weather forecasting; weather maps; uncertainty and predictability; probability forecasts.

Demonstrations and Experiments

- 1) Study of synoptic charts & weather reports, working principle of weather station.
- 2) Processing and analysis of weather data
 - a) To calculate the sunniest time of the year.
 - b) To study the variation of rainfall amount and intensity by wind direction.
 - c) To observe the sunniest/driest day of the week.
 - d) To examine the maximum and minimum temperature throughout the year.
 - e) To evaluate the relative humidity of the day.
 - f) To examine the rainfall amount month wise.
- 3) Exercises in chart reading: Plotting of constant pressure charts, surfaces charts, upper wind charts and its analysis.
- 4) Formats and elements in different types of weather forecasts/ warning (both aviation and non- aviation)

Reference Books

- Aviation Meteorology, I.C. Joshi, 3rd edition 2014, Himalayan Books
- The weather Observers Hand book, Stephen Burt, 2012, Cambridge University Press. Meteorology, S.R. Ghadekar, 2001, Agromet Publishers, Nagpur.
- Text Book of Agrometeorology, S.R. Ghadekar, 2005, Agromet Publishers, Nagpur. Why the weather, Charls Franklin Brooks, 1924, Chpraman & Hall, London.
- Atmosphere and Ocean, John G. Harvey, 1995, The Artemis Press.

3. General Electives (for honours students of other disciplines)

3.1. GE T1 - Mechanics

Mechanics

4 Credits

Vectors

Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter.

Ordinary Differential Equations

1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients.

Laws of Motion

Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass.

Momentum and Energy

Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets.

Rotational Motion

Angular velocity and angular momentum. Torque. Conservation of angular momentum.

Gravitation

Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Basic idea of global positioning system (GPS). Weightlessness. Physiological effects on astronauts.

Oscillations

Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations.

Elasticity

Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of Rigidity modulus and moment of inertia - q , η and $\ll$ by Searles method.

Special Theory of Relativity

Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities.

Reference Books

- University Physics. F.W. Sears, M.W. Zemansky and H.D. Young, 13/e, 1986. Addison-Wesley
- Mechanics Berkeley Physics, v.1: Charles Kittel, et.al. 2007, Tata McGraw-Hill.
- Physics – Resnick, Halliday & Walker 9/e, 2010, Wiley
- Engineering Mechanics, Basudeb Bhattacharya, 2nd edn., 2015, Oxford University Press
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

3.2. GE P1 – Mechanics Lab

Mechanics

2 Credits

List of Practical

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
2. To determine the Height of a Building using a Sextant.
3. To determine the Moment of Inertia of a Flywheel.
4. To determine the Young's Modulus of a Wire by Optical Lever Method.
5. To determine the Modulus of Rigidity of a Wire by Maxwell's needle.
6. To determine the Elastic Constants of a Wire by Searle's method.
7. To determine g by Bar Pendulum.
8. To determine g by Kater's Pendulum.
9. To study the Motion of a Spring and calculate (a) Spring Constant, (b) g .

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- Engineering Practical Physics, S.Panigrahi & B.Mallick, 2015, Cengage Learning India Pvt. Ltd.
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

3.3. GE T2 - Electricity and Magnetism

Electricity and Magnetism

4 Credits

Vector Analysis

Review of vector algebra (Scalar and Vector product), gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only).

Electrostatics

Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric.

Magnetism

Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law.

Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferro- magnetic materials.

Electromagnetic Induction

Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field.

Maxwell's equations and Electromagnetic wave propagation

Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization.

Reference Books

- Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education
- Electricity & Magnetism, J.H. Fewkes & J.Yarwood. Vol. I, 1991, Oxford Univ. Press
- Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
- D.J.Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.

3.4. GE P2 – Electricity and Magnetism Lab

Electricity and Magnetism

2 Credits

List of Practical

- 1) To use a Multimeter for measuring
 - a) Resistances
 - b) AC and DC Voltages
 - c) DC Current
 - d) Checking electrical fuses.
- 2) Ballistic Galvanometer:
 - a) Measurement of charge and current sensitivity
 - b) Measurement of CDR
 - c) Determine a high resistance by Leakage Method
 - d) To determine Self Inductance of a Coil by Rayleigh's Method.
- 3) To compare capacitances using De'Sauty's bridge.
- 4) Measurement of field strength B and its variation in a Solenoid (Determine dB/dx)
- 5) To study the Characteristics of a Series RC Circuit.
- 6) To study a series LCR circuit LCR circuit and determine its
- 7) Resonant frequency
- 8) Quality factor
- 9) To study a parallel LCR circuit and determine its:
- 10) Anti-resonant frequency and
- 11) Quality factor Q
- 12) To determine a Low Resistance by Carey Foster's Bridge.
- 13) To verify the Thevenin and Norton theorems
- 14) To verify the Superposition, and Maximum Power Transfer Theorems

Reference Books

- Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Ed.2011, Kitab Mahal
- Engineering Practical Physics, S.Panigrahi & B.Mallick,2015, Cengage Learning India Pvt. Ltd.

3.5. GE T3 - Thermal Physics and Statistical Mechanics

Thermal Physics and Statistical Mechanics

4 Credits

Laws of Thermodynamics

Thermodynamic Description of system: Zeroth Law of thermodynamics and temperature. First law and internal energy, conversion of heat into work, Various Thermodynamical Processes, Applications of First Law: General Relation between CP and CV, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Coefficient, Reversible and irreversible processes, Second law and Entropy, Carnot's cycle & theorem, Entropy changes in reversible & irreversible processes, Entropy-temperature diagrams, Third law of thermodynamics, Unattainability of absolute zero.

Thermo-dynamical Potentials

Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwell's relations and applications - Joule-Thompson Effect, Clausius- Clapeyron Equation, Expression for $(C_P - C_V)$, C_P/C_V , TdS equations.

Kinetic Theory of Gases

Derivation of Maxwell's law of distribution of velocities and its experimental verification, Mean free path (Zeroth Order), Transport Phenomena: Viscosity, Conduction and Diffusion (for vertical case), Law of equipartition of energy (no derivation) and its applications to specific heat of gases; mono-atomic and diatomic gases.

Theory of Radiation

Blackbody radiation, Spectral distribution, Concept of Energy Density, Derivation of Planck's law, Deduction of Wien's distribution law, Rayleigh- Jeans Law, Stefan Boltzmann Law and Wien's displacement law from Planck's law.

Statistical Mechanics

Phase space, Macrostate and Microstate, Entropy and Thermodynamic probability, Maxwell-Boltzmann law - distribution of velocity - Quantum statistics - Fermi-Dirac distribution law - electron gas - Bose-Einstein distribution law - photon gas - comparison of three statistics.

Reference Books

- Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.
- A Treatise on Heat, Meghnad Saha, and B.N. Srivastava, 1969, Indian Press.
- Thermodynamics, Enrico Fermi, 1956, Courier Dover Publications.
- Heat and Thermodynamics, M.W.Zemasky and R. Dittman, 1981, McGraw Hill
- Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears and
- G.L. Salinger. 1988, Narosa
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
- Thermal Physics, A. Kumar and S.P. Taneja, 2014, R. chand Publications.

3.6. GE P3 – Thermal Physics and Statistical Lab

Thermal Physics and Statistical

2 Credits

List of Practical

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barne's constant flow method.
2. Measurement of Planck's constant using black body radiation.
3. To determine Stefan's Constant.

4. To determine the coefficient of thermal conductivity of Cu by Searle's Apparatus.
5. To determine the Coefficient of Thermal Conductivity of Cu by Angstrom's Method.
6. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method.
7. To determine the temperature co-efficient of resistance by Platinum resistance thermometer.
8. To study the variation of thermo emf across two junctions of a thermocouple with temperature.
9. To record and analyze the cooling temperature of an hot object as a function of time using a thermocouple and suitable data acquisition system
10. To calibrate Resistance Temperature Device (RTD) using Null Method/Off- Balance Bridge

Reference Books

- Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
- A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal, 1985, Vani Publication.

3.7. GE T4 - Waves and Optics

Waves and Optics

4 Credits

Superposition of Two Collinear Harmonic oscillations

Linearity & Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats).

Superposition of Two Perpendicular Harmonic Oscillations

Graphical and Analytical Methods. Lissajous Figures with equal and unequal frequency and their uses.

Waves Motion- General

Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity.

Sound

Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem - Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels - Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria.

Wave Optics

Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle.

Interference

Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index.

Michelson's Interferometer

Idea of form of fringes (no theory needed), Determination of wavelength, Wavelength difference, Refractive index, and Visibility of fringes.

Diffraction

Fraunhofer diffraction- Single slit; Double Slit. Multiple slits and Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half- period zone analysis.

Polarization

Transverse nature of light waves. Plane polarized light – production and analysis. Circular and elliptical polarization.

Reference Books

- Fundamentals of Optics, F.A Jenkins and H.E White, 1976, McGraw-Hill
- Principles of Optics, B.K. Mathur, 1995, Gopal Printing
- Fundamentals of Optics, H.R. Gulati and D.R. Khanna, 1991, R. Chand Publications
- University Physics. F.W. Sears, M.W. Zemansky and H.D. Young. 13/e, 1986. Addison-Wesley

3.8. GE P4 – Waves and Optics Lab

Waves and Optics

2 Credits

List of Practical

1. To investigate the motion of coupled oscillators
2. To determine the Frequency of an Electrically Maintained Tuning Fork by Melde's Experiment and to verify $\lambda^2 \propto T$ Law.
3. To study Lissajous Figures
4. Familiarization with Schuster's focussing; determination of angle of prism.
5. To determine the Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
6. To determine the Refractive Index of the Material of a Prism using Sodium Light.
7. To determine Dispersive Power of the Material of a Prism using Mercury Light
8. To determine the value of Cauchy Constants.
9. To determine the Resolving Power of a Prism.
10. To determine wavelength of sodium light using Fresnel Biprism.
11. To determine wavelength of sodium light using Newton's Rings.
12. To determine the wavelength of Laser light using Diffraction of Single Slit.
13. To determine wavelength of (1) Sodium and (2) Spectral lines of the Mercury light using plane diffraction Grating
14. To determine the Resolving Power of a Plane Diffraction Grating.
15. To measure the intensity using photosensor and laser in diffraction patterns of single and double slits.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

3.9. GE T5 - Digital, Analogue Circuits and Instrumentation

Digital, Analog Circuits and Instrumentation

4 Credits

Digital Circuits

Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates.

De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Minterms and Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map

Binary Addition. Binary Subtraction using 2's Complement Method). Half Adders and Full Adders and Subtractors, 4-bit binary Adder-Subtractor.

Semiconductor Devices and Amplifiers

Semiconductor Diodes: P and N type semiconductors. Barrier Formation in PN Junction Diode. Qualitative Idea of Current Flow Mechanism in Forward and Reverse Biased Diode. PN junction and its characteristics. Static and Dynamic Resistance. Principle and structure of (1) LEDs, (2) Photodiode, (3) Solar Cell

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Active, Cutoff & Saturation regions Current gains α and β . Relations between α and β . Load Line analysis of Transistors. DC Load line & Q- point. Voltage Divider Bias Circuit for CE Amplifier. H-parameter, Equivalent Circuit. Analysis of single-stage CE amplifier using hybrid Model. Input & output Impedance. Current, Voltage and Power gains. Class A, B & C Amplifiers.

Operational Amplifiers (Black Box approach)

Characteristics of an Ideal and Practical Op-Amp (IC 741), Open-loop and closed- loop Gain. CMRR, concept of Virtual ground. Applications of Op-Amps: (1) Inverting and non-inverting Amplifiers, (2) Adder,

(3) Subtractor, (4) Differentiator, (5) Integrator, (6) Zero crossing detector.

Sinusoidal Oscillators: Barkhausen's Criterion for Self-sustained Oscillations. Determination of Frequency of RC Oscillator

Instrumentations

Introduction to CRO: Block Diagram of CRO. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference.

Power Supply: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers Calculation of Ripple Factor and Rectification Efficiency, Basic idea about capacitor filter, Zener Diode and Voltage Regulation.

Timer IC: IC 555 Pin diagram and its application as Astable and Monostable Multivibrator.

Reference Books

- Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
- Electronic devices & circuits, S. Salivahanan & N.S. Kumar, 2012, Tata Mc-Graw Hill
- Microelectronic Circuits, M.H. Rashid, 2nd Edn., 2011, Cengage Learning.
- Modern Electronic Instrumentation and Measurement Tech., Helfrick and Cooper, 1990, PHI Learning
- Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw Hill
- Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.
- Fundamentals of Digital Circuits, A. Anand Kumar, 2nd Edition, 2009, PHI Learning Pvt. Ltd.
- OP-AMP & Linear Digital Circuits, R.A. Gayakwad, 2000, PHI Learning Pvt. Ltd.

3.10. GE P5– Digital, Analogue Circuits and Instruments Lab

Digital, Analog Circuits and Instruments

2 Credits

List of Practical

1. To measure (a) Voltage, and (b) Frequency of a periodic waveform using CRO
2. To verify and design AND, OR, NOT and XOR gates using NAND gates.
3. To minimize a given logic circuit.
4. Half adder, Full adder and 4-bit Binary Adder.
5. Adder-Subtractor using Full Adder I.C.
6. To design an astable multivibrator of given specifications using 555 Timer.
7. To design a monostable multivibrator of given specifications using 555 Timer.
8. To study IV characteristics of PN diode, Zener and Light emitting diode
9. To study the characteristics of a Transistor in CE configuration.
10. To design a CE amplifier of given gain (mid-gain) using voltage divider bias.
11. To design an inverting amplifier of given gain using Op-amp 741 and study its frequency response.
12. To design a non-inverting amplifier of given gain using Op-amp 741 and study its Frequency Response.
13. To study Differential Amplifier of given I/O specification using Op-amp.
14. To investigate a differentiator made using op-amp.
15. To design a Wien Bridge Oscillator using an op-amp.

Reference Books

- Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
- Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
- OP-Amps & Linear Integrated Circuit, R.A. Gayakwad, 4th Edn, 2000, Prentice Hall.
- Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.

3.11. GE T6 - Elements of Modern Physics

Elements of Modern Physics

4 Credits

Planck's quantum

Planck's constant and light as a collection of photons; Photo- electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson-Germer experiment.

Problems with Rutherford model

Instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra.

Position measurement

Gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle- impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle.

Two slit interference experiment

Two slit interference experiment with photons, atoms & particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wavefunction, probabilities and normalization; Probability and probability current densities in one dimension.

One Dimensional infinitely Rigid Box

Energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunnelling in one dimension - across a step potential and across a rectangular potential barrier.

Size and structure of atomic nucleus and its relation with atomic weight

Impossibility of an electron being in nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula and binding energy.

Radioactivity

Stability of nucleus; Law of radioactive decay; Mean life and half-life; decay; decay - energy released, spectrum and Pauli's prediction of neutrino; -ray emission.

Fission and fusion

Mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions.

Reference Books

- Concepts of Modern Physics, Arthur Beiser, 2009, McGraw-Hill
- Modern Physics, J.R. Taylor, C.D. Zafiratos, M.A. Dubson, 2009, PHI Learning
- Six Ideas that Shaped Physics: Particle Behave like Waves, Thomas A. Moore, 2003, McGraw Hill
- Quantum Physics, Berkeley Physics, Vol.4. E.H. Wichman, 2008, Tata McGraw- Hill Co.
- Modern Physics, R.A. Serway, C.J. Moses, and C.A. Moyer, 2005, Cengage Learning
- Modern Physics, G. Kaur and G.R. Pickrell, 2014, McGraw Hill

3.12. GE P6 – Elements of Modern Physics Lab

Elements of Modern Physics

2 Credits

List of Practical

1. To determine value of Boltzmann constant using V-I characteristic of PN diode.
2. To determine work function of material of filament of directly heated vacuum diode.
3. To determine the ionization potential of mercury.
4. To determine value of Planck's constant using LEDs of at least 4 different colours.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the absorption lines in the rotational spectrum of Iodine vapour.
7. To study the diffraction patterns of single and double slits using laser and measure its intensity variation using Photosensor & compare with incoherent source – Na.
8. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
9. To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet.
10. To setup the Millikan oil drop apparatus and determine the charge of an electron.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

3.13. GE T7 – Solid State Physics

Solid State Physics

4 Credits

Crystal Structure

Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis – Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor.

Elementary Lattice Dynamics

Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T³ law

Magnetic Properties of Matter

Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia – and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss.

Dielectric Properties of Materials

Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeier relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons.

Elementary band theory

Kronig Penny model. Band Gaps. Conductors, Semiconductors and insulators. P and N type Semiconductors. Conductivity of Semiconductors, mobility, Hall Effect, Hall coefficient.

Superconductivity

Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect.

Reference Books

- Introduction to Solid State Physics, Charles Kittel, 8th Ed., 2004, Wiley India Pvt. Ltd.
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India
- Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
- Solid State Physics, N.W. Ashcroft and N.D. Mermin, 1976, Cengage Learning
- Solid State Physics, Rita John, 2014, McGraw Hill
- Solid-state Physics, H. Ibach and H. Luth, 2009, Springer
- Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India
- Solid State Physics, M.A. Wahab, 2011, Narosa Publications

3.14. GE P7 – Solid State Physics Lab

Solid State Physics

2 Credits

List of Practical

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)
6. To determine the refractive index of a dielectric layer using SPR
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To study the BH curve of iron using a Solenoid and determine the energy loss.
9. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four-probe method (room temperature to 150 oC) and to determine its band gap.
10. To determine the Hall coefficient of a semiconductor sample.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, I.Prakash & Ramakrishna, 11th Edn., 2011, Kitab Mahal
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

3.15. GE T₈ – Quantum Mechanics

Quantum Mechanics

6 Credits

Time dependent Schrodinger equation

Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Eigenvalues and Eigenfunctions. Position, momentum

& Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle

Time independent Schrodinger equation

Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to the spread of Gaussian wavepacket for a free particle in one dimension; wave packets, Fourier transforms and momentum space wavefunction; Position- momentum uncertainty principle.

General discussion of bound states in an arbitrary potential

continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem- square well potential; Quantum mechanics of simple harmonic oscillator-energy levels

and energy eigenfunctions using Frobenius method.

Quantum theory of hydrogen-like atoms

Radial wave functions; Orbital angular momentum quantum numbers l and m ; s, p, d,.. shells (idea only) (qualitative idea only)

Atoms in Electric and Magnetic Fields

Electron Angular Momentum. Space Quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment & Magnetic Energy, Gyromagnetic Ratio & Bohr Magneton.

Atoms in External Magnetic Fields

Normal and Anomalous Zeeman Effect

Many electron atoms

Pauli's Exclusion Principle. Symmetric and Antisymmetric Wave Functions. Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total Angular Momentum. Vector Model. Spin- orbit coupling in atoms, L-S and J-J couplings.

Reference Books

- A Text book of Quantum Mechanics, P.M. Mathews & K. Venkatesan, 2nd Ed., 2010, McGraw Hill
- Quantum Mechanics, Robert Eisberg and Robert Resnick, 2nd Edn., 2002, Wiley.
- Quantum Mechanics, Leonard I. Schiff, 3rd Edn. 2010, Tata McGraw Hill.
- Quantum Mechanics, G. Aruldas, 2nd Edn. 2002, PHI Learning of India.
- Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning.
- Quantum Mechanics for Scientists and Engineers, D.A.B. Miller, 2008, Cambridge University Press

Additional Books for Reference

- Quantum Mechanics, Eugen Merzbacher, 2004, John Wiley and Sons, Inc
- Introduction to Quantum Mechanics, David J. Griffith, 2nd Ed. 2005, Pearson Education
- Quantum Mechanics, Walter Greiner, 4th Edn., 2001, Springer

3.16. GE T9 - Nuclear and Particle Physics

Nuclear and Particle Physics

6 Credits

General Properties of Nuclei

Constituents of nucleus and their Intrinsic properties, quantitative facts about mass, radii, charge density (matter density), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excited states.

Nuclear Models

Liquid drop model approach, semi empirical mass formula and significance of its various terms, condition of nuclear stability, two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force.

Radioactivity decay

(a) Alpha decay: basics of α -decay processes, theory of α - emission, Gamow factor, Geiger Nuttall law, α - decay spectroscopy. (b) β -decay: energy kinematics for β -decay, positron emission, electron capture, neutrino

hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion.

Nuclear Reactions

Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct reaction, resonance reaction, Coulomb scattering(Rutherford scattering).

Interaction of Nuclear Radiation with matter

Energy loss due to ionization (Bethe- Block formula), energy loss of electrons, Cerenkov radiation. Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter.

Detector for Nuclear Radiations

Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si and Ge) for charge particle and photon detection (concept of charge carrier and mobility), neutron detector.

Particle Accelerators

Accelerator facility available in India: Van-de Graff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons.

Particle physics

Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, colour quantum number and gluons.

Reference Books

- Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
- Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
- Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004)
- Introduction to Elementary Particles, D. Griffith, John Wiley & Sons
- Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi
- Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP- Institute of Physics Publishing, 2004).
- Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
- Theoretical Nuclear Physics, J.M. Blatt & V.F. Weisskopf (Dover Pub. Inc., 1991)

Syllabus



ENLIGHTENMENT TO PERFECTION

B.Sc. Program Course in Physics Choice Based Credit System University of North Bengal

(Introduced from 2018-19 session)

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Scheme for CBCS Curriculum

Credit Distribution across Courses

		Credits	
Course Type	Total Papers	Theory + Practical	Theory + Tutorials*
Core Courses#	12	12*4 =48 12*2 =24	12*5 =60 12*1=12
Discipline Specific Electives##	6	6*4=24 6*2=12	6*5=30 6*1=6
Ability Enhancement Language Courses	2	2*2=4	2*2=4
Skill Enhancement Courses\$	4	4*2=8	4*2=8
TOTAL CREDITS		120	120

04 Courses from each of the 03 subjects of choice ## 02 papers from each subjects of choice including paper of interdisciplinary nature \$ 02 papers from any two out of the three subjects of choice *Tutorials of 1 Credit will be conducted in case there is no practical component

Details of Semester wise distribution of courses

Semester	CORE COURSE (12)	Ability nhance-ment Compulsory Course (AECC) (2)	Skill Enhan-ement Co urse (SEC) (2)	Discipline Specific Elective DSE (6)
I	Mechanics Theory and Lab	AECC-1 (English/MIL Communication)/ Environmental Science		
	DSC- 2 A			
	DSC- 3 A			
II	Electricity and Magnetism Theory and Lab	AECC-2 Environmental Science (English/ MIL Communication)		
	DSC- 2 B			
	DSC- 3 B			
III	Thermal Physics and Statistical Mechanics Theory and Lab		SEC-1 Computational Physics/Electrical Circuits and Network	
	DSC- 2 C			

	DSC- 3 C		(Any one)	
IV	Waves and Optics Theory and Lab		SEC -2 Basic Instrumenta- tion Skills/ Renewable Energy and Energy Harvesting (any one)	
	DSC- 2 D			
	DSC- 3 D			
V			SEC -3	DSE-1 A Elements of Modern Physics/Nuclear and Particle Physics Theory and Lab (any one)
				DSE-2 A
				DSE-3 A
VI			SEC -4	DSE-1 B Solid State Physics/Quantum Mechanics Theory and Lab (any one)
				DSE-2 B
				DSE-3 B

Mode of Continuing Evaluation and Practicals

a. Components of Continuing Evaluation (Refer Regulation 15 ix & 15 xxiv)

Any two of the following components are to be followed for any particular paper:
Class Test/Projects/Seminar Presentations/term paper/reports

b. Mode of Continuing Evaluation

To be evaluated by the concerned paper teachers. If a paper is taught by a single teacher it should be evaluated by the teacher concerned **and another teacher nominated by the HOD/DIC of Physics Department of the college.**

c. Practical Examination

Centre: Concerned College

Examiners: Two internal examiners, being nominated by the concerned college, are to be appointed by the Controller of Examinations.

Distribution of marks: Lab Note Book – 2 Working Formula – 2 Experiment – 10
Results and Accuracy – 2 Viva-voce – 4 Total – 20

Detailed Syllabus

Semester I

PHYSICS-DSC 1 A: MECHANICS

(Credits: Theory-04, Practicals-02) Theory: 60 Lectures

Vectors: Vector algebra. Scalar and vector products. Derivatives of a vector with respect to a parameter. **(4 Lectures)**

Ordinary Differential Equations: 1st order homogeneous differential equations. 2nd order homogeneous differential equations with constant coefficients. **(6 Lectures)**

Laws of Motion: Frames of reference. Newton's Laws of motion. Dynamics of a system of particles. Centre of Mass. **(10 Lectures)**

Momentum and Energy: Conservation of momentum. Work and energy. Conservation of energy. Motion of rockets. **(6 Lectures)**

Rotational Motion: Angular velocity and angular momentum. Torque. Conservation of angular momentum. **(5 Lectures)**

Gravitation: Newton's Law of Gravitation. Motion of a particle in a central force field (motion is in a plane, angular momentum is conserved, areal velocity is constant). Kepler's Laws (statement only). Satellite in circular orbit and applications. Geosynchronous orbits. Weightlessness. Basic idea of global positioning system (GPS). **(8 Lectures)**

Oscillations: Simple harmonic motion. Differential equation of SHM and its solutions. Kinetic and Potential Energy, Total Energy and their time averages. Damped oscillations. **(6 Lectures)**

Elasticity: Hooke's law - Stress-strain diagram - Elastic moduli-Relation between elastic constants - Poisson's Ratio-Expression for Poisson's ratio in terms of elastic constants - Work done in stretching and work done in twisting a wire - Twisting couple on a cylinder - Determination of Rigidity modulus by static torsion - Torsional pendulum-Determination of Rigidity modulus and moment of inertia - q , η and σ_{by} Searles method **(8 Lectures)**

Special Theory of Relativity: Constancy of speed of light. Postulates of Special Theory of Relativity. Length contraction. Time dilation. Relativistic addition of velocities. **(7 Lectures)**

Note: Students are not familiar with vector calculus. Hence all examples involve differentiation either in one dimension or with respect to the radial coordinate.

Reference Books:

- University Physics. FW Sears, MW Zemansky and HD Young 13/e, 1986. Addison- Wesley
- Mechanics Berkeley Physics course, v.1: Charles Kittel, et. Al. 2007, Tata McGraw- Hill.
- Physics – Resnick, Halliday & Walker 9/e, 2010, Wiley
- Engineering Mechanics, Basudeb Bhattacharya, 2nd edn., 2015, Oxford University Press
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.

PHYSICS LAB: DSC 1A LAB: MECHANICS

60 Lectures

1. Measurements of length (or diameter) using vernier caliper, screw gauge and travelling microscope.
2. To determine the Height of a Building using a Sextant.
3. To determine the Moment of Inertia of a Flywheel.
4. To determine the Young's Modulus of a Wire by Optical Lever Method.
5. To determine the Modulus of Rigidity of a Wire by Maxwell's needle.
6. To determine the Elastic Constants of a Wire by Searle's method.
7. To determine g by Bar Pendulum.
8. To determine g by Kater's Pendulum.
9. To determine g and velocity for a freely falling body using Digital Timing Technique
10. To study the Motion of a Spring and calculate (a) Spring Constant (b) Value of g

Reference Books:

- Advanced Practical Physics for students, B.L.Flint and H.T.Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers.
- Engineering Practical Physics, S.Panigrahi & B.Mallick, 2015, Cengage Learning India Pvt. Ltd.
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

Semester II

PHYSICS-DSC 2A: ELECTRICITY AND MAGNETISM

(Credits: Theory-04, Practicals-02) Theory: 60 Lectures

Vector Analysis: Review of vector algebra (Scalar and Vector product), gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stoke's theorem of vectors (statement only). **(12 Lectures)**

Electrostatics: Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Parallel plate, spherical and cylindrical condenser. Energy per unit volume in electrostatic field. Dielectric medium, Polarisation, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor completely filled with dielectric.

(22 Lectures)

Magnetism: Magnetostatics: Biot-Savart's law & its applications- straight conductor, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law.

Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para- and ferro-magnetic materials.

(10 Lectures)

Electromagnetic Induction: Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field. **(6 Lectures)**

Maxwell's equations and Electromagnetic wave propagation: Equation of continuity of current, Displacement current, Maxwell's equations, Poynting vector, energy density in electromagnetic field, electromagnetic wave propagation through vacuum and isotropic dielectric medium, transverse nature of EM waves, polarization. **(10 Lectures)**

Reference Books:

Electricity and Magnetism, Edward M. Purcell, 1986, McGraw-Hill Education..

- Electricity and Magnetism, J.H. Fewkes & J. Yarwood. Vol. I, 1991, Oxford Univ. Press.
- Electricity and Magnetism, D C Tayal, 1988, Himalaya Publishing House.
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
- D.J. Griffiths, Introduction to Electrodynamics, 3rd Edn, 1998, Benjamin Cummings.

PHYSICS LAB- DSC 2A LAB: ELECTRICITY AND MAGNETISM

60 Lectures

- 1) To use a Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, and (d) checking electrical fuses.
- 2) Ballistic Galvanometer:
 - i) Measurement of charge and current sensitivity
 - ii) Measurement of CDR
 - iii) Determine a high resistance by Leakage Method
 - iv) To determine Self Inductance of a Coil by Rayleigh's Method.
- 3) To compare capacitances using De'Sauty's bridge.
- 4) Measurement of field strength B and its variation in a Solenoid (Determine dB/dx).
- 5) To study the Characteristics of a Series RC Circuit.
- 6) To study the a series LCR circuit and determine its (a) Resonant Frequency, (b) Quality Factor
- 7) To study a parallel LCR circuit and determine its (a) Anti-resonant frequency and (b) Quality factor Q
- 8) To determine a Low Resistance by Carey Foster's Bridge.
- 9) To verify the Thevenin and Norton theorem
- 10) To verify the Superposition, and Maximum Power Transfer Theorem

Reference Books

- Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
- Engineering Practical Physics, S.Panigrahi & B.Mallick, 2015, Cengage Learning India Pvt. Ltd.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers

Semester III

PHYSICS-DSC 3A: THERMAL PHYSICS AND STATISTICAL MECHANICS

(Credits: Theory-04, Practicals-02) Theory: 60 Lectures

Laws of Thermodynamics:

Thermodynamic Description of system: Zeroth Law of thermodynamics and temperature. First law and internal energy, conversion of heat into work, Various Thermodynamical Processes, Applications of First Law: General Relation between C_p & C_v , Work Done during Isothermal and Adiabatic Processes, Compressibility & Expansion Coefficient, Reversible & irreversible processes, Second law & Entropy, Carnot's cycle & theorem, Entropy changes in reversible & irreversible processes, Entropy-temperature diagrams, Third law of thermodynamics, Unattainability of absolute zero. **(22 Lectures)**

Thermodynamic Potentials: Enthalpy, Gibbs, Helmholtz and Internal Energy functions, Maxwell's relations & applications - Joule-Thompson Effect, Clausius-Clapeyron Equation, Expression for $(C_p - C_v)$, C_p/C_v , TdS equations. **(10 Lectures)**

Kinetic Theory of Gases: Derivation of Maxwell's law of distribution of velocities and its experimental verification, Mean free path (Zeroth Order), Transport Phenomena: Viscosity, Conduction and Diffusion (for vertical case), Law of equipartition of energy (no derivation) and its applications to specific heat of gases; mono-atomic and diatomic gases. **(10 Lectures)**

Theory of Radiation: Blackbody radiation, Spectral distribution, Concept of Energy Density, Derivation of Planck's law, Deduction of Wien's distribution law, Rayleigh- Jeans Law, Stefan Boltzmann Law and Wien's displacement law from Planck's law. **(6 Lectures)**

Statistical Mechanics: Phase space, Macrostate and Microstate, Entropy and Thermodynamic probability, Maxwell-Boltzmann law - distribution of velocity - Quantum statistics - Fermi-Dirac distribution law - electron gas - Bose-Einstein distribution law - photon gas - comparison of three statistics. **(12 Lectures)**

Lectures)

Reference Books:

- Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.
- A Treatise on Heat, Meghnad Saha, and B.N. Srivastava, 1969, Indian Press.
- Thermodynamics, Enrico Fermi, 1956, Courier Dover Publications.
- Heat and Thermodynamics, M.W.Zemasky and R. Dittman, 1981, McGraw Hill
- Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears & G.L.Salinger. 1988, Narosa
- University Physics, Ronald Lane Reese, 2003, Thomson Brooks/Cole.
- Thermal Physics, A. Kumar and S.P. Taneja, 2014, R. chand Publications.

PHYSICS LAB-DSC 3A LAB: THERMAL PHYSICS AND STATISTICAL MECHANICS

60 Lectures

1. To determine Mechanical Equivalent of Heat, J, by Callender and Barne's constant flow method.
2. Measurement of Planck's constant using black body radiation.
3. To determine Stefan's Constant.
4. To determine the coefficient of thermal conductivity of copper by Searle's Apparatus.
5. To determine the Coefficient of Thermal Conductivity of Cu by Angstrom's Method.
6. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton's disc method.
7. To determine the temperature co-efficient of resistance by Platinum resistance thermometer.
8. To study the variation of thermo emf across two junctions of a thermocouple with temperature.
9. To record and analyze the cooling temperature of an hot object as a function of time using a thermocouple and suitable data acquisition system
10. To calibrate Resistance Temperature Device (RTD) using Null Method/Off-Balance Bridge

Reference Books:

- Advanced Practical Physics for students, B.L.Flint & H.T.Worsnop, 1971, Asia Publishing House.
 - Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
 - A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.
 - A Laboratory Manual of Physics for Undergraduate Classes, D.P. Khandelwal, 1985, Vani Publication.
-

Semester IV

PHYSICS-DSC 4A: WAVES AND OPTICS

(Credits: Theory-04, Practicals-02) Theory: 60 Lectures

Superposition of Two Collinear Harmonic oscillations: Linearity and Superposition Principle. (1) Oscillations having equal frequencies and (2) Oscillations having different frequencies (Beats). **(4 Lectures)**

Superposition of Two Perpendicular Harmonic Oscillations: Graphical and Analytical Methods. Lissajous Figures with equal and unequal frequency and their uses. **(2 Lectures)**

Waves Motion- General: Transverse waves on a string. Travelling and standing waves on a string. Normal Modes of a string. Group velocity, Phase velocity. Plane waves. Spherical waves, Wave intensity. **(7 Lectures)**

Fluids: Surface Tension: Synclastic and anticlastic surface - Excess of pressure - Application to spherical and cylindrical drops and bubbles - variation of surface tension with temperature - Jaeger's method. Viscosity: Viscosity - Rate flow of liquid in a capillary tube - Poiseuille's formula - Determination of coefficient of viscosity of a liquid - Variations of viscosity of a liquid with temperature lubrication. Physics of low pressure - production and measurement of low pressure - Rotary pump - Diffusion pump. Molecular pump - Knudsen absolute gauge - penning and pirani gauge – Detection of leakage. **(6 Lectures)**

Sound: Simple harmonic motion - forced vibrations and resonance - Fourier's Theorem
- Application to saw tooth wave and square wave - Intensity and loudness of sound - Decibels - Intensity levels - musical notes - musical scale. Acoustics of buildings: Reverberation and time of reverberation - Absorption coefficient - Sabine's formula - measurement of reverberation time - Acoustic aspects of halls and auditoria. **(6 Lectures)**

Wave Optics: Electromagnetic nature of light. Definition and Properties of wave front. Huygens Principle. **(3 Lectures)**

Interference: Interference: Division of amplitude and division of wavefront. Young's Double Slit experiment. Lloyd's Mirror and Fresnel's Biprism. Phase change on reflection: Stokes' treatment. Interference in Thin Films: parallel and wedge-shaped films. Fringes of equal inclination (Haidinger Fringes); Fringes of equal thickness (Fizeau Fringes). Newton's Rings: measurement of wavelength and refractive index. **(10 Lectures)**

Michelson's Interferometer: Idea of formation of fringes (no theory needed), Determination of wavelength, Wavelength difference, Refractive index and Visibility of fringes. **(3 Lectures)**

Diffraction: Fraunhofer diffraction: Single slit; Double Slit. Multiple slits & Diffraction grating. Fresnel Diffraction: Half-period zones. Zone plate. Fresnel Diffraction pattern of a straight edge, a slit and a wire using half-period zone analysis. **(14 Lectures)**

Polarization: Transverse nature of light waves. Plane polarized light – production and analysis. Circular and elliptical polarization. **(5 Lectures)**

Reference Books:

- Fundamentals of Optics, F A Jenkins and H E White, 1976, McGraw-Hill
- Principles of Optics, B.K. Mathur, 1995, Gopal Printing
- Fundamentals of Optics, H.R. Gulati and D.R. Khanna, 1991, R. Chand Publication

- University Physics. FW Sears, MW Zemansky and HD Young 13/e, 1986. Addison-Wesley

PHYSICS LAB-DSC 4A LAB: WAVES AND OPTICS

60 Lectures

1. To investigate the motion of coupled oscillators
2. To determine the Frequency of an Electrically Maintained Tuning Fork by Melde's Experiment and to verify $\lambda^2 - T$ Law.
3. To study Lissajous Figures
4. Familiarization with Schuster's focussing; determination of angle of prism.
5. To determine the Coefficient of Viscosity of water by Capillary Flow Method (Poiseuille's method).
6. To determine the Refractive Index of the Material of a given Prism using Sodium Light.
7. To determine Dispersive Power of the Material of a given Prism using Mercury Light
8. To determine the value of Cauchy Constants of a material of a prism.
9. To determine the Resolving Power of a Prism.
10. To determine wavelength of sodium light using Fresnel Biprism.
11. To determine wavelength of sodium light using Newton's Rings.
12. To determine the wavelength of Laser light using Diffraction of Single Slit.
13. To determine wavelength of (1) Sodium & (2) spectrum of Mercury light using plane diffraction Grating
14. To determine the Resolving Power of a Plane Diffraction Grating.
15. To measure the intensity using photosensor and laser in diffraction patterns of single and double slits.

Reference Books:

- Advanced Practical Physics for students, B.L. Flint & H.T. Worsnop, 1971, Asia Pub. House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

Discipline Specific Elective

Select two papers

PHYSICS- DSE: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTATION

(Credits: Theory-04, Practicals-02) Theory: 60 Lectures

UNIT-1: Digital Circuits

Difference between Analog and Digital Circuits. Binary Numbers. Decimal to Binary and Binary to Decimal Conversion, AND, OR and NOT Gates (Realization using Diodes and Transistor). NAND and NOR Gates as Universal Gates. XOR and XNOR Gates. **(4 Lectures)**

De Morgan's Theorems. Boolean Laws. Simplification of Logic Circuit using Boolean Algebra. Fundamental Products. Minterms and Maxterms. Conversion of a Truth Table into an Equivalent Logic Circuit by (1) Sum of Products Method and (2) Karnaugh Map. **(5 Lectures)**

Binary Addition. Binary Subtraction using 2's Complement Method). Half Adders and Full Adders and Subtractors, 4-bit binary Adder-Subtractor. **(4 Lectures)**

UNIT-2: Semiconductor Devices and Amplifiers: _

Semiconductor Diodes: p and n type semiconductors. Barrier Formation in PN Junction Diode. Qualitative Idea of Current Flow Mechanism in Forward and Reverse Biased Diode. PN junction and its characteristics. Static and Dynamic Resistance. Principle and structure of (1) LEDs (2) Photodiode (3) Solar Cell. **(5 Lectures)**

Bipolar Junction transistors: n-p-n and p-n-p Transistors. Characteristics of CB, CE and CC Configurations. Active, Cutoff, and Saturation Regions. Current gains α and β . Relations between α and β . Load Line analysis of Transistors. DC Load line and Q- point. Voltage Divider Bias Circuit for CE Amplifier. h-parameter Equivalent Circuit. Analysis of a single-stage CE amplifier using Hybrid Model. Input and Output Impedance. Current, Voltage and Power Gains. Class A, B, & C Amplifiers. **(12 Lectures)**

UNIT-3: Operational Amplifiers (Black Box approach):

Characteristics of an Ideal and Practical Op-Amp (IC 741), Open-loop & Closed-loop Gain. CMRR, concept of Virtual ground. Applications of Op-Amps: (1) Inverting and Non-inverting Amplifiers, (2) Adder, (3) Subtractor, (4) Differentiator, (5) Integrator,

(6) Zero Crossing Detector. **(13 Lectures)**

Sinusoidal Oscillators: Barkhausen's Criterion for Self-sustained Oscillations. Determination of Frequency of RC Oscillator **(5 Lectures)**

UNIT-4: Instrumentations:

Introduction to CRO: Block Diagram of CRO. Applications of CRO: (1) Study of Waveform, (2) Measurement of Voltage, Current, Frequency, and Phase Difference.

(3 Lectures) Power Supply: Half-wave Rectifiers. Centre-tapped and Bridge Full-wave Rectifiers Calculation of Ripple Factor and Rectification Efficiency, Basic idea about capacitor filter, Zener Diode and Voltage Regulation **(6 Lectures)**

Timer IC: IC 555 Pin diagram and its application as Astable & Monostable Multivibrator

(3 Lectures)

Reference Books:

- Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
- Electronic devices and circuits, S. Salivahanan and N. Suresh Kumar, 2012, Tata Mc-Graw Hill.
- Microelectronic Circuits, M.H. Rashid, 2ndEdn.,2011, Cengage Learning.
- Modern Electronic Instrumentation & Measurement Tech., Helfrick&Cooper,1990, PHI Learning
- Digital Principles & Applications, A.P. Malvino, D.P. Leach & Saha, 7th Ed.,2011, Tata McGraw Hill
- Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford Univ. Press.
- Fundamentals of Digital Circuits, A. Anand Kumar, 2nd Edition, 2009, PHI Learning Pvt. Ltd.
- OP-AMP and Linear Digital Circuits, R.A. Gayakwad, 2000, PHI Learning Pvt. Ltd.

PRACTICALS - DSE LAB: DIGITAL AND ANALOG CIRCUITS AND INSTRUMENTS

60 Lectures

1. To measure (a) Voltage, and (b) Frequency of a periodic waveform using a CRO
2. To verify and design AND, OR, NOT and XOR gates using NAND gates.
3. To minimize a given logic circuit.
4. Half adder, Full adder and 4-bit Binary Adder.
5. Adder-Subtractor using Full Adder I.C.
6. To design an astable multivibrator of given specifications using 555 Timer.
7. To design a monostable multivibrator of given specifications using 555 Timer.
8. To study IV characteristics of PN diode, Zener and Light emitting diode
9. To study the characteristics of a Transistor in CE configuration.
10. To design a CE amplifier of a given gain (mid-gain) using voltage divider bias.
11. To design an inverting amplifier of given gain using Op-amp 741 and study its frequency response.
12. To design a non-inverting amplifier of given gain using Op-amp 741 and study its Frequency Response.
13. To study a precision Differential Amplifier of given I/O specification using Op- amp.
14. To investigate the use of an op-amp as a Differentiator
15. To design a Wien Bridge Oscillator using an op-amp.

Reference Books:

- Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M. Miller, 1994, Mc-Graw Hill.
- Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
- OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall.
- Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.

PHYSICS- DSE: ELEMENTS OF MODERN PHYSICS

(Credits: Theory-04, Practicals-02) Theory:

60 Lectures

Planck's quantum, Planck's constant and light as a collection of photons; Photo-electric effect and Compton scattering. De Broglie wavelength and matter waves; Davisson- Germer experiment. **(8 Lectures)**

Problems with Rutherford model- instability of atoms and observation of discrete atomic spectra; Bohr's quantization rule and atomic stability; calculation of energy levels for hydrogen like atoms and their spectra. **(4**

Lectures)

Position measurement- gamma ray microscope thought experiment; Wave-particle duality, Heisenberg uncertainty principle- impossibility of a particle following a trajectory; Estimating minimum energy of a confined particle using uncertainty principle; Energy-time uncertainty principle. **(4 Lectures)**

Two slit interference experiment with photons, atoms and particles; linear superposition principle as a consequence; Matter waves and wave amplitude; Schrodinger equation for non-relativistic particles; Momentum and Energy operators; stationary states; physical interpretation of wavefunction, probabilities and normalization; Probability and probability current densities in one dimension. **(11**

Lectures)

One dimensional infinitely rigid box- energy eigenvalues and eigenfunctions, normalization; Quantum dot as an example; Quantum mechanical scattering and tunnelling in one dimension - across a step potential and across a rectangular potential barrier. **(12 Lectures)**

Size and structure of atomic nucleus and its relation with atomic weight; Impossibility of an electron being in the nucleus as a consequence of the uncertainty principle. Nature of nuclear force, NZ graph, semi-empirical mass formula and binding energy.

(6 Lectures) Radioactivity: stability of nucleus; Law of radioactive decay; Mean life & half-life; α decay; β decay - energy released, spectrum and Pauli's prediction of neutrino; γ -ray emission. **(11 Lectures)**

Fission and fusion - mass deficit, relativity and generation of energy; Fission - nature of fragments and emission of neutrons. Nuclear reactor: slow neutrons interacting with Uranium 235; Fusion and thermonuclear reactions.

(4 Lectures)

Reference Books:

- Concepts of Modern Physics, Arthur Beiser, 2009, McGraw-Hill
- Modern Physics, John R. Taylor, Chris D. Zafiratos, Michael A. Dubson, 2009, PHI Learning
- Six Ideas that Shaped Physics: Particle Behave like Waves, Thomas A. Moore, 2003, McGraw Hill
- Quantum Physics, Berkeley Physics Course Vol.4. E.H. Wichman, 2008, Tata McGraw-Hill Co.
- Modern Physics, R.A. Serway, C.J. Moses, and C.A. Moyer, 2005, Cengage Learning

- Modern Physics, G. Kaur and G.R. Pickrell, 2014, McGraw Hill

PRACTICALS -DSE-1 LAB: ELEMENTS OF MODERN PHYSICS

60 Lectures

1. To determine value of Boltzmann constant using V-I characteristic of PN diode.
2. To determine work function of material of filament of directly heated vacuum diode.
3. To determine value of Planck's constant using LEDs of at least 4 different colours.
4. To determine the ionization potential of mercury.
5. To determine the wavelength of H-alpha emission line of Hydrogen atom.
6. To determine the absorption lines in the rotational spectrum of Iodine vapour.
7. To study the diffraction patterns of single and double slits using laser source and measure its intensity variation using Photosensor and compare with incoherent source – Na light.
8. Photo-electric effect: photo current versus intensity and wavelength of light; maximum energy of photo-electrons versus frequency of light
9. To determine the value of e/m by magnetic focusing.
10. To setup the Millikan oil drop apparatus and determine the charge of an electron.

Reference Books:

- Advanced Practical Physics for students, B.L. Flint & H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

PHYSICS-DSE: MATHEMATICAL PHYSICS

(Credits: Theory-04, Practicals-02) Theory: 60 Lectures

The emphasis of the course is on applications in solving problems of interest to physicists. The students are to be examined entirely on the basis of problems, seen and unseen.

Calculus of functions of more than one variable: Partial derivatives, exact and inexact differentials. Integrating factor, with simple illustration. Constrained Maximization using Lagrange Multipliers.

(6 Lectures)

Fourier Series: Periodic functions. Orthogonality of sine and cosine functions, Dirichlet Conditions (Statement only). Expansion of periodic functions in a series of sine and cosine functions and determination of Fourier coefficients. Complex representation of Fourier series. Expansion of functions with arbitrary period. Expansion of non-periodic functions over an interval. Even and odd functions and their Fourier expansions. Application. Summing of Infinite Series.

(10 Lectures)

Frobenius Method and Special Functions: Singular Points of Second Order Linear Differential Equations and their importance. Frobenius method and its applications to differential equations. Legendre, Bessel, Hermite and Laguerre Differential Equations. Properties of Legendre Polynomials: Rodrigues Formula, Orthogonality. Simple recurrence relations.

(16 Lectures)

Some Special Integrals: Beta and Gamma Functions and Relation between them. Expression of Integrals in terms of Gamma Functions. Error Function (Probability Integral).

(4 Lectures)

Partial Differential Equations: Solutions to partial differential equations, using separation of variables: Laplace's Equation in problems of rectangular, cylindrical and spherical symmetry. **(10 Lectures)**

Complex Analysis: Brief Revision of Complex Numbers and their Graphical Representation. Euler's formula, De Moivre's theorem, Roots of Complex Numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Examples of analytic functions. Singular functions: poles and branch points, order of singularity, branch cuts. Integration of a function of a complex variable. Cauchy's Inequality. Cauchy's Integral formula.

(14 Lectures)

Reference Books:

- Mathematical Methods for Physicists: Arfken, Weber, 2005, Harris, Elsevier.
- Fourier Analysis by M.R. Spiegel, 2004, Tata McGraw-Hill.
- Mathematics for Physicists, Susan M. Lea, 2004, Thomson Brooks/Cole.
- An Introduction to Ordinary Differential Equations, Earl A Coddington, 1961, PHI Learning.
- Differential Equations, George F. Simmons, 2006, Tata McGraw-Hill.
- Essential Mathematical Methods, K.F. Riley and M.P. Hobson, 2011, Cambridge University Press
- Partial Differential Equations for Scientists and Engineers, S.J. Farlow, 1993, Dover Publications.
- Mathematical methods for Scientists and Engineers, D.A. McQuarrie, 2003, Viva Books.

PRACTICALS -DSE LAB: MATHEMATICAL PHYSICS

60 Lectures

The aim of this course is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- *Highlights the use of computational methods to solve physical problems*
- *Use of computer language as a tool in solving physics problems (applications)*
- *The course will consist of lectures (both theory and practical) in the Computer Lab*
- *Evaluation done not on the programming but on the basis of formulating the problem*
- *Aim at teaching students to construct the computational problem to be solved*
- *Students can use anyone operating system Linux or Microsoft Windows*

Topics	Description with Applications
Basics of scientific computing	Binary and decimal arithmetic, Floating point numbers, algorithms, Sequence, Selection and Repetition, single and double precision arithmetic, underflow & overflow- emphasize the importance of making equations in terms of dimensionless variables, Iterative methods
Errors and error Analysis	Truncation and round off errors, Absolute and relative errors, Floating point computations.
Review of C & C++ Programming fundamentals	Introduction to Programming, constants, variables and data types, operators and Expressions, I/O statements, scanf and printf, c in and c out, Manipulators for data formatting, Control statements (decision making and looping statements) (<i>If-statement. If-else Statement. Nested if Structure. Else-if Statement. Ternary Operator. Goto Statement. Switch Statement. Unconditional and Conditional Looping. While-Loop. Do-While Loop. FOR Loop. Break and Continue Statements. Nested Loops</i>), Arrays (1D&2D) and strings, user defined functions, Structures and Unions, Idea of classes and objects
Programs: using C/C++ language	Sum & average of a list of numbers, largest of a given list of numbers and its location in the list, sorting of numbers in ascending-descending order, Binary search

Random number generation	Area of circle, area of square, volume of sphere, value of pi (π)
Solution of Algebraic and Transcendental equations by Bisection, Newton Raphson and Secant methods	Solution of linear and quadratic equation, solving $(\sin\alpha)^2$, $\alpha = \tan\alpha$, $I = I_0 \alpha $ in optics
Interpolation by Newton Gregory Forward and Backward difference formula, Error estimation of linear interpolation	Evaluation of trigonometric functions e.g. $\sin \theta$, $\cos \theta$, $\tan \theta$, etc.
Numerical differentiation (Forward and Backward difference formula) and Integration (Trapezoidal and Simpson rules), Monte Carlo method	Given Position with equidistant time data to calculate velocity and acceleration and vice-versa. Find the area of B-H Hysteresis loop
Solution of Ordinary Differential Equations (ODE) First order Differential equation Euler, modified Euler and Runge-Kutta (RK) second and fourth order methods	First order differential equation - Radioactive decay - Current in RC, LC circuits with DC source - Newton's law of cooling - Classical equations of motion - Attempt following problems using RK 4 order method: - Solve the coupled differential equations $\frac{dy}{dx} = y + x, \frac{dy}{dx} = 3x^3 - x$ - for four initial conditions $x(0) = 0$, $y(0) = -1, -2, -3, -4$. - Plot x vs y for each of the four initial conditions on the same screen for $0 \leq t \leq 15$ - The differential equation describing the motion of a pendulum is $\frac{d^2P}{dt^2} = -\sin(P)$. The pendulum is released at t^2 from rest at an angular displacement α, i. e. $P(0) = \alpha$ and $P'(0) = 0$. Solve the equation for $\alpha = 0.1, 0.5$ and 1.0 and plot P as a function of time in the range $0 \leq t \leq 8\pi$. Also plot the analytic solution valid for small P ($\sin(P) = P$)

Reference Books:

- Introduction to Numerical Analysis, S.S. Sastry, 5thEdn., 2012, PHI Learning Pvt. Ltd.
 - Schaum's Outline of Programming with C⁺⁺. J.Hubbard, 2000, McGraw-Hill Publications.
 - Numerical Recipes in C⁺⁺: The Art of Scientific Computing, W.H. Press et al., 3rdEdn., 2007, Cambridge University Press.
 - A first course in Numerical Methods, Uri M. Ascher and Chen Greif, 2012, PHI Learning
 - Elementary Numerical Analysis, K.E. Atkinson, 3rd Edition, 2007, Wiley India Edition.
 - Numerical Methods for Scientists and Engineers, R.W. Hamming, 1973, Courier Dover Pub.
 - An Introduction to Computational Physics, T. Pang, 2ndEdn., 2006, Cambridge Univ. Press
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PHYSICS-DSE: SOLID STATE PHYSICS

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

Crystal Structure: Solids: Amorphous and Crystalline Materials. Lattice Translation Vectors. Lattice with a Basis – Central and Non-Central Elements. Unit Cell. Miller Indices. Reciprocal Lattice. Types of Lattices. Brillouin Zones. Diffraction of X-rays by Crystals. Bragg's Law. Atomic and Geometrical Factor. (12

Lectures)

Elementary Lattice Dynamics: Lattice Vibrations and Phonons: Linear Monoatomic and Diatomic Chains. Acoustical and Optical Phonons. Qualitative Description of the Phonon Spectrum in Solids. Dulong and Petit's Law, Einstein and Debye theories of specific heat of solids. T^3 law. (10 Lectures)

Magnetic Properties of Matter: Dia-, Para-, Ferri- and Ferromagnetic Materials. Classical Langevin Theory of dia – and Paramagnetic Domains. Quantum Mechanical Treatment of Paramagnetism. Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains. Discussion of B-H Curve. Hysteresis and Energy Loss.

(12 Lectures)

Dielectric Properties of Materials: Polarization. Local Electric Field at an Atom. Depolarization Field. Electric Susceptibility. Polarizability. Clausius Mosotti Equation. Classical Theory of Electric Polarizability. Normal and Anomalous Dispersion. Cauchy and Sellmeier relations. Langevin-Debye equation. Complex Dielectric Constant. Optical Phenomena. Application: Plasma Oscillations, Plasma Frequency, Plasmons. (10 Lectures)

Elementary band theory: Kronig Penny model. Band Gaps. Conductors, Semiconductors and insulators. P and N type Semiconductors. Conductivity of Semiconductors, mobility, Hall Effect, Hall coefficient. (10 Lectures)

Superconductivity: Experimental Results. Critical Temperature. Critical magnetic field. Meissner effect. Type I and type II Superconductors, London's Equation and Penetration Depth. Isotope effect.

(6 Lectures)

Reference Books:

- Introduction to Solid State Physics, Charles Kittel, 8th Ed., 2004, Wiley India Pvt. Ltd.
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India
- Introduction to Solids, Leonid V. Azaroff, 2004, Tata Mc-Graw Hill
- Solid State Physics, Neil W. Ashcroft and N. David Mermin, 1976, Cengage Learning
- Solid State Physics, Rita John, 2014, McGraw Hill
- Solid-state Physics, H. Ibach and H Luth, 2009, Springer
- Elementary Solid State Physics, 1/e M. Ali Omar, 1999, Pearson India

- Solid State Physics, M.A. Wahab, 2011, Narosa Publications

PRACTICALS-DSE LAB: SOLID STATE PHYSICS

60 Lectures

1. Measurement of susceptibility of paramagnetic solution (Quinck's Tube Method)
2. To measure the Magnetic susceptibility of Solids.
3. To determine the Coupling Coefficient of a Piezoelectric crystal.
4. To measure the Dielectric Constant of a dielectric Materials with frequency
5. To determine the complex dielectric constant and plasma frequency of metal using Surface Plasmon resonance (SPR)
6. To determine the refractive index of a dielectric layer using SPR
7. To study the PE Hysteresis loop of a Ferroelectric Crystal.
8. To draw the BH curve of iron using a Solenoid and determine the energy loss from Hysteresis.
9. To measure the resistivity of a semiconductor (Ge) crystal with temperature by four- probe method (from room temperature to 150 °C) and to determine its band gap. To determine the Hall coefficient of a semiconductor sample.

Reference Books

- Advanced Practical Physics for students, B.L. Flint and H.T. Worsnop, 1971, Asia Publishing House.
- Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Ed., 2011, Kitab Mahal, New Delhi
- Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006, Prentice-Hall of India

PHYSICS-DSE: QUANTUM MECHANICS

(Credits: Theory-04, Practicals-02) Theory: 60 Lectures

Time dependent Schrodinger equation: Time dependent Schrodinger equation and dynamical evolution of a quantum state; Properties of Wave Function. Interpretation of Wave Function Probability and probability current densities in three dimensions; Conditions for Physical Acceptability of Wave Functions. Normalization. Linearity and Superposition Principles. Eigenvalues and Eigenfunctions. Position, momentum & Energy operators; commutator of position and momentum operators; Expectation values of position and momentum. Wave Function of a Free Particle.

(6 Lectures)

Time independent Schrodinger equation-Hamiltonian, stationary states and energy eigenvalues; expansion of an arbitrary wavefunction as a linear combination of energy eigenfunctions; General solution of the time dependent Schrodinger equation in terms of linear combinations of stationary states; Application to the spread of Gaussian wavepacket for a free particle in one dimension; wave packets, Fourier transforms and momentum space wavefunction; Position-momentum uncertainty principle. **(10 Lectures)**

General discussion of bound states in an arbitrary potential- continuity of wave function, boundary condition and emergence of discrete energy levels; application to one-dimensional problem-square well potential; Quantum mechanics of simple harmonic oscillator-energy levels and energy eigenfunctions using Frobenius method.

(12 Lectures)

Quantum theory of hydrogen-like atoms: time independent Schrodinger equation in spherical polar coordinates; separation of variables for the second order partial differential equation; angular momentum operator and quantum numbers; Radial wavefunctions from Frobenius method; Orbital angular momentum quantum numbers l and m ; s, p, d,.. shells (idea only) **(10 Lectures)**

Atoms in Electric and Magnetic Fields:- Electron Angular Momentum. Space Quantization. Electron Spin and Spin Angular Momentum. Larmor's Theorem. Spin Magnetic Moment. Stern-Gerlach Experiment. Zeeman Effect: Electron Magnetic Moment and Magnetic Energy, Gyromagnetic Ratio and Bohr Magneton.

(8 Lectures)

Atoms in External Magnetic Fields:- Normal and Anomalous Zeeman Effect. **(4 Lectures)**

Many electron atoms:- Pauli's Exclusion Principle. Symmetric and Antisymmetric Wave Functions. Periodic table. Fine structure. Spin orbit coupling. Spectral Notations for Atomic States. Total Angular Momentum. Vector Model. Spin-orbit coupling in atoms-L-S and J-J couplings. **(10 Lectures)**

Reference Books:

- A Text book of Quantum Mechanics, P.M. Mathews & K. Venkatesan, 2nd Ed., 2010, McGraw Hill
- Quantum Mechanics, Robert Eisberg and Robert Resnick, 2ndEdn., 2002, Wiley.
- Quantum Mechanics, Leonard I. Schiff, 3rdEdn. 2010, Tata McGraw Hill.
- Quantum Mechanics, G. Aruldas, 2ndEdn. 2002, PHI Learning of India.
- Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning.
- Quantum Mechanics for Scientists & Engineers, D.A.B. Miller, 2008, Cambridge University Press

Additional Books for Reference

- Quantum Mechanics, Eugen Merzbacher, 2004, John Wiley and Sons, Inc.
- Introduction to Quantum Mechanics, David J. Griffith, 2nd Ed. 2005, Pearson Education
- Quantum Mechanics, Walter Greiner, 4thEdn., 2001, Springer

PRACTICAL-DSE LAB: QUANTUM MECHANICS

60 Lectures

Use C/C++/Scilab for solving the following problems based on Quantum Mechanics like

1. Solve the s-wave Schrodinger equation for the ground state and the first excited state of the hydrogen atom:

$$\frac{d^2y}{xx^2} = A(r)u(r), A(r) = 2n \frac{2n}{k^2} [V(r) - E] \quad \text{where } V(r) = -\frac{e^2}{r}$$

Here, m is the reduced mass of the electron. Obtain the energy eigenvalues and plot the corresponding wavefunctions. Remember that the ground state energy of the hydrogen atom is ≈ -13.6 eV. Take $e = 3.795$ (eVÅ)^{1/2}, $\hbar c = 1973$ (eVÅ) and $m = 0.511 \times 10^6$ eV/c².

2. Solve the s-wave radial Schrodinger equation for an atom:

$$\frac{d^2y}{xx^2} = A(r)u(r), A(r) = 2n \frac{2n}{k^2} [V(r) - E]$$

Where m is the reduced mass of the system (which can be chosen to be the mass of an electron), for the screened coulomb potential

$$V(r) = -\frac{e^2}{r}$$

Find the energy (in eV) of the ground state of the atom to an accuracy of three significant digits. Also, plot the corresponding wavefunction. Take $e = 3.795$ (eVÅ)^{1/2}, $m = 0.511 \times 10^6$ eV/c², and $a = 3$ Å, 5 Å, 7 Å. In these units $\hbar c = 1973$ (eVÅ). The ground state energy is expected to be above -12 eV in all three cases.

3. Solve the s-wave radial Schrodinger equation for a particle of mass m:

$$\frac{d^2y}{xx^2} = A(r)u(r), A(r) = 2n \frac{2n}{k^2} [V(r) - E]$$

For the anharmonic oscillator potential

$$V(r) = \frac{1}{2}kr^2 + \frac{1}{3}br^3$$

for the ground state energy (in MeV) of the particle to an accuracy of three significant digits. Also, plot the corresponding wave function. Choose $m = 940$ MeV/c², $k = 100$ MeV fm⁻², $b = 0, 10, 30$ MeV fm⁻³. In these units, $\hbar c = 197.3$ MeV fm. The ground state energy is expected to lie between 90 and 110 MeV for all three cases.

4. Solve the s-wave radial Schrodinger equation for the vibrations of hydrogen molecule:

$$\frac{d^2y}{xx^2} = A(r)u(r), A(r) = 2n \frac{2n}{k^2} [V(r) - E]$$

where μ is the reduced mass of the two-atom system for the Morse potential

$$V(r) = D(e^{-2ar^*} - e^{-ar^*}), \quad r^* = \frac{(r - r_0)}{r}$$

Find the lowest vibrational energy (in MeV) of the molecule to an accuracy of three significant digits. Also plot the corresponding wave function. Take: $m = 940 \times 10^6 \text{ eV}/c^2$, $D = 0.755501 \text{ eV}$, $\alpha = 1.44$, $r_0 = 0.131349 \text{ \AA}$

Laboratory based experiments:

1. Study of Electron spin resonance- determine magnetic field as a function of the resonance frequency
2. Study of Zeeman effect: with external magnetic field; Hyperfine splitting
3. To study the quantum tunnelling effect with solid state device, e.g. tunnelling current in backward diode or tunnel diode.

Reference Books:

- Schaum's Outline of Programming with C++. J.Hubbard, 2000 , McGraw-Hill Publications.
- Numerical Recipes in C: The Art of Scientific Computing, W.H.Press et al., 3rdEdn., 2007, Cambridge University Press.
- Elementary Numerical Analysis, K.E.Atkinson, 3rd Ed n . , 2007 , Wiley India Edition.
- A Guide to MATLAB, B.R. Hunt, R.L. Lipsman, J.M. Rosenberg, 2014, 3rd Edn., Cambridge University Press
- Simulation of ODE/PDE Models with MATLAB®, OCTAVE and SCILAB: Scientific and Engineering Applications: A. Vande Wouwer, P. Saucez, C. V. Fernández.2014 Springer ISBN: 978-3319067896
- Scilab by example: M. Affouf2012ISBN: 978-1479203444
- Scilab (A Free Software to Matlab): H. Ramchandran, A.S. Nair. 2011 S. Chand and Company, New Delhi ISBN: 978-8121939706
- Scilab Image Processing: Lambert M. Surhone. 2010Betascript Publishing ISBN: 978- 6133459274A
- Quantum Mechanics, Leonard I. Schiff, 3rdEdn. 2010, Tata McGraw Hill.
- Quantum Mechanics, Bruce Cameron Reed, 2008, Jones and Bartlett Learning.

PHYSICS-DSE: EMBEDDED SYSTEM: INTRODUCTION TO MICROCONTROLLERS

(Credits: Theory-04, Practicals-02) Theory: 60 Lectures

Embedded system introduction: Introduction to embedded systems and general purpose computer systems, architecture of embedded system, classifications, applications and purpose of embedded systems, challenges and design issues in embedded systems, operational and non-operational quality attributes of embedded systems, elemental description of embedded processors and microcontrollers. **(6 Lectures)**

Review of microprocessors: Organization of Microprocessor based system, 8085 μ p pin diagram and architecture, concept of data bus and address bus, 8085 programming model, instruction classification, subroutines, stacks and its implementation, delay subroutines, hardware and software interrupts. **(4 Lectures)**

8051 microcontroller: Introduction and block diagram of 8051 microcontroller, architecture of 8051, overview of 8051 family, 8051 assembly language programming, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions.

(12 Lectures)

8051 I/O port programming: Introduction of I/O port programming, pin out diagram of 8051 microcontroller, I/O port pins description and their functions, I/O port programming in 8051, (Using Assembly Language), I/O programming: Bit manipulation. **(4 Lectures)**

Programming of 8051: 8051 addressing modes and accessing memory using various addressing modes, assembly language instructions using each addressing mode, arithmetic & logic instructions, 8051 programming in C:- for time delay and I/O operations and manipulation, for arithmetic & logic operations, for ASCII and BCD conversions. **(12 Lectures)**

Timer and counter programming: Programming 8051 timers, counter programming. **(3 Lectures)**

Serial port programming with and without interrupt: Introduction to 8051 interrupts, programming timer interrupts, programming external hardware interrupts and serial communication interrupt, interrupt priority in the 8051. **(6 Lectures)**

Interfacing 8051 microcontroller to peripherals: Parallel and serial ADC, DAC interfacing, LCD interfacing. **(2 Lectures)**

Programming Embedded Systems: Structure of embedded program, infinite loop, compiling, linking and locating, downloading and debugging. **(3Lectures)**

Embedded system design and development: Embedded system development environment, file types generated after cross compilation, disassembler/ decompiler, simulator, emulator and debugging, embedded product development life-cycle, trends in embedded industry. **(8 Lectures)**

Reference Books:

- Embedded Systems: Architecture, Programming & Design, R. Kamal, 2008, Tata McGraw Hill
- The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
- Embedded Microcomputer System: Real Time Interfacing, J.W. Valvano, 2000, Brooks/Cole
- Embedded Systems and Robots, Subrata Ghoshal, 2009, Cengage Learning
- Introduction to embedded system, K.V. Shibu, 1st Edition, 2009, McGraw Hill
- Microcontrollers in practice, I.Susnea and M.Mitescu, 2005, Springer.
- Embedded Systems: Design & applications, 1/e S.F. Barrett, 2008, Pearson Education India
- Embedded Microcomputer systems: Real time interfacing, J.W.Valvano 2011,Cengage Learning

PRACTICALS- DSE LAB: EMBEDDED SYSTEM: INTRODUCTION TO MICROCONTROLLERS

60 Lectures

Following experiments using 8051:

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's.
5. Program to glow first four LED then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left.
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement, some information on LCD display, interfacing a keyboard.

Reference Books:

- Embedded Systems: Architecture, Programming & Design, R. Kamal, 2008, Tata McGraw Hill
- The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
- Embedded Microcomputer System: Real Time Interfacing, J.W. Valvano, 2000, Brooks/Cole
- Embedded System, B.K. Rao, 2011, PHI Learning Pvt. Ltd.
- Embedded Microcomputer systems: Real time interfacing, J.W.Valvano 2011,Cengage Learning

PHYSICS-DSE: Nuclear & Particle Physics (Credits: Theory-05, Tutorials-01)

Theory: 75 Lectures

General Properties of Nuclei: Constituents of nucleus and their Intrinsic properties, quantitative facts about size, mass, charge density (matter energy), binding energy, average binding energy and its variation with mass number, main features of binding energy versus mass number curve, N/A plot, angular momentum, parity, magnetic moment, electric moments, nuclear excited states. **(10 Lectures)**

Nuclear Models: Liquid drop model approach, semi empirical mass formula and significance of various terms, condition of nuclear stability. Two nucleon separation energies, Fermi gas model (degenerate fermion gas, nuclear symmetry potential in Fermi gas), evidence for nuclear shell structure, nuclear magic numbers, basic assumption of shell model, concept of mean field, residual interaction, concept of nuclear force.

(12 Lectures)

Radioactivity decay:(a) Alpha decay: basics of α -decay processes, theory of α - emission, Gamow factor, Geiger Nuttall law, α -decay spectroscopy. (b) β -decay: energy kinematics for β -decay, positron emission, electron capture, neutrino hypothesis. (c) Gamma decay: Gamma rays emission & kinematics, internal conversion. **(10 Lectures)**

Nuclear Reactions: Types of Reactions, Conservation Laws, kinematics of reactions, Q-value, reaction rate, reaction cross section, Concept of compound and direct reaction, resonance reaction, Coulomb scattering (Rutherford scattering). **(8 Lectures)**

Interaction of Nuclear Radiation with matter: Energy loss due to ionization (Bethe- Block formula), energy loss of electrons, Cerenkov radiation, Gamma ray interaction through matter, photoelectric effect, Compton scattering, pair production, neutron interaction with matter. **(8 Lectures)**

Detector for Nuclear Radiations: Gas detectors: estimation of electric field, mobility of particle, for ionization chamber and GM Counter. Basic principle of Scintillation Detectors and construction of photo-multiplier tube (PMT). Semiconductor Detectors (Si & Ge) for charge particle and photon detection (concept of charge carrier and mobility). **(8 Lectures)**

Particle Accelerators: Accelerator facility available in India: Van-de Graaff generator (Tandem accelerator), Linear accelerator, Cyclotron, Synchrotrons. **(5 Lectures)**

Particle physics: Particle interactions; basic features, types of particles and its families. Symmetries and Conservation Laws: energy and momentum, angular momentum, parity, baryon number, Lepton number, Isospin, Strangeness and charm, concept of quark model, color quantum number and gluons. **(14 Lectures)**

Reference Books:

- Introductory nuclear Physics by Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).
- Concepts of nuclear physics by Bernard L. Cohen. (Tata Mcgraw Hill, 1998).
- Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004)
- Introduction to Elementary Particles, D. Griffith, John Wiley & Sons
- Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi
- Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP- Institute of Physics Publishing, 2004).
- Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).
- Theoretical Nuclear Physics, J.M. Blatt & V.F. Weisskopf (Dover Pub.Inc., 1991)

PHYSICS-DSE: Medical Physics (Credits: Theory-04, Practicals-02) Theory: 60 Lectures

PHYSICS OF THE BODY-I

Basic Anatomical Terminology: Standard Anatomical Position, Planes. Familiarity with terms like-Superior, Inferior, Anterior, Posterior, Medial, Lateral, Proximal and Distal. **Mechanics of the body:** Skeleton, forces, and body stability. Muscles and dynamics of body movement. Physics of Locomotors Systems: joints and movements, Stability and Equilibrium. **Energy household of the body:** Energy balance in the body, Energy consumption of the body, Heat losses of the body, Thermal Regulation. **Pressure system of body:** Physics of breathing, Physics of cardiovascular system. **(8 Lectures)**

PHYSICS OF THE BODY-II

Acoustics of the body: Nature and characteristics of sound, Production of speech, Physics of the ear, Diagnostics with sound and ultrasound. **Optical system of the body:** Physics of the eye. **Electrical system of the body:** Physics of the nervous system, Electrical signals and information transfer. **(10 Lectures)**

PHYSICS OF DIAGNOSTIC AND THERAPEUTIC SYSTEMS-I

X- RAYS: Electromagnetic spectrum, production of x-rays, x-ray spectra, Brehmsstrahlung, Characteristic x-ray. **X-ray tubes & types:** Coolidge tube, x-ray tube design, tube cooling stationary mode, Rotating anode x-ray tube, Tube rating, quality and intensity of x-ray. X-ray generator circuits, half wave and full wave rectification, filament circuit, kilo voltage circuit, types of X-Ray Generator, high frequency generator, exposure timers and switches, HT cables, HT generation. **(7 Lectures)**

RADIATION PHYSICS: Radiation units exposure, absorbed dose, units: rad, gray, relative biological effectiveness, effective dose, inverse square law. Interaction of radiation with matter Compton & photoelectric effect, Rem & Sievert, linear attenuation coefficient. **Radiation Detectors:** Thimble chamber, condenser chambers, Geiger Muller counter, Scintillation counters and Solid State detectors, ionization chamber, Dosimeters, survey methods, area monitors, TLD, Semiconductor detectors. **(7 Lectures)**

MEDICAL IMAGING PHYSICS: Evolution of Medical Imaging, X-ray diagnostics and imaging, Physics of nuclear magnetic resonance (NMR), NMR imaging, MRI Radiological imaging, Ultrasound imaging, Physics of Doppler with applications and modes, Vascular Doppler. Radiography: Filters, grids, cassette, X-ray film, film processing, fluoroscopy. **Computed tomography scanner-** principle & function, display, generations, mammography. Thyroid uptake system and Gamma camera (Only Principle, function and display). **(9 Lectures)**

RADIATION ONCOLOGY PHYSICS: External Beam Therapy (Basic Idea): Telecobalt, Conformal Radiation Therapy (CRT), 3DCRT, IMRT, Image Guided Radiotherapy, EPID, Rapid Arc, Proton Therapy, Gamma Knife, Cyber Knife. Contact Beam Therapy (Basic Idea): Brachytherapy-LDR and HDR, Intra Operative Brachytherapy. Radiotherapy, kilo voltage machines, deep therapy machines, Telecobalt machines, Medical linear accelerator. Basics of Teletherapy units, deep x-ray, Telecobalt units, medical linear accelerator, Radiation protection, external beam characteristics, dose maximum and build up – bolus, percentage depth dose, tissue maximum ratio and tissue phantom ratio, Planned target Volume and Gross Tumour Volume. **(9 Lectures)**

RADIATION AND RADIATION PROTECTION: Principles of radiation protection

,protective materials-radiation effects , somatic, genetic stochastic and deterministic effect. Personal monitoring devices: TLD film badge , pocket dosimeter, OSL dosimeter. Radiation dosimeter. Natural radioactivity, Biological effects of radiation, Radiation monitors. Steps to reduce radiation to Patient, Staff and Public. Dose Limits for Occupational workers and Public. AERB: Existence and Purpose. **(5 Lectures)**

PHYSICS OF DIAGNOSTIC AND THERAPEUTIC SYSTEMS-II

Diagnostic nuclear medicine: Radiopharmaceuticals for radioisotope imaging,

Radioisotope imaging equipment, Single photon and positron emission tomography. Therapeutic nuclear medicine: Interaction between radiation and matter Dose and isodose in radiation treatment.

Medical Instrumentation: Basic Ideas of Endoscope and Cautery, Sleep Apnea and Cpap Machines, Ventilator and its modes. **(5 Lectures)**

References:

- Medical Physics, J.R. Cameron and J.G. Skofronick, Wiley (1978)
- Basic Radiological Physics Dr. K. Thayalan - Jayapee Brothers Medical Publishing Pvt. Ltd. New Delhi (2003)
- Christensen's Physics of Diagnostic Radiology: Curry, Dowdey and Murry - Lippincot Williams and Wilkins (1990)
- Physics of Radiation Therapy: F M Khan - Williams and Wilkins, Third edition (2003)
- Physics of the human body, Irving P. Herman, Springer (2007).
- The essential physics of Medical Imaging: Bushberg, Seibert, Leidholdt and Boone Lippincot Williams and Wilkins, Second Edition (2002)
- Handbook of Physics in Diagnostic Imaging: R.S. Livingstone: B.I. Publication Pvt Ltd.
- The Physics of Radiology-H E Johns and Cunningham.

PRACTICALS -DSE LAB: Medical Physics 60 Lectures

1. Understanding the working of a manual Hg Blood Pressure monitor and measure the Blood Pressure.
2. Understanding the working of a manual optical eye-testing machine and to learn eye-testing.
3. Correction of Myopia (short sightedness) using a combination of lenses on an optical bench/breadboard.
4. Correction of Hypermetropia/Hyperopia (long sightedness) using a combination of lenses on an optical bench/breadboard.
5. To learn working of Thermoluminescent dosimeter (TLD) badges and measure the background radiation.
6. Familiarization with Geiger-Muller (GM) Counter and to measure background radiation.
7. Familiarization with Radiation meter and to measure background radiation.
8. Familiarization with the Use of a Vascular Doppler.

Reference Books:

- Basic Radiological Physics Dr. K. Thayalan - Jayapee Brothers Medical Publishing Pvt. Ltd. New Delhi (2003)
- Christensen's Physics of Diagnostic Radiology: Curry, Dowdey and Murry - Lippincot Williams and Wilkins (1990)
- Physics of Radiation Therapy: F M Khan - Williams and Wilkins, Third edition (2003)
- The essential physics of Medical Imaging: Bushberg, Seibert, Leidholdt and Boone Lippincot Williams and Wilkins, Second Edition (2002)
- The Physics of Radiology-H E Johns and Cunningham.
- Advanced Practical Physics for students, B.L. Flint & H.T. Worsnop, 1971, Asia Publishing House.
- Handbook of Physics in Diagnostic Imaging: Roshan S. Livingstone: B. I. Publications Pvt Ltd.
- A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition, 2011, Kitab Mahal, New Delhi.

Skill Enhancement Course (any four) (Credit: 02 each)- SEC1 to SEC4

PHYSICS WORKSHOP SKILL

(Credits: 02)

30 Lectures

The aim of this course is to enable the students to familiar and experience with various mechanical and electrical tools through hands-on mode

Introduction: Measuring units. conversion to SI and CGS. Familiarization with meter scale, Vernier calliper, Screw gauge and their utility. Measure the dimension of a solid block, volume of cylindrical beaker/glass, diameter of a thin wire, thickness of metal sheet, etc. Use of Sextant to measure height of buildings, mountains, etc. **(4 Lectures)**

Mechanical Skill: Concept of workshop practice. Overview of manufacturing methods: casting, foundry, machining, forming and welding. Types of welding joints and welding defects. Common materials used for manufacturing like steel, copper, iron, metal sheets, composites and alloy, wood. Concept of machine processing, introduction to common machine tools like lathe, shaper, drilling, milling and surface machines. Cutting tools, lubricating oils. Cutting of a metal sheet using blade. Smoothing of cutting edge of sheet using file. Drilling of holes of different diameter in metal sheet and wooden block. Use of bench vice and tools for fitting. Make funnel using metal sheet. **(10 Lectures)**

Electrical and Electronic Skill: Use of Multimeter. Soldering of electrical circuits having discrete components (R, L, C, diode) and ICs on PCB. Operation of oscilloscope. Making regulated power supply. Timer circuit, Electronic switch using transistor and relay. **(10 Lectures)**

Introduction to prime movers: Mechanism, gear system, wheel, Fixing of gears with motor axel. Lever mechanism, Lifting of heavy weight using lever. braking systems, pulleys, working principle of power generation systems. Demonstration of pulley experiment. **(6 Lectures)**

Reference Books:

- A text book in Electrical Technology - B L Theraja – S. Chand and Company.
- Performance and design of AC machines – M.G. Say, ELBSEdn.
- Mechanical workshop practice, K.C. John, 2010, PHI Learning Pvt. Ltd.
- Workshop Processes, Practices and Materials, Bruce J Black 2005, 3rd Edn., Editor Newnes [ISBN: 0750660732]
- New Engineering Technology, Lawrence Smyth/Liam Hennessy, The Educational Company of Ireland [ISBN: 0861674480]

COMPUTATIONAL PHYSICS

(Credits: 02)

Theory: 30 Lectures

The aim of this course is not just to teach computer programming and numerical analysis but to emphasize its role in solving problems in Physics.

- Highlights the use of computational methods to solve physical problems
- Use of computer language as a tool in solving physics problems (applications)
- Course will consist of hands on training on the Problem solving on Computers.

Introduction: Importance of computers in Physics, paradigm for solving physics problems for solution. Usage of linux as an Editor. **Algorithms and Flowcharts:** Algorithm: Definition, properties and development. Flowchart: Concept of flowchart, symbols, guidelines, types. Examples: Cartesian to Spherical Polar Coordinates, Roots of Quadratic Equation, Sum of two matrices, Sum and Product of a finite series, calculation of $\sin(x)$ as a series, algorithm for plotting (1) lissajous figures and (2) trajectory of a projectile thrown at an angle with the horizontal. **(4 Lectures)**

Scientific Programming: Some fundamental Linux Commands (Internal and External commands). Development of FORTRAN, Basic elements of FORTRAN: Character Set, Constants and their types, Variables and their types, Keywords, Variable Declaration and concept of instruction and program. Operators: Arithmetic, Relational, Logical and Assignment Operators. Expressions: Arithmetic, Relational, Logical, Character and Assignment Expressions. Fortran Statements: I/O Statements (unformatted/formatted), Executable and Non-Executable Statements, Layout of Fortran Program, Format of writing Program and concept of coding, Initialization and Replacement Logic. Examples from physics problems. **(5 Lectures)**

Control Statements: Types of Logic (Sequential, Selection, Repetition), Branching Statements (Logical IF, Arithmetic IF, Block IF, Nested Block IF, SELECT CASE and ELSE IF Ladder statements), Looping Statements (DO-CONTINUE, DO-ENDDO, DO- WHILE, Implied and Nested DO Loops), Jumping Statements (Unconditional GOTO, Computed GOTO, Assigned GOTO) Subscripted Variables (Arrays: Types of Arrays, DIMENSION Statement, Reading and Writing Arrays), Functions and Subroutines (Arithmetic Statement Function, Function Subprogram and Subroutine), RETURN, CALL, COMMON and EQUIVALENCE Statements), Structure, Disk I/O Statements, open a file, writing in a file, reading from a file. Examples from physics problems.

(5 Lectures)

Programming:

1. Exercises on syntax on usage of FORTRAN
2. Usage of GUI Windows, Linux Commands, familiarity with DOS commands and working in an editor to write sources codes in FORTRAN.
3. To printout all natural even/ odd numbers between given limits.
4. To find maximum, minimum and range of a given set of numbers.
5. Calculating Euler number using $\exp(x)$ series evaluated at $x=1$

(6 Lectures)

Scientific word processing: Introduction to LaTeX: TeX/LaTeX word processor, preparing a basic LaTeX file, Document classes, Preparing an input file for LaTeX, Compiling LaTeX File, LaTeX tags for creating different environments, Defining LaTeX commands and environments, Changing the type style, Symbols from other languages. **Equation representation:** Formulae and equations, Figures and other floating bodies, Lining in columns- Tabbing and tabular environment, Generating table of contents, bibliography and citation, Making an index and glossary, List making environments, Fonts, Picture environment and colors, errors. **(6 Lectures)**

Visualization: Introduction to graphical analysis and its limitations. Introduction to Gnuplot. importance of visualization of computational and computational data, basic Gnuplot commands: simple plots, plotting data from a file, saving and exporting, multiple data sets per file, physics with Gnuplot (equations, building functions, user defined variables and functions), Understanding data with Gnuplot

Hands on exercises:

1. To compile a frequency distribution and evaluate mean, standard deviation etc.
2. To evaluate sum of finite series and the area under a curve.
3. To find the product of two matrices
4. To find a set of prime numbers and Fibonacci series.
5. To write program to open a file and generate data for plotting using Gnuplot.
6. Plotting trajectory of a projectile projected horizontally.
7. Plotting trajectory of a projectile projected making an angle with the horizontally.
8. Creating an input Gnuplot file for plotting a data and saving the output for seeing on the screen. Saving it as an eps file and as a pdf file.
9. To find the roots of a quadratic equation.
10. Motion of a projectile using simulation and plot the output for visualization.
11. Numerical solution of equation of motion of simple harmonic oscillator and plot the outputs for visualization.
12. Motion of particle in a central force field and plot the output for visualization.

(9 Lectures)

Reference Books:

- Introduction to Numerical Analysis, S.S. Sastry, 5th Edn., 2012, PHI Learning Pvt. Ltd.
- Computer Programming in Fortran 77". V. Rajaraman (Publisher:PHI).
- LaTeX—A Document Preparation System", Leslie Lamport (Second Edition, Addison-Wesley, 1994).
- Gnuplot in action: understanding data with graphs, Philip K Janert, (Manning 2010)
- Schaum's Outline of Theory and Problems of Programming with Fortran, S Lipsdutz and A Poe, 1986Mc-Graw Hill Book Co.
- Computational Physics: An Introduction, R. C. Verma, et al. New Age International Publishers, New Delhi(1999)
- A first course in Numerical Methods, U.M. Ascher and C. Greif, 2012, PHI Learning
- Elementary Numerical Analysis, K.E. Atkinson, 3rd Edn ., 2 007, Wiley India Edition.

ELECTRICAL CIRCUITS AND NETWORK SKILLS

(Credits: 02)

Theory: 30 Lectures

The aim of this course is to enable the students to design and trouble shoots the electrical circuits, networks and appliances through hands-on mode

Basic Electricity Principles: Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with multimeter, voltmeter and ammeter. **(3Lectures)**

Understanding Electrical Circuits: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources. Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money. **(4Lectures)**

Electrical Drawing and Symbols: Drawing symbols. Blueprints. Reading Schematics. Ladder diagrams. Electrical Schematics. Power circuits. Control circuits. Reading of circuit schematics. Tracking the connections of elements and identify current flow and voltage drop. **(4Lectures)**

Generators and Transformers: DC Power sources. AC/DC generators. Inductance, capacitance, and impedance. Operation of transformers. **(3Lectures)**

Electric Motors: Single-phase, three-phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motor. **(4 Lectures)**

Solid-State Devices: Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources **(3Lectures)**

Electrical Protection: Relays. Fuses and disconnect switches. Circuit breakers. Overload devices. Ground-fault protection. Grounding and isolating. Phase reversal. Surge protection. Interfacing DC or AC sources to control elements (relay protection device) **(4Lectures)**

Electrical Wiring: Different types of conductors and cables. Basics of wiring-Star and delta connection. Voltage drop and losses across cables and conductors. Instruments to measure current, voltage, power in DC and AC circuits. Insulation. Solid and stranded cable. Conduit. Cable trays. Splices: wirenuts, crimps, terminal blocks, split bolts, and solder. Preparation of extension board. **(5Lectures)**

Reference Books:

- A text book in Electrical Technology - B L Theraja - S Chand & Co.
- A text book of Electrical Technology - A K Theraja
- Performance and design of AC machines - M G Say ELBS Edn.

BASIC INSTRUMENTATION SKILLS

(Credits: 02)

Theory: 30 Lectures

This course is to get exposure with various aspects of instruments and their usage through hands-on mode. Experiments listed below are to be done in continuation of the topics.

Basic of Measurement: Instruments accuracy, precision, sensitivity, resolution range etc. Errors in measurements and loading effects. **Multimeter:** Principles of measurement of dc voltage and dc current, ac voltage, ac current and resistance. Specifications of a multimeter and their significance. **(4 Lectures)**

Electronic Voltmeter: Advantage over conventional multimeter for voltage measurement with respect to input impedance and sensitivity. Principles of voltage, measurement (block diagram only). Specifications of an electronic Voltmeter/ Multimeter and their significance. **AC millivoltmeter:** Type of AC millivoltmeters: Amplifier- rectifier, and rectifier- amplifier. Block diagram ac millivoltmeter, specifications and their significance. **(4 Lectures)**

Cathode Ray Oscilloscope: Block diagram of basic CRO. Construction of CRT, Electron gun, electrostatic focusing and acceleration (Explanation only– no mathematical treatment), brief discussion on screen phosphor, visual persistence & chemical composition. Time base operation, synchronization. Front panel controls. Specifications of a CRO and their significance. **(6 Lectures)**

Use of CRO for the measurement of voltage (dc and ac frequency, time period. Special features of dual trace, introduction to digital oscilloscope, probes. Digital storage Oscilloscope: Block diagram and principle of working. **(3 Lectures)**

Signal Generators and Analysis Instruments: Block diagram, explanation and specifications of low frequency signal generators. pulse generator, and function generator. Brief idea for testing, specifications. Distortion factor meter, wave analysis. **(4 Lectures)**

Impedance Bridges & Q-Meters: Block diagram of bridge. working principles of basic (balancing type) RLC bridge. Specifications of RLC bridge. Block diagram & working principles of a Q- Meter. Digital LCR bridges. **(3 Lectures)**

Digital Instruments: Principle and working of digital meters. Comparison of analog & digital instruments. Characteristics of a digital meter. Working principles of digital voltmeter. **(3 Lectures)**

Digital Multimeter: Block diagram and working of a digital multimeter. Working principle of time interval, frequency and period measurement using universal counter/ frequency counter, time- base stability, accuracy and resolution. **(3 Lectures)**

The test of lab skills will be of the following test items:

1. Use of an oscilloscope.
2. CRO as a versatile measuring device.
3. Circuit tracing of Laboratory electronic equipment,
4. Use of Digital multimeter/VTVM for measuring voltages
5. Circuit tracing of Laboratory electronic equipment,
6. Winding a coil / transformer.
7. Study the layout of receiver circuit.
8. Trouble shooting a circuit
9. Balancing of bridges

Laboratory Exercises

1. To observe the loading effect of a multimeter while measuring voltage across a low resistance and high resistance.
2. To observe the limitations of a multimeter for measuring high frequency voltage and currents.
3. To measure Q of a coil and its dependence on frequency, using a Q- meter.
4. Measurement of voltage, frequency, time period and phase angle using CRO.
5. Measurement of time period, frequency, average period using universal counter/ frequency counter.
6. Measurement of rise, fall and delay times using a CRO.
7. Measurement of distortion of a RF signal generator using distortion factor meter.
8. Measurement of R, L and C using a LCR bridge/ universal bridge.

Open Ended Experiments:

1. Using a Dual Trace Oscilloscope
2. Converting the range of a given measuring instrument (voltmeter, ammeter)

Reference Books:

- A text book in Electrical Technology - B L Theraja - S Chand and Co.
- Performance and design of AC machines - M G Say ELBS Edn.
- Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
- Logic circuit design, Shimon P. Vingron, 2012, Springer.
- Digital Electronics, Subrata Ghoshal, 2012, Cengage Learning.
- Electronic Devices and circuits, S. Salivahanan & N. S.Kumar, 3rd Ed., 2012, Tata Mc-Graw Hill
- Electronic circuits: Handbook of design and applications, U.Tietze, Ch.Schenk, 2008, Springer
- Electronic Devices, 7/e Thomas L. Floyd, 2008, Pearson India

RENEWABLE ENERGY AND ENERGY HARVESTING

(Credits: 02)

Theory: 30 Lectures

The aim of this course is not just to impart theoretical knowledge to the students but to provide them with exposure and hands-on learning wherever possible

Fossil fuels and Alternate Sources of energy: Fossil fuels and Nuclear Energy, their limitation, need of renewable energy, non-conventional energy sources. An overview of developments in Offshore Wind Energy, Tidal Energy, Wave energy systems, Ocean Thermal Energy Conversion, solar energy, biomass, biochemical conversion, biogas generation, geothermal energy tidal energy, Hydroelectricity. **(3Lectures)**

Solar energy: Solar energy, its importance, storage of solar energy, solar pond, non convective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems. **(6Lectures)**

Wind Energy harvesting: Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies. **(3Lectures)**

Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, WaveEnergy Devices. **(3Lectures)**

Tide characteristics and Statistics, Tide Energy Technologies, Ocean Thermal Energy, Osmotic Power, Ocean Bio-mass. **(2Lectures)**

Geothermal Energy: Geothermal Resources, Geothermal Technologies. **(2Lectures)**

Hydro Energy: Hydropower resources, hydropower technologies, environmental impact of hydro power sources. **(2Lectures)**

Piezoelectric Energy harvesting: Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power **(4Lectures)**

Electromagnetic Energy Harvesting: Linear generators, physics mathematical models, recent applications **(2Lectures)**

Carbon captured technologies, cell, batteries, power consumption **(2Lectures)**

Environmental issues and Renewable sources of energy, sustainability. **(1 Lecture)**

Demonstrations and Experiments

1. Demonstration of Training modules on Solar energy, wind energy, etc.
2. Conversion of vibration to voltage using piezoelectric materials
3. Conversion of thermal energy into voltage using thermoelectric modules.

Reference Books:

- Non-conventional energy sources - G.D Rai - Khanna Publishers, New Delhi
- Solar energy - M P Agarwal - S Chand and Co. Ltd.
- Solar energy - Suhas P Sukhative Tata McGraw - Hill Publishing Company Ltd.
- Godfrey Boyle, "Renewable Energy, Power for a sustainable future", 2004, Oxford University Press, in association with The Open University.
- Dr. P Jayakumar, Solar Energy: Resource Assesment Handbook, 2009
- J.Balfour, M.Shaw and S. Jarosek, Photovoltaics, Lawrence J Goodrich (USA).
- http://en.wikipedia.org/wiki/Renewable_energy

TECHNICAL DRAWING

(Credits: 02)

Theory: 30 Lectures

Introduction: Drafting Instruments and their uses. lettering: construction and uses of various scales: dimensioning as per I.S.I. 696-1972. Engineering Curves: Parabola: hyperbola: ellipse: cycloids, involute: spiral: helix and loci of points of simple moving mechanism. 2D geometrical construction. Representation of 3D objects. Principles of projections. **(4 Lectures)**

Projections: Straight lines, planes and solids. Development of surfaces of right and oblique solids. Section of solids. **(6 Lectures)**

Object Projections: Orthographic projection. Interpenetration and intersection of solids. Isometric and oblique parallel projection of solids. **(4 Lectures)**

CAD Drawing: Introduction to CAD and Auto CAD, precision drawing and drawing aids, Geometric shapes, Demonstrating CAD- specific skills (graphical user interface. Create, retrieve, edit, and use symbol libraries. Use inquiry commands to extract drawing data). Control entity properties. Demonstrating basic skills to produce 2- D and 3-D drawings. 3D modeling with Auto CAD (surfaces and solids), 3D modeling with sketch up, annotating in Auto CAD with text and hatching, layers, templates & design center, advanced plotting (layouts, viewports), office standards, dimensioning, internet and collaboration, Blocks, Drafting symbols, attributes, extracting data. basic printing, editing tools, Plot/Print drawing to appropriate scale. **(16 Lectures)**

Reference Books:

- K. Venugopal, and V. Raja Prabhu. Engineering Graphic, New Age International
- AutoCAD 2014 & AutoCAD 2014/Donnie Gladfelter/Sybex/ISBN:978-1-118-57510-9
- Architectural Design with Sketchup/Alexander Schreyer/John Wiley & Sons/ISBN: 978-1-118-12309-6

Radiation Safety (Credits: 02)

Theory: 30 Lectures

The aim of this course is for awareness and understanding regarding radiation hazards and safety. The list of laboratory skills and experiments listed below the course are to be done in continuation of the topics

Basics of Atomic and Nuclear Physics: Basic concept of atomic structure; X rays characteristic and production; concept of bremsstrahlung and auger electron, The composition of nucleus and its properties, mass number, isotopes of element, spin, binding energy, stable and unstable isotopes, law of radioactive decay, Mean life and half life, basic concept of alpha, beta and gamma decay, concept of cross section and kinematics of nuclear reactions, types of nuclear reaction, Fusion, fission.

(6 Lectures)

Interaction of Radiation with matter: Types of Radiation: Alpha, Beta, Gamma and Neutron and their sources, sealed and unsealed sources, **Interaction of Photons** - Photo- electric effect, Compton Scattering, Pair Production, Linear and Mass Attenuation Coefficients, **Interaction of Charged Particles:** Heavy charged particles - Beth-Bloch Formula, Scaling laws, Mass Stopping Power, Range, Straggling, Channeling and Cherenkov radiation. Beta Particles- Collision and Radiation loss (Bremsstrahlung), **Interaction of Neutrons-** Collision, slowing down and Moderation.

(7Lectures)

Radiation detection and monitoring devices: Radiation Quantities and Units: Basic idea of different units of activity, KERMA, exposure, absorbed dose, equivalent dose, effective dose, collective equivalent dose, Annual Limit of Intake (ALI) and derived Air Concentration (DAC). **Radiation detection:** Basic concept and working principle of *gas detectors* (Ionization Chambers, Proportional Counter, Multi-Wire Proportional Counters (MWPC) and Gieger Muller Counter), *Scintillation Detectors* (Inorganic and Organic Scintillators), *Solid States Detectors* and *Neutron Detectors*, *Thermo luminescent Dosimetry*.

(7Lectures)

Radiation safety management: *Biological effects of ionizing radiation*, Operational limits and basics of radiation hazards evaluation and control: radiation protection standards, International Commission on Radiological Protection (ICRP) principles, justification, optimization, limitation, introduction of safety and risk management of radiation. Nuclear waste and disposal management. Brief idea about Accelerator driven Sub-critical system (ADS) for waste management.

(5Lectures)

Application of nuclear techniques: Application in medical science (e.g., MRI, PET, Projection Imaging Gamma Camera, radiation therapy), Archaeology, Art, Crime detection, Mining and oil. *Industrial Uses:* Tracing, Gauging, Material Modification, Sterization, Food preservation.

(5Lectures)

Experiments

1. Study the background radiation levels using Radiation meter

Characteristics of Geiger Muller (GM) Counter:

1. Study of characteristics of GM tube and determination of operating voltage and plateau length using background radiation as source (without commercial source).

2. Study of counting statistics using background radiation using GM counter.
3. Study of radiation in various materials (e.g. K₂SO₄ etc.). Investigation of possible radiation in different routine materials by operating GM at operating voltage.
4. Study of absorption of beta particles in Aluminum using GM counter.
5. Detection of α particles using reference source & determining its half life using spark counter
6. Gamma spectrum of Gas Light mantle (Source of Thorium)

Reference Books:

1. W.E. Burcham and M. Jobes – Nuclear and Particle Physics – Longman (1995)
2. G.F. Knoll, Radiation detection and measurements
3. Thermoluminescence Dosimetry, Mcknlay, A.F., Bristol, Adam Hilger (Medical Physics Handbook 5)
4. W.J. Meredith and J.B. Massey, “Fundamental Physics of Radiology”. John Wright and Sons, UK, 1989.
5. J.R. Greening, “Fundamentals of Radiation Dosimetry”, Medical Physics Hand Book Series, No.6, Adam Hilger Ltd., Bristol 1981.
6. Practical Applications of Radioactivity and Nuclear Radiations, G.C. Lowental and P.L. Airey, Cambridge University Press, U.K., 2001
7. Martin and S.A. Harbisor, An Introduction to Radiation Protection, John Willey & Sons, Inc. New York, 1981.
8. NCRP, ICRP, ICRU, IAEA, AERB Publications.
9. W.R. Hendee, “Medical Radiation Physics”, Year Book – Medical Publishers Inc. London, 1981

APPLIED OPTICS

(Credits: 02)

THEORY: 30 Lectures

Theory includes only qualitative explanation. Minimum five experiments should be performed covering minimum three sections.

(i) Sources and Detectors

(9 Periods)

Lasers, Spontaneous and stimulated emissions, Theory of laser action, Einstein's coefficients, Light amplification, Characterization of laser beam, He-Ne laser, Semiconductor lasers

Experiments on Lasers:

- a. Determination of the grating radial spacing of the Compact Disc (CD) by reflection using He-Ne or solid state laser.
- b. To find the width of the wire or width of the slit using diffraction pattern obtained by a He-Ne or solid state laser.
- c. To find the polarization angle of laser light using polarizer and analyzer
- d. Thermal expansion of quartz using laser

Experiments on Semiconductor Sources and Detectors:

- a. V-I characteristics of LED
- b. Study the characteristics of solid state laser
- c. Study the characteristics of LDR
- d. Photovoltaic Cell
- e. Characteristics of IR sensor

(ii) Fourier Optics

(6 Periods)

Concept of Spatial frequency filtering, Fourier transforming property of a thin lens

Experiments on Fourier Optics:

a. Fourier optic and image processing

1. Optical image addition/subtraction
2. Optical image differentiation
3. Fourier optical filtering
4. Construction of an optical 4f system

b. Fourier Transform Spectroscopy

Fourier Transform Spectroscopy (FTS) is a powerful method for measuring emission and absorption spectra, with wide application in atmospheric remote sensing, NMR spectrometry and forensic science.

Experiment:

To study the interference pattern from a Michelson interferometer as a function of mirror separation in the interferometer. The resulting interferogram is the Fourier transform of the power spectrum of the source. Analysis of experimental interferograms allows one to determine the transmission characteristics of several interference filters. Computer simulation can also be done.

(iii) Holography**(6 Periods)**

Basic principle and theory: coherence, resolution, Types of holograms, white light reflection hologram, application of holography in microscopy, interferometry, and character recognition

Experiments on Holography and interferometry:

1. Recording and reconstructing holograms
2. Constructing a Michelson interferometer or a Fabry Perot interferometer
3. Measuring the refractive index of air
4. Constructing a Sagnac interferometer
5. Constructing a Mach-Zehnder interferometer
6. White light Hologram

(iv) Photonics: Fibre Optics**(9 Periods)**

Optical fibres and their properties, Principal of light propagation through a fibre, The numerical aperture, Attenuation in optical fibre and attenuation limit, Single mode and multimode fibres, Fibre optic sensors: Fibre Bragg Grating

Experiments on Photonics: Fibre Optics

- a. To measure the numerical aperture of an optical fibre
- b. To study the variation of the bending loss in a multimode fibre
- c. To determine the mode field diameter (MFD) of fundamental mode in a single-mode fibre by measurements of its far field Gaussian pattern
- d. To measure the near field intensity profile of a fibre and study its refractive index profile
- e. To determine the power loss at a splice between two multimode fibre

Reference Books:

- Fundamental of optics, F. A. Jenkins & H. E. White, 1981, Tata McGraw hill.
- LASERS: Fundamentals & applications, K.Thyagrajan & A.K.Ghatak, 2010, Tata McGraw Hill
- Fibre optics through experiments, M.R.Shenoy, S.K.Khijwania, et.al. 2009, Viva Books
- Nonlinear Optics, Robert W. Boyd, (Chapter-I), 2008, Elsevier.
- Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer.
- Optical Systems and Processes, Joseph Shamir, 2009, PHI Learning Pvt. Ltd.
- Optoelectronic Devices and Systems, S.C. Gupta, 2005, PHI Learning Pvt. Ltd.
- Optical Physics, A.Lipson, S.G.Lipson, H.Lipson, 4th Edn., 1996, Cambridge Univ. Press

WEATHER FORECASTING

(Credits: 02)

Theory: 30 Lectures

The aim of this course is not just to impart theoretical knowledge to the students but to enable them to develop an awareness and understanding regarding the causes and effects of different weather phenomenon and basic forecasting techniques

Introduction to atmosphere: Elementary idea of atmosphere: physical structure and composition; compositional layering of the atmosphere; variation of pressure and temperature with height; air temperature; requirements to measure air temperature; temperature sensors: types; atmospheric pressure: its measurement; cyclones and anticyclones: its characteristics. **(9 Periods)**

Measuring the weather: Wind; forces acting to produce wind; wind speed direction: units, its direction; measuring wind speed and direction; humidity, clouds and rainfall, radiation: absorption, emission and scattering in atmosphere; radiation laws. **(4 Periods)**

Weather systems: Global wind systems; air masses and fronts: classifications; jet streams; local thunderstorms; tropical cyclones: classification; tornadoes; hurricanes. **(3 Periods)**

Climate and Climate Change: Climate: its classification; causes of climate change; global warming and its outcomes; air pollution; aerosols, ozone depletion, acid rain, environmental issues related to climate. **(6 Periods)**

Basics of weather forecasting: Weather forecasting: analysis and its historical background; need of measuring weather; types of weather forecasting; weather forecasting methods; criteria of choosing weather station; basics of choosing site and exposure; satellites observations in weather forecasting; weather maps; uncertainty and predictability; probability forecasts. **(8 Periods)**

Demonstrations and Experiments:

1. Study of synoptic charts & weather reports, working principle of weather station.
2. Processing and analysis of weather data:
 - (a) To calculate the sunniest time of the year.
 - (b) To study the variation of rainfall amount and intensity by wind direction.
 - (c) To observe the sunniest/driest day of the week.
 - (d) To examine the maximum and minimum temperature throughout the year.
 - (e) To evaluate the relative humidity of the day.
 - (f) To examine the rainfall amount month wise.
3. Exercises in chart reading: Plotting of constant pressure charts, surfaces charts, up wind chart analysis.
4. Formats and elements in different types of weather forecasts/ warning (both aviation and non aviation)

Reference books:

- Aviation Meteorology, I.C. Joshi, 3rd edition 2014, Himalayan Books
- The weather Observers Hand book, Stephen Burt, 2012, Cambridge University Press.
- Meteorology, S.R. Ghadekar, 2001, Agromet Publishers, Nagpur.
- Text Book of Agrometeorology, S.R. Ghadekar, 2005, Agromet Publishers, Nagpur.
- Why the weather, Charls Franklin Brooks, 1924, Chpraman & Hall, London.
- Atmosphere and Ocean, John G. Harvey, 1995, The Artemis Press.



Salesian College, Siliguri
(Autonomous)

National Education Policy (NEP) 2020 Curriculum Framework
For
Bachelor of Science in Physics

Offered by the

Department of Physics
Deanery of Sciences
Salesian College (Autonomous), Siliguri

NAAC Accredited A Grade (3rd cycle) and twice UGC certified College with Potential for Excellence (CPE)

Affiliated to the University of North Bengal
Siliguri - 734001
West Bengal

Vision

The vision of the Department of Physics is to build the rudiments for excellence and motivate the students to discover their latent talents through theoretical and practical physics and apply them to contribute to the betterment of self and of society and the nation at large.

Mission

The mission of the Department of Physics is to strive to attain high standards of excellence in generating and propagating knowledge in physics. The faculty members are committed to providing education that combines rigorous academics with the joy of discovery through nurturing a vibrant academic ambience conducive to study, creation, and dissemination of knowledge.

Exit Options:

Qualification	Exit Stage
Certificate in Physics	After successful completion of semesters I and II with 44 credits
Diploma in Physics	After successful completion of semesters I to IV with 86 credits
B.Sc. in Physics	After successful completion of semesters I to VI with 126 credits
B.Sc. (Hons.) in Physics	After successful completion of semesters I to VIII with 168 credits
B.Sc. (Hons. with Research) in Physics	After successful completion of semesters I to VIII with 168 credits, including 12 research credits

Program Objectives

Certificate in Physics

The Certificate course in Physics aims to provide

1. A comprehensive overview of introductory physics, mathematics and computation required to model and analyse elementary physical phenomena.
2. Development of analytical skills and competence in applying simple physical concepts to real life phenomena.
3. Encouragement and development of general critical and analytical thinking, scientific reasoning, problem-solving skills, written and verbal communication skills, and teamwork.
4. Self-conception with regard to moral and ethical awareness, leadership qualities, innovative ideas and life-long learning, and an appreciation for multicultural competence and multilingualism.
5. An ability to improve the knowledge and skills required to pursue higher levels of education or a career in the sciences.

Diploma in Physics

The Diploma course in Physics aims to provide

1. A comprehensive overview of the major areas of physics, mathematics and computation required to model and analyse general physical phenomena.
2. Development of analytical skills and competence in applying common physical concepts to real life phenomena.
3. Encouragement and development of general critical and analytical thinking, scientific reasoning, problem-solving skills, written and verbal communication skills, and teamwork.
4. Self-conception with regard to moral and ethical awareness, leadership qualities, innovative ideas and life-long learning, and an appreciation for multicultural competence and multilingualism.
5. An ability to improve the knowledge and skills required to pursue higher levels of education or a career in the sciences.

B. Sc. in Physics

The Bachelors course in Physics aims to provide

1. A comprehensive and detailed overview of all primary fields of physics, with the mathematical and computational background required to model and analyse most physical phenomena.
2. Development of analytical skills and competence in applying both common and abstract physical concepts to real life phenomena.
3. Encouragement and development of general critical and analytical thinking, scientific reasoning, problem-solving skills, written and verbal communication skills, and teamwork.
4. Self-conception with regard to moral and ethical awareness, leadership qualities, innovative ideas and life-long learning, and an appreciation for multicultural competence and multilingualism.
5. Sufficient knowledge to be able to participate in graduate and career entrance examinations such as IIT-JAM, CUET (PG), UPSC-CSE etc.

6. An ability to improve the knowledge and skills required to pursue higher levels of education or a career in the sciences.

B. Sc. (Hons./Hons. with Research) in Physics

The Bachelors (Hons./Hons. with Research) course in Physics aims to provide

1. A comprehensive and detailed overview of all primary fields of physics, with the mathematical and computational background required to model and analyse most physical phenomena.
2. A comprehensive and detailed overview of important advanced fields of physics.
3. Development of analytical skills and competence in recognizing and applying any pertinent physical concept to real life phenomena.
4. Encouragement and development of general critical and analytical thinking, scientific reasoning, problem-solving skills, written and verbal communication skills, and teamwork.
5. Self-conception with regard to moral and ethical awareness, leadership qualities, innovative ideas and life-long learning, and an appreciation for multicultural competence and multilingualism.
6. Sufficient knowledge to be able to participate in graduate/post-graduate and career entrance examinations such as IIT-JAM, CUET (PG), JEST, GATE, UPSC-CSE etc.
7. An ability to improve the knowledge and skills required to pursue higher levels of education or a career in the sciences.
8. Exposure to the latest advancements of physics, research and allied fields.

Program Outcomes

The learning outcomes of the undergraduate degree course in physics are

a) Knowledgeable and Technically Capable:

The graduate has the ability to apply the knowledge of basic science principles in the solution of complex problems of scientific and technical interest.

b) Problem Solver:

The graduate has the ability to identify, formulate and analyse complex scientific problems and reach substantiated conclusions using first principles of mathematical, computational and natural sciences.

c) Innovative Thinker:

The graduate has the ability to create, select and apply suitable techniques, resources and the use of modern analytical and scientific tools to identify, formulate and solve problems pertaining to applied science.

d) Modern Tools Oriented:

The graduate has the ability to apply appropriate techniques and resources of modern technology and computational tools for prediction and modelling of science problems.

e) *Scientifically Tempered:*

The graduate has the ability to develop a scientific temper and inquisitiveness for further studies, research and the promotion of scientific thinking.

f) *Effective Communicator:*

The graduate has the ability to communicate scientific and technical information in oral, written and graphical form to both science and lay audience.

g) *Group Worker:*

The graduate has the ability to work as a member and a leader in any team, and to manage projects and work in a multidisciplinary environment.

h) *Global Citizen:*

The graduate has an understanding of their professional, social and ethical responsibilities for a better society.

i) *Life-Long Learner:*

The graduate has the ability to recognize the need and importance of engaging in life-long learning.

Assessment

The Formative and Summative Assessments are to be evaluated as per the Assessment & Evaluation Policy Manual of Salesian College. For each course, the Board of Studies has provided a recommended, non-binding schema for assessment.

***Proposed Courses offered by the Department of Physics
4 Year Bachelors Course***

Semester	Paper Code	Paper	Credits (Theory)	Credits (Lab)	Teaching Hours
I	23PHYMAJ101	Calculus and Vector Analysis	4	0	4
	23PHYMAJ102	Mechanics and Properties of Matter	3	1	3 + 2
	23PHYSEC101	Introduction to Computers & Programming	0	3	6
	23PHYMDC101	Astronomy and Cosmology for the Curious	3	0	3
	23PHYVAC101	Quantum Crossroads I		1	2
		Total	15		20
II	23PHYMAJ103	Electricity and Magnetism	3	1	3 + 2
	23PHYMAJ104	Waves and Optics	3	1	3 + 2
	23PHYSEC102	Practical Electricity	2	1	2 + 2
	23PHYMDC102	Quantum Physics for the Curious	3	0	3
	23PHYMIN102	Mechanics	3	1	3 + 2
	23PHYVAC102	Quantum Crossroads II		1	2
		Total	19		24
III	23PHYMAJ201	Differential Eqns and Complex Analysis	4	0	4
	23PHYMAJ202	Digital Electronics	3	1	3+2
	23PHYSEC201	Numerical Methods using Computation	0	3	6
	23PHYMDC201	Physics of Sports	3	0	3
	23PHYVAC201	Quantum Crossroads III		1	2
		Total	15		20
IV	23PHYMAJ203	Thermal Physics	3	1	3 + 2
	23PHYMAJ204	Relativity and Modern Physics	3	1	3 + 2

	23PHYMAJ205	Analog Electronics	3	1	3 + 2
	23PHYMIN202	Electricity and Magnetism	3	1	3 + 2
	23PHYVAC202	Quantum Crossroads IV		1	2
		Total	17		22
V	23PHYMAJ301	Solid State Physics	3	1	3 + 2
	23PHYMAJ302	Analytical Mechanics	3	1	3 + 2
	23PHYMAJ303	Quantum Mechanics	3	1	3 + 2
	23PHYVAC301	Quantum Crossroads V		1	2
		Total	13		17
VI	23PHYMAJ304	Statistical Mechanics	3	1	3 + 2
	23PHYMAJ305	Atomic and Molecular Physics	3	1	3 + 2
	23PHYMAJ306	Elective I	4	0	4
	23PHYMIN302	Electronics	3	1	3 + 2
		Total	16		19
VII	23PHYMAJ401	Nuclear and Particle Physics	4	0	4
	23PHYMAJ402	Statistics and Research Methodology	3	1	3 + 2
	23PHYMAJ403	Advanced Mathematical Physics	4	0	4
	23PHYMAJ404	Elective II	4	0	4
		OR			
	23PHYMAJ405	Research	4		4
		Total	16		17
VIII	23PHYMAJ406	Advanced Electrodynamics	3	1	3 + 2
	23PHYMAJ407	Elective III	4	0	4
	23PHYMAJ408	Introduction to Nanophysics	4	0	4
	23PHYMAJ409	Elective IV	4	0	4
		OR			
	23PHYMAJ410	Research	8		8

	23PHYMIN402	Waves and Optics	3	1	3 + 2
		Total	20		22
		Grand Total	131		161

LIST OF ELECTIVES

Elective I	Elective II	Elective III	Elective IV
Physical Acoustics and Applications	Astronomy and Astrophysics	Advanced Quantum Mechanics	Advanced Solid State Physics
Magnetism in Materials	Nonlinear Dynamics and Chaos Theory	Physics of Radiation	Lasers and Advanced Optics

1. Programme Matrix of Courses offered by the Department of Physics (1st Year)

Semester	Course Code	Course Type	Title of the Course	Credit	Lecture Tutorial Practical (L+T+P)	Total Hours	Total Marks
I	23PHYMAJ101	Major	Calculus and Vector Analysis	4	3+1+0	60	100
	23PHYMAJ102	Major	Mechanics and Properties of Matter	4	3+0+1	75	100
	23PHYSEC101	SEC	Introduction to Computers & Programming	3	0+0+3	90	100
	23PHYMDC101	MDC	Astronomy and Cosmology for the Curious	3	3+0+0	45	100
	23PHYVAC101	VAC	Quantum Crossroads I	1	0+0+1	30	50
	Total			15		300	
II	23PHYMAJ103	Major	Electricity and Magnetism	4	3+0+1	75	100
	23PHYMAJ104	Major	Waves and Optics	4	3+0+1	75	100
	23PHYMIN102	Minor	Mechanics	4	3+0+1	75	100
	23PHYSEC102	SEC	Practical Electricity	3	2+0+1	60	100
	23PHYMDC102	MDC	Quantum Physics for the Curious	3	3+0+0	45	100
	23PHYVAC102	VAC	Quantum	1	0+0+1	30	50

			Crossroads II				
	Total			19		360	

Students' Progression Mapping			
RBT - Cognitive Level Mapping		Dave's Psychomotor Mapping	
Symbols	Meaning	Symbols	Meaning
R	Remembering	I	Imitation
U	Understanding	M	Manipulation
A1	Applying	P	Precision
A2	Analysing	A	Articulation
E	Evaluating	N	Naturalization
C	Creating		

Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMAJ101 - Calculus and Vector Analysis

1. Course Description

Course Code	23PHYMAJ101	
Course Title	Calculus and Vector Analysis	
Credits	4	
Total Hours	60	
Hours per Week	4	
Course Type	Major	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course: a. Aims to recapitulate basic understanding of calculus. b. Helps to explore the application of calculus in physics based problems. c. Helps to understand and apply the concept of vectors. d. Teaches the basic operations of vectors.	
Prerequisite	Student must have introductory knowledge of limits, derivatives, integrals (definite and indefinite), partial fractions, and vectors	
Course Objectives	A student will be able to: i. Develop skills in finding derivatives of functions and applying them to solve problems related to rates of change, optimization, etc. ii. Develop skills in solving definite and indefinite integrals and applying them to cases involving areas, volumes, and accumulation. iii. Understand the basic properties of vectors and their manipulation using addition, subtraction, scalar multiplication, and dot & cross products. iv. Understand vector equations and their applications in solving problems related to lines, planes, and curves. v. Introduce the concepts of vector differentiation and integration and their applications.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the concepts of integral and differential calculus in relation to the various physical and mathematical contexts.	R
CO2	Explain the importance of vector quantities in physics-based problems and restate the operation of vector quantities.	U

CO3	Classify and solve different kinds of derivatives, such as total, partial, exact and inexact derivatives, and apply them to physics-based problems.	A1		
CO4	Analyze the concept and properties of special functions such as Gamma function, Beta function, Dirac Delta function, etc., and apply them to solve numerical problems of physical interest.	A2		
CO5	Evaluate the different orthogonal coordinate systems and select the appropriate mutual and operator transformations.	E		
CO6	Construct solutions for real-life physics-based problems using vector differentiation & vector integration.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Single Variable Calculus Functions of a single variable: plotting functions, tangent to the curve; continuity; instantaneous and average quantities; the derivative; chain rule; higher order derivatives; implicit differentiation; mean value theorem; maxima and minima; approximations using Taylor and binomial theorems Indefinite integrals; integrals by substitution; integration by parts; definite integrals; area under curves; first and second fundamental theorems of calculus; special techniques of integration: trigonometric substitution, partial fractions, completing the square, polar coordinates etc. The Gaussian integral; the Dirac delta function: representation as a limit of Gaussian and rectangular functions; basic properties Beta and Gamma functions and their properties; relation between beta and gamma functions; reduction of integrals to Gamma functions; the error function	15	1, 4	R U A1 A2 E C
Unit II	Vector Algebra Review of scalars and vectors; properties of vectors under rotations; scalar product and its	5	2	R U A1 A2

	invariance under rotation; vector product and interpretation as area; scalar triple product and interpretation as volume; vector triple product			E C
Unit III	Multivariable Calculus Orthogonal coordinate systems: Cartesian, spherical polar, and cylindrical polar coordinates, conversions between coordinate systems Partial derivatives and total derivatives; exact and inexact differentials; chain rule for partial derivatives; directional derivatives and the gradient; constrained maximization using Lagrange multipliers	8	3, 5	R U A1 A2 E C
Unit IV	Vector Differentiation Curves, surfaces, scalar and vector fields; time derivatives of a vector function Directional and normal derivatives; gradient of a scalar field and its geometric interpretation; divergence and curl of a vector field; the Laplacian operator; product rules and second derivatives of the del operator; gradient, divergence, curl and Laplacian in Cartesian, spherical and cylindrical coordinates (with derivation)	8	1, 2, 6	R U A1 A2 E C
Unit V	Vector Integration Parametric integrals of vector curves; infinitesimal line elements; line integrals and Green's theorem in a plane Multiple integrals and the Jacobian; infinitesimal surface and volume elements; surface integrals; areas of surfaces of revolution; volume integrals and determination of volumes; parameterization and coordinate conversions for integration Flux of a vector field; Gauss' divergence theorem; Stoke's theorem; applications	9	1, 2, 6	R U A1 A2 E C
Learning Resources: Textbooks 1. Dass, H.K. & Verma, R. (2019). <i>Mathematical physics</i> (8th ed.). S. Chand Publishing 2. Gupta, B.D. (2022). <i>Mathematical physics</i> (4th ed.). S. Chand Publishing				

3. Riley, K.F., Hobson, M.P., & Bence, S.J. (2018). *Mathematical methods for physics and engineering* (3rd ed.). Cambridge University Press
4. Nearing, J. (2010). *Mathematical tools for physicists*. Dover Publications.
http://www-mdp.eng.cam.ac.uk/web/library/enginfo/textbooks_dvd_only/nearing/math_methods.pdf
5. Thomas, G., Hass, J., Heil, C., & Weir, M. (2018). *Thomas' calculus* (14th ed.). Pearson Education
6. Spiegel, M., Lipschutz, S., & Spellman, D. (2009). *Schaum's outlines: Vector analysis* (2nd ed.). McGraw-Hill Education

Suggested Readings

1. Spiegel, M. (2009). *Schaum's outline of advanced mathematics for engineers and scientists*. McGraw-Hill Education
2. Anton, H., Bivens, I., & Davis Stephens. (2015). *Calculus* (10th ed.). Wiley
3. Kreyszig, E. (2017). *Advanced engineering mathematics* (10th ed.). Wiley
4. McMullen, C. (2018). *Essential calculus skills practice workbook with full solutions*. Zishka Publishing
5. Fernandez, O. (2017). *Everyday calculus: Discovering the hidden math all around us* (rev. ed.). Princeton University Press

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment, (ii) the student must be present for Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment: The Summative Assessment will be a written examination of 50 marks of at least 2 hours duration, using the RBT categorization and scheme.

Section	Marks per question	No. of questions to be answered	No. of questions given	Total marks for Section
A	2	5	8	10
B	5	4	6	20
C	10	2	4	20
			Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment	50	100%	50
Formative Assessment I	20	50%	10
Formative Assessment II	50		25
Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Ms. Sujata Sinha (Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMAJ102 - Mechanics and Properties of Matter

1. Course Description

Course Code	23PHYMAJ102
Course Title	Mechanics and Properties of Matter
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - Aims to train the students in the basic knowledge of Physics, and the laws governing it. - Helps to introduce the students to conservation laws and their utility in understanding the behaviour of physical systems. - Focuses on the motion of rigid bodies about any fixed point and any arbitrary axis passing through this point. - Helps the students understand the elastic properties of materials and the Physics behind the characteristics of liquids. - Helps the students develop knowledge of the central force and its characteristics, including gravitation. - Teaches the basics of harmonic motion and its characteristics. It will help the students understand the periodic motions in Nature.
Prerequisite	Students must have an introductory knowledge of kinematics in 1 and 2D, linear and rotational motion, energy, elasticity, Newtonian gravitation, and oscillations. Must take PHYMAJ101 concurrently
Course Objectives	A student will be able to: - Acquire preliminary knowledge of the laws of motion, the concept of Galilean invariance, the system of particles, and collisions. - Demonstrate the concepts of conservative and non-conservative forces, fictitious forces, translational and rotational dynamics and the ability to calculate the moment of inertia of various rigid bodies. - Describe the general properties of matter and the principles of elasticity, fluid flow, viscosity, and surface tension. - Analyse the laws of gravitation and central force motion and derive Kepler's law to demonstrate the motion of planets. - Explain the phenomenon of simple harmonic motion and the properties of the systems executing it.
Course Outcomes based on RBT and Cognitive Level Mapping	

At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define and identify the fundamental laws of motion and associated concepts such as collisions	R		
CO2	Distinguish between inertial and non-inertial reference frames and interpret the physical consequences arising from them.	U		
CO3	Apply the motion of a particle under central force motion to demonstrate the properties and characteristics of gravitation.	A1		
CO4	Examine and investigate the general properties of matter and various physical constants.	A2		
CO5	Evaluate the differential equation of simple harmonic motion and assess the nature of oscillations.	E		
CO6	Construct the motion of a rigid body including translational & rotational motion.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Fundamentals of Dynamics and Non-Inertial Systems Laws of motion, Galilean transformation, Conservation laws, System of particles and Centre of Mass, Motion of rockets. Elastic and Inelastic collisions, Laboratory and Centre of Mass frames. Conservative and non-conservative forces, Potential Energy. Potential energy curves and equilibrium. Work done by non-conservative forces. Law of Conservation of Energy. Non-inertial frames and fictitious forces. Uniformly rotating frame. Rotating coordinate systems. Centrifugal force. Coriolis force and its applications.	13	1, 2	R U A1 A2 E C
Unit II	Rotational Dynamics: Angular momentum of a particle and system of particles, Torque, Conservation of angular momentum, Rotation about a fixed axis, Rotational energy	7	1, 6	R U A1 A2 E C

	Moment of Inertia, Theorem of perpendicular axis and Theorem of parallel axes. Calculation of moment of inertia for rectangular, cylindrical and spherical bodies.			
Unit III	Properties of Matter Elasticity: Stress-Strain diagram, Relation between Elastic constants – Young’s modulus, Bulk’s modulus and modulus of rigidity. Poisson’s ratio. Work done in stretching and in twisting a wire, twisting torque on a cylinder or wire. Viscosity: Streamline and Turbulent flow, Equation of Continuity, Coefficient of Viscosity by Poiseuille’s method and Stoke’s method. Surface Tension: Relation between surface tension and surface energy, pressure difference across curved surface, excess pressure inside spherical liquid drop. Angle of Contact and capillary ascent. Measurement of surface tension.	9	4	R U A1 A2 E C
Unit IV	Gravitation and Central Force Motion Law of Gravitation. Gravitational potential energy, potential, and field intensity. Motion of a particle under a central force field. Two-body problem, its reduction to a one-body problem, and its solution. The energy equation and energy diagram. Kepler’s Laws. Satellites in circular orbits and escape velocity.	8	3	R U A1 A2 E C
Unit V	Oscillations Simple Harmonic Motion, its differential equation and solution. Vertical oscillations of the light loaded spring, expression for force constant and determination of acceleration due to gravity. Energy and their time-average values. Damped oscillations. Forced oscillations, transient and steady states, Resonance, sharpness of resonance, power dissipation and Quality Factor.	8	5	R U A1 A2 E C
Learning Resources: Text Books				

1. Mathur, D.S. (2000). *Mechanics*. S. Chand & Co.
2. Lal B. & Subrahmanyam N. (2002). *Properties of matter*. S. Chand & Co
3. Murugesan R. (2010). *Elements of properties of matter*. S. Chand & Co.
4. Chatterjee, H. & Sengupta, R. (2010). *A treatise on general properties of matter* (7th rev. ed.). New Central Book Agency (P) Limited

Suggested readings

1. Kittel, K., Knight, W. D., Ruderman, M. A., Helmholz, A. C., & Moyer, B. J. (2011). *Mechanics*. Tata McGraw-Hill
2. Halliday, D., Resnick, R., & Walker, J. (2007) *Fundamentals of physics*. John Wiley & Sons
3. Kleppner, D. & Kolenkow, R. J. (2017) *An introduction to mechanics*. McGraw Hill Education

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Practicals

Course Code	23PHYMAJ102
Course Title	Mechanics and Properties of Matter
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	I
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: a. Helps introduce students to different measuring instruments and their applications and significance. b. Emphasises the need to have hands-on experience with the measurement of physical quantities and understand the theoretical concepts through practical means. c. Aims to help in estimating the physical properties of rigid bodies and the elastic and mechanical properties of different materials using scientific instruments. d. Aims to help in assessing the properties of liquids through simple experiments.
Prerequisite	Students must have an introductory knowledge of kinematics in 1 and 2D, linear and rotational motion, energy, elasticity, Newtonian gravitation, and oscillations. Must take PHYMAJ101 concurrently
Course Objectives	A student will be able to: a. Identify, choose, and calibrate appropriate measuring instruments for a particular experiment.

	b. Record experimental data in a systematic manner and compute the results using the right physical or mathematical procedures. c. Interpret and communicate their results in an appropriate manner using written reports with the necessary data visualizations. d. Check the credibility of theoretical claims from experiments. e. Nurture their scientific temperament and encourage them to build upon their experience gained from conducting experiments.			
Course Outcomes based on Dave's Psychomotor Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of mechanical and elastic properties.	I		
CO2	Recreate any previously imitated experiment on the study of mechanical and elastic properties.	M		
CO3	Demonstrate skilled use of common measuring instruments such as callipers, gauges, measuring telescopes, etc.	P		
CO4	Be proficient in the setup and use of experimental apparatus used for the study of mechanical and elastic properties.	P		
CO5	Adapt or modify previously imitated experiments to analyze new mechanical and elastic properties.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. Measurements of length/ diameter using vernier calliper, screw gauge and travelling microscope 2. Determination of g and velocity of freely falling body using digital timing technique 3. To study the motion of a spring and calculate: (a) it's spring constant, (b) modulus of rigidity of the spring material and (c) value of g. 4. To measure the radius of curvature of a spherical surface using a spherometer 5. To determine the value of g using a bar pendulum	30	1, 2, 3,4,5	I M P A

	6. To determine the surface tension of a liquid by capillary tube method 7. To determine the coefficient of viscosity of water by Poiseuille's method 8. To determine the modulus of rigidity of the material of a wire by dynamical method 9. To determine the modulus of rigidity of the material of a wire by statical method 10. To determine the modulus of rigidity of the material of a wire by Maxwell's needle 11. To determine the Young's modulus of the material of a wire by optical lever method 12. To determine the moment of inertia of a flywheel <i>A minimum of EIGHT (8) experiments is to be performed</i>			

Learning Resources:

Text Books

1. Chattopadhyay, D. & Rakshit, P. C. (2011). *An advanced course in practical physics*. New Central Book Agency (P) Limited
2. Raychaudhuri, D. P. (n.d.). *Manual of practical physics*. Allied Book Agency
3. Dasgupta, C.R. (1985). *A handbook of practical physics*. Book Syndicate Private Limited
4. Singh, H. & Hemne, P.S. (2022). *B.Sc. practical physics*. S. Chand & Co.
5. Chandra, B. (2023). *PHY MAJ102P: Mechanics - Lab guidebook for practicals*. (n.p.)

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment for theory and practical **each**, (ii) the student must be present for Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment (Theory): The Summative Assessment will be a written examination of 50 marks of at least 2 hours duration, using the RBT categorization and scheme.

Section	Marks per question	No. of questions to be answered	No. of questions given	Total marks for Section
A	2	5	8	10
B	5	4	6	20
C	10	2	4	20
			Total	50

Summative Assessment (Practical): The Summative Assessment will be an examination of 50 marks of at least 3 hours duration. The student will be made to perform one or more experiments chosen at random from the topics given in the syllabus.

Sl. No.	Component	Marks per component
1	Practical Examination	30
2	Viva-voce	10
3	Lab notebook or Lab assignment	10
	Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment (Theory)	50	50%	25
Summative Assessment (Practical)	50		25
Formative Assessment I	20		10
Formative Assessment II	50		25
Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Digvijay Kharga (Signature) Mr. Mayukh Mazumdar (Signature) Dr. Prajwal Chettri	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYSEC101 - Introduction to Computers & Programming

1. Course Description

Course Code	23PHYSEC101	
Course Title	Introduction to Computers and Programming	
Credits	3	
Total Hours	90	
Hours per Week	6	
Course Type	Skill Enhancement Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course: a. Introduces a student to the concept of using computers to enhance their scientific and numerical analysis skills. b. Trains a student in the construction and writing of technical scientific reports and papers. c. Teaches a student the basic concepts of programming using Python. d. Introduces tools and modules in Python used for advanced numerical and scientific analysis. e. Introduces the methods and skills needed to appropriately visualize technical data for analysis.	
Prerequisite	Students must be able to type on a keyboard and use a mouse. They must have elementary knowledge of linear and polynomial equations, differentiation, integration, differential equations, statistics, and conic sections.	
Course Objectives	A student will be able to: i. Learn about the benefits of FOSS software and common examples of them. ii. Write and construct a technical report or paper. iii. Acquire knowledge about the fundamentals of basic scientific and numerical programming using Python. iv. Use of common Python modules used in numerical and scientific programming, and their commonly used methods. v. Construct appropriate diagrams and charts for the purposes of data visualization and analysis.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Identify the benefits of FOSS software and name common examples of them.	R

CO2	Express physical and mathematical phenomena using appropriate Python code and data visualization approaches.	U		
CO3	Demonstrate physical phenomena or mathematical outcomes using Python code.	A1		
CO4	Investigate a physical phenomenon computationally and outline its result in a technical report or paper.	A2		
CO5	Determine parameters or evaluate the outcomes of physical situations using computational modelling with Python.	E		
CO6	Design computational algorithms that replicate common physical phenomena.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	FOSS and Operating Systems Lecture: FOSS and its importance; the Four Essential Freedoms; meaning of proprietary software; examples of popular FOSS software and alternatives to proprietary software Operating Systems (overview only): Windows, Macintosh, Linux, Android; general overview of Linux distributions, packages and repositories Lab: Introduction to and the basic functions and FOSS software of the Manjaro operating system (or whichever Linux system is in use)	6	1	R U A1 A2 E C
Unit II	Writing Technical Documents Lecture: Overview of the LibreOffice software suite; introduction to LibreOffice Writer; fonts: serif, san-serif and monospace fonts; appropriate selection of fonts Desmos graphing calculator: line plots from functions and data points; areas, derivatives and integrals of curves, linear regression; polar plots	14	4	R U A1 A2 E C

	Writing and formatting a technical report/paper Lab: writing and formatting text; inserting and formatting images; using the formula editor; creating model graphs and graphs from data; typesetting pages for print; writing a technical report			
Unit III	Introduction to Python Programming Lecture: constants, variables and common data types; strings and string manipulation; <i>input()</i> and <i>print()</i> statements; arithmetic, comparative and boolean relations; <i>if-else</i> conditionals; <i>for</i> and <i>while</i> loops; nesting; <i>break</i> and <i>return</i>; lists and tuples: introduction, methods, and use in iteration; functions and recursion; writing files to and reading from disk; search algorithms: linear/sequential, front and back, and binary Lab: simple programs to demonstrate use of conditionals and loops; summation; sorting, generation of number series; searching lists; computation of areas and volumes.	22	2, 3	R U A1 A2 E C
Unit IV	Modules for Scientific Computing Lecture: Modules; examples of common modules used in daily and scientific computing (overview only); importing modules; the <i>math</i> module: common methods and functions The <i>numpy</i> and <i>scipy</i> modules; arrays, array operations; slicing; random number generation; the <i>linalg</i> submodule; functions for matrix and vector analysis: addition, multiplication, scalar and vector products, inverses, determinants, eigen values and vectors <i>solve()</i> - solutions of a linear system of equations; <i>roots()</i> - roots of a polynomial equation; mean and standard deviation; <i>polyfit()</i> - linear fitting to data, and <i>interp()</i> - linear interpolation; <i>gradient()</i> -	26	5, 6	R U A1 A2 E C

	numerical differentiation, and <i>trapz()</i> - numerical integration; <i>odeint()</i> - solutions of differential equations Lab: programs that demonstrate the use of modules and their inbuilt functions; conversion of coordinate systems; roots of equations used in physics; equation of a line from linear experimental data; velocity and acceleration at a point from displacement and vice-versa; areas of non-standard regions (e.g. BH loop)			
Unit V	Data Visualization Lecture: the <i>matplotlib</i> module; other popular visualization modules (overview only); formatting graphs: log and semilog axes, simple TeX notation; creating subplots Plotting of 2D data: line plots; scatter plots; histograms; polar plots Plotting of 3D data: surface plots; contour plots; colour maps Lab: solving and plotting trajectories of 2D motion and collisions; estimating and plotting lines of best fit for linear experimental data; plotting solutions of differential equations; line plots of curves in Cartesian and polar coordinates; plots of temperature distribution on 2D surfaces etc.	22	5, 6	R U A1 A2 E C

Learning Resources: (Latest edition books listed in APA style: Seventh Edition)

Open Online Resources

1. Free Software Foundation. (2021, February 2). *What is free software?* GNU Operating System. <https://www.gnu.org/philosophy/free-sw.en.html>
2. Linux Training Academy. (2023, n.d.). *Linux distribution: Introduction and overview*. Linux Training Academy. <https://www.linuxtrainingacademy.com/linux-distribution-intro/>
3. LibreOffice Documentation Team. (2022). *Writer guide 7.3*. <https://documentation.libreoffice.org/assets/Uploads/Documentation/en/WG7.3/WG73-WriterGuide.pdf>
4. Desmos. (2022, April 17). *Learn Desmos* [Video playlist]. Youtube. https://www.youtube.com/playlist?list=PLfM6zMgnbgOGLZc_Yj3QVK3Vz_L4Cw59
5. Corey Schafer. (2019, April 22). *Python programming beginner tutorials* [Video playlist]. Youtube. <https://www.youtube.com/playlist?list=PL-osiE80TeTskrapNbzxHwofuILCjGgY7>

6. freeCodeCamp.org. (2019, August 7). *Python Numpy tutorial for beginners* [Video]. Youtube. <https://www.youtube.com/watch?v=QUT1VHiLmmI&pp=ygUSZnJlZWVvZGVjYW1wIG51bXB5>
7. Mr. P. Solver. (2021, June 1). *SciPy tutorial (2022): For physicists, engineers, and mathematicians* [Video]. Youtube. <https://www.youtube.com/watch?v=jmX4FOUEfgU>
8. sentdex. (2016, January 20). *Matplotlib tutorial series - Graphing in Python* [Video playlist]. Youtube. <https://www.youtube.com/playlist?list=PLQVvva0QuDfefDfXb9Yf0la1fPDklPF>

Suggested readings

1. Stallman, R. (2015). *Free software, free society: Selected essays of Richard M. Stallman* (3rd ed.). GNU Press. <https://www.gnu.org/doc/fsfs3-hardcover.pdf>
2. Hering, L., & Hering, H. (2019). *How to write technical reports: Understandable structure, good design, convincing presentation*. Springer
3. Matthes, E. (2016). *Python crash course: A hands-on, project-based introduction to programming*. No Starch Press. https://bedford-computing.co.uk/learning/wp-content/uploads/2015/10/No.Starch.Python.Oct_.2015.ISBN_.1593276036.pdf
4. Sweigart, A. (2019). *Automate the boring stuff with Python* (2nd ed.). No Starch Press. <https://automatetheboringstuff.com/>
5. Idris, I. (2015) *Numpy beginner's guide: Build efficient, high-speed programs using the high-performance Numpy mathematical library*. Packt Publishing Ltd.
6. Johansson, R. (2018). *Numerical Python: Scientific computing and data science applications with Numpy, SciPy and Matplotlib*. Apress
7. Rougier, N. P. (2021) *Scientific visualization: Python + Matplotlib*. <https://inria.hal.science/hal-03427242/document>

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment, (ii) the student must be present for Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment: The Summative Assessment will be an examination of 50 marks of at least 3 hours duration. The student will be made to write one or more computational programs chosen at random from the topics given in the syllabus.

Sl. No.	Component	Marks per component
1	Practical Examination	30
2	Viva-voce	10

3	Lab notebook or Lab assignment	10
	Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment	50	100%	50
Formative Assessment I	20	50%	10
Formative Assessment II	50		25
Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMDC101 - Astronomy and Cosmology for the Curious

1. Course Description

Course Code	23PHYMDC101	
Course Title	Astronomy and Cosmology for the Curious	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multi-Disciplinary Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	All Students (except students who have studied Physics)	
Regulation	2023	
Course Overview	This course: a. Introduces a student to the large scale structure of the Universe at a qualitative level without any mathematical or technical prerequisites. b. Introduces the student to the history of astronomy in India and abroad until the discovery of universal gravitation. c. Gives the student an overview of the Solar System and its major components, stars and galaxies. d. Introduces the student to the Lambda-CDM Standard Model of cosmology in simple terms. e. Briefly acquaints the student with the biggest open problems in modern day cosmology. f. Gives the student an overview of important space organisations and missions.	
Prerequisite	Students must have graduated from higher secondary school. Students cannot have studied physics in classes 11 & 12.	
Course Objectives	A student will be able to: i. Understand and appreciate the history of astronomy in India and abroad until the discovery of universal gravitation. ii. Identify and summarise the important properties of all major bodies in the Solar System. iii. Summarize the processes of the creation and evolution of stars, how they radiate energy, and how they form galaxies. iv. Understand the arguments for Big Bang cosmology, summarise the evolution of the Universe, and discuss open problems in cosmology. v. Familiarize themselves with important space agencies and significant space missions and probes.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping

CO1	Recall the history of astronomy in India and abroad until the discovery of universal gravitation.	R		
CO2	Distinguish between the different major bodies within the Solar System and summarise their properties.	U		
CO3	Apply qualitative physical arguments for the acceptance of the Big Bang and the current Standard Model of cosmology.	A1		
CO4	Categorize and outline different open problems in cosmology like dark matter, dark energy, the fate of the Universe, etc.	A2		
CO5	Critique important space agencies and significant space missions and probes.	E		
CO6	Propose how the gravitational forces and fusion process within stars lead to their evolution as a singular entity and as a group in galaxies.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	A Brief History of Astronomy till 1700 CE <i>Astronomy in India:</i> Astronomy in the <i>Vedas</i>, Important Indian astronomers and their contributions <i>Astronomy outside India:</i> Brief overview of Babylonian, Hellenistic, Aristotelian, and Greco-Roman astronomy <i>Birth of modern astronomy:</i> Astronomy before Copernicus, Heliocentric model of Copernicus; Kepler's laws; Galileo's arguments; Newton and universal gravitation; Basic principles of telescopes	7	1	R U A1 A2 E C
Unit II	The Solar System <i>The Sun:</i> Structure and properties, Solar phenomena, Solar cycle and its effects on Earth <i>The Earth and Moon:</i> Earth - composition and properties, Tectonic plates, Rotation and revolution, The seasons; Moon - composition and properties, Craters, Tides, Phases, Solar and lunar eclipses, Theories of lunar origin;	8	2	R U A1 A2 E C

	Solar, lunar, and lunisolar calendars <i>The terrestrial planets:</i> Mercury, Venus and Mars, Possibility of life and human colonization on Mars <i>The gas giants:</i> Jupiter and Saturn, Great Red Spot, The Galilean moons, Saturn's Rings and their origin, Titan <i>The ice giants:</i> Uranus and Neptune, Rings, Axial tilt of Uranus, Great Dark Spot <i>Dwarf planets and the outer regions:</i> The asteroid belt, Meteors and meteorites, Trans-Neptunian objects, Comets, Dwarf planets, The Oort cloud, Planet 9 <i>The edges of our existence:</i> The boundaries of the Solar System, The Voyager missions, Exoplanets			
Unit III	Stars and Galaxies <i>Setting the stage:</i> Important stars and constellations, Einstein's energy-mass equivalence <i>The birth and evolution of a star:</i> Protostars, Brown dwarfs, Main sequence stars, Fusion processes, White dwarfs, Red giants <i>The "death" of a star:</i> Supergiants, Supernovae, Neutron stars and pulsars, Black holes and wormholes, The origin and fate of the Solar System <i>Deciphering objects far away:</i> Measuring cosmological distances, Morphological types of galaxies and properties <i>How galaxies behave:</i> Evolution of galaxies, Clusters and groups, Superclusters, Filaments, Overview of the Milky Way and the Local Group	11	6	R U A1 A2 E C
Unit IV	Cosmology <i>Setting the stage:</i> Spacetime, Overview of Einstein's special and general relativity, Time	13	3, 4	R U A1 A2

	dilation <i>The Universe in motion:</i> Discovery of the expanding Universe, The Big Bang; The formation of matter; The Dark Ages; The first stars and galaxies; The present state of the Universe <i>What can we detect but not see?</i> Dark matter and dark energy <i>How will all things “end”:</i> The fate of the Universe: Big Crunch, eternal expansion, Big Rip scenarios <i>Are we alone in the Universe?</i> The Drake equation, Astrobiology and biosignatures, The Goldilocks zone, Possible candidates in the Solar System and among exoplanets, The Fermi paradox			E C
Unit V	Space Organizations and Missions <i>India:</i> ISRO: History and activities, <i>Aryabhata</i>, <i>Chandrayaan</i>, MOM <i>Abroad:</i> NASA and ESA: the Hubble Space Telescope, the James Webb Space telescope, the Kepler Telescope, ISS, important telescopes in India and abroad <i>Space missions and probes:</i> <i>Sputnik I</i>, <i>Vostok I</i>, <i>Apollo 11</i>, <i>Soyuz T-11</i>, <i>Cassini-Huygens</i>, <i>Curiosity</i>, <i>New Horizons</i> (instructor may add or remove topics as they see fit)	6	5	R U A1 A2 E C

Learning Resources:

Text Books

1. Weinberg, S. (2015). *To explain the world: The discovery of modern science*. HarperCollins
2. Fox, K. C. (2002). *The Big Bang theory: What it is, where it came from, and why it works*. Jossey Bass
3. Ouellette, J (2006). *Black bodies and quantum cats: Tales of pure genius and mad science*. Oneworld Publications
4. Comins, N. F., & Kaufmann, W. J. (2005). *Discovering the Universe* (7th ed.). W.H. Freeman & Co.
5. Coles, P. (2014). *Cosmology: A very short introduction*. Oxford University Press

Suggested readings

1. Buchwald, J., & Fox, R. (Eds.). (2017). *The Oxford handbook of the history of physics*. Oxford University Press
2. Simonyi, K. (2012). *A cultural history of physics*. CRC Press

3. Maran, S. (2017). *Astronomy for dummies* (4th ed.). Wiley
4. Chaisson, E., & McMillan, S. (2014). *Astronomy today* (8th ed.). Pearson.
5. Griffiths, D. J. (2012). *Revolutions in Twentieth-century physics*. Cambridge University Press

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment, (ii) the student must be present for Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment: The Summative Assessment will be a written examination of 50 marks of at least 2 hours duration, using the RBT categorization and scheme.

Section	Marks per question	No. of questions to be answered	No. of questions given	Total marks for Section
A	2	5	8	10
B	5	4	6	20
C	10	2	4	20
			Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment	50	100%	50
Formative Assessment I	20	50%	10
Formative Assessment II	50		25
Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYVAC101 - Quantum Crossroads I

2. Course Description

Course Code	23PHYVAC101	
Course Title	Quantum Crossroads I	
Credits	1	
Total Hours	30	
Hours per Week	2	
Course Type	Value Added Course	
Semester	I	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course: a. Trains a student to plan, rehearse and present technical and mathematical information to an audience of their peers b. Provides students with an avenue to express technical information in an academic or professional environment. c. Trains students to comport themselves vocally and physically while presenting in front of an audience. d. Teaches students the use of digital aids such as slideshow software and projectors for the use of dissemination of information.	
Prerequisite	Students must be majoring in Physics. Students must have a reasonable command of English	
Course Objectives	A student will be able to: i. Read and understand technical information from a paper, article or other specialized manuals. ii. Analyze and break down the given information and assimilate with pre-existing knowledge. iii. Construct and present technical knowledge to an audience of their peers in a clear and lucid manner. iv. Critically evaluate and argue for or against the thesis of the paper.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the details of the paper being presented	R
CO2	Interpret the paper and relate it to their pre-existing knowledge	U
CO3	Present the knowledge in a clear and lucid manner to an audience of their peers	A1

CO4	Appraise and break down the information being presented.	A2		
CO5	Critique and argue for or against the thesis of the paper.	E		
CO6	Design and construct a presentation that disseminates knowledge from the paper to an audience.	C		
Course Structure				
Session Number	Content	Total Hours	COs	RBT
1	Hours 1 & 2: Introduction to the Course	2	-	-
2-10	Hour 1: Presentation by one 3rd year student Hour 2: Summarized report on the presentation	18	1,2,4	R U A2 E
11	Hour 1: Demo presentation by faculty Hour 2: Report on demo presentation	2	1,2,4	R U A2 E
12-14	Hour 1: Learning Google Slides and on using Google Scholar Hour 2: Practical class for the same	6	1,2,4	R U A2 E
15	Hour 1: How to present oneself in front of an audience Hour 2: Practice session for the same	2	3	A1 C
Learning Resources: None				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** submit the final report for Summative Assessment, and (ii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: Students have to present a written report for each presentation that they attend, and also write reports for all the practical work done in the tutorial classes. Each report will be graded out of 10 and finally converted to a fraction of 20 marks.

Summative Assessment: The Summative Assessment will be a final assignment of 25 marks.

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment	25	100%	25

Formative Assessment	10 times the number of reports	variable	20
Attendance	5	100%	5
		Total	50

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

SEMESTER – II

23PHYMAJ103 - Electricity and Magnetism

2. Course Description

Course Code	23PHYMAJ103
Course Title	Electricity and Magnetism
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - The course focuses on the distribution of fields near static electric charge configurations. It gives the students a basic understanding of conductors, dielectrics, polarization, and electrostatic energy. - It helps to introduce the students to magnetic force, steady current, and magnetic phenomena. It aims to help understand the fundamentals of magnetization in matter and assess the magnetic properties of materials. - It teaches the basics of electromagnetic induction due to time-varying fields and magnetostatic energy. - It focuses on understanding the behaviour of the electric and magnetic fields in an electromagnetic wave.
Prerequisite	Students must have an introductory knowledge of electrostatics, magnetostatics, and electrodynamics. Students must have completed the PHYMAJ101 course
Course Objectives	A student will be able to: - Understanding the basic properties of static electricity and applying their concepts and mathematical techniques to different cases. - Applications of electrostatics in conductors and dielectrics, such as capacitors, and their practical uses. - Understand the causes of magnetic phenomena and their properties, such as the Biot-Savart law, Ampere's law, etc. - Applications of magnetic properties to matter such as susceptibility, permeability, etc. - Identifying the connection between electricity & magnetism and allied phenomena such as electromagnetic induction. - Studying electromagnetic theory using Maxwell's equations and applying it to electromagnetic waves in different media.
Course Outcomes based on RBT and Cognitive Level Mapping	

At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define the electric field & electric potential and describe the relation of electrostatics to various aspects of electrical charge.	R		
CO2	Explain the concepts of electromagnetic induction and its applications.	U		
CO3	Calculate the magnetic field, magnetic vector potential and energy stored for various steady-current carrying systems using various methods.	A1		
CO4	Examine the wave equations from Maxwell's equations for different media and categorize the electromagnetic waves & their properties.	A2		
CO5	Evaluate various types of magnetism, such as dia-, para-, and ferro-magnetism, and draw conclusions on their properties.	E		
CO6	Formulate the electric field, electric potential, and energy stored for discrete and continuous charge systems using suitable methods.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Electric Field and Electric Potential: Electric field: Electric field lines. Electric flux. Coulomb's law. Gauss' Law with applications to charge distributions with spherical, cylindrical and planar symmetry. Conservative nature of Electrostatic Field. Electrostatic Potential. Laplace's and Poisson equations. Electrostatic boundary value problem and Method of Images: Uniqueness theorem, Laplace's equation , Method of images.	12	1	R U A1 A2 E C

Unit II	Electrostatics in Conductors and Dielectrics: Conductors and Dielectrics, Electric Dipole, Dielectric Polarization, Gauss's law in Dielectric medium, Boundary Conditions. Electrostatic Energy and Capacitor: Electrostatic energy of a system of charged conductors, capacitors and their combinations, energy stored in a charged capacitor.	10	6	R U A1 A2 E C
Unit III	Magnetic Field: Magnetic force between current elements and definition of Magnetic Field B. Biot-Savart's Law and its simple applications: straight wire and circular loop. Current Loop as a Magnetic Dipole and its Dipole Moment. Ampere's Circuital Law and its application to (1) infinite straight wire, (2) Infinite planar surface current and (3) Solenoid. Properties of B: curl and divergence. Axial vector property of B and its consequences. Magnetic Vector Potential. Magnetic Force on (1) point charge (2) current carrying wire (3) between current elements. Torque on a current loop in a uniform Magnetic Field. Magnetic Scalar Potential.	8	2	R U A1 A2 E C
Unit IV	Magnetic Properties of Matter: Magnetization vector (M). Magnetic Intensity (H). Magnetic Susceptibility and permeability. Relation between B, H, M. Comparison of Dia-, Para- and Ferromagnetism. B-H curve and hysteresis loss.	5	3	R U A1 A2 E C
Unit V	Electromagnetic Induction: Faraday's law. Self-Inductance and Mutual Inductance. Neumann's Formula. Reciprocity Theorem. Energy stored in a Magnetic Field. Electromagnetic Theory: Maxwell's equations, Poynting's vector and Poynting's theorem. Wave equation in free space, dielectric medium and conducting medium. Polarization of plane electromagnetic waves, Methods of producing plane polarized light: simple reflection, double reflection and dichroism, Malus law.	10	4, 5	R U A1 A2 E C
Learning Resources:				

Text Books

1. Ghosh, B. (2008). *Foundations of electricity and magnetism* (3rd rev. ed.). Books & Allied (P) Limited
2. Murugesan, R. (2019). *Electricity and magnetism* (10th ed.). S. Chand & Co.
3. Griffiths, D. J. (2015). *Introduction to electrodynamics* (4th ed.). Cambridge University Press
4. Sadiku, M. N. O. (2018). *Elements of electromagnetics* (7th ed.). Oxford University Press
5. Subrahmanyam, N., Lal, B., & Avadhanulu, M. N. (2006). *A textbook of optics* (23rd rev. ed.). S. Chand & Co.
6. Gupta, A. B. (2013). *Modern optics* (3rd ed.). Books & Allied (P) Limited

Suggested readings

1. Purcell, E. M., & Morin, D. J. (2013). *Electricity and magnetism* (3rd ed.). Cambridge University Press
2. Manohara, S. R., & Shubha A. (2018). *Electricity, magnetism and electromagnetic theory*. S. Chand & Co.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Practicals

Course Code	23PHYMAJ103
Course Title	Electricity and Magnetism
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: a. The course provides the knowledge to measure various physical quantities through a scientific approach. b. It aims to help in estimating various electric and magnetic properties of materials using scientific apparatus. c. It focuses on giving training in the use of precision measurements, calibration, and error analysis.
Prerequisite	Students must have an introductory knowledge of electrostatics, magnetostatics, and electrodynamics. Students must have completed the PHYMAJ101 course
Course Objectives	A student will be able to: i. Enabling the students to determine unknown resistances by applying the principles of the potentiometer and Carey Foster's bridge.

	ii. Enabling students to compute magnetic field strength and its gradient and determine energy losses from the hysteresis. iii. Enabling students to produce and detect plane polarized light and graphically construct patterns to prove polarization laws. iv. Enabling students to analyze plane polarized light and to map it graphically v. Enabling students to record experimental data in a systematic manner and hence construct the experiment report on paper. vi. Computing experimental results from the working formulae and graphs and interpreting the results.			
Course Outcomes based on Dave's Psychomotor Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of electricity and magnetism.	I		
CO2	Recreate any previously imitated experiment on the study of electricity and magnetism.	M		
CO3	Demonstrate skilled use of common measuring instruments such as galvanometers, Wheatstone bridges, polarizers, etc.	P		
CO4	Be proficient in the setup and use of experimental apparatus used for the study of electricity and magnetism.	P		
CO5	Adapt or modify previously imitated experiments to analyze new properties from electricity and magnetism.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. To determine an unknown Low Resistance using Potentiometer. 2. To determine an unknown Low Resistance using Carey Foster's Bridge. 3. Measurement of field strength B and its variation in a solenoid (determine dB/dx)	30	1, 2, 3,4,5	I M P A

	4. To determine self-inductance of a coil by Anderson's bridge. 5. To study polarization of light by reflection and determine the polarizing angle for air-glass interface. 6. To verify Malus law for plane polarized light. 7. To draw the BH curve of Fe using Solenoid & determine energy loss from Hysteresis. 8. To verify Brewster's law for plane polarized light. 9. To determine internal resistance of a cell using (a) potentiometer and (b) voltmeter & ammeter. 10. To measure large EMF by means of a potentiometer. <i>A minimum of EIGHT (8) experiments is to be performed</i>			
Learning Resources: Text Books 1. Chattopadhyay, D., & Rakshit, P. C. (2011). <i>An advanced course in practical physics</i>. New Central Book Agency (P) Limited 2. Raychaudhuri, D. P. (n.d.). <i>Manual of practical physics</i>. Allied Book Agency 3. Dasgupta, C.R. (1985). <i>A handbook of practical physics</i>. Book Syndicate Private Limited 4. Singh, H., & Hemne, P.S. (2022). <i>B.Sc. practical physics</i>. S. Chand & Co.				

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment for theory and practical **each**, (ii) the student must be present for Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment (Theory): The Summative Assessment will be a written examination of 50 marks of at least 2 hours duration, using the RBT categorization and scheme.

Section	Marks per question	No. of questions to be answered	No. of questions given	Total marks for Section
A	2	5	8	10
B	5	4	6	20
C	10	2	4	20
			Total	50

Summative Assessment (Practical): The Summative Assessment will be an examination of 50 marks of at least 3 hours duration. The student will be made to perform one or more experiments chosen at random from the topics given in the syllabus.

Sl. No.	Component	Marks per component
1	Practical Examination	30
2	Viva-voce	10
3	Lab notebook or Lab assignment	10
	Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment (Theory)	50	50%	25
Summative Assessment (Practical)	50		25
Formative Assessment I	20		10
Formative Assessment II	50		25
Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Ms. Sujata Sinha (Signature) Dr. Digvijay Kharga	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMAJ104 - Waves and Optics

3. Course Description

Course Code	23PHYMAJ104
Course Title	Waves and Optics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - The course helps students get familiarised with important aspects of waves and oscillations and hence study different optical phenomena. - It helps students study the nature of waves in a generic manner. - It helps students describe the course of waves through different materials. - It makes students acquainted with the history of development of light, with brevity. - It helps students describe different optical phenomena like interference and diffraction. - It helps the students to build a strong background for different experiments. - It bolsters the drawing skills (ray diagrams, experimental setups, fringe patterns, etc.) of the students.
Prerequisite	Students must have an introductory knowledge of oscillations, waves, superpositions, and light. Students must have completed the PHYMAJ101 and MATMIN101 courses.
Course Objectives	A student will be able to: - Introduce the basic concepts of superposition principle, Lissajous figures, wave motion, coherence, interference, and diffraction phenomena. - Apply the superposition principle and Huygen's principle to explain important phenomena in waves and optics. - Describe the workings of interferometers and judge their relative importance in physics. - Explain the motion of waves in different media with the help of key concepts and mathematics. - Draw and explain interference and diffraction patterns.

	vi. Explain the setup for important experiments like Melde's experiment and Young's double-slit experiments, and hence describe the significance of the results.			
Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Describe waves of various kinds and their properties in terms of differential equations and their solutions.	R		
CO2	Summarize the wave theory of light and explain the concept of waveguides.	U		
CO3	Apply the concept of fringe formation and calculate the wavelength of light.	A1		
CO4	Differentiate between interference and diffraction phenomena of light.	A2		
CO5	Select optical instruments such as standard light sources, spectrometers, grating, slits, etc. for the purpose of evaluating various optical properties.	E		
CO6	Use the superposition principle to formulate the resultant displacement in various kinds of physical situations.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Superposition of Harmonic oscillations Collinear: Linearity and Superposition Principle. Superposition of two collinear oscillations having (1) equal frequencies and (2) different frequencies (Beats). Superposition of N collinear Harmonic Oscillations with (1) equal phase differences and (2) equal frequency differences. Perpendicular: Graphical and Analytical	7	1, 3, 6	R U A1 A2 E C

	Methods. Lissajous Figures with equal and unequal frequency and their uses.			
Unit II	Wave Motion Plane and Spherical Waves. Longitudinal and Transverse Waves. Plane Progressive (Travelling) Waves. Wave Equation. Particle and Wave Velocities. Differential Equation. Pressure of a Longitudinal Wave. Energy Transport. Intensity of Wave. Water Waves: Ripple and Gravity Waves Velocity of Waves Velocity of Transverse Vibrations of Stretched Strings. Velocity of Longitudinal Waves in a Fluid in a Pipe. Newton's Formula for Velocity of Sound. Laplace's Correction.	8	1,2,3,5, 6	R U A1 A2 E C
Unit III	Superposition of Two Harmonic Waves Standing (Stationary) Waves in a String: Fixed and Free Ends. Analytical Treatment. Phase and Group Velocities. Changes with respect to Position and Time. Energy of Vibrating String. Transfer of Energy. Normal Modes of Stretched Strings. Plucked and Struck Strings. Melde's Experiment. Longitudinal Standing Waves and Normal Modes. Open and Closed Pipes. Superposition of N Harmonic Waves.	7	1,3,4	R U A1 A2 E C
Unit IV	Nature of Light A brief history of light, the corpuscular and wave theories of light, electromagnetic nature of light (qualitative discussions only), Definition and properties of wave front. Huygens Principle. Temporal and Spatial Coherence. Introduction to Interference: Coherence (brief qualitative discussion), Young's double-slit experiment - derivation of fringe width, conditions for observable interference Interference by Division of Wavefront: Fresnel's Biprism - qualitative analysis of fringe pattern, applications (determine of unknown wavelength and thickness of thin sheet); interference with white light	14	3,4,5,6	R U A1 A2 E C

	Interference by Division of Amplitude: Stokes' treatment, interference in thin films (wedge-shaped and parallel films), Newton's rings - analysis of interference pattern and applications Interferometers: The Michelson Interferometer - qualitative discussions on construction, formation of fringes and importance in physics; determination of wavelength of light			
Unit V	Diffraction of Light Introduction to Diffraction: Interference versus Diffraction, Classification of Diffraction types Fraunhofer Type Diffraction: Single slit and double slit diffraction - qualitative discussions on diffraction pattern and positions of maxima and minima; the theory of plane transmission grating; resolving and dispersive power of a grating Fresnel Type Diffraction: Fresnel's half period zones, zone plate theory, comparison between zone plate and convex lens, diffraction at a: circular aperture and thin wire (only qualitative discussion of the fringe patterns)	9	3, 4, 5	R U A1 A2 E C

Learning Resources:

Text Books

1. Ghatak, A. (2017). *Optics* (6th ed). McGraw Hill Education (India)
2. Gupta, A. B. (2013). *Modern optics* (4th ed.). Books and Allied (P) Ltd.
3. Bajaj, N. K. (2017). *The physics of waves and oscillations*. Tata McGraw-Hill
4. Chaudhuri, R. N. (2010). *Waves and oscillations* (2nd ed.). New Age International Publishers
5. Chattopadhyay, D., & Rakshit, P. C. (2011). *Vibrations, waves and acoustics*. Books & Allied (P) Ltd.
6. Jenkins, F. A. & White, H. E. (2017). *Fundamentals of optics* (4th Indian ed.). McGraw Hill Education.

Suggested readings

1. Parthasarathy, H. (2019). *Waves and optics*. CRC Press
2. Hecht, E. (2019). *Optics*. Pearson
3. Kumar, A., Gulati, H. R. & Khanna, D. R. (n.d.). *Fundamentals of optics*. R. Chand Publications
4. Pain, H. J. (2006). *The physics of vibrations and waves* (6th ed.). John Wiley and Sons

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Practicals

Course Code	23PHYMAJ203
Course Title	Waves and Optics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - The course helps students get acquainted with different instruments (especially pertinent to the experiments of optics) and their applications and limitations. - It emphasises the necessity of hands-on experience with the measurement of physical quantities and understanding theoretical concepts through experiments. - It aims to help in estimating the quantifiers and studying important properties related to different optical phenomena through experiments. - It aims to help study important properties of waves and oscillations through experiments. - It aims to make students accustomed to working in the dark room (for optics experiments only).
Prerequisite	Students must have an introductory knowledge of oscillations, waves, superpositions, and light. Students must have completed the PHYMAJ101 and MATMIN101 courses.
Course Objectives	A student will be able to: - Enabling students to identify the important parts of an instrument and understand the significance of the constants of an instrument. - Setting up the experiment by properly assorting important components. - Enabling the students to record experimental data in a systematic manner and hence construct the experiment report on paper. - Computing the experimental results mathematically from the graphs with the help of a working formula. - Making visual representations of the experimental data, wherever necessary (primarily graphs), and hence interpreting the results.

	vi. Nurturing the scientific temperament among the students and encouraging them to reflect on their personal experiences of conducting the experiments.			
Course Outcomes based on Dave's Psychomotor Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of waves and optics.	I		
CO2	Recreate any previously imitated experiment on the study of waves and optics.	M		
CO3	Demonstrate skilled use of common measuring instruments such as spectrometers, light sources, lasers, gratings, etc.	P		
CO4	Be proficient in the setup and use of experimental apparatus used for the study of waves and optics.	P		
CO5	Adapt or modify previously imitated experiments to analyze new properties from waves and optics.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. To determine the velocity of sound through a wire using sonometer 2. To study Lissajous Figures (with phase analyses for different phases) 3. To verify the laws of transverse vibrations using Melde's apparatus 4. To determine the frequency of an electric tuning fork by Melde's experiment and verify the square of wavelength - time period law 5. To study the vibration of guitar strings 6. To determine the angle of a prism	30	1, 2, 3,4,5	I M P A

	7. To determine the refractive index of material of a prism using a sodium source 8. To determine the dispersive power and Cauchy constants of the material of a prism using a mercury source 9. To determine the wavelength of sodium light using Fresnel's Biprism 10. To determine the wavelength of sodium light using Newton's Rings method 11. To determine the refractive index of a liquid using Newton's Rings method 12. To determine the wavelength of a laser source using single slit diffraction 13. To determine the wavelength of (a) sodium light and (b) spectral lines of mercury source using a plane diffraction grating 14. To study the diffraction at a straight wire. <i>A minimum of EIGHT (8) experiments is to be performed</i>			
Learning Resources: Text Books 1. Chattopadhyay, D., & Rakshit, P. C. (2011). <i>An advanced course in practical physics</i>. New Central Book Agency (P) Limited 2. Raychaudhuri, D. P. (n.d.). <i>Manual of practical physics</i>. Allied Book Agency 3. Dasgupta, C.R. (1985). <i>A handbook of practical physics</i>. Book Syndicate Private Limited 4. Singh, H., & Hemne, P.S. (2022). <i>B.Sc. practical physics</i>. S. Chand & Co.				

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment for theory and practical **each**, (ii) the student must be present for

Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment (Theory): The Summative Assessment will be a written examination of 50 marks of at least 2 hours duration, using the RBT categorization and scheme.

Section	Marks per question	No. of questions to be answered	No. of questions given	Total marks for Section
A	2	5	8	10
B	5	4	6	20
C	10	2	4	20
			Total	50

Summative Assessment (Practical): The Summative Assessment will be an examination of 50 marks of at least 3 hours duration. The student will be made to perform one or more experiments chosen at random from the topics given in the syllabus.

Sl. No.	Component	Marks per component
1	Practical Examination	30
2	Viva-voce	10
3	Lab notebook or Lab assignment	10
	Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment (Theory)	50	50%	25
Summative Assessment (Practical)	50		25
Formative Assessment I	20		10
Formative Assessment II	50		25

Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Prajwal Chettri (Signature) Mr. Mayukh Mazumdar	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYSEC102 - Practical Electricity

4. Course Description

Course Code	23PHYSEC102
Course Title	Practical Electricity
Credits	3
Total Hours	60
Hours per Week	4
Course Type	Skill Enhancement Course
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - The course aims to provide knowledge on practical electrical circuits. - The students will have an understanding of application of resistors, inductors and capacitors in circuits. - Students will learn maintenance practices for electrical equipment and systems. - Students will learn the importance of electrical safety practices, including proper grounding, insulation, and handling of electrical hazards. - Students will develop skills in diagnosing and troubleshooting electrical problems in circuits and systems.
Prerequisite	Students must have an introductory knowledge of electromagnetic theory and electric circuits. Students must be taking PHYMAJ103 concurrently
Course Objectives	A student will be able to: - Understanding the basic concepts and laws of electrical circuits, such as voltage, current, resistance, Ohm's Law, etc., and their applications. - Developing techniques to analyze and solve electrical circuits such as Kirchhoff's laws, nodal analysis, and mesh analysis. - Identifying and understanding the characteristics of active and passive electrical components and analyzing the transient and steady-state responses of circuits. - Understanding the principles of electrical power generation, transmission, and distribution along with different types of electrical systems, such as single-phase and three-phase systems. - Introducing the student to electrical codes, standards, and regulations related to wiring and electrical installations. - Understanding the principles of electrical safety and the importance of following proper procedures.
Course Outcomes based on RBT and Cognitive Level Mapping	

At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Identify and recall the basic concepts and laws of electrical circuits, such as voltage, current, resistance, Ohm's Law, etc., and their applications.	R		
CO2	Summarize the principles of electrical power generation, transmission, and distribution along with different types of electrical systems, such as single-phase and three-phase systems.	U		
CO3	Apply techniques of analysis such as Kirchhoff's laws, nodal analysis, mesh analysis, etc., to calculate electrical circuit parameters.	A1		
CO4	Analyze various active and passive electrical components and investigate their characteristics and behaviour in electric circuits.	A2		
CO5	Recommend and argue for the correct procedure to implement in accordance with the principles of electrical safety.	E		
CO6	Propose and correctly interpret the various standards related to electrical codes and regulations related to wiring and electrical installations.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Basic Electricity Principles Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel combinations. Ammeters, voltmeters, galvanometers and conversion of galvanometer to either instrument. AC Electricity and DC Electricity. Ideal Constant-voltage and Constant-current Sources.	6	1, 4	R U A1 A2 E C
Unit II	Electrical Circuits AC Circuits: Kirchhoff's laws for AC circuits. Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt.	8	1, 3, 4	R U A1 A2

	Response of inductors and capacitors with DC and AC sources. DC circuit theory: Kirchhoff's laws for DC circuits, voltage division, current division, Y (Wye)-delta transformations. RC and RL in DC circuits. Complex Reactance and Impedance. Series LCR Circuit: (1) Resonance, (2) Power Dissipation and (3) Quality Factor, and (4) Band Width. Parallel LCR Circuit			E C
Unit III	Network theorems Network Theorems: Thevenin theorem, Norton theorem, Superposition theorem, Reciprocity theorem, Maximum Power Transfer theorem. Applications to dc circuits.	5	3	R U A1 A2 E C
Unit IV	Generators, Motors and Transformers DC Power sources. AC/DC generators. Single-phase, three-phase & DC motors. Basic design. Speed & power of ac motor Operation of transformers.	5	1,6	R U A1 A2 E C
Unit V	Electrical Protection Relays. Fuses and disconnect switches. Circuit breakers. Overload devices. Ground-fault protection. Grounding and isolating. Phase reversal. Surge protection. Interfacing DC or AC sources to control elements (relay protection device)	6	5,6	R U A1 A2 E C

Learning Resources:

Text Books

1. Mahajan, S., & Choudhury, S. R. (2017). *Electricity, magnetism and electromagnetic theory*. Tata McGraw-Hill
2. Yarwood, J. (1973). *Electricity and magnetism*. University Tutorial Press.
<https://archive.org/details/electricitymagne0000yarw/page/n7/mode/2up>
3. Say, M. G. (2002). *Performance and design of alternating current machines* (3rd ed.). CBS Publishers and Distributors.
4. Theraja, B. L., Theraja, A. K., & Tarnekar, S. G. (2019). *A textbook of electrical technology: Basic electrical engineering* (Volume 1) (23rd rev. ed.). S Chand & Co.
5. Theraja, B. L., Theraja, A. K., & Tarnekar, S. G. (2019). *A textbook of electrical technology: AC & DC machines* (Volume 2) (23rd rev. ed.). S Chand & Co.
6. Purcell, E. M., & Morin, D. J. (2013) *Electricity and magnetism* (3rd ed.). Cambridge University Press

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Practicals

Course Code	23PHYSEC102	
Course Title	Practical Electricity	
Credits	3	
Total Hours	60	
Hours per Week	4	
Course Type	Skill Enhancement Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course: 1. The course helps students get acquainted with different circuit components. 2. It focuses on hands-on experience with the measurement of physical quantities and understanding theoretical concepts through experiments. 3. It aims to help in studying important properties related to transient phenomena of electricity through experiments.	
Prerequisite	Students must have an introductory knowledge of electromagnetic theory and electric circuits. Students must be taking PHYMAJ103 concurrently	
Course Objectives	A student will be able to: i. Studying the characteristics of circuit components. ii. Proving the network theorems experimentally. iii. Analyzing and understanding the characteristics of series and parallel LCR circuits. iv. Learning about electrical protection components. v. Constructing a motion sensor for the operation of an automatic lighting system. vi. Construct a single phase DC motor and to find the average power generated by the motor.	
Course Outcomes based on Dave's Psychomotor Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of electric circuits.	I
CO2	Recreate any previously imitated experiment on the study of electric circuits.	M
CO3	Demonstrate skilled use of common electrical instruments such as multimeters, relays, bread boards, etc.	P

CO4	Be proficient in the setup and use of experimental apparatus used for the study of electric circuits.	P		
CO5	Adapt or modify previously imitated experiments to analyze new properties from electric circuits.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. To study the characteristics of a series RC Circuit. 2. To verify the Thevenin and Norton theorems. 3. To verify the Superposition, and Maximum power transfer theorems. 4. To study the response curve of a Series LCR circuit and determine its (a) Resonant frequency, (b) Impedance at resonance, (c) Quality factor Q, and (d) Band width. 5. To study the response curve of a parallel LCR circuit and determine its (a) Anti- resonant frequency and (b) Quality factor Q. 6. To construct a single phase DC motor and to find the average power generated by the motor. 7. To construct a relay alarm in case of an overloaded circuit. 8. To construct a motion sensor for the operation of an automatic lighting system. 9. To calibrate voltmeter and ammeter using potentiometer.	30	1, 2, 3,4,5	I M P A

Learning Resources:

Text Books

1. Chattopadhyay, D., & Rakshit, P. C. (2011). *An advanced course in practical physics*. New Central Book Agency (P) Limited
2. Raychaudhuri, D. P. (n.d.). *Manual of practical physics*. Allied Book Agency
3. Dasgupta, C.R. (1985). *A handbook of practical physics*. Book Syndicate Private Limited
4. Singh, H., & Hemne, P.S. (2022). *B.Sc. practical physics*. S. Chand & Co.

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment for theory and practical **each**, (ii) the student must be present for Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment (Theory): The Summative Assessment will be a written examination of 50 marks of at least 2 hours duration, using the RBT categorization and scheme.

Section	Marks per question	No. of questions to be answered	No. of questions given	Total marks for Section
A	2	5	8	10
B	5	4	6	20
C	10	2	4	20
			Total	50

Summative Assessment (Practical): The Summative Assessment will be an examination of 50 marks of at least 3 hours duration. The student will be made to perform one or more experiments chosen at random from the topics given in the syllabus.

Sl. No.	Component	Marks per component
1	Practical Examination	30

2	Viva-voce	10
3	Lab notebook or Lab assignment	10
	Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment (Theory)	50	50%	25
Summative Assessment (Practical)	50		25
Formative Assessment I	20		10
Formative Assessment II	50		25
Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Ms. Sujata Sinha (Signature) Dr. Prajwal Chettri	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMIN102 - Mechanics

5. Course Description

Course Code	23PHYMIN102
Course Title	Mechanics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Students not from Physics
Regulation	2023
Course Overview	This course: - The course aims to train the students in the basic knowledge of Physics, and the laws governing it. - It helps to introduce the students to conservation laws and their utility in understanding the behaviour of physical systems. - It aims to introduce the student to the special theory of relativity. - It focuses on the motion of rigid bodies about any fixed point and any arbitrary axis passing through this point. - It helps the students understand the elastic properties of materials and the Physics behind the characteristics of liquids. - It helps the students develop knowledge of the central force and its characteristics, including gravitation. - It teaches the basics of harmonic motion and its characteristics. It will help the students understand the periodic motions in Nature.
Prerequisite	Students should have elementary knowledge of vectors, algebra, calculus, kinematics, linear and rotational dynamics, energy, elasticity, and oscillations.
Course Objectives	A student will be able to: - Acquire preliminary knowledge and the mathematics required for the laws of motion, the concept of Galilean invariance, the system of particles, and collisions. - Demonstrate the concepts of conservative and non-conservative forces, equilibrium, and fictitious forces that arise in non-inertial reference frames. - Understand the analogy between translational and rotational dynamics and the ability to calculate the moment of inertia of various rigid bodies. - Describe the general properties of matter and the principles of elasticity, fluid flow, viscosity, and surface tension. - Analyze the laws of gravitation and central force motion and derive Kepler's law to demonstrate the motion of planets. - Explain the phenomenon of simple harmonic motion and the properties of the systems executing it.

Course Outcomes based on RBT and Cognitive Level Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Define and identify the fundamental laws of motion and associated concepts such as collisions.	R		
CO2	Distinguish between inertial and non-inertial reference frames and interpret the physical consequences arising from them.	U		
CO3	Apply the motion of a particle under central force motion to demonstrate the properties and characteristics of gravitation.	A1		
CO4	Analyse the motion of a rigid body, including translational and rotational motion.	A2		
CO5	Evaluate the differential equation of simple harmonic motion and assess the nature of oscillations.	E		
CO6	Combine and investigate the general properties of matter and various physical constants.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Vectors: Vector Algebra, Scalar and Vector products, Derivatives of a vector with respect to a parameter, Radial and Transverse components of velocity and acceleration, Uniform Circular Motion. Ordinary Differential Equations: 1st order homogeneous differential equations, 2nd order homogeneous differential equations with constant coefficients. Fundamentals of Dynamics: Laws of motion, Galilean transformation, Conservation laws, System of particles and Centre of Mass, Motion of rockets.	10	1, 2	R U A1 A2 E C

	Collisions: Elastic and Inelastic collisions, Laboratory and Centre of Mass frames.			
Unit II	Work and Energy: Conservative and non-conservative forces, Potential Energy. Potential energy curves and equilibrium. Work done by non-conservative forces. Law of Conservation of Energy. Special Theory of Relativity: Historical background of Special Theory of Relativity, Postulates. Length contraction. Time dilation. Twin paradox. Relativistic addition of velocities. Relativistic variation of mass, mass-energy equivalence. Non-Inertial Systems: Non-inertial frames and fictitious forces. Uniformly rotating frame. Rotating coordinate systems. Centrifugal force. Coriolis force,	8	4, 6	R U A1 A2 E C
Unit III	Rotational Dynamics: Angular momentum of a particle and system of particles, Torque, Conservation of angular momentum, Rotation about a fixed axis, Rotational energy, Moment of Inertia, Theorem of perpendicular axis and Theorem of parallel axes. Flywheel, theory of compound pendulum and determination of acceleration due to gravity. Gravitation and Central Force Motion: Law of Gravitation. Gravitational potential energy, potential, and field intensity. Motion of a particle under a central force field and Kepler's Laws (statement only). Satellites in circular and geosynchronous orbits.	12	3, 4	R U A1 A2 E C
Unit IV	Elasticity: Stress-Strain diagram, Relation between Elastic constants – Young's modulus, Bulk's modulus and modulus of rigidity. Poisson's ratio. Work done in stretching and in twisting a wire, twisting torque on a cylinder or wire.	9	6	R U A1 A2 E C

	Viscosity: Streamline and Turbulent flow, Equation of Continuity, Coefficient of Viscosity. Surface Tension: Relation between surface tension and surface energy. Angle of Contact and capillary ascent.			
Unit V	Oscillations: Simple Harmonic Motion, its differential equation and solution. Vertical oscillations of the light loaded spring, expression for force constant and determination of acceleration due to gravity. Energy and their time-average values. Damped oscillations (Overview).	6	5	R U A1 A2 E C

Learning Resources:

Text Books

1. Mathur, D.S. (2000). *Mechanics*. S. Chand & Co.
2. Lal B. & Subrahmanyam N. (2002). *Properties of matter*. S. Chand & Co
3. Murugesan R. (2010). *Elements of properties of matter*. S. Chand & Co.
4. Chatterjee, H. & Sengupta, R. (2010). *A treatise on general properties of matter* (7th rev. ed.). New Central Book Agency (P) Limited

Suggested readings

1. Kittel, K., Knight, W. D., Ruderman, M. A., Helmholz, A. C., & Moyer, B. J. (2011). *Mechanics*. Tata McGraw-Hill
2. Halliday, D., Resnick, R., & Walker, J. (2007) *Fundamentals of physics*. John Wiley & Sons
3. Kleppner, D. & Kolenkow, R. J. (2017) *An introduction to mechanics*. McGraw Hill Education

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Practicals

Course Code	23PHYMIN101
Course Title	Mechanics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	Students not from Physics
Regulation	2023

Course Overview	This course: a. The course helps introduce students to different measuring instruments and their applications and significance. b. It emphasises the need to have hands-on experience with the measurement of physical quantities and understand the theoretical concepts through practical means. c. It aims to help in estimating the physical properties of rigid bodies and the elastic and mechanical properties of different materials using scientific instruments. d. It aims to help in assessing the properties of liquids through simple experiments.	
Prerequisite	Students should have elementary knowledge of vectors, algebra, calculus, kinematics, linear and rotational dynamics, energy, elasticity, and oscillations.	
Course Objectives	A student will be able to: i. Identify, choose, and calibrate appropriate measuring instruments for a particular experiment. ii. Record experimental data in a systematic manner and compute the results using the right physical or mathematical procedures. iii. Interpret and communicate their results in an appropriate manner using written reports with the necessary data visualizations. iv. Check the credibility of theoretical claims from experiments. v. Nurture their scientific temperament and encourage them to build upon their experience gained from conducting experiments.	
Course Outcomes based on Dave's Psychomotor Mapping At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of mechanical and elastic properties.	I
CO2	Recreate any previously imitated experiment on the study of mechanical and elastic properties.	M
CO3	Demonstrate skilled use of common measuring instruments such as callipers, gauges, measuring telescopes, etc.	P
CO4	Be proficient in the setup and use of experimental apparatus used for the study of mechanical and elastic properties.	P
CO5	Adapt or modify previously imitated experiments to analyze new mechanical and elastic properties.	A
Course Content		

Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. Measurements of length/ diameter using vernier calliper, screw gauge and travelling microscope 2. Determination of g and velocity of freely falling body using digital timing technique 3. To study the motion of a spring and calculate (a) its spring constant, (b) modulus of rigidity of the spring material and (c) value of g. 4. To determine the value of g using a bar pendulum 5. To determine the surface tension of a liquid by capillary tube method 6. To determine the modulus of rigidity of the material of a wire by dynamical method 7. To determine the modulus of rigidity of the material of a wire by Maxwell's needle 8. To determine the Young's modulus of the material of a wire by optical lever method 9. To determine the moment of inertia of a flywheel <i>A minimum of EIGHT (8) experiments is to be performed</i>	30	1, 2, 3,4,5	I M P A
Learning Resources: Text Books 1. Chattopadhyay, D., & Rakshit, P. C. (2011). An advanced course in practical physics. New Central Book Agency (P) Limited 2. Raychaudhuri, D. P. (n.d.). Manual of practical physics. Allied Book Agency 3. Dasgupta, C.R. (1985). A handbook of practical physics. Book Syndicate Private Limited 4. Singh, H., & Hemne, P.S. (2022). B.Sc. practical physics. S. Chand & Co. 5. Chandra, B. (2023). <i>PHY MINOR:Mechanics - Lab guidebook for practicals.</i> (n.p.)				

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment for theory and practical **each**, (ii) the student must be present for Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment (Theory): The Summative Assessment will be a written examination of 50 marks of at least 2 hours duration, using the RBT categorization and scheme.

Section	Marks per question	No. of questions to be answered	No. of questions given	Total marks for Section
A	2	5	8	10
B	5	4	6	20
C	10	2	4	20
			Total	50

Summative Assessment (Practical): The Summative Assessment will be an examination of 50 marks of at least 3 hours duration. The student will be made to perform one or more experiments chosen at random from the topics given in the syllabus.

Sl. No.	Component	Marks per component
1	Practical Examination	30
2	Viva-voce	10
3	Lab notebook or Lab assignment	10
	Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment (Theory)	50		25

Summative Assessment (Practical)	50	50%	25
Formative Assessment I	20		10
Formative Assessment II	50		25
Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Digvijay Kharga (Signature) Mr. Mayukh Mazumdar (Signature) Dr. Prajwal Chettri	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMDC102 - Quantum Physics for the Curious

3. Course Description

Course Code	23PHYMDC102
Course Title	Quantum Physics for the Curious
Credits	3
Total Hours	45
Hours per Week	3
Course Type	Multi-Disciplinary Course
Semester	II
Intended Level	Certificate
Issue(s) Addressed	
Course Offered to	All Students (except students who have studied Physics)
Regulation	2023
Course Overview	This course: - Introduce a student to the physics of the very small at a qualitative level without any mathematical or technical prerequisites. - Introduce the student to the history of the development of quantum theory and its effect on physics - Give the student a qualitative overview of the Standard Model of particle physics and the experimental apparatus required. - Briefly acquaint the student with the practical applications of quantum theory. - Give the student an overview of the modern fields of quantum computing and quantum cryptography.
Prerequisite	Students must have graduated from higher secondary school. Students cannot have studied physics in classes 11 & 12.
Course Objectives	A student will be able to: - Understanding the history and reasons for the development of quantum theory. - Identifying the main ideas and developments in old quantum theory. - Identifying the main ideas and developments during the first quantum revolution and its impact on the foundations of physics. - Outlining the basic principles of the Standard Model of Particle Physics and its major components, and identifying the major experiments devoted to the field, e.g., CERN. - Outlining the important practical applications of quantum theory in electronics, chemistry, telecommunications, and imaging. - Familiarizing themselves with the ideas of quantum entanglement and its extension into the modern fields of quantum cryptography and quantum computing.
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:	

COs	Statements	Cognitive Level Mapping		
CO1	Describe the history and identify the reasons for the development of quantum theory.	R		
CO2	Discuss the basic principles of the Standard Model of particle physics and summarize the major experiments devoted to the field.	U		
CO3	Qualitatively present the ideas of quantum entanglement and its applications.	A1		
CO4	Appraise the main ideas and developments during the first quantum revolution and analyze its impact on the foundations of physics.	A2		
CO5	Critique the main ideas and developments in old quantum theory and the first quantum revolution.	E		
CO6	Generate the important practical applications of quantum theory in electronics, chemistry, telecommunications, and imaging.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Old Quantum Theory <i>Background information:</i> The nature of waves; Einstein's special theory of relativity; The spectral lines of hydrogen; the ultraviolet catastrophe <i>Physics becomes confusing:</i> The introduction of quanta and the photon; early atomic models; the wave-particle duality of light. <i>Lights in the darkness:</i> Matter waves; exclusion principle	12	1,5	R U A1 A2 E C
Unit II	The First Quantum Revolution <i>The birth of quantum mechanics:</i> Schrodinger's equation; Heisenberg's uncertainty principle; Dirac's antimatter prediction	11	4,5	R U A1 A2 E C

	<i>The death of classical physics:</i> The probabilistic nature of quantum theory; deterministic vs probabilistic schools of thought <i>A philosophical interlude:</i> The measurement problem; the Many-World's interpretation and the multiverse			
Unit III	The Standard Model of Particle Physics <i>The most fundamental of all things:</i> Discoveries of the electron, proton and neutron; overview of the current Standard Model <i>Discovering the building blocks:</i> Particle accelerators: CERN, LIGO, IndIGO, and other examples	8	2	R U A1 A2 E C
Unit IV	Applications of Quantum Mechanics <i>Revolutions in technology:</i> The electronics revolution; lasers, holography and the telecommunications revolution; MRIs; next generation microscopes; superconductivity and exotic states of matter (brief overview)	7	6	R U A1 A2 E C
Unit V	The Second Quantum Revolution <i>Quantum entanglement is weird:</i> quantum entanglement and its experimental verification <i>Present day revolutions:</i> Quantum information; overview of quantum cryptography and quantum computing	7	3	R U A1 A2 E C
Learning Resources:				

Text Books

1. Gribbin, J. (1985). *In search of Schrodinger's cat: Quantum physics and reality*. Black Swan
2. Gamov, G. & Stannard, R. (2001). *The new world of Mr Tompkins* (3rd rev. ed.). Cambridge University Press
3. Rae, A. (2005). *Quantum physics: Beginner's guide*. Pan MacMillian India
4. Baggott, J. (2011). *The quantum story: A history in 40 moments*. Oxford University Press
5. Oerter, R. (2006). *The theory of almost everything: The Standard Model, the unsung triumph of modern physics*. Plume
6. Zeilinger, A. (2023). *Dance of the photons: Einstein, entanglement and quantum teleportation*. Penguin

Suggested readings

1. Simonyi, K. (2012). *A cultural history of physics*. CRC Press
2. Brush, S. (2015). *Making 20th Century science: How theories became knowledge*. Oxford University Press
3. Kumar, M. (2011). *Quantum: Einstein, Bohr and the great debate about the nature of reality*. W.W. Norton & Co.
4. Buchwald, J., & Fox, R. (Eds.). (2017). *The Oxford handbook of the history of physics*. Oxford University Press
5. Zukav, G. (2009). *The dancing Wu Li masters*. HarperOne
6. Baggott, J. (2020). *Quantum reality*. Cambridge University Press
7. Schumm, B. A. (2004). *Deep down things: The breathtaking beauty of particle physics*. The Johns Hopkins University Press
8. Gilder, L. (2009). *The age of entanglement: When quantum physics was reborn*. Knopf

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** be present for and score a minimum of 40% in the Summative Assessment, (ii) the student must be present for Formative Assessment II (Mid-Semester Examinations), and (iii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: 50 marks distributed across three different forms of Assessment. Evaluated as per the Assessment & Evaluation Framework Document of Salesian College.

Summative Assessment: The Summative Assessment will be a written examination of 50 marks of at least 2 hours duration, using the RBT categorization and scheme.

Section	Marks per question	No. of questions to be answered	No. of questions given	Total marks for Section
A	2	5	8	10

B	5	4	6	20
C	10	2	4	20
			Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment	50	100%	50
Formative Assessment I	20	50%	10
Formative Assessment II	50		25
Formative Assessment III	20		10
Attendance	5	100%	5
		Total	100

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYVAC102 - Quantum Crossroads II

4. Course Description

Course Code	23PHYVAC102	
Course Title	Quantum Crossroads II	
Credits	1	
Total Hours	30	
Hours per Week	2	
Course Type	Value Added Course	
Semester	II	
Intended Level	Certificate	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course: a. Trains a student to plan, rehearse and present technical and mathematical information to an audience of their peers b. Provides students with an avenue to express technical information in an academic or professional environment. c. Trains students to comport themselves vocally and physically while presenting in front of an audience. d. Teaches students the use of digital aids such as slideshow software and projectors for the use of dissemination of information.	
Prerequisite	Students must be majoring in Physics. Students must have a reasonable command of English	
Course Objectives	A student will be able to: i. Read and understand technical information from a paper, article or other specialized manuals. ii. Analyze and break down the given information and assimilate with pre-existing knowledge. iii. Construct and present technical knowledge to an audience of their peers in a clear and lucid manner. iv. Critically evaluate and argue for or against the thesis of the paper.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the details of the paper being presented	R
CO2	Interpret the paper and relate it to their pre-existing knowledge	U
CO3	Present the knowledge in a clear and lucid manner to an audience of their peers	A1

CO4	Appraise and break down the information being presented.	A2		
CO5	Critique and argue for or against the thesis of the paper.	E		
CO6	Design and construct a presentation that disseminates knowledge from the paper to an audience.	C		
Course Structure				
Session Number	Content	Total Hours	COs	RBT
1	Hours 1 & 2: Introduction to the Course	2	-	-
2-8	Hour 1: Presentation by one 2nd year student Hour 2: Summarized report on the presentation	14	1,2,4	R U A2 E
9	Hour 1: Demo presentation by faculty Hour 2: Report on demo presentation	2	1,2,4	R U A2 E
10-15	Hour 1: Presentation by 1st year student Hour 2: Summarized report on the presentation	12	1,3,4, 5,6	R A1 A2 E C
Learning Resources:				
None				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

2. Assessment

The student **must** score a minimum of 40% of the total maximum marks assigned to the entire paper to pass the course, subject to the following restrictions: (i) the student **must** make a presentation of their own and submit the report of the same assessment, and (ii) the student should have a **minimum** of 75% attendance for the entire course.

Formative Assessment: The Formative Assessment will be of 50 marks and will be based on their individual presentations. This grade will then be converted out of 20.

Summative Assessment: The Summative Assessment will consist of a written report by the student for each presentation that they attend. Each report will be graded out of 10 and finally converted to a fraction of 25 marks.

Sl. No.	Category	Score
1	Organization	15
2	Content Knowledge	25

3	Style	5
4	Delivery	5
	Total	50

Evaluation Scheme of the entire Course

Component	Marks	Final Weightage	Final Marks
Summative Assessment	10 times the number of reports	variable	25
Formative Assessment	50	40%	20
Attendance	5	100%	5
		Total	50

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

The curriculum document for the Department of Physics have been carefully examined and approved by the undersigned:

Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University Gangtok, Sikkim (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMAJ201 - Differential Eqns and Complex Analysis

Course Description

Course Code	23PHYMAJ201
Course Title	Differential Eqns and Complex Analysis
Credits	4
Total Hours	60
Hours per Week	4
Course Type	Major
Semester	III
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - Introduces the student to the techniques of Fourier analysis in their study of periodic and non-periodic functions. - Helps to explore solutions of ordinary and partial differential equations using the Wronskian method, series solution, separation of variables, etc. - Aims to teach the student the applications and importance of special orthogonal functions. - Trains the student to investigate and analyze integration of functions using the concepts of complex analysis.
Prerequisite	Students must have completed PHYMAJ101 and MATMIN101 or their equivalents.
Course Objectives	A student will be able to: - Understand the theory of periodic functions and Fourier transform techniques to analyze different functions. - Develop skills in solving first and second-order differential equations using different solutions methods. - Familiarize with the characteristics of special orthogonal functions and their associated importance in physics-based problems. - Acquire knowledge and limitation of solving partial differential equations using separation of variables. - Develop techniques of complex analysis to analyze real and complex functions and solve definite integrals.
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:	

COs	Statements	Cognitive Level Mapping		
CO1	Identify Dirichlet conditions for convergence and recall the importance of Parseval's theorem.	R		
CO2	Understand and explain the concepts of Fourier coefficients, Frobenius method and Fourier transform.	U		
CO3	Apply separation of variables technique to solve partial differential equations.	A1		
CO4	Analyze the solutions of differential equations and properties of Legendre, Bessel and other special orthogonal functions.	A2		
CO5	Evaluate complex integrals using contour integrals and Cauchy's integral theorem, and judge their effectiveness.	E		
CO6	Construct solutions to definite integrals using complex analysis for different physics-based problems.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Fourier Series and Introduction to the Fourier Transform Periodic functions, Dirichlet conditions (statement only). Fourier coefficients of even and odd functions, arbitrary periods and non-periodic functions. Complex representation of a Fourier series. Parseval's theorem. Fourier transform (no proof), Transforms of window, delta, Gaussian, and even/odd functions. Convolution and Parseval's theorem.	8	1, 2	R U A1 A2 E C
Unit II	Differential Equations and Frobenius Method First Order Differential equations: Linear Equations and Integrating Factor.	10	2, 4	R U A1 A2 E C

	Second Order Differential equations: Homogeneous Equations with constant coefficients. Characteristic Equation. Wronskian and general solution. Existence and Uniqueness Theorem for Initial Value Problems (statement only). Particular Integral. Series solution of second order linear differential equations. Ordinary and Singular points. Frobenius method and its limitations.			
Unit III	Special Orthogonal Functions Legendre differential equation. Properties of Legendre polynomials: Rodrigues formula, Generating function, Orthogonality. Simple recurrence relations. Expansion of function in a series of Legendre polynomials. Bessel differential equation. Bessel Functions of the First Kind: Generating Function, Simple recurrence relations. Zeros of Bessel Functions ($J_0(x)$ and $J_1(x)$) and Orthogonality. Hermite and Laguerre differential equations. Solution and Generating function.	10	4	R U A1 A2 E C
Unit IV	Partial Differential Equations Solutions to partial differential equations using the separation of variables. 1D Wave equation and 1D Diffusion Equation. Laplace's Equation in problems of rectangular, cylindrical, and spherical symmetry.	8	3	R U A1 A2 E C
Unit V	Complex Analysis Complex numbers and their graphical representation. Euler's formula, De Moivre's theorem, powers, roots, and logarithms of complex numbers. Functions of Complex Variables. Analyticity and Cauchy-Riemann Conditions. Singularities and zeros.	14	5, 6	R U A1 A2 E C

	Integration of a function of a complex variable. Contour Integrals and Cauchy's Integral Theorem, Cauchy's Integral formula (no proof). Residues and the Residue Theorem (no proof). Laurent and Taylor's expansion (no proof). Application in solving definite integrals: sinusoidal functions, Fourier, and real integrals.			

Learning Resources:

Textbooks

1. Dass, H.K. & Verma, R. (2019). *Mathematical physics* (8th ed.). S. Chand Publishing.
2. Gupta, B.D. (2022). *Mathematical physics* (4th ed.). S. Chand Publishing.
3. Riley, K.F., Hobson, M.P., & Bence, S.J. (2023). *Mathematical methods for physics and engineering* (3rd res. South Asia ed.). Cambridge University Press
4. Harper, C. (1995), *Introduction to Mathematical Physics*. Prentice-Hall of India Pvt. Ltd.
5. Spiegel, M., Lipschutz, S., Schiller, J. J., & Spellman, D. (2009). *Complex Variables*. McGraw Hill.

Suggested Readings

1. Kreyszig, E. (2017). *Advanced engineering mathematics* (10th ed.). John Wiley & Sons.
2. Boas, M. L. (1983). *Mathematical methods in the physical sciences* (2nd ed.). John Wiley & Sons.
3. Arfken, G. B. & Weber, H. J. (2005). *Mathematical methods for physicists* (6th ed.). Elsevier
4. Tolstov, G.P. (1976). *Fourier series* (rev ed., R.A. Silverman, Trans). Dover Publications Inc.
5. Boyce, W.E. & DiPrima, R.C. (2001). *Elementary differential equations and boundary value problems* (7th ed.). John Wiley & Sons
6. Bell, W.W. (1968). *Special functions for scientists and engineers*. D. van Nostrand Co. Ltd.
7. Zill, D.G. & Shanahan, P.D (2003). *A first course in complex analysis with applications*. Jones and Bartlett Publishers

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of a series of three Formative Assessments of 50 marks over the course of the Semester, and a final Summative Assessment of 50 marks which will be a Theory Examination.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Digvijay Kharga	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMAJ202 - Digital Electronics

Course Description

Course Code	23PHYMAJ202	
Course Title	Digital Electronics	
Credits	4	
Total Hours	75	
Hours per Week	5	
Course Type	Major	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course aims to: a. Train the students in the basic knowledge of Digital Electronics. b. Introduce the students to strategies to simplify Boolean expressions. c. Harness the circuit drawing skills among students. d. Help the students understand the working and necessity of arithmetic circuits. e. Develop students' interpretation of digital signals. f. Teaches the working of flip-flops, registers, counters and multivibrators.	
Prerequisite	Students must have completed PHYSEC102.	
Course Objectives	A student will be able to: i. Acquire preliminary knowledge of different electronic components and number systems. ii. Demonstrate truth tables and Boolean expressions in the form of electronic circuits. iii. Distinguish between combinational and sequential circuits. iv. Analyse the working of different electronic circuits (adders/subtractors, de/ multiplexers, en/decoders, flip-flops, etc.). v. Construct different types of multivibrators using IC 555.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Define and identify different types of electronic components	R

CO2	Understand the working of different electronic circuits and distinguish between combinational and sequential circuits.	U		
CO3	Apply the laws of Boolean algebra and Karnaugh Map mechanisms to simplify electronic circuits.	A1		
CO4	Investigate the working of different types of Flip-flops.	A2		
CO5	Judge the necessity of registers and counters	E		
CO6	Construct electronic circuits based on provided truth table and/ or desired outcomes	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Digital Systems Distinction between Analog and Digital Circuits. Number Systems (Binary, Decimal, Octal and Hexadecimal). Conversion between different Number Systems Logic gates - AND, OR and NOT (realization of these gates using diodes and transistors). NOR and NAND as Universal gates. XOR and XNOR gates as parity checkers (Qualitative treatment only) Active and Passive components. Discrete components. Wafer & Chips. Classification of ICs. Advantages and disadvantages of ICs. Scales of Integration: SSI, MSI, LSI and VLSI (only definition and basic idea)	7	1,2,6	R U A1 A2 C
Unit II	Boolean Algebra & Data Processing Circuits Boolean Laws, De Morgan's Theorem. Minterms and Maxterms. Simplification of a logic circuit/ Conversion of a truth table into equivalent logic circuit using: (1) Boolean Algebra, (2) K(Karnaugh)-Map	10	1,2,3,6	R U A1 A2 E C

	Basic idea of : Multiplexers & Demultiplexers, Encoders & Decoders			
Unit III	Combinational & Sequential Circuits Combinational Circuits - definition and examples Arithmetic Circuits - Binary addition. Binary subtraction (using 1's and 2's complement methods). Half and Full Adders. Half and Full Subtractors. 4-bit Binary Adder-cum-Subtractor Sequential Circuits - definitions and examples. Comparison between Combinational and Sequential Circuits. RS, D, T and JK Flip-Flops. Clocked (Level and Edge Triggered) Flip-Flops. Race Around condition in JK Flip-Flop. Master/ Slave JK Flip-Flop.	12	1,2,3,4,6	R U A1 A2 E C
Unit IV	Shift Registers & Counters Shift Registers - Serial-In-Serial-Out, Serial-In-Parallel-Out, Parallel-In-Serial-Out and Parallel-In-Parallel-Out Shift Registers (all up to 4 bits) Counters - Asynchronous Counters. Decade Counter. Synchronous Counter. Ring Counter (all up to 4 bits). State Diagram of a Counter.	10	1,3,5,6	R U A1 A2 E C
Unit V	The 555 IC Timer Block diagram of IC 555. Pin diagram of IC 555 Applications of IC 555 - Astable and Monostable Multivibrator	6	1,6	R U A1 A2 E C
Learning Resources: Text Books 1. Ghosh, B. (2010). <i>Fundamental Principles of Electronics</i> . Books & Allied Ltd. 2. Paikaray, R. & Dash, A. K. (2021). <i>Digital Systems and Applications</i> . Kalyani Publishers				

Suggested readings

1. Leach, D. P. , Malvino, A. P. & Saha, G. (2011). *Digital Principles and Applications (7th Ed.)*. Tata McGraw Hill Education Private Limited, New Delhi.
2. Maini, A. K. (2007). *Digital Electronics: Principles, Devices and Applications*. John Wiley & Sons, Ltd.
3. Tokheim, R. L. (1993). *Schaum's Outlines of Digital Principles*. McGraw Hill
4. Floyd, T. L. (2006). *Digital Fundamentals (9th ed.)*. Pearson Prentice Hall.
5. Tocci, R.J., Widmer, N.S. & Moss, G.L. (2007). *Digital systems: Principles and applications (10th ed.)*. Pearson Prentice Hall.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of a series of three Formative Assessments of 50 marks over the course of the Semester, and two final Summative Assessments of 50 marks each: one which will be a Theory Examination and the other a Practical Examination. The two Summative Assessments will be combined to give one final score of 50 marks.

Practicals

Course Description

Course Code	23PHYMAJ202
Course Title	Digital Electronics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	III
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: a. Helps introduce students to different digital electronic instruments and trainer kits. b. Emphasises the need to have hands-on experience with the measurement of physical quantities and understand the theoretical concepts through practical means. c. Trains students to construct electronic circuits using discrete and integrated components.

	d. Aims to help in studying the performance of different electronic circuits.			
Prerequisite	Students must have completed PHYSEC102.			
Course Objectives	A student will be able to: i. Identify and choose appropriate electronic components to construct electronic circuits. ii. Record experimental data in a systematic manner (truth tables) iii. Interpret and communicate their results in an appropriate manner using written reports with the necessary data visualizations. iv. Check the credibility of theoretical claims (truth tables) from experiments. v. Nurture their scientific temperament and encourage them to build upon their experience gained from conducting experiments.			
Course Outcomes based on Dave's Psychomotor Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Replicate the steps required to familiarize themselves with experiments and setups related to the different electronic circuits.	I		
CO2	Recreate any previously imitated experimental circuits on the study of outputs.	M		
CO3	Demonstrate skilled use of common instruments and components such as digital multimeter, breadboard, etc.	P		
CO4	Be proficient in the setup and use of digital trainer kits used for the conversion of truth tables and Boolean expressions into electronic circuits.	P		
CO5	Adapt or modify previously imitated experiments in the form of electronic circuits to analyze the performance of new circuits.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's Levels
	List of Experiments: 1. To test a diode and a transistor using a Multimeter. 2. To design AND and OR gates using diodes. 3. To design a NOT gate using a transistor.	30	1, 2, 3,4, 5	I M P A

	4. To design and verify AND, OR, NOT and XOR gates using NAND gates. 5. To design a combinational logic circuit for a specific truth table. 6. To convert a Boolean expression into a logic circuit and design it using logic gate ICs. 7. To minimize a given logic circuit. 8. To design and study the following: half adder, full adder and 4-bit binary adder (using full adder IC). 9. To design and study the following: half subtractor, full subtractor and 4-bit adder-cum-subtractor (using full adder IC). 10. To design the following flip-flops using NAND gates: RS, clocked RS, D-type, T-type and JK 11. To design a JK Master/Slave Flip-Flop using Flip-Flop ICs. 12. To design a 4-bit Counter using D-type/ JK Flip-Flops ICs and study the timing diagram. 13. To design an astable multivibrator of given specifications using 555 timer IC. <i>Experiment No.1 is compulsory. A minimum of EIGHT (8) experiments is to be performed from the remaining practicals in the list.</i>			
Learning Resources: Text Books 1. Jena, K. K. (2021). <i>Digital Systems and Applications</i>. Kalyani Publishers 2. Ghosh, B. (2010). <i>Fundamental Principles of Electronics</i>. Books & Allied Ltd. 3. Hayes, T.C. (2016). <i>Learning the art of electronics: A hands-on lab course</i>. Cambridge University Press.				

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(Signature) Mr. Mayukh Mazumdar	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYSEC201 - Numerical Methods using Computation

Course Description

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Course Code	23PHYSEC201
Course Title	Numerical Methods using Computation
Credits	3
Total Hours	90
Hours per Week	6
Course Type	SEC
Semester	III
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: a. Introduces a student to the concept of using computers for numerical and scientific computation. b. Trains a student in constructing and writing code to model physical systems and extract usable results. c. Teaches a student the basic concepts of commonly used numerical methods for root finding, eigen values, solving systems of equations, solving differential equations, optimization etc. d. Introduces tools and modules in Python used for advanced numerical and scientific analysis and the technical visualization of data.
Prerequisite	Students must have completed PHYMAJ101, MATMIN101, and PHYSEC101 or their equivalents.
Course Objectives	A student will be able to: i. Acquire knowledge about the fundamentals of basic scientific and numerical programming using Python. ii. Use common root finding techniques, methods of interpolation and the ability to fit curves to data points. iii. Solve systems of equations and extract the eigen values and eigen vectors of a matrix iv. Use numerical techniques for integration and differentiation, along with methods of solving ordinary differential equations. v. Perform simple optimization both with and without constraints.
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:	

COs	Statements	Cognitive Level Mapping		
CO1	Recall commonly used modules and methods of Python in the use of numerical analysis.	R		
CO2	Express physical and mathematical phenomena using appropriate Python code and data visualization approaches.	U		
CO3	Solve the equations modelling the physical phenomenon using numerical techniques.	A1		
CO4	Analyze physical phenomena or mathematical outcomes using Python code.	A2		
CO5	Determine parameters or evaluate the outcomes of physical situations using computational modelling with Python.	E		
CO6	Design computational algorithms that replicate common physical phenomena.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Review of <i>Python</i>	15	1	R U A1 A2 E C
	Variables, Data types, Conditionals, Loops, Functions, common methods and modules like <i>len()</i> , <i>math</i> etc.			
	Review of <i>numpy</i> and <i>scipy</i> modules: the <i>linalg</i> submodule and common matrix methods, <i>solve()</i> , <i>roots()</i> , <i>polyfit()</i> , <i>interp()</i> , <i>gradient()</i> , <i>trapz()</i> , <i>odeint()</i>			
	Review of <i>matplotlib()</i> : 2D graphs, formatting plots, subplots, plotting lines of best fit			
Unit II	Numerical Algebraic Methods	15	2,3,4,5,6	R U A1 A2 E C
	Roots of nonlinear equations of one variable (algorithms only): Bisection method, Newton-Raphson method, Müller’s method for complex roots			
	Polynomial interpolation using Newton’s method, Curve fitting using least squares:			

	linear, polynomial and exponential fits, application to common problems in physics			
Unit III	Numerical Methods for Linear Algebra Solution of a system of linear algebraic equations using Gauss elimination method Eigen values and eigen vectors of a symmetric matrix using the Jacobi method, Eigen values and eigen vectors of any real matrix using the QR decomposition into shifted inverse power method, Applications to common matrices and tensors in physics.	23	2,3,4, 5,6	R U A1 A2 E C
Unit IV	Numerical Methods in Calculus Numerical differentiation: first and second order derivatives using forward, backward, and central difference formulae. Numerical integration: Trapezoidal rule, Simpson's $\frac{3}{8}$ rule Ordinary Differential Equations: Euler's method, fourth-order Runge-Kutta method (algorithm only), solution of first and second order differential equations, application to common differential equations in physics	22	2,3,4, 5,6	R U A1 A2 E C
Unit V	Optimization Single dimension optimization using Golden Section search. Unconstrained multivariate scalar function minimization using <i>scipy.optimize</i> methods (use of Python method only). Constrained linear programming using the simplex method.	15	2,3,4, 5,6	R U A1 A2 E C
Learning Resources: Textbooks 1. Chapra, S.C. & Canale, R.P. (2021). <i>Numerical methods for engineers</i> (8th ed.). McGraw Hill.				

2. Gupta, R.K. (2019). *Numerical methods: Fundamentals and applications*. Cambridge University Press.
3. Sastry, S. (2012). *Introductory methods of numerical analysis* (5th ed.). Prentice Hall India
4. Jain, M.K., Iyengar, S.R.K. & Jain, R.K. (2022). *Numerical methods for scientific and engineering computation* (8th ed.). New Age International Publishers

Suggested Readings

1. Beu, T.A. (2015). *Introduction to numerical programming: A practical guide for scientists and engineers using Python and C/C++*. CRC Press.
2. Gezerlis, A (2020). *Numerical methods in physics with Python*. Cambridge University Press.
3. Hill, C. (2020). *Learning scientific programming with Python* (2nd ed.). Cambridge University Press.
4. Kiusalaas, J. (2013). *Numerical methods in engineering with Python 3*. Cambridge University Press.
5. Kong, Q., Siau, T. & Bayern, A.M. (2021). *Python programming and numerical methods: A guide for engineers and scientists*. Academic Press.

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of a series of three Formative Assessments of 50 marks over the course of the Semester, and a final Summative Assessment of 50 marks which will be a Practical Examination.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMDC201 - Physics of Sports

Course Description

Course Code	23PHYMDC201	
Course Title	Physics of Sports	
Credits	3	
Total Hours	45	
Hours per Week	3	
Course Type	Multidisciplinary	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	All Students (except those who have studied Physics)	
Regulation	2023	
Course Overview	This course: a. Aims to train the students in the preliminaries of Physics and measurements. b. Helps the students to understand the Physics underlying various sports equipment. c. Helps the students to understand the Physics underlying various sports manoeuvres d. Focuses on the effects of surroundings on athletes’ performance. e. Attempts to analyse different sports records in the light of Physics.	
Prerequisite	Students should not have studied physics in classes 11 & 12.	
Course Objectives	A student will be able to: i. Acquire preliminary knowledge of concepts of different physical quantities. ii. Demonstrate the underlying Physics of different sports. iii. Compare between different sporting manoeuvres and equipment iv. Analyse some rare feats achieved by athletes. v. Appreciate the necessity of different laws of Physics in sports.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Name different units of measurements and define some essential physical quantities.	R
CO2	Distinguish between translational/ rotational motion and kinetics/ kinematics in the light of sports.	U

CO3	Apply the laws of Physics (Mechanics) to explain different sports phenomena.	A1		
CO4	Investigate the underlying Physics of different sports.	A2		
CO5	Judge the effectiveness of different manoeuvres and equipment used in various sports.	E		
CO6	Plan creative sporting manoeuvres and wardrobes/ gears for optimal performance and safety	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	The Preliminaries: Brief on the nature of Physics (with special regards to Mechanics); How Physics and Sports are related. Basic dimensions and units of measurements Understanding velocity, momentum, force, friction, work, power, energy, etc. (with examples from sports). Revisiting Newton’s Laws of Motion. Learning to read graphs in mechanics. <u>Suggested activities:</u> <i>Numerical conversions between different units:</i> 1. Heights and masses of athletes 2. Dimensions of different sports courts/ tracks/ fields	8	1,3,4	R U A1 A2
Unit II	Translational Motion in Sports: Projectiles in sports (cricket ball, shot put, javelin, discus, etc.). Impulse in sports. Collisions in sports. Coefficient of restitution and sports balls. <u>Suggested activities:</u>	9	1, 2,3,4, 5	R U A1 A2 E C

	1. Observe the projectile trajectory of different sports equipment in motion in the playground. 2. Study/Review of online resources.			
Unit III	High Energy Sports: Understanding the concepts of work, mechanical energy and conservation of energy. Work, power and weightlifting Mechanical energy and field events (pole vault and high jump); analysing the role of pole and the Fosbury technique <u>Suggested activities:</u> <i>Review and analysis of pole vault, high jump and weightlifting manoeuvres through online resources.</i>	8	1, 2,3,4, 5	R U A1 A2 E C
Unit IV	Rotational Motion in Sports: Torques in sports (wrestling) and training (strength-training devices) Centre of gravity, stability and human movement Angular speed in sports (discus throw) Moment of Inertia, angular velocity and sports (pirouettes and diving) <u>Suggested activities:</u> <i>Observe and Verify the principle of conservation of angular momentum in regular activities</i>	10	1, 2,3,4, 5,6	R U A1 A2 E C
Unit V	Aerodynamics and Hydrodynamics in Sports: Effects of air on sports, basic concepts of aerodynamics (drag and lift), analysing the aerodynamics of soccer balls (Roberto Carlos' banana kick versus France, 1997), discus (the discus paradox) and javelin (Uwe Hohn's record throw, 1984).	10	1, 2,3,4, 5,6	R U A1 A2 E C

	Effect of water in sports, hydrodynamics of swimming			
	<u>Suggested activities:</u> 1. Refer to online resources of the special moments referred in this unit. 2. Kick a spinning soccer ball and a non-spinning soccer ball and compare the results.			

Learning Resources:

Text Books

1. McGinnis, P. M. (2005). *Biomechanics of Sport and Exercise (2nd ed.)*. Human Kinetics
2. Spathopoulos, V. N. (2013). *An Introduction to the Physics of Sports*. Createspace Independent Pub
3. Anonymous (n.d.). *Physics: Textbook for Class XI (Part I)*. National Council of Education Research and Training

Suggested readings

1. Barrow, J. D. (2012). *Mathletics*. Vintage Books, London
2. Normani, F. (n.d.). *The Physics Of Sports*. Real World Physics Problems. <https://www.real-world-physics-problems.com/physics-of-sports.html>
3. Rajput, R., Kumar, V., & Singh, A. (2019). The Application of physics in sports. *International Journal of Physiology, Nutrition and Physical Education*; 4(1)
4. Di Maria, G. (March 5, 2022). The Physics of Sports. *Times Europe*. <https://www.eetimes.eu/the-physics-of-sports/>

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of a series of three Formative Assessments of 50 marks over the course of the Semester, and a final Summative Assessment of 50 marks which will be a Theory Examination.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Mr. Mayukh Mazumdar	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYVAC201 - Quantum Crossroads III

Course Description

Course Code	23PHYVAC201	
Course Title	Quantum Crossroads III	
Credits	1	
Total Hours	30	
Hours per Week	2	
Course Type	Value Added Course	
Semester	III	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course: a. Trains a student to plan, rehearse and present technical, scientific and mathematical information to the audience. b. Provides students with an avenue to express technical information in an academic or professional environment. c. Trains students to comport themselves vocally and physically while presenting in front of an audience. d. Teaches students the use of digital aids such as microsoft office and graphical tools for the use of dissemination of information.	
Prerequisite	Students must have opted Physics as their Major subject. Students must have a reasonable command of English	
Course Objectives	i. A student will be able to: ii. Read and understand technical information from various online resources such as research articles or other specialized manuals. iii. Analyze and break down the given information and assimilate with pre-existing knowledge. iv. Construct and present technical knowledge to an audience of their peers in a clear and lucid manner. v. Critically evaluate and argue for or against the thesis of the paper.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping

CO1	Describe the details of the scientific information presented in articles, books and other online resources	R		
CO2	Interpret the information and relate it to their pre-existing knowledge	U		
CO3	Present the knowledge in a clear and lucid manner	A1		
CO4	Appraise and break down the information being presented.	A2		
CO5	Critique and argue for or against the thesis of the paper.	E		
CO6	Design and construct a presentation that disseminates knowledge from the paper to an audience.	C		
Course Structure				
Session Number	Content	Total Hours	COs	RBT
1	Hours 1 & 2: Reorientation to the Course	2	-	-
2-10	Hour 1: Presentation by one 3rd year student Hour 2: Summarized report on the presentation	18	1,2,4	R U A2 E
11	Hour 1: Demo presentation by faculty. Hour 2: Report on demo presentation.	2	1,2,4	R U A2 E
12-14	Hour 1: Learning chalkboard presentation of published peer-reviewed research articles and literature review. Hour 2: Practical class for the same.	6	1,2,4	R U A2 E
15	Hour 1: Chalkboard and time management; presenting graphical data by hand. Hour 2: Practice session for the same	2	3	A1 C
Learning Resources: Handouts provided by faculty / supervisor.				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of one Formative Assessment of 50 marks over the course of the Semester, and a final Summative Assessment of 50 marks.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Digvijay Kharga (Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMAJ203 - Thermal Physics

Course Description

Course Code	23PHYMAJ203
Course Title	Thermal Physics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - Aims to develop understanding of the inter-relation between heat and work with the aid of laws governing thermodynamics. - Introduces basic concepts of temperature, internal energy, heat, entropy and the thermodynamic potentials. - Helps to apply thermodynamic concepts to topics such as heat engines, the expansion of gases and phase changes. - Helps to apply and understand indicator diagrams. - Provides an introduction to Maxwell's Thermodynamic Relations and their applications in various thermodynamic processes. - Offers subtle introduction of Maxwell-Boltzman distribution law and its application in understanding molecular kinetics in gases in the regime of thermodynamics.
Prerequisite	Students must have introductory knowledge of partial and total derivatives, integrals, statistics and some special functions.
Course Objectives	A student will be able to: - Understand the basic concepts of thermodynamics such as temperature, pressure, system, properties, process, state, cycles and equilibrium. - Conduct experiments regarding the measurement and calibration of temperatures and investigate heat transfer parameters. - Identify the properties of substances on property diagrams and obtain the data from property tables. - Define energy transfer through mass, heat and work for closed and control volume systems.

	v. Apply the Laws of Thermodynamics on closed and control volume systems. vi. Analyze the thermal efficiencies of heat engines and the coefficients of performance for refrigerators.

Course Outcomes based on RBT and Cognitive Level Mapping

At the end of this course, a student will be able to:

COs	Statements	Cognitive Level Mapping
CO1	Grasp the fundamental principles of thermodynamics, statistical mechanics, and kinetic theory by demonstrating the ability to simplify and model real systems and to explain, analyze, and predict a variety of natural phenomena.	R
CO2	Demonstrate communication skills by clearly explaining both in oral and written form the mathematical and physical concepts learned in this course.	U
CO3	Gain an appreciation of the history of thermal physics and the knowledge to follow current research and literature in a variety of fields where thermal physics has a central role.	A1
CO4	Apply advanced mathematical methods such as calculus, linear algebra, probability and statistics to explain and predict the thermal properties of systems.	A2
CO5	Optimize parameters for enhancing the efficiency of heat engines and refrigerators. Analyze flow of heat in different materials.	E
CO6	Construct thermometers based on thermoelectric effect and investigate calibration curves for positive temperature coefficient materials. Construct set-ups for heat transfer studies on different conducting and nonconducting materials.	C

Course Content

Units	Content	Lecture Hours	COs	RBT
Unit I	Introduction to Thermodynamics Zeroth and First Law of Thermodynamics: Extensive and intensive variables,	15	1, 4	R U A1 A2

	Thermodynamic Equilibrium, Zeroth Law of Thermodynamics and Concept of Temperature, Work and Heat, State Functions, First Law of Thermodynamics and its differential form, Internal Energy, First Law and various processes, Applications of First Law: General Relation between C_p and C_v, Work Done during Isothermal and Adiabatic Processes, Compressibility and Expansion Co-efficient. Second Law of Thermodynamics: Reversible and Irreversible process with examples. Inter-conversion of Heat and Work. Heat Engines. Carnot's Cycle, Carnot engine and efficiency. Refrigerator, Second Law of Thermodynamics: Kelvin-Planck and Clausius Statements and their Equivalence. Carnot's Theorem. Applications of Second Law of Thermodynamics: Thermodynamic Scale of Temperature and its Equivalence to Perfect Gas Scale. Entropy: Concept of Entropy, Clausius Theorem. Clausius Inequality, Second Law of Thermodynamics in terms of Entropy. Entropy of a perfect gas. Principle of Increase of Entropy. Entropy Changes in Reversible and Irreversible processes with examples. Entropy of the Universe. Entropy Changes in Reversible and Irreversible Processes. Principle of Increase of Entropy. Temperature–Entropy diagrams for Cycle. Third Law of Thermodynamics. Unattainability of Absolute Zero.			E C
Unit II	Thermodynamic Potentials Thermodynamic Potentials: Internal Energy, Enthalpy, Helmholtz Free Energy, Gibb's Free Energy. Magnetic Work, Adiabatic demagnetization, First and second order Phase Transitions with examples, Clausius Clapeyron Equation and Ehrenfest equations Liquefaction of gases, Phase behaviour of Helium (basics).	5	2	R U A1 A2 E C
Unit III	Maxwell's Thermodynamic Relations Derivations and applications of Maxwell's Relations, Maxwell's Relations: Clausius -	8	3, 5	R U A1

	Clapeyron equation, Values of C_p-C_v , TdS Equations, Joule-Kelvin coefficient for Ideal and Van der Waal Gases, Energy equations, Change of Temperature during Adiabatic Process.			A2 E C
Unit IV	Kinetic Theory of Gases Distribution of Velocities: Maxwell-Boltzmann Law of Distribution of Velocities in an Ideal Gas and its Experimental Verification. Doppler Broadening of Spectral Lines and Stern's Experiment. Mean, RMS and Most Probable Speeds. Degrees of Freedom. Law of Equipartition of Energy (No proof required). Specific heats of Gases. Molecular Collisions: Mean Free Path. Collision Probability. Estimates of Mean Free Path. Transport Phenomenon in Ideal Gases: Viscosity, Thermal Conductivity and Diffusion. Brownian Motion and its Significance. Real Gases: Behaviour of Real Gases: Deviations from the Ideal Gas Equation. The Virial Equation. Andrew's Experiments on CO_2 Gas. Critical Constants. Continuity of Liquid and Gaseous State. Vapour and Gas. Boyle Temperature. Van der Waal's Equation of State for Real Gases. Values of Critical Constants. Law of Corresponding States. Comparison with Experimental Curves. P-V Diagrams. Joule's Experiment. Free Adiabatic Expansion of a Perfect Gas. Joule-Thomson Porous Plug Experiment. Joule- Thomson Effect for Real and Van der Waal Gases. Temperature of Inversion. Joule- Thomson Cooling.	8	1, 2, 6	R U A1 A2 E C

Learning Resources:

Textbooks

1. Gupta, A. B. & Roy, H. P. *Thermal physics*, Books & Allied Ltd.
2. Kumar, A. & Taneja, S. P. (2014) *Thermal physics*, S. Chand Publications.
3. Garg, S., Bansal, R., & Ghosh, C.K. (2012) *Thermal physics* (2nd ed.), Tata McGraw-Hill.
4. Sharma, K. N., & Satyal, B. S. *Thermal physics*, Kalyani Publishers.

5. Zemansky, M.W. & Dittman, R. (1981) *Heat and thermodynamics*. McGraw-Hill.
6. Helrich, C. S. (2009). *Modern thermodynamics with statistical mechanics*, Springer.
7. Sears, S.W. & Salinger, G.L. (1988). *Thermodynamics, kinetic theory & statistical thermodynamics*, Narosa.
8. Blundell, S. J. & Blundell, K. M. (2012) *Concepts in thermal physics* (2nd ed.), Oxford University Press.
9. Callen, H. B. (1985). *Thermodynamics and an introduction to thermostatistics*, Wiley.
10. Schroeder, D.V. (2000). *An introduction to thermal physics*. Addison-Wesley.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of a series of three Formative Assessments of 50 marks over the course of the Semester, and two final Summative Assessments of 50 marks each: one which will be a Theory Examination and the other a Practical Examination. The two Summative Assessments will be combined to give one final score of 50 marks.

Practicals

Course Description

Course Code	23PHYMAJ203
Course Title	Thermal Physics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: a. The course provides the knowledge to measure various physical parameters related to heat and thermodynamics through a scientific approach. b. It aims to help in understanding heat transfer processes, thermoelectric effect and similar other properties of materials using scientific apparatus. c. It focuses on giving training in the use of precision measurements, calibration of instruments and error analysis.

Prerequisite	Students must have an introductory knowledge of thermodynamics and basic instrumentation skills.			
Course Objectives	A student will be able to: i. Use appropriate experimental set-ups to determine thermal conductivity, calibrate thermometers and investigate the equivalence of heat and work ii. Investigate heat transfer mechanisms governed by laws of thermodynamics. iii. Record experimental data and calculate results using appropriate procedure. iv. Graphically interpret the outcome of the experiment.			
Course Outcomes based on Dave's Psychomotor Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Assess their theoretical understanding of heat kinetics with experimental findings.	I		
CO2	Recreate any previously imitated experiment on the study of thermal properties of materials.	M		
CO3	Demonstrate skilled use of common measuring instruments such as Wire-Bridges, Vernier Calliper, Screw Gauge, Potentiometers, Multimeters, etc.	P		
CO4	Be proficient in the setup and use of experimental apparatus used for the investigating heat transfer studies and calibration of thermometers.	P		
CO5	Improvise previously imitated experiments to analyze thermal properties of new materials and devise calibration strategies	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. To determine Mechanical Equivalent of Heat, J, by Callender and Barne's constant flow method.	30	1, 2, 3,4,5	I M P A

	2. To determine the Coefficient of Thermal Conductivity of Cu by Searle's Apparatus. 3. To determine the Coefficient of Thermal Conductivity of Cu by Angstrom's Method. 4. To determine the Coefficient of Thermal Conductivity of a bad conductor by Lee and Charlton's disc method. 5. To determine the Temperature Coefficient of Resistance by Platinum Resistance Thermometer (PRT). 6. To study the variation of Thermo-Emf of a Thermocouple with Difference of Temperature of its Two Junctions. 7. To calibrate a thermocouple to measure temperature in a specified Range using (1) Null Method (2) Direct measurement using Op-Amp difference amplifier and to determine Neutral Temperature.			

Learning Resources:

Textbooks

1. Chattopadhyay, D. and Rakshit, P. C. *An Advanced Course in Practical Physics*, New Central Book Agency.
2. Singh, H. and Hemne, P. S. *B.Sc. Practical Physics*, S Chand and Company Limited.
3. Flint, B. L. and Worsnop, H. T. 1971, *Advanced Practical Physics for students*, Asia Publishing House.
4. Prakash, I. and Ramakrishna, 11th Ed., 2011, *A Text Book of Practical Physics*, Kitab Mahal.
5. Nelson, M. and Ogborn, J. M. 4th Edition, reprinted 1985, *Advanced level Physics Practicals*, Heinemann Educational Publishers
6. Khandelwal, D. P. 1985, *A Laboratory Manual of Physics for undergraduate classes*, Vani Pub.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Prajwal Chettri	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMAJ204 - Relativity and Modern Physics

Course Description

Course Code	23PHYMAJ204
Course Title	Relativity and Modern Physics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - Aims to provide an introduction to the special theory of relativity. - Gives an overview of the foundational discoveries that lead to quantum theory. - Teaches introductory quantum mechanics and the methods of solving simple physical problems. - Introduces students to the fields of laser optics and nuclear physics. - Familiarizes students with different types of radioactivity, fusion and fission processes, and the effects and dangers of radiation.
Prerequisite	Students must have completed PHYMAJ103, PHYMAJ104, and PHYMAJ201 or their equivalents.
Course Objectives	A student will be able to: - Learn about the special theory of relativity. - Reconstruct the important steps that lead to the development of quantum theory. - Acquire knowledge about using Schrodinger's equation to solve simple time-independent systems. - Learn about the basic theoretical principles of lasers and nuclear physics. - Acquire knowledge of the different types of radioactivity, fusion and fission processes, and the effects of radiation.
Course Outcomes based on RBT and Cognitive Level Mapping At the end of this course, a student will be able to:	

COs	Statements	Cognitive Level Mapping		
CO1	Define and identify the fundamental steps that lead to the establishment of quantum theory.	R		
CO2	Distinguish between different types of radioactivity and nuclear processes.	U		
CO3	Apply the basic principles of quantum physics to understand the inner workings of lasers and the nucleus.	A1		
CO4	Examine and investigate special relativity and its consequences.	A2		
CO5	Evaluate the different theoretical and experimental steps that lead to the development of quantum theory.	E		
CO6	Construct models and solve Schrodinger's equations for various simple physical systems.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Special Theory of Relativity Luminiferous ether, the Michelson-Morley experiment and its conclusions, Postulates of the Special Theory of Relativity, Relativity of simultaneity, Lorentz transforms and its inverse, Length contraction, Time dilation, Relativistic transformations of velocity and frequency, addition of velocities, relativistic Doppler effect, Relativistic dynamics: momentum and energy, mass-energy equivalence relation, photon dynamics	7	4	R U A1 A2 E C
Unit II	Historical Foundations of Quantum Mechanics Classical theory of radiation: Stefan's law, Wein's displacement law, Rayleigh-Jeans law (statements only), ultraviolet catastrophe, quanta and Planck's Law (no derivation). Photoelectric effect, Explanation via light quantization, Work function and stopping	8	1,5	R U A1 A2 E C

	potential, X-ray scattering in crystals, Bragg's law, Compton effect and particle nature of light Gold foil experiment (overview) and Rutherford's atomic model, Bohr's semiclassical atomic model, explanation for hydrogen spectral series, Franck-Hertz experiment (overview), Bohr's correspondence principle, de Broglie's matter waves, application to Bohr model, Davisson-Germer experiment, wave-particle duality			
Unit III	Introductory Quantum Mechanics Wave packets: group velocity, phase velocity, matter wave packets, dispersion of a moving wave packet, Heisenberg's uncertainty principle, use in estimations of energy, interaction ranges etc. The wave function, Born's probabilistic interpretation, Necessity for normalisation, Probability density, Position, momentum and energy operators (no detailed discussion of operators), Computation of expectation values Non-relativistic time dependent Schrödinger's equation in one dimension, Simplification via separation of variables, Time independent Schrödinger's equation, Continuity conditions for wave functions, Applications of time independent Schrödinger's equation: infinite 1D potential well, extension to 2D and 3D cases, finite 1D well, potential step, potential barrier and tunnelling, physical examples of applications	11	6	R U A1 A2 E C
Unit IV	Lasers and Nuclear Physics Lasers: Einstein's A and B coefficients, Spontaneous and stimulated emissions, Optical pumping and population inversion, Three-level lasers: Ruby Laser and He-Ne Laser	7	3	R U A1 A2 E C

	Basic properties of nuclei, isotopes, nuclear stability and the NZ graph, Binding energy, Nuclear forces as an exchange force and virtual particles (overview only) Liquid drop model and the semi-empirical mass formula, Shell model and magic numbers (qualitative discussion only)			
Unit V	Nuclear Reactions and Radiation Radioactivity: decay law, decay rate, mean life, and half life, Conservation laws in radioactive decay Alpha decay, Explanation using finite potential well, Antimatter and positrons (overview), Beta decay, Prediction of the neutrino, Electron capture, Carbon dating, Gamma decay, Pair production, Naturally radioactive elements Basic properties of nuclear reactions, Mass deficit and energy generation, Reaction cross section, Nuclear fission, Explanation using liquid drop model, Self-sustained chain reaction, Overview of nuclear reactors, Nuclear fusion, Solar proton-proton fusion chain, Terrestrial fusion via the deuterium-tritium-helium chain Interaction of radiation and matter, Biological dangers of radiation, Radiation detection: Geiger counter, scintillation detector, semiconductor detectors	12	2	R U A1 A2 E C

Learning Resources:

Textbooks

1. Murugesan, R. & Sivaprasath, K. (2019). *Modern physics* (18th ed.). S Chand.
2. Aruldas, G. & Rajagopal, P. (2005). *Modern physics*. Prentice Hall India.
3. Beiser, A., Mahajan, S. & Choudhury, S.R. (2015). *Concepts of modern physics* (7th Indian ed.). McGraw Hill
4. Krane, K.S. (2021) *Modern physics* (4th Indian ed.). Wiley

Suggested Readings

1. Felder, G.N. & Felder, K.M. (2023). *Modern physics*. Cambridge University Press.

2. Prakash, S. & Saluja, S. (2012) *Quantum mechanics*. Kedar Nath Ram Nath
3. Tipler, P.A. & Lewellyn, R.A. (2012). *Modern physics* (6th ed.). WH Freeman & Co.
4. Harris, R. (2014). *Modern physics* (2nd ed.). Pearson.
5. Helrich, C.S. (2021). *The quantum theory - origins and ideas: A historical primer for physics students*. Springer
6. van der Waerden, B.L. (Ed.) (1968). *Sources of quantum mechanics*. Dover Publications.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of a series of three Formative Assessments of 50 marks over the course of the Semester, and two final Summative Assessments of 50 marks each: one which will be a Theory Examination and the other a Practical Examination. The two Summative Assessments will be combined to give one final score of 50 marks.

Practicals

Course Description

Course Code	23PHYMAJ204
Course Title	Relativity and Modern Physics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: a. Aims to demonstrate the existence of quantum phenomena via simple experiments. b. Acquire knowledge about the use of physical and mathematical techniques to verify theoretical predictions from modern physics. c. Familiarizes students with the use of lasers, diodes, photodetectors etc. for experimental purposes. d. Learn about methods of experimental setup and the possibilities and limits of various experimental devices and measuring apparatus.

Prerequisite	Students must have completed PHYMAJ103, PHYMAJ104, and PHYMAJ201 or their equivalents.			
Course Objectives	A student will be able to: i. Demonstrate the existence of basic quantum phenomena in the laboratory. ii. Acquire knowledge about the use of lasers, diodes, photodetectors etc. for experimental purposes to verify theoretical predictions. iii. Learn about the working and setup of lasers, photodetectors, etc. for experimental use. iv. Acquire knowledge of advanced techniques such as ESR spectroscopy for experimental analysis.			
Course Outcomes based on Dave's Psychomotor Mapping				
At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of quantum and wave phenomena.	I		
CO2	Recreate any previously imitated experiment on the study of quantum and wave phenomena.	M		
CO3	Demonstrate skilled use and applications of instruments such as lasers, slits, diffraction gratings, photodetectors, etc.	P		
CO4	Be proficient in the setup and use of experimental apparatus used for the study of quantum and wave phenomena.	P		
CO5	Adapt or modify previously imitated experiments to analyze quantum and wave properties.	A		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. Measurement of Planck's constant using black body radiation and a photo-detector 2. Photo-electric effect: photo current versus intensity and wavelength of	30	1, 2, 3,4,5	I M P A

	light; maximum energy of photo-electrons versus frequency of light - To determine the Planck's constant using LEDs of at least 4 different colours. - To determine the ionization potential of mercury. - To determine the value of e/m by (a) Magnetic focusing or (b) Bar magnet. - To show the tunnelling effect in a tunnel diode using I-V characteristics. - To determine the wavelength of a laser source using diffraction of a single slit. - To determine (1) wavelength and (2) angular spread of He-Ne laser using plane diffraction grating <i>A minimum of SIX (6) experiments are to be performed</i>			

Learning Resources:

Text Books

1. Chattopadhyay, D. & Rakshit, P. C. (2011). *An advanced course in practical physics*. New Central Book Agency (P) Limited.
2. Raychaudhuri, D. P. (n.d.). *Manual of practical physics*. Allied Book Agency.
3. Dasgupta, C.R. (1985). *A handbook of practical physics*. Book Syndicate Private Limited.
4. Singh, H. & Hemne, P.S. (2022). *B.Sc. practical physics*. S. Chand & Co.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMAJ205 - Analog Electronics

Course Description

Course Code	23PHYMAJ205	
Course Title	Analog Electronics	
Credits	4	
Total Hours	75	
Hours per Week	5	
Course Type	Major	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course: a. Aims to teach the student the fundamentals of PN junction diodes and their different applications. b. Familiarizes the student regarding the operation and characteristics of BJT and FET. c. Introduces the student to a transistor hybrid model of circuit analysis, feedback amplifiers and oscillators. d. Helps to understand the basic working of an OP-AMP and explore their linear and non-linear applications.	
Prerequisite	Students must have completed PHYSEC102 and PHYMAJ202 or their equivalents.	
Course Objectives	A student will be able to: i. Acquire the knowledge of the working of PN junction diodes and their varied applications. ii. Summarize the different regions of operation in a transistor, and understand transistor biasing and stability analysis. iii. Develop skills in circuit analysis of an amplifier using transistor hybrid model and principles of multistage amplifiers. iv. Understand the effect of feedback on the characteristics of amplifiers and the working of oscillators. v. Familiarize themselves with the basic working principle of OP-AMP and their common applications	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping

CO1	Recall the concepts of intrinsic, extrinsic semiconductors, open-circuit PN junction, and describe the mechanism of barrier formation.	R		
CO2	Explain the energy band diagram across the junction diode and under the current flow mechanisms.	U		
CO3	Apply the concepts of two-terminal devices, transistors and amplifiers in various applications.	A1		
CO4	Analyze transistor biasing techniques, effects of feedback connection, characteristics of operational amplifiers, etc.	A2		
CO5	Evaluate the input-output characteristics, gain, frequency response of transistors and amplifiers.	E		
CO6	Design circuits such as rectifiers, amplifiers, oscillators, converters, etc., catering to the specific applications.	C		
Course Content				
Units	Content	Lecture Hours	COs	RBT
Unit I	Diodes and their Applications Intrinsic and Extrinsic semiconductors. Energy Level Diagram. Diffusion current and Drift Current. Open-circuit PN junction and barrier formation. Height and width of the depletion layer, and energy band diagram across the junction diode. Current Flow Mechanism in Forward and Reverse Biased Diodes. Static and Dynamic Resistance. Applications of two-terminal devices: Rectifiers – Ripple factor, rectification efficiency, and C-filter; Zener diodes and voltage regulation; Light-emitting Diodes, Photo-diodes and Solar cells.	10	1, 4	R U A1 A2 E C

Unit II	Transistors Bipolar Junction Transistors (BJT): NPN and PNP Transistors. Characteristics of Common Base (CB), Common Emitter (CE) and Common Collector (CC) configurations. Different regions of operations – Active, Cutoff and Saturation Regions. Relationship between the current gains – α and β. Physical Mechanism of Current Flow. Transistor biasing and stability using Fixed Bias and Voltage Divider Bias. Load Line analysis of Transistors. DC Load line and Q-point. Field Effect Transistors (FET): Comparison with BJT. Structure and basic principles of operation of Junction Field Effect Transistor (JFET) and Metal Oxide Semiconductor Field Effect Transistor (MOSFET).	10	2	R U A1 A2 E C
Unit III	Amplifiers and Oscillators Transistor Hybrid Model (2-port network): h-parameters with equivalent circuit. Analysis of a single-stage CE amplifier. Input and Output Impedance. Current, Voltage, and Power Gains. Class A, B, AB, and C amplifiers. Principles of multistage amplifiers, Two-stage RC-coupled amplifier (frequency response of a CE amplifier), Bode plot. Feedback Amplifiers – Principle, Types of feedback connection, Effects of Positive and Negative Feedback on gain, distortion, noise, bandwidth, input impedance, and output impedance. Sinusoidal Oscillators: Barkhausen criterion for self-sustained oscillations. Hartley, Colpitts, and RC Phase shift oscillator.	15	3, 5	R U A1 A2 E C

Unit IV	Operational Amplifiers (OP-AMP) Characteristics of an Ideal and Practical OP-AMP (IC 741). Offset null adjustments. Concept of Virtual ground. Open-loop and Closed-loop Gain. Frequency Response, Common Mode Rejection Ratio (CMRR), and Slew Rate. Applications of OP-AMPs: Linear – Inverting and non-inverting amplifiers, Adder, Subtractor, Differentiator, Integrator, Log amplifier, and Zero-crossing detector. Nonlinear – inverting and non-inverting comparators, and Schmidt triggers. Wein bridge oscillator. Other Applications: Digital-to-Analog Converter (DAC) – Weighted and R-2R Ladder resistive network. Analog-to-Digital Converter (ADC) – Counter controlled and Successive approximation.	10	1, 2, 6	R U A1 A2 E C

Learning Resources:

Textbooks

1. Ghosh, B. (2010). *Fundamental Principles of Electronics* (2nd ed.). Books & Allied Ltd.
2. Malvino, A. & Bates, D. J. (2017). *Electronic Principles* (7th ed.). McGraw Hill Education.
3. Streetman, B. G. & Banerjee, S. K. (2010). *Solid State Electronic Devices* (6th ed.). PHI Learning Private Ltd.

Suggested Readings

1. Floyd, T. L. (2012). *Electronic Devices: Conventional Current Version* (9th ed.). Pearson Prentice Hall.
2. Boylestad, R.L. & Nashelsky, L. (2013). *Electronic devices and circuit theory* (11th ed.). Pearson.
3. Horowitz, P. & Hill, W. (2016). *The art of electronics* (3rd ed.). Cambridge University Press.
4. Simpson, R.E. (1987). *Introductory electronics for scientists and engineers* (2nd ed.). Allyn and Bacon, Inc.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of a series of three Formative

Assessments of 50 marks over the course of the Semester, and two final Summative Assessments of 50 marks each: one which will be a Theory Examination and the other a Practical Examination. The two Summative Assessments will be combined to give one final score of 50 marks.

Practicals

Course Description

Course Code	23PHYMAJ205
Course Title	Analog Electronics
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Major
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	Physics
Regulation	2023
Course Overview	This course: - Helps introduce students to different electrical components, devices and their applications. - Emphasises the need to have hands-on experience with the measurement of physical quantities and understand the theoretical concepts through practical means. - Teaches the student to study and investigate the characteristics of devices and amplifiers. - Aims to train the student in designing circuits for different OP-AMP applications.
Prerequisite	Students must have completed PHYSEC102 and PHYMAJ202 or their equivalents.
Course Objectives	A student will be able to: - Identify, reproduce, and calibrate different semiconductor devices recalling their underlying fundamental principles. - Record experimental data in a systematic manner and compute the results and also identify the errors in observations. - Interpret and present the findings in appropriate manner using written reports with the necessary investigative discussions, circuit designs, data visualizations, etc.

	d. Verify the validity and limitations of theoretical results based on experimental observations. e. Develop experimentation skills and scientific temperament.			
Course Outcomes based on Dave's Psychomotor Mapping At the end of this course, a student will be able to:				
COs	Statements	Cognitive Level Mapping		
CO1	Replicate the steps required to familiarize themselves with experiments and instruments related to the study of characteristic curves of semiconductor devices.	I		
CO2	Recreate and build any previously discussed instructions for the study of the working of practical ADC and DAC experimental setups.	M		
CO3	Demonstrate skill in setup and use of experimental instruments for interpretation of different characterizations.	P		
CO4	Formulate and modify previously developed experimental methods to analyze and achieve defined results.	A		
CO5	Effectively design amplifiers and oscillators in an intuitive manner for different applications and meeting specific requirements.	N		
Course Content				
Units	Content	Lecture Hours	COs	Dave's
Unit I	List of Experiments: 1. Study the I-V characteristics of a PN junction diode, and a light-emitting diode. 2. Study the I-V characteristics of a Zener diode and its use as a voltage regulator. 3. Study the input and output characteristics of a Bipolar Junction Transistor in CE configuration. 4. Design a Wien bridge oscillator for a given frequency using an OP-AMP. 5. Design and study the Colpitts oscillator.	30	1, 2, 3,4,5	I M P A

	6. Study a digital-to-analog converter (DAC) with the given specifications. 7. Study the analog-to-digital converter (ADC) IC. 8. Design an inverting amplifier using OP-AMP (741,351) and study its frequency response. 9. Design a non-inverting amplifier using OP-AMP (741,351) and study its frequency response. 10. Design an adder of two dc voltages using OP-AMP in inverting and non-inverting modes. 11. Design and investigate the use of an OP-AMP as an Integrator. 12. Design and investigate the use of an OP-AMP as a Differentiator. <i>A minimum of EIGHT (8) experiments are to be performed</i>			

Learning Resources:

Text Books

1. Chattopadhyay, D. & Rakshit, P. C. (2011). *An advanced course in practical physics*. New Central Book Agency (P) Limited.
2. Raychaudhuri, D. P. (n.d.). *Manual of practical physics*. Allied Book Agency.
3. Dasgupta, C.R. (1985). *A handbook of practical physics*. Book Syndicate Private Limited.
4. Singh, H. & Hemne, P.S. (2022). *B.Sc. practical physics*. S. Chand & Co.
5. Hayes, T.C. (2016). *Learning the art of electronics: A hands-on lab course*. Cambridge University Press.
6. Fischer-Cripps, A.C. (2015). *The electronics companion: Devices and circuits for physicists and engineers* (2nd ed.). CRC Press.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Digvijay Kharga	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch

23PHYMIN202 - Electricity and Magnetism

Course Description

Course Code	23PHYMIN202
Course Title	Electricity and Magnetism
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Minor
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	All students who have undertaken 23PHYMIN102 paper in Sem II
Regulation	2023
Course Overview	This course: - Introduces revision unit on vector analysis. - Provides understanding of electric fields due to charge based on different geometrical distribution using the concept of calculus and vector analysis. - Provides basic understanding of conductors, dielectrics, polarization and electrostatic energy. - Introduces the students to the fundamentals of magnetization in matter and assess the magnetic properties of materials. - Teaches the basics of electromagnetic induction due to time-varying fields. - Delivers an understanding of the behaviour of the electric and magnetic fields in an electromagnetic wave.
Prerequisite	Students must have completed the 23PHYMIN102 course. Students should have introductory knowledge of electrostatics, magnetostatics, calculus and vector analysis.
Course Objectives	A student will be able to: - Understand the basic properties of static electricity and applying their concepts and mathematical techniques to different cases. - Apply the concept of electrostatics in conductors and dielectrics, such as capacitors and their practical uses. - Analyze the effect of magnetic field on conductors governed by the Biot-Savart law, Ampere's law, etc. - Understand magnetic and electric properties of matter such as susceptibility, permeability, etc. - Identify the connection between electricity and magnetism and allied phenomena such as electromagnetic induction.

	vi. Use Maxwell's equations to electromagnetic waves in different media.

Course Outcomes based on RBT and Cognitive Level Mapping

At the end of this course, a student will be able to:

COs	Statements	Cognitive Level Mapping
CO1	Define the electric field and electric potential and describe the relation of electrostatics to varied distribution of electrical charges.	R
CO2	Explain the concepts of electrostatics, magnetism, electromagnetic induction and its applications.	U
CO3	Calculate the magnetic field, magnetic vector potential and energy stored for various steady-current carrying systems using various methods.	A1
CO4	Examine the wave equations from Maxwell's equations for different media and categorize the electromagnetic waves and their properties.	A2
CO5	Evaluate charge distribution and electric field due to varied geometry of objects. Evaluate various types of magnetism, such as dia-, para-, and ferro-magnetism, and draw conclusions on their properties.	E
CO6	Formulate the electric field, electric potential, and energy stored for discrete and continuous charge systems using suitable methods.	C

Course Content

Units	Content	Lecture Hours	COs	RBT
Unit I	Vector Analysis Review of Scalar and Vector product, gradient, divergence, Curl and their significance, Vector Integration, Line, surface and volume integrals of Vector fields, Gauss-divergence theorem and Stokes' theorem of vectors (No proof required).	15	1, 4	R U A1 A2 E C
Unit II	Electrostatics Electrostatic Field, electric flux, Gauss's theorem of electrostatics. Applications of Gauss theorem- Electric field due to point	5	2	R U A1 A2

	charge, infinite line of charge, uniformly charged spherical shell and solid sphere, plane charged sheet, charged conductor. Electric potential as line integral of electric field, potential due to a point charge, electric dipole, uniformly charged spherical shell and solid sphere. Calculation of electric field from potential. Capacitance of an isolated spherical conductor. Polarization, Displacement vector. Gauss's theorem in dielectrics. Parallel plate capacitor filled with dielectric.			E C
Unit III	Magnetism Magnetostatics: Biot-Savart's law and its applications- straight conductor, circular coil, solenoid carrying current. Divergence and curl of magnetic field. Magnetic vector potential. Ampere's circuital law. Magnetic properties of materials: Magnetic intensity, magnetic induction, permeability, magnetic susceptibility. Brief introduction of dia-, para-and ferro- magnetic materials.	8	3, 5	R U A1 A2 E C
Unit IV	Electromagnetic Induction Faraday's laws of electromagnetic induction, Lenz's law, self and mutual inductance, L of single coil, M of two coils. Energy stored in magnetic field.	8	1, 2, 6	R U A1 A2 E C
Unit V	Maxwell's equations and Electromagnetic wave propagation Equation of continuity of current, Displacement current, Maxwell's equations, electromagnetic wave propagation through vacuum and isotropic dielectric medium, polarization (brief introduction).	9	1, 2, 6	R U A1 A2 E C

Learning Resources:

Textbooks

1. Purcell, E. M. (1986). *Electricity and Magnetism*, McGraw-Hill Education
2. Manohara, S. R., & Shubha, A. (2018). *Electricity, magnetism and electromagnetic theory*. S. Chand & Co.
3. Sharma, K. K. & Satyal, B. S. *Electricity and Magnetism* (2nd ed.), Kalyani Publishers.

4. Murugesan, R. *Electricity and Magnetism*, S. Chand and Company Limited.
5. Fewkes, J. H. and Yarwood, J. (1991) *Electricity & Magnetism*, Oxford Univ. Press
6. Tayal, D. C. (1988) *Electricity and Magnetism*, Himalaya Publishing House.
7. Reese, R. L. (2003) *University Physics*, Thomson Brooks/Cole.
8. Griffiths, D. J. (2013) *Introduction to Electrodynamics* (4th ed.), Benjamin Cummings.

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of a series of three Formative Assessments of 50 marks over the course of the Semester, and two final Summative Assessments of 50 marks each: one which will be a Theory Examination and the other a Practical Examination. The two Summative Assessments will be combined to give one final score of 50 marks.

Practicals

Course Description

Course Code	23PHYMIN202
Course Title	Electricity and Magnetism
Credits	4
Total Hours	75
Hours per Week	5
Course Type	Minor
Semester	IV
Intended Level	Diploma
Issue(s) Addressed	
Course Offered to	All students who have undertaken 23PHYMIN102 paper in Sem II
Regulation	2023
Course Overview	This course: a. Provides knowledge to measure various physical quantities through a scientific approach. b. It aims to help in estimating various electric and magnetic properties of materials using scientific apparatus. c. It focuses on giving training in the use of precision measurements, calibration, and error analysis.
Prerequisite	Students must have an introductory knowledge of working with ac/dc currents, multimeters, plug and play set-ups, breadboard and Wire bridges.

Course Objectives	A student will be able to:					
	i. Determine unknown resistances, current and analyze fuses using Multimeter.					
	ii. Apply the principles of the potentiometer and Carey Foster's bridge.					
	iii. Determine energy loss due to hysteresis, investigate LCR circuits and determine resonant frequency.					
	iv. Experimentally verify Thevenin and Norton's and Maximum Power Transfer theorems.					
	v. To record experimental data in a systematic manner and hence construct the experiment report on paper.					
	vi. Compute experimental results from the working formulae and graphs and interpret the results.					
Course Outcomes based on Dave's Psychomotor Mapping						
At the end of this course, a student will be able to:						
COs	Statements			Cognitive Level Mapping		
CO1	Familiarize themselves with experiments and instruments related to the study of electricity and magnetism and correspondingly replicate the results.			I		
CO2	Recreate any previously imitated experiment on the study of electricity and magnetism.			M		
CO3	Demonstrate skilled use of common measuring instruments such as galvanometers, Wire bridges, multimeters etc.			P		
CO4	Use experimental apparatus for the study of electricity and magnetism in a proficient manner.			P		
CO5	Improvize or modify previously imitated experiments to investigate electrical and magnetic properties of materials.			A		
Course Content						
Units	Content			Lecture Hours	COs	Dave's

Unit I	1. To use a Multimeter for measuring a) Resistances b) AC and DC Voltages c) DC Current d) Checking electrical fuses. 2. Measurement of energy loss due to BH hysteresis. 3. Measurement of energy loss due to PE hysteresis. 4. To determine self-inductance of a coil by Anderson's bridge. 5. To verify Malus' law for plane polarized light. 6. To determine the value of e/m by (a) Magnetic focussing and (b) Bar magnet. 7. To verify Brewster's law for plane polarized light. 8. Measurement of field strength B and its variation in a solenoid (determine dB/dx). A minimum of SIX (6) experiments is to be performed.	30	1, 2, 3,4,5	I M P A

Learning Resources:

Textbooks

1. Murugesan, R. *Electricity and Magnetism*, S. Chand and Company Limited.
2. Singh, H. and Hemne, P. S. *B.Sc. Practical Physics*, S Chand and Company Limited.
3. Chattopadhyay, D. and Rakshit, P. C. *An Advanced Course in Practical Physics*, New Central Book Agency
4. Flint, B. L. and Worsnop, H. T. *Advanced Practical Physics for students*, Asia Publishing House.
5. Nelson, M. and Ogborn, J. M. *Advanced level Physics Practicals*, Heinemann Educational Publishers
6. Prakash, I. and Ramakrishna, 11th Ed.2011, *A Text Book of Practical Physics*, Kitab Mahal
7. Panigrahi, S. and Mallick, B. 2015, *Engineering Practical Physics*, Cengage Learning India Pvt. Ltd.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
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23PHYVAC202 - Quantum Crossroads IV

Course Description

Course Code	23PHYVAC202	
Course Title	Quantum Crossroads IV	
Credits	1	
Total Hours	30	
Hours per Week	2	
Course Type	Value Added Course	
Semester	IV	
Intended Level	Diploma	
Issue(s) Addressed		
Course Offered to	Physics	
Regulation	2023	
Course Overview	This course: a. Trains a student to plan, rehearse and present technical, scientific and mathematical information to the audience. b. Provides students with an avenue to express technical information in an academic or professional environment. c. Trains students to comport themselves vocally and physically while presenting in front of an audience. d. Teaches students the use of digital aids such as microsoft office and graphical tools for the use of dissemination of information.	
Prerequisite	Students must have opted Physics as their Major subject. Students must have a reasonable command of English	
Course Objectives	A student will be able to: Read and understand technical information from various online resources such as research articles or other specialized manuals. Analyze and break down the given information and assimilate with pre-existing knowledge. Construct and present technical knowledge to an audience of their peers in a clear and lucid manner. Critically evaluate and argue for or against the thesis of the paper.	
Course Outcomes based on RBT and Cognitive Level Mapping		
At the end of this course, a student will be able to:		
COs	Statements	Cognitive Level Mapping
CO1	Describe the details of the scientific information presented in articles, books and other online resources	R

CO2	Interpret the information and relate it to their pre-existing knowledge	U		
CO3	Present the knowledge in a clear and lucid manner	A1		
CO4	Appraise and break down the information being presented.	A2		
CO5	Critique and argue for or against the thesis of the paper.	E		
CO6	Design and construct a presentation that disseminates knowledge from the paper to an audience.	C		
Course Structure				
Session Number	Content	Total Hours	COs	RBT
1	Hours 1 & 2: Reorientation to the Course	2	-	-
2-9	Hour 1: Presentation by one 2nd year student Hour 2: Summarized report on the presentation	16	1,2,4	R U A2 E
10-15	Hour 1: Presentation by 1st year student Hour 2: Summarized report on the presentation	12	1,3,4, 5,6	R A1 A2 E C
Learning Resources: Handouts provided by faculty / supervisor				

R: Remembering, U: Understanding, A1: Applying, A2: Analysing, E: Evaluating, C: Creating

Assessment

The student shall be assessed and evaluated as per the Examination Policy of Salesian College (Autonomous), Siliguri. The assessment will consist of one Formative Assessment of 50 marks over the course of the Semester, and a final Summative Assessment of 50 marks.

Prepared by:	Checked and verified by:	Approved by:	External Experts - Board of Studies
(Signature) Dr. Digvijay Kharga (Signature) Mr. Bikramjit Chandra	(Signature) Dr. Prajwal Chettri Head of the Department	(Signature) Mr. Subhajit Paul Dean of Sciences	(Signature) Dr. Bikash Ch. Paul Professor Department of Physics University of North Bengal (Signature) Dr. Ranjan Sharma Associate Professor Department of Physics Coochbehar Panchanan Barma University (Signature) Dr. Amitabha Bhattacharyya Associate Professor Department of Physics Sikkim University (Signature) Mr. Tamanash Das Supervisor (Retd.) Draughtsman Civil Trade ITI Tollygunge, Kolkata (Signature) Mr. Aaush Pradhan (Alumnus) 2018 batch



SALESIAN COLLEGE
(AUTONOMOUS) | SONADA
SILIGURI

Curriculum Document

under

National Education Policy (NEP) 2020 Curriculum
Framework

for

DEPARTMENTS OF MATHEMATICS

and

STATISTICS (MINOR)

SEMESTERS: I – IV

Regulation Year: 2023

Approved by: _____
(Subhajit Paul, Chairperson, BoS of Mathematics & Statistics.)

Date: _____

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PREAMBLE

This culminated document contains the complete curriculum framework with course objectives & outcomes and assessment rubrics for the first two semesters designed by the Dept of Mathematics for its students of four-year undergraduate programmes (FYUGP) with Honours in Mathematics as the single Major and Statistics as one of the Minor subjects. This design aligns with the layout suggested by the UGC published in the document “Curriculum and Credit Framework for Undergraduate Programmes” in 2022¹, and the regulations of Salesian College (Autonomous), Sonada & Siliguri.

1.1 Vision & Mission Statements

Vision: The Department of Mathematics, Salesian College envisages empowering the students with the ability to think critically and rationally along the lines of the robustness of Mathematical logic and to prepare them for the quest for higher knowledge and experiences in the fields of both Academia and Industry with a mindset to collaborate with interdisciplinary fields for a holistic betterment of the society.

Mission: To exercise relevant pedagogies to provide in-depth analysis and the sense of appreciation of Mathematical concepts while fostering scientific temper and encouraging rational thinking.

1.2 Graduate Attributes

1.2.1 Generic outcomes

1. **Complex problem-solving:** The graduates should be able to demonstrate the capability to solve different kinds of problems in familiar and non-familiar contexts and apply the learning to real-life situations.
2. **Critical thinking:** The graduates should be able to demonstrate the capability to
 - apply analytic thought to a body of knowledge, including the analysis and evaluation of policies, and practices, as well as evidence, arguments, claims, beliefs, and the reliability and relevance of evidence,

¹available at https://www.ugc.gov.in/pdfnews/7193743_FYUGP.pdf.

- identify relevant assumptions or implications; and formulate coherent arguments,
 - identify logical flaws and holes in the arguments of others,
 - analyse and synthesize data from a variety of sources and draw valid conclusions and support them with evidence and examples.
- 3. Creativity:** The graduates should be able to demonstrate the ability to
- create, perform, or think in different and diverse ways about the same objects or scenarios,
 - deal with problems and situations that do not have simple solutions,
 - innovate and perform tasks in a better manner,
 - view a problem or a situation from multiple perspectives,
 - think ‘out of the box’ and generate solutions to complex problems in unfamiliar contexts,
 - adopt innovative, imaginative, lateral thinking, interpersonal skills and emotional intelligence.
- 4. Communication Skills:** The graduates should be able to demonstrate the skills that enable them to
- listen carefully, read texts and research papers analytically and present complex information in a clear and concise manner to different groups/audiences,
 - express thoughts and ideas effectively in writing and orally and communicate with others using appropriate media,
 - confidently share views and express herself/himself,
 - construct logical arguments using correct technical language related to a field of learning, work/vocation, or an area of professional practice, and convey ideas, thoughts, and arguments using language that is respectful and sensitive to gender and other minority groups.
- 5. Analytical reasoning/thinking:** The graduates should be able to demonstrate the capability to
- evaluate the reliability and relevance of evidence;
 - identify logical flaws in the arguments of others;
 - analyse and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and address opposing viewpoints.
- 6. Research-related skills:** The graduates should be able to demonstrate
- a keen sense of observation, inquiry, and capability for asking relevant/appropriate questions,
 - the ability to problematize, synthesize, and articulate issues and design research proposals,
 - the ability to define problems, formulate appropriate and relevant research questions, formulate hypotheses, test hypotheses using quantitative and qualitative data, establish hypotheses, make inferences based on the analysis and interpretation of data, and predict cause-and-effect relationships,
 - the capacity to develop appropriate methodology and tools for data collection,

- the appropriate use of statistical and other analytical tools and techniques,
 - the ability to plan, execute and report the results of an experiment or investigation,
 - the ability to acquire the understanding of basic research ethics and skills in practising/doing ethics in the field/personal research work, regardless of the funding authority or field of study.
- 7. Coordination/Collaboration:** The graduates should be able to demonstrate the ability to
- work effectively and respectfully with diverse teams,
 - facilitate cooperative or coordinated effort on the part of a group,
 - act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
- 8. Leadership qualities:** The graduates should be able to demonstrate the capability for
- mapping out the tasks of a team or an organization and setting direction.
 - formulating an inspiring vision and building a team that can help achieve the vision, motivating and inspiring team members to engage with that vision.
 - using management skills to guide people to the right destination.
- 9. Lifelong learning of skills:** The graduates should be able to demonstrate the ability to
- acquire new knowledge and skills, including ‘learning how to learn skills, that are necessary for pursuing learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social, and cultural objectives, and adapting to changing trades and demands of the workplace, including adapting to the changes in work processes in the context of the fourth industrial revolution, through knowledge/ skill development/reskilling,
 - work independently, identify appropriate resources required for further learning,
 - acquire organizational skills and time management to set self-defined goals and targets with timelines.
 - inculcate a healthy attitude to be a lifelong learner.
- 10. Digital and technological skills:** The graduates should be able to demonstrate the capability to
- use ICT in a variety of learning and work situations,
 - access, evaluate, and use a variety of relevant information sources, and use appropriate software for analysis of data.
- 11. Multicultural competence and inclusive spirit:** The graduates should be able to demonstrate
- the acquisition of knowledge of the values and beliefs of multiple cultures and a global perspective to honour diversity,
 - capability to effectively engage in a multicultural group/society and interact respectfully with diverse groups,

- capability to lead a diverse team to accomplish common group tasks and goals.
- gender sensitivity and adopting a gender-neutral approach, as also empathy for the less advantaged and the differently-abled including those with learning disabilities.

12. Value inculcation: The graduates should be able to demonstrate the acquisition of knowledge and attitude that are required to

- embrace and practice constitutional, humanistic, ethical, and moral values in life, including universal human values of truth, righteous conduct, peace, love, non violence, scientific temper, citizenship values,
- practice responsible global citizenship required for responding to contemporary global challenges, enabling learners to become aware of and understand global issues and to become active promoters of more peaceful, tolerant, inclusive, secure, and sustainable societies,
- formulate a position/argument about an ethical issue from multiple perspectives,
- identify ethical issues related to work, and follow ethical practices, including avoiding unethical behaviour such as fabrication, falsification or misrepresentation of data, or committing plagiarism, and adhering to intellectual property rights,
- recognise environmental and sustainability issues, and participate in actions to promote sustainable development.
- adopt an objective, unbiased, and truthful actions in all aspects of work,
- instil integrity and identify ethical issues related to work, and follow ethical practices.

13. Autonomy, responsibility, and accountability: The graduates should be able to demonstrate the ability to

- apply knowledge, understanding, and/or skills with an appropriate degree of independence relevant to the level of the qualification,
- work independently, identify appropriate resources required for a project, and manage a project through to completion,
- exercise responsibility and demonstrate accountability in applying knowledge and/or skills in work and/or learning contexts appropriate for the level of the qualification, including ensuring safety and security at workplaces.

14. Environmental awareness and action: The graduates should be able to demonstrate the acquisition of and ability to apply the knowledge, skills, attitudes, and values required to take appropriate actions for

- mitigating the effects of environmental degradation, climate change, and pollution,
- effective waste management, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development and living.

15. Community engagement and service: The graduates should be able to demonstrate the capability to participate in community-engaged services/activities for promoting the well- being of society.

- 16. Empathy:** The graduates should be able to demonstrate the ability to identify with or understand the perspective, experiences, or points of view of another individual or group, and to identify and understand other people's emotions.

1.2.2 Programme specific outcomes

After completion of the 4 year programme with Honours in Mathematics, a student should be able to

- (a) demonstrate fundamental systematic knowledge of mathematics and its applications in engineering, science, technology and mathematical sciences;
- (b) demonstrate educational skills in areas of analysis, geometry, algebra, mechanics, differential equations, etc;
- (c) apply knowledge, understanding, and skills to identify the difficult/ unsolved problems in mathematics and to collect the required information in possible range of sources and try to analyse and evaluate these problems using appropriate methodologies;
- (d) fulfil learning requirements in mathematics, drawing from a range of contemporary research works and their applications in diverse areas of mathematical sciences;
- (e) apply disciplinary knowledge and skills in mathematics in newer domains and uncharted areas;
- (f) identify challenging problems in mathematics and obtain well-defined solutions;
- (g) exhibit subject-specific transferable knowledge in mathematics relevant to job trends and employment opportunities.

1.3 Programme Structure

The honours programme in Mathematics at Salesian College (Autonomous) Siliguri spans across eight semesters over four years. Following table shows the total number of courses to be taken by a student in this entire period of study.

Course type	# Courses	Credit/ course	Total credits
Major courses	24	4	96
Minor courses	8	4	32
Multidisciplinary courses	3	3	9
Skill enhancement courses	3	3	9
Ability enhancement courses	4	2	8
Value added courses	10	1	10
Internship	1	4	4
Total	53		168

Table 1.1: Cumulative course structure for Bachelor Degree programme with Honours with Major in Mathematics

1.3.1 Distribution of courses offered by Dept of Mathematics

Sem	Course code	Course title	Credits
MAJOR COURSES			
I	23MATMAJ101	Classical Algebra & Two-dimensional Geometry	4
	23MATMAJ102	ODE I and Application of Calculus	4
II	23MATMAJ103	Real Analysis I	4
	23MATMAJ104	Abstract Algebra I	4
III	23MATMAJ201	Linear Algebra I	4
	23MATMAJ202	Real Analysis II	4
IV	23MATMAJ203	Abstract Algebra II	4
	23MATMAJ204	Real Analysis III	4
	23MATMAJ205	ODE II and Three-dimensional Geometry	4
V	23MATMAJ301	Numerical Analysis	4
	23MATMAJ302	Multivariate Calculus	4
	23MATMAJ303	Probability Theory	4
	23MATMAJ304	Operations Research	4
VI	23MATMAJ305	Integral Calculus	4
	23MATMAJ306	Complex Analysis	4
	23MATMAJ307	Abstract Algebra III	4
VII	23MATMAJ401	Partial Differential Equations	4
	23MATMAJ402	Metric Spaces	4
	23MATMAJ403	Linear Algebra II	4
	23MATMAJ404	Number Theory <i>or</i> Vector Analysis	4
VIII	23MATMAJ405	General Topology	4
	23MATMAJ406	Measure Theory	4
	23MATMAJ407	Differential Geometry <i>or</i> Integral Transform	4
	23MATMAJ408	Functional Analysis <i>or</i> Graph Theory	4
MINOR COURSES			
I	23MATMIN101	Linear Algebra and Differential Equations	4
	23STAMIN101	Statistical Methods	4
III	23MATMIN201	Discrete Mathematics	4

Sem	Course code	Course title	Credits
	23STAMIN201	Fundamentals of Probability	4
V	23MATMIN301	Numerical Analysis <i>or</i> Advanced Calculus	4
	23STAMIN301		4
VII	23MATMIN401	Optimisation Techniques <i>or</i> Algebra	4
	23STAMIN401		4
SKILL ENHANCEMENT COURSES (SEC)			
I	23MATSEC101	Typesetting in $\text{\LaTeX}$	3
II	23MATSEC102	Graph Theory	3
III	23MATSEC201	Mathematical Modelling	3
VALUE ADDED COURSES (VAC)			
I	23MATVAC101	Introduction to Number Systems	1
II	23MATVAC102	Prerequisites to Linear Algebra	1
III	23MATVAC201	Graphing using GeoGebra	1
IV	23MATVAC202	Poster Presentation	1
V	23MATVAC301	Problem solving techniques	1
VI	23MATVAC302	Students' Seminar	1
MULTI-DISCIPLINARY COURSES (MDC)			
I	23MATMDC101	Basic Mathematics	3
II	23MATMDC102	Mathematics for Competitive Examinations	3

1.3.2 Course matrix for Mathematics Major students (Sem I – IV)

Course code	Type	Course title	Credits (L+T+P) ²	Classes/ week
SEMESTER I				
23MATMAJ101	Major	Classical Algebra & 2-D Geometry	4 + 0 + 0	4
23MATMAJ102	Major	ODE I & Application of Calculus	4 + 0 + 0	4
23STAMIN101	Minor	Statistical Methods	3 + 0 + 1	5
23MATSEC101	SEC	Typesetting in $\text{\LaTeX}$	1 + 0 + 2	5
23MATVAC101	VAC	Introduction to Number Systems	0 + 0 + 1	2

²L: Lecture, T: Tutorial, P: Practical / Field work.

Course code	Type	Course title	Credits (L+T+P)	Classes/ week
23ENGAEC101	AEC	Compulsory English I	2 + 0 + 0	2
23***MDC101	MDC	Multi-disciplinary course	3 + 0 + 0	3
23SCSVED101	VAC	Value Education	1 + 0 + 0	1
Total			22	26
SEMESTER II				
23MATMAJ103	Major	Real Analysis I	4 + 0 + 0	4
23MATMAJ104	Major	Abstract Algebra I	4 + 0 + 0	4
23CSCMIN101	Minor	C Programming	3 + 0 + 1	5
23MATSEC102	SEC	Graph Theory	3 + 0 + 0	3
23MATVAC102	VAC	Prerequisites to Linear Algebra	0 + 0 + 1	2
23ENGAEC102	AEC	Compulsory English II	2 + 0 + 0	2
23***MDC101	MDC	Multi-disciplinary course	3 + 0 + 0	3
23SCSVED102	VAC	Value Education	1 + 0 + 0	1
Total			22	24
SEMESTER III				
23MATMAJ201	Major	Linear Algebra I	4 + 0 + 0	4
23MATMAJ202	Major	Real Analysis II	4 + 0 + 0	4
23STAMIN201	Minor	Fundamentals of Probability	3 + 0 + 1	5
23MATSEC201	SEC	Mathematical Modelling	3 + 0 + 0	3
23MATVAC201	VAC	Graphing using GeoGebra	0 + 0 + 1	2
23ENGAEC201	AEC	Environmental Sciences I	2 + 0 + 0	2
23***MDC201	MDC	Multi-disciplinary course	3 + 0 + 0	3
23SCSVED201	VAC	Value Education	1 + 0 + 0	1
Total			22	24
SEMESTER IV				
23MATMAJ203	Major	Abstract Algebra II	4 + 0 + 0	4
23MATMAJ204	Major	Real Analysis III	4 + 0 + 0	4
23MATMAJ205	Major	ODE II and 3-D Geometry	4 + 0 + 0	4
23CSCMIN201	Minor	Digital Electronics	4 + 0 + 0	4
23MATVAC201	VAC	Poster presentation	0 + 0 + 1	2

Programme Structure

Course code	Type	Course title	Credits (L+T+P)	Classes/ week
23ENGAEC201	AEC	Environmental Sciences I	2 + 0 + 0	2
23SCSVED201	VAC	Value Education	1 + 0 + 0	1
Total			20	21

SYLLABI FOR MAJOR COURSES

2.1 23MATMAJ101: Classical Algebra & Two-dimensional Geometry

2.1.1 Course description

<i>Course code:</i> 23MATMAJ101 <i>Course category:</i> Major <i>Title of the course:</i> Classical Algebra & Two-dimensional Geometry				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
I	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- basic algebraic operations with real variables;
- binomial theorem with a positive integer index;
- solution of quadratic equations;
- evaluation of determinants up to order 3.

Objectives

At the end of the course, the students should be able to

MAJ101-Ob1	Familiarise themselves with estimation processes using inequalities.
MAJ101-Ob2	Develop an understanding of the argand plane and the complex numbers as vectors.
MAJ101-Ob3	Solve a polynomial equation up to degree 4 and investigate other equations of particular types.
MAJ101-Ob4	Develop an understanding of the conic sections.

Corresponding outcomes

The outcome corresponding to the learning objective [MAJ101-Ob1](#), is

MAJ101-CO1: Remember the important inequalities and apply the appropriate inequality for specific problems.

The outcome corresponding to the learning objective [MAJ101-Ob2](#), is

MAJ101-CO2: Understand basic structure of Argand plane and perform algebra thereat.

The outcomes corresponding to the learning objective [MAJ101-Ob3](#), are

MAJ101-CO3: Solve cubic, biquadratic, reciprocal and binomial equations, demonstrating proficiency in identifying and manipulating these specific equation types.

MAJ101-CO4: Locate positions of roots and exhibit relations of roots and coefficients.

The outcome corresponding to the learning objective [MAJ101-Ob4](#), is

MAJ101-CO5: Analyse geometric objects, employ coordinate systems, derive equations, and apply geometric concepts to solve problems.

Content

Unit: 1	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ101-Ob1 and MAJ101-Ob2	Cognitive levels achieved through outcomes: Remembering: MAJ101-CO1 Understanding: MAJ101-CO2 Applying: MAJ101-CO1 and MAJ101-CO2	
INEQUALITIES: $AM \geq GM \geq HM$; Theorem of weighted means. Statements only and applications of m^{th} power theorem, Cauchy-Schwartz inequality, Holder's inequality, Minkowski's inequality.		
COMPLEX NUMBERS: Polar representation. De Moivre's theorem for rational indices and its applications. Trigonometric, logarithm, exponential and hyperbolic functions of complex variable.		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ101-Ob3	Cognitive levels achieved through outcomes:	
	Remembering:	MAJ101-CO3 and MAJ101-CO4
	Understanding:	MAJ101-CO3 and MAJ101-CO4
	Applying:	MAJ101-CO3 and MAJ101-CO4
THEORY OF EQUATIONS: Polynomials and their properties. Relation between roots and coefficients. Transformation of equations. Cubic and biquadratic equations. Cardan's and Ferrari's method. Solutions of reciprocal and binomial equations. Symmetric functions of roots. Location of roots.		

Unit: 3	Credits: 2	Lecture hours: 30
Objectives mapped: MAJ101-Ob4	Cognitive levels achieved through outcomes:	
	Remembering:	MAJ101-CO5
	Understanding:	MAJ101-CO5
	Applying:	MAJ101-CO5
2-DIMENSIONAL GEOMETRY: Transformation of axes. Pair of straight lines. Reduction of general equation of second degree into canonical forms. Tangents and normals. Pole and polars. Polar equations.		

Suggested readings

1. Mapa, S K, *Higher Algebra: Classical*, Sarat Book House.
2. Khan, R M, *Algebra [Classical, Modern, Linear and Boolean]*, New Central Book Agency.
3. Chakravorty, J G, and Ghosh P R, *Advanced Analytical Geometry*, U N Dhur & Sons Pvt Ltd.
4. Khan, R M, *Analytical Geometry of Two and Three Dimensions and Vector Analysis*, New Central Book Agency.

Reference books

1. Andreescu, T, and Andrica, D, *Complex Numbers from A to Z*, Birkhäuser.
2. Burnside, W S, and Panton, A W, *The Theory of Equations*, Wentworth Press.
3. Bej, N K, and Mukherjee, A, *Analytical Geometry Of Two & Three Dimensions (Advanced Level)*, Book & Allied Pvt Ltd.

2.1.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.2 23MATMAJ102: Ordinary Differential Equations I and Applications of Calculus

2.2.1 Course description

<i>Course code:</i> 23MATMAJ102 <i>Course category:</i> Major <i>Title of the course:</i> Ordinary Differential Equations I and Applications of Calculus				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
I	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- computational processes in calculus like evaluating limits, investigating continuity, etc.;
- different differentiation techniques, including rules for differentiation, chain rule, product rule, and quotient rule;
- different techniques of integration, such as substitution, integration by parts, partial fractions, etc.

Objectives

At the end of the course, the students should be able to

MAJ102-Ob1 Develop a solid understanding of the basic concepts related to ordinary differential equations (ODEs) including order, linearity, and solutions (particular solutions, general solutions, and initial value problems) and also learn to classify different types of ODEs based on their order, linearity, and degree.

MAJ102-Ob2 Learn various methods and techniques to solve different types of ODEs. These may include first order, second order linear, higher order, special types and system of ODEs.

MAJ102-Ob3 Investigate several properties of a curve and classify them.

MAJ102-Ob4 Calculate length of a curve, area bounded by a curve, and volume of a surface generated by a curve.

Corresponding outcomes

The outcome corresponding to the learning objective **MAJ102-Ob1** is

MAJ102-CO1: Identify different types of ODEs.

The outcomes corresponding to the learning objective **MAJ102-Ob2**, are

MAJ102-CO2: Solve first order ODEs utilising the standard techniques for separable, exact, linear, homogeneous or Bernoulli cases.

MAJ102-CO3: Compute exact solutions of solvable first order ODEs and linear ODEs of higher order using various methods.

MAJ102-CO4: Describe the concepts of general solution and particular integral of a linear ODE of an arbitrary order, and also to obtain them using prescribed methods.

The outcomes corresponding to the learning objective **MAJ102-Ob3**, are

MAJ102-CO5: Remember the formulæ of various attributes and trace a given curve by calculating them.

MAJ102-CO6: Calculate the higher order derivatives and limits of indeterminate forms.

The outcome corresponding to the learning objective **MAJ102-Ob4**, is

MAJ102-CO7: Calculate length of a curve, area bounded by a curve, and volume of a surface generated by a curve.

Content

Unit: 1	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ102-Ob1 and MAJ102-Ob2	Cognitive levels achieved through outcomes: Remembering: MAJ102-CO1 Understanding: MAJ102-CO1 and MAJ102-CO4 Applying: MAJ102-CO2 to MAJ102-CO4	
Definition and examples of Ordinary Differential equations (ODEs). Formulation of ODE by eliminating parameters. General, particular, explicit, implicit and singular solutions of a differential equation. Exact differential equations and integrating factors, separable equations and equations reducible to this form, linear equation and Bernoulli equations, special integrating factors and transformations.		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ102-Ob2	Cognitive levels achieved through outcomes: Remembering: MAJ102-CO4 Understanding: MAJ102-CO3	
General solution of homogeneous equation of second order, principle of super position for homogeneous equation, Wronskian: its properties and applications, Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation, method of undetermined coefficients, method of variation of parameters.		

Unit: 3	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ102-Ob3	Cognitive levels achieved through outcomes: Remembering: MAJ102-CO5 Understanding: MAJ102-CO5 Applying: MAJ102-CO5 and MAJ102-CO6	

APPLICATION OF DIFFERENTIAL CALCULUS: Successive differentiation, Leibnitz theorem. Curvature, convexity and concavity. Asymptotes. Envelope & evolutes. Nature of a singular point. Curve tracing.

Unit: 4	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ102-Ob4	Cognitive levels achieved through outcomes:	
	Remembering:	MAJ102-CO7
	Understanding:	MAJ102-CO7
	Applying:	MAJ102-CO7
APPLICATION OF INTEGRAL CALCULUS: Derivations and illustrations of reduction formulæ of the type $\int \sin^n x \, dx$, $\int \cos^n x \, dx$, $\int \sec^n x \, dx$, $\int \tan^n x \, dx$, $\int (\log x)^n \, dx$, $\int \sin nx \cos mx \, dx$ etc. Arc length of a curve, arc length of parametric curves, area enclosed by a curve, area between two curves, area and volume of revolution.		

Suggested readings

1. Ghosh, R K, and Maity K C, *An Introduction to Differential Equations*, New Central Book Agency.
2. Raisinghania, M D, *Ordinary and Partial Differential Equation*, S Chand Publishing.
3. Ross, S L, *Differential Equations*, Wiley.
4. Ghosh, R K, and Maity, K C, *An Introduction to Analysis: Differential Calculus: Part I*, New Central Book Agency.
5. Ghosh, R K, and Maity, K C, *An Introduction to Analysis: Integral Calculus*, New Central Book Agency.

2.2.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.3 23MATMAJ103: Real Analysis I

2.3.1 Course description

<i>Course code:</i> 23MATMAJ103				
<i>Course category:</i> Major				
<i>Title of the course:</i> Real Analysis I				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
II	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- basic algebraic operations with real variables;
- special algebraic operations and functions like indices, logarithms, exponentiations, factorials, etc.;
- sets, relations and mappings;
- statements of common inequalities and manipulating them.

Objectives

At the end of the course, the students should be able to

MAJ103-Ob1 Narrate the definition of real numbers and apply its intrinsic properties.

MAJ103-Ob2 Understand the topology of real numbers.

MAJ103-Ob3 Manipulate and investigate sequences and series of real numbers.

Corresponding outcomes

The outcomes corresponding to the learning objective **MAJ103-Ob1**, are

MAJ103-CO1: Know the axiomatic construction of real numbers and apply Archimedean property to various sums.

MAJ103-CO2: Distinguish between countable and uncountable sets.

The outcome corresponding to the learning objective **MAJ103-Ob2**, is

MAJ103-CO3: Remember and use the results about open and closed sets, limit points, adherent points.

The outcomes corresponding to the learning objective **MAJ103-Ob3**, are

MAJ103-CO4: Know and investigate the definitions and key properties of sequences and series of real numbers and calculate their limits.

MAJ103-CO5: Explain the difference and relation between a Cauchy sequence and a convergent sequence.

Content

Unit: 1	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ103-Ob1	Cognitive levels achieved through outcomes:	
	Remembering:	MAJ103-CO1 and MAJ103-CO2
	Understanding:	MAJ103-CO1 and MAJ103-CO2
	Applying:	MAJ103-CO1 and MAJ103-CO2
REVIEW OF THE SET OF REAL NUMBERS: Algebraic, Order and Completeness axioms. Archimedean property. Density property of rational numbers. Nested interval theorem. Decimal representation of real numbers. Cardinality of sets. Uncountability of $\mathbb{R}$.		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ103-Ob2	Cognitive levels achieved through outcomes:	
	Remembering:	MAJ103-CO3
	Understanding:	MAJ103-CO3
	Applying:	MAJ103-CO3
SUBSETS OF $\mathbb{R}$: Interior points, Open sets, Closed sets, Limit points, Derived sets, Bolzano-Weierstrass' theorem, Closure of a Set.		

Unit: 3	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ103-Ob3	Cognitive levels achieved through outcomes: Remembering: MAJ103-CO4 Understanding: MAJ103-CO4 and MAJ103-CO5 Applying: MAJ103-CO4 and MAJ103-CO5	
SEQUENCES OF REAL NUMBERS: Bounded sequence. Convergent and limit of a sequence. Limit theorems. Monotone sequences, monotone convergence theorem. Subsequences, Bolzano-Weierstrass' theorem for sequences, limit superior and limit inferior, monotone subsequence theorem (statement only). Cauchy sequence, Cauchy's convergence criterion.		

Unit: 4	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ103-Ob3	Cognitive levels achieved through outcomes: Remembering: MAJ103-CO4 Understanding: MAJ103-CO4 Applying: MAJ103-CO4	
INFINITE SERIES OF REAL NUMBERS: Convergence and divergence, Cauchy criterion. Tests for convergence (statements only): Comparison test (first and second kind), Ratio test, Root test, Condensation test, Raabe's test, Logarithmic test, Gauss's test. Alternating series, Leibniz test, absolute and conditional convergence, Riemann's rearrangement theorem (statement only). (Only) Applications of Abel's test and Dirichlet's test.		

Suggested readings

1. Mapa, S K, *Introduction to Real Analysis*, Sarat Book House.
2. Bartle, R G, and Sherbert, D R, *Introduction to Real Analysis*, Wiley India Edition, Wiley India Pvt Ltd.

Reference books

1. Goldberg, R R, *Methods of Real Analysis*, Oxford & IBH Publishing.
2. Apostol, T M, *Mathematical Analysis*, Narosa Publications.
3. Rudin, W, *Principles of Mathematical Analysis*, Tata McGraw Hill Education.
4. Tao, T, *Analysis I*, TRIM Series, Hindustan Book Agency.
5. Lang, S, *Undergraduate Analysis*, Undergraduate Texts in Mathematics Series, Springer.
6. Abbott, S, *Understanding Analysis*, Undergraduate Texts in Mathematics Series, Springer.

2.3.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.4 23MATMAJ104: Abstract Algebra I

2.4.1 Course description

<i>Course code:</i> 23MATMAJ104 <i>Course category:</i> Major <i>Title of the course:</i> Abstract Algebra I				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
II	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- basic properties of addition and multiplication of real numbers, complex numbers, matrices;;
- basic congruence arithmetic;
- composition of functions.

Objectives

At the end of the course, the students should be able to

MAJ104-Ob1	Describe and provide examples (with justifications) of groups from different domains of mathematics.
MAJ104-Ob2	Investigate whether a given subset of a group is a subgroup.
MAJ104-Ob3	Illustrate power of an element, order of an element and order of a group.
MAJ104-Ob4	Demonstrate a coset of a subgroup and prove Lagrange's theorem for a finite group.

Corresponding outcomes

The outcomes corresponding to the learning objectives [MAJ104-Ob1](#), are

MAJ104-CO1: Remember the postulates of a group and verify them for a given non-empty set with a binary composition.

MAJ104-CO2: Apply various results to construct a group from an algebraic structure satisfying an incomplete set of postulates.

The outcome corresponding to the learning objective [MAJ104-Ob2](#), is

MAJ104-CO3: Prove the necessary and sufficient condition for a subset to be a subgroup, and apply it in various examples.

The outcome corresponding to the learning objective [MAJ104-Ob3](#), is

MAJ104-CO4: Prove various results regarding order of an element and order of a group.

The outcome corresponding to the learning objective [MAJ104-Ob4](#), is

MAJ104-CO5: State and prove Lagrange's theorem and apply it in various scenarios.

Content

Unit: 1	Credits: 2	Lecture hours: 30
Objectives mapped: MAJ104-Ob1	Cognitive levels achieved through outcomes: Remembering: MAJ104-CO1 Understanding: MAJ104-CO1 and MAJ104-CO2 Applying: MAJ104-CO1 and MAJ104-CO2	

Groupoid, semigroup, monoid, groups, commutative groups; Elementary properties of groups: finite semigroup with cancellation properties is a group, semigroup containing unique solution of $ax = b$ and $xa = b$ is a group. Particularly, $\mathbb{Z}_n$ group, U_n group, Klein's 4 group, symmetric group S_n , alternating group A_n , matrix group $M_n(\mathbb{R})$, multiplicative group of n^{th} roots of unity, Dihedral group, quaternion group (through matrices) etc.

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ104-Ob2	Cognitive levels achieved through outcomes:	
	Remembering:	MAJ104-CO3
	Understanding:	MAJ104-CO3
	Applying:	MAJ104-CO3
Subgroups and examples of subgroups; Necessary and sufficient conditions for a subset of a group to be a subgroup; Union and intersection of subgroups; Centralizer, normalizer, center of a group, product of two subgroups.		

Unit: 3	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ104-Ob3 and MAJ104-Ob4	Cognitive levels achieved through outcomes: Remembering: MAJ104-CO4 and MAJ104-CO5 Understanding: MAJ104-CO4 and MAJ104-CO5 Applying: MAJ104-CO4 and MAJ104-CO5	
Order of an element and a group; Generators, cyclic group and its properties, necessary and sufficient condition; Cosets, properties of cosets, Lagrange's theorem and consequences including Fermat's Little theorem.		

Suggested readings

1. Mapa, S K, *Higher Algebra: Abstract and Linear*, Sarat Book House.
2. Khan, R M, *Algebra: Classical, Modern, Linear and Boolean*, New Central Book Agency.
3. Herstein, I N, *Topics in Algebra*, Wiley.
4. Dummit, D S and Foote, R M, *Abstract Algebra*, Wiley.

Reference books

1. Chakraborty, A, *Modern Algebra*, Levant Books.
2. Gallian, J A, *Contemporary Abstract Algebra*, Narosa Publishing House.
3. Artin, M, *Abstract Algebra*, Pearson.
4. Rotman, J J, *An Introduction to the Theory of Groups*, Springer Verlag.

2.4.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.5 23MATMAJ201: Linear Algebra I

2.5.1 Course description

<i>Course code:</i> 23MATMAJ201				
<i>Course category:</i> Major				
<i>Title of the course:</i> Linear Algebra I				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
III	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- basic properties of addition and multiplication of real numbers, complex numbers, matrices, determinants;
- the course 23MATVAC102.

Objectives

At the end of the course, the students should be able to

MAJ201-Ob1	Define and understand vector space and related concepts.
MAJ201-Ob2	Understand Cayley-Hamilton theorem and compute eigenvalues and eigenvectors.
MAJ201-Ob3	Apply elementary operations to find the rank of a matrix.
MAJ201-Ob4	Analyse properties of a linear transformation and establish its properties.
MAJ201-Ob5	Find the change of basis matrix.

Corresponding outcomes

The outcomes corresponding to the learning objective **MAJ201-Ob1**, are

MAJ201-CO1: Define vector space, subspace, basis, linear transformation,

MAJ201-CO2: State and prove various related theorems.

The outcome corresponding to the learning objective **MAJ201-Ob2**, is

MAJ201-CO3: Prove Cayley-Hamilton theorem and compute eigenvalues and eigenvectors.

The outcomes corresponding to the learning objective **MAJ201-Ob3**, are

MAJ201-CO4: Apply elementary operations to find the rank of a matrix.

MAJ201-CO5: Analyse and solve a system of linear equations using rank of the coefficient matrix.

The outcomes corresponding to the learning objective **MAJ201-Ob4**, are

MAJ201-CO6: Prove various related theorems.

MAJ201-CO7: Find the matrix of a linear transformation and determine properties of the same in terms of the matrix.

The outcome corresponding to the learning objective **MAJ201-Ob5**, is

MAJ201-CO8: Find the change of basis matrix.

Content

Unit: 1	Credits: 2	Lecture hours: 30
Objectives mapped: MAJ201-Ob1	Cognitive levels achieved through outcomes: Remembering: MAJ201-CO1 Understanding: MAJ201-CO1 and MAJ201-CO2	
Vector spaces, subspaces, algebra of subspaces, quotient spaces. Linear combination of vectors, linear span, linear independence, basis and dimension. Deletion, Existence, Extension and Replacement theorems for basis of finite dimensional vector spaces. Ordered basis, coordinatisation of vectors.		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ201-Ob2 and MAJ201-Ob3	Cognitive levels achieved through outcomes: Understanding: MAJ201-CO2 Applying: MAJ201-CO3 Analysing: MAJ201-CO4	

Rank of a matrix, row and column rank. Determination of rank using elementary operations, echelon matrices, normal form. System of linear equations: homogeneous system, non-homogeneous system. Characteristics polynomial, characteristics equation. Eigenvalues and eigenvectors of a matrix. Cayley-Hamilton Theorem.

Unit: 3	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ201-Ob4 and MAJ201-Ob5	Cognitive levels achieved through outcomes: Understanding: MAJ201-CO6 and MAJ201-CO8 Evaluating: MAJ201-CO7	
Linear transformations (LT): null space, range space, rank and nullity of a LT, Rank-Nullity theorem. Matrix representation of a LT relative to ordered bases. Algebra of LTs, correspondence between LTs and matrices. Properties of LTs in terms of matrices. Change of coordinate matrix.		

Suggested readings

1. Mapa, S K, *Higher Algebra: Abstract and Linear*, Sarat Book House.
2. Khan, R M, *Algebra: Classical, Modern, Linear and Boolean*, New Central Book Agency.
3. Hoffman, K and Kunze, R, A, *Linear Algebra*, Prentice Hall of India Pvt Ltd.

Reference books

1. Friedberg, S H, Insel, A J, and Spence, L A, *Linear Algebra*, 4th Ed, Prentice Hall of India Pvt Ltd, 2004.
2. Lang, S, *Introduction to Linear Algebra*, 2nd Ed, Springer, 2005.
3. Strang, G, *Linear Algebra and its Applications*, Thomson, 2007.
4. Kumaresan, S, *Linear Algebra – A Geometric Approach*, Prentice Hall of India, 1999.
5. Lay, D C, *Linear Algebra and its Applications*, 3rd Ed, Pearson Education Asia, Indian Reprint, 2007.

2.5.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.5.3 Approval (23MATMAJ201)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Manoj Ray Bakshi	Subhajit Paul	Subhajit Paul

2.6 23MATMAJ202: Real Analysis II

2.6.1 Course description

<i>Course code:</i> 23MATMAJ202				
<i>Course category:</i> Major				
<i>Title of the course:</i> Real Analysis II				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
III	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- the definition of relations, mappings and related concepts.
- the course 23MATMAJ103.

Objectives

At the end of the course, the students should be able to

- MAJ202-Ob1 Define and compute limit of a function.
- MAJ202-Ob2 Identify the points of continuity and discontinuity of a function.
- MAJ202-Ob3 Understand, prove and apply various properties of continuous functions.
- MAJ202-Ob4 Understand the notion of differentiability of a function.
- MAJ202-Ob5 Evaluate the Taylor series expansion of a given function.

Corresponding outcomes

The outcomes corresponding to the learning objective **MAJ202-Ob1**, are

MAJ202-CO1: Define both-sided and one-sided limits of a function.

MAJ202-CO2: Prove various theorems and apply them to find the limit of a function.

The outcome corresponding to the learning objective [MAJ202-Ob2](#), are

MAJ202-CO3: Define a continuous function.

MAJ202-CO4: Apply various results to determine the continuity of a function.

The outcome corresponding to the learning objective [MAJ202-Ob3](#), are

MAJ202-CO5: Understand, prove and apply various properties of continuous functions.

MAJ202-CO6: Uniformly continuous functions and compact sets.

The outcome corresponding to the learning objective [MAJ202-Ob4](#), are

MAJ202-CO7: Determine whether a function is differentiable at a given point.

MAJ202-CO8: Prove and apply various related results.

The outcome corresponding to the learning objective [MAJ202-Ob5](#), is

MAJ202-CO9: Evaluate the Taylor series expansion of a given function.

Content

Unit: 1	Credits: 1	Lecture hours: 10
Objectives mapped: MAJ202-Ob1	Cognitive levels achieved through outcomes: Remembering: MAJ202-CO1 Understanding: MAJ202-CO2 Applying: MAJ202-CO2	
LIMIT OF A FUNCTION: ϵ - δ definition, sequential criterion for limits, divergence criteria. Limit theorems, one sided limits. Infinite limits and limits at infinity.		

Unit: 2	Credits: 1	Lecture hours: 25
Objectives mapped: MAJ202-Ob2 and MAJ202-Ob3	Cognitive levels achieved through outcomes: Remembering: MAJ202-CO3 Understanding: MAJ202-CO5 Applying: MAJ202-CO4 Analysing: MAJ202-CO6	
CONTINUITY: ϵ-δ definition, sequential criterion for continuity. Algebra of continuous functions. Continuous functions on an interval: Bolzano's theorem, intermediate value theorem, preservation of intervals theorem. Discontinuities, types of discontinuity. Uniform continuity, non-uniform continuity criteria, uniform continuity theorem. Lipschitz condition. Compact sets: Open cover definition. Characterisations of compact sets, Heine-Borel theorem, sequential and Bolzano-Weierstrass compactness. Continuous functions on compact sets.		

Unit: 3	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ202-Ob4	Cognitive levels achieved through outcomes: Understanding: MAJ202-CO7 Applying: MAJ202-CO7 Evaluating: MAJ202-CO8	
DIFFERENTIATION: Differentiability of a function at a point and in an interval, Carathéodory's theorem, algebra of differentiable functions. Intermediate value property of derivatives: Darboux's theorem. Relative extrema, absolute extremum theorem. Mean value theorems (MVT): Rolle's theorem, Lagrange's MVT, Cauchy's MVT. Applications of mean value theorem to inequalities and approximation of polynomials.		

Unit: 4	Credits: 1	Lecture hours: 10
Objectives mapped: MAJ202-Ob5	Cognitive levels achieved through outcomes: Analysing: MAJ202-CO8	
Taylor's theorem with Lagrange's form, Cauchy's form and general form of remainder. Taylor's series and Maclaurin's series expansions of various functions. Application of Taylor's theorem to inequalities.		

Suggested readings

1. Mapa, S K, *Introduction to Real Analysis*, Sarat Book House.
2. Bartle, R G, and Sherbert, D R, *Introduction to Real Analysis*, Wiley India Edition, Wiley India Pvt Ltd.
3. Ghosh, R K, and Maity, K C, *An Introduction to Analysis, Differentail Calculus: Part I*, New Central Book Agency (P) Ltd.
4. Malik, S C, and Arora, S, *Mathematical Analysis*, New Age International Pvt Ltd.

Reference books

1. Goldberg, R R, *Methods of Real Analysis*, Oxford & IBH Publishing.
2. Apostol, T M, *Mathematical Analysis*, Narosa Publications.
3. Rudin, W, *Principles of Mathematical Analysis*, Tata McGraw Hill Education.
4. Tao, T, *Analysis I*, TRIM Series, Hindustan Book Agency.
5. Lang, S, *Undergraduate Analysis*, Undergraduate Texts in Mathematics Series, Springer.
6. Abbott, S, *Understanding Analysis*, Undergraduate Texts in Mathematics Series, Springer.

2.6.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.6.3 Approval (23MATMAJ202)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Subhajit Paul	Subhajit Paul	Subhajit Paul

2.7 23MATMAJ203: Abstract Algebra II

2.7.1 Course description

<i>Course code:</i> 23MATMAJ203				
<i>Course category:</i> Major				
<i>Title of the course:</i> Abstract Algebra II				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
IV	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- the course 23MATMAJ104.

Objectives

At the end of the course, the students should be able to

- MAJ203-Ob1** Understand the relation between normal subgroups and group homomorphisms.
- MAJ203-Ob2** Apply the fundamental concepts in ring theory such as of the ideals, quotient rings, integral domains, and fields in further branches of pure and applied Mathematics.
- MAJ203-Ob3** Apply ring homomorphism and isomorphism theorems in the branch of modules, Galois Theory and field extensions.

Corresponding outcomes

The outcome corresponding to the learning objective **MAJ203-Ob1**, is

MAJ203-CO1: Identify and manipulate normal subgroups and corresponding group homomorphisms.

The outcome corresponding to the learning objective **MAJ203-Ob2**, is

MAJ203-CO2: Describe and analyse the fundamental concepts in ring theory such as of the ideals, quotient rings, integral domains, and fields.

The outcomes corresponding to the learning objective **MAJ203-Ob3**, are

MAJ203-CO3: Describe ring homomorphism, kernel and image of a homomorphism.

MAJ203-CO4: Demonstrate three ring isomorphism theorems with examples.

Content

Unit: 1	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ203-Ob1	Cognitive levels achieved through outcomes: Understanding: MAJ203-CO1 Analysing: MAJ203-CO1	
Normal subgroups. Quotient groups. Group homomorphisms. Isomorphism theorems.		

Unit: 2	Credits: 2	Lecture hours: 30
Objectives mapped: MAJ203-Ob1	Cognitive levels achieved through outcomes: Understanding: MAJ203-CO2 Analysing: MAJ203-CO2	
Definition and examples of rings and fields. Properties of rings, subrings, integral domains and fields. Necessary and sufficient conditions for subrings and subfields. Characteristics of a ring. Ideal, ideal generated by a subset of a ring, operations on ideals, prime and maximal ideals. Quotient rings.		

Unit: 3	Credits: 1	Lecture hours: 15

Objectives mapped: MAJ203-Ob2	Cognitive levels achieved through outcomes: Understanding: MAJ203-CO3 Applying: MAJ203-CO4 Analysing: MAJ203-CO4
Ring homomorphisms: properties of ring homomorphisms. Isomorphism theorems I, II and III.	

Suggested readings

1. Mapa, S K, *Higher Algebra: Abstract and Linear*, Sarat Book House.
2. Fraleigh, J B, *A First Course in Abstract Algebra*, 7th Ed, Pearson, 2002.
3. Herstein, I N, *Topics in Algebra*, Wiley.
4. Dummit, D S and Foote, R M, *Abstract Algebra*, Wiley.

Reference books

1. Sen, M K, Ghosh, S, Mukhopadhyay P, Maity S, *Topics in Abstract Algebra*, 4th Ed, Universities Press.
2. Chakraborty, A, *Modern Algebra*, Levant Books.
3. Gallian, J A, *Contemporary Abstract Algebra*, Narosa Publishing House.
4. Artin, M, *Abstract Algebra*, Pearson.
5. Rotman, J J, *An Introduction to the Theory of Groups*, Springer Verlag.

2.7.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.7.3 Approval (23MATMAJ203)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Debdut Sengupta	Subhajit Paul	Subhajit Paul

2.8 23MATMAJ204: Real Analysis III

2.8.1 Course description

<i>Course code:</i> 23MATMAJ204				
<i>Course category:</i> Major				
<i>Title of the course:</i> Real Analysis III				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
IV	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- the course 23MATMAJ202.

Objectives

At the end of the course,

- MAJ204-Ob1 Students will be able to articulate the fundamental principles of Riemann integration and apply them to solve problems.
- MAJ204-Ob2 Understanding of sequence and series concepts will enable students to analyse and manipulate functions, providing a strong foundation for advanced mathematical studies.
- MAJ204-Ob3 Application of power series in problem-solving scenarios will enhance students' mathematical modeling skills and analytical thinking.
- MAJ204-Ob4 Students will develop the ability to reason mathematically and construct logical arguments in the context of calculus concepts.
- MAJ204-Ob5 Analyse mathematical structures and understanding the convergence and divergence of functions in various mathematical contexts.

Corresponding outcomes

The outcome corresponding to the learning objective [MAJ204-Ob1](#), is

MAJ204-CO1: Articulate the fundamental principles of Riemann integration and apply them to solve problems.

The outcome corresponding to the learning objective [MAJ204-Ob2](#), is

MAJ204-CO2: Analyse and manipulate functions, providing a strong foundation for advanced mathematical studies.

The outcome corresponding to the learning objective [MAJ204-Ob3](#), is

MAJ204-CO3: Model a given problem in terms of sequences and series of functions and evaluate its various properties.

The outcome corresponding to the learning objective [MAJ204-Ob4](#), is

MAJ204-CO4: Solve various problems in the context of Calculus concepts.

The outcome corresponding to the learning objective [MAJ204-Ob5](#), is

MAJ204-CO5: Analyse mathematical structures and understanding the convergence and divergence of functions in various mathematical contexts.

Content

Unit: 1	Credits: 2	Lecture hours: 30
Objectives mapped: MAJ204-Ob1 and MAJ204-Ob2	Cognitive levels achieved through outcomes: Understanding: MAJ204-CO1 Applying: MAJ204-CO2 Analysing: MAJ204-CO2	
RIEMANN INTEGRATION: Formulation of Riemann integration: partition, lower sum, upper sum, inequalities of lower sum and upper sum. Upper integral and lower integral. Darboux's definition of Riemann integration. Necessary and sufficient conditions for Riemann integration. Riemann sum, Riemann's definition of integration. Integrability of functions: continuous functions, functions with finitely many points of discontinuity, functions with infinitely many points of discontinuity. Riemann integrability of functions of the form: cf , $f \pm g$, fg , $ f $, monotone functions. Intermediate value theorem for integrals; Fundamental theorem of Integral Calculus, Mean value theorems of Integral Calculus: First Mean value theorem, Second Mean value theorem, Bonnet's form & Weierstrass form (Statement only).		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ204-Ob3 and MAJ204-Ob4	Cognitive levels achieved through outcomes: Understanding: MAJ204-CO3 Applying: MAJ204-CO4 Evaluating: MAJ204-CO3	

SEQUENCE OF FUNCTIONS: Definition, pointwise and uniform convergence, limit function, Cauchy condition for uniform convergence, sup-norm test for uniform convergence, Dini's theorem. Theorems on continuity, derivability and integrability of the limit function of a sequence of functions.

SERIES OF FUNCTIONS: Definition, pointwise and uniform convergence, sum function, Weierstrass M -test for uniform convergence. Theorems on continuity, derivability and integrability of the sum function of a series of functions, Abel's test and Dirichlet's test (statement only).

Unit: 3	Credits: 1	Lecture hours: 15
Objectives mapped: MAJ204-Ob4 and MAJ204-Ob5	Cognitive levels achieved through outcomes: Applying: MAJ204-CO5 Evaluating: MAJ204-CO4	
POWER SERIES: Definition, convergence, radius of convergence, interval of convergence, derivability and integration of sum function, term by term differentiation and integration, equality of power series, Abel’s theorem and Weierstrass approximation theorem (statement only).		

Suggested readings

1. Ghosh, R K, and Maity, K C, *An Introduction to Analysis, Integral Calculus*, New Central Book Agency (P) Ltd.
2. Ghosh, R K, and Maity, K C, *An Introduction to Analysis, Differentail Calculus: Part II*, New Central Book Agency (P) Ltd.
3. Mapa, S K, *Introduction to Real Analysis*, Sarat Book Distributors.

Reference books

1. Bartle, R G, and Sherbert, D R, *Introduction to Real Analysis*, Wiley India Edition, Wiley India Pvt Ltd.
2. Narayan, S, and Mittal, P K, *Integral Calculus*, S Chand & Co Ltd.
3. Apostol, T M, *Calculus, Vol: I*, Willey student edition, Wiley India Pvt Ltd.
4. Ross, K A, *The Theory of Calculus*, Undergraduate Texts in Mathematics, Springer (SIE), Indian Reprint, 2004.

2.8.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.

- (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
- (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.8.3 Approval (23MATMAJ204)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Bikiran Das	Subhajit Paul	Subhajit Paul

2.9 23MATMAJ205: Ordinary Differential Equations II & Three-dimensional Geometry

2.9.1 Course description

<i>Course code:</i> 23MATMAJ205 <i>Course category:</i> Major <i>Title of the course:</i> Ordinary Differential Equations II & Three-dimensional Geometry				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
IV	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- the course 23MATMAJ101.
- the course 23MATMAJ102.
- basic concepts of 3-D geometry, such as the equation of a plane, distance between points in 3D, and visualization of 3D objects.

Objectives

At the end of the course, the students should be able to

- MAJ205-Ob1** Introduce the concept of power series solutions for solving ordinary differential equations, focusing on their convergence and applications.

- MAJ205-Ob2** Introduce phase plane analysis as a method for visualizing and understanding the behaviour of solutions to first-order systems of ordinary differential equations.
- MAJ205-Ob3** Study stability concepts in the context of phase plane analysis, identifying critical points and classifying them as stable, unstable, or semi-stable.
- MAJ205-Ob4** Understand the geometrical terminologies and have a detailed idea of the planes, straight lines in 3D, Spheres, Cylindrical surfaces, Central Conicoids, Paraboloids, Plane sections of Conicoids along with the tangent and normal of the Conicoids.
- MAJ205-Ob5** Develop an idea of classification of quadrics.
- MAJ205-Ob6** Develop an idea of generating lines.
- MAJ205-Ob7** Be familiar with the illustrations of graphing standard quadric surfaces like cones, Paraboloids, hyperboloids and ellipsoids.

Corresponding outcomes

The outcome corresponding to the learning objective **MAJ205-Ob1**, is

MAJ205-CO1: Apply power series method to find the solution of the ordinary differential equation understanding the convergence and divergence.

The outcome corresponding to the learning objective **MAJ205-Ob2**, is

MAJ205-CO2: Learn and apply phase plane analysis techniques to visualize and interpret solutions to first-order systems of differential equations.

The outcome corresponding to the learning objective **MAJ205-Ob3**, is

MAJ205-CO3: Analyse stability concepts in the context of phase plane analysis, identifying critical points and classifying them as stable, unstable, or semi-stable.

The outcomes corresponding to the learning objective **MAJ205-Ob4**, are

MAJ205-CO4: Acquire a level of proficiency in particular in using equation of plane in terms of its intercepts on axis and the equation of the planes through the given point length of the perpendicular from a given point to a given plane.

MAJ205-CO5: Explore the basic concept of the equation of a line, angle between the line and a plane, and the shortest distance between two lines.

MAJ205-CO6: Develop their knowledge and apply the skills in the study of the sphere.

The outcome corresponding to the learning objectives **MAJ205-Ob5** to **MAJ205-Ob7**, is

MAJ205-CO7: Gain a broader understanding on cones, Paraboloids, ellipsoids, hyperboloids and use the facts, formulas and techniques learned in this course to prove applications of those.

Content

Unit: 1	Credits: 2	Lecture hours: 30
Objectives mapped: MAJ205-Ob1 to MAJ205-Ob3	Cognitive levels achieved through outcomes: Remembering: MAJ205-CO2 Understanding: MAJ205-CO1 Applying: MAJ205-CO1 to MAJ205-CO3	
ORDINARY DIFFERENTIAL EQUATIONS: Singularities and their classifications. Power series solution of a differential equation about an ordinary point, solution about a regular singular point. Equilibrium points, interpretation of the phase plane, critical points and paths of linear systems and non-linear systems.		

Unit: 2	Credits: 2	Lecture hours: 30
Objectives mapped: MAJ205-Ob4 to MAJ205-Ob7	Cognitive levels achieved through outcomes: Remembering: MAJ205-CO4 to MAJ205-CO7 Understanding: MAJ205-CO4 to MAJ205-CO7 Applying: MAJ205-CO4 to MAJ205-CO7	
THREE DIMENSIONAL GEOMETRY: Introduction to coordinate system in three dimension. Straight line, Plane, Spheres, Cylindrical surfaces, Central Conicoids, Paraboloids, Plane sections of Conicoids, Generating lines, Classification of quadrics.		

Suggested readings

1. Chakravorty, J G, and Ghosh, P R, *Advanced Analytical Geometry*, U N Dhur and Sons Pvt Ltd.
2. Khan, R M, *Analytical Geometry of Two and Three Dimensions and Vector Analysis*, New Central Book Agency.
3. Ghosh, R K and Maity, K C, *An Introduction to differential equations*, New Central Book Agency.
4. Raisinghanian, M D, *Ordinary and Partial Differential Equations*, S Chand Publishing.
5. Ross, S L, *Differential Equations*, Wiley.

Reference books

1. Coddington, E A, *An Introduction to Ordinary Differential Equations*, Dover Books on Mathematics Series, Dover Publications Inc.
2. Bej, N K, and Mukherjee, A, *Analytical Geometry of Two & Three Dimensions (Advanced Level)*, Book & Allied Pvt Ltd.

2.9.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.

2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:

- (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
- (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
- (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

2.9.3 Approval (23MATMAJ205)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Snigdha Roy	Subhajit Paul	Subhajit Paul

SYLLABI FOR MATHEMATICS MINOR COURSES

3.1 23MATMIN101: Linear Algebra and Differential Equations

3.1.1 Course description

<i>Course code:</i> 23MATMIN101				
<i>Course category:</i> Major				
<i>Title of the course:</i> Linear Algebra and Differential Equations				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
I	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- basic algebraic manipulations with one or more real variables, matrices, determinants (up to order 3) etc.;
- computational processes in calculus like evaluating limits, investigating continuity, etc.;
- different differentiation techniques, including rules for differentiation, chain rule, product rule, and quotient rule;
- different techniques of integration, such as substitution, integration by parts, partial fractions, etc.

Objectives

At the end of the course, the students should be able to

MIN101-Ob1	Identify an invertible matrix and compute the inverse using elementary operations.
MIN101-Ob2	Investigate a system of linear equations and find the solution(s).
MIN101-Ob3	Compute and analyse the eigenvalues and eigenvectors of a matrix.

MIN101-Ob4 Develop a solid understanding of the basic concepts related to ordinary differential equations (ODEs) including order, linearity, and solutions (particular solutions, general solutions, and initial value problems) and also learn to classify different types of ODEs based on their order, linearity, and degree.

MIN101-Ob5 Learn different techniques to solve first order and higher order ODEs.

Corresponding outcomes

The outcome corresponding to the learning objective **MIN101-Ob1**, is

MIN101-CO1: Use elementary operations to compute rank of a matrix by reducing to echelon or normal forms.

The outcome corresponding to the learning objective **MIN101-Ob2**, is

MIN101-CO2: Identify a solvable system of linear equations and solve it.

The outcomes corresponding to the learning objective **MIN101-Ob3**, are

MIN101-CO3: Compute eigenvalues by solving the characteristic equation and find corresponding eigenvectors,

MIN101-CO4: Use Cayley-Hamilton theorem to find the inverse of a matrix.

The outcome corresponding to the learning objective **MIN101-Ob4**, is

MIN101-CO5: Identify different types of ODEs.

The outcome corresponding to the learning objective **MIN101-Ob5**, are

MIN101-CO6: Apply different techniques to solve first order and higher order ODEs.

Content

Unit: 1	Credits: 2	Lecture hours: 30
Objectives mapped: MIN101-Ob1 to MIN101-Ob3	Cognitive levels achieved through outcomes: Remembering: MIN101-CO1 and MIN101-CO2 Understanding: MIN101-CO1 and MIN101-CO2 Applying: MIN101-CO1 to MIN101-CO4	
LINEAR ALGEBRA: Elementary operations, Row/column reduced echelon matrix, Rank of matrix, Normal forms, Inverse of a matrix. Systems of linear equations: $AX = b$. Solutions, Consistency, Coefficient matrix. Homogeneous and non-homogeneous system of equations. Solutions using elementary operations. Characteristic polynomial and Characteristic equation of a square matrix. Cayley-Hamilton theorem. Computations (only) of eigenvalues and eigenvectors.		

Unit: 2	Credits: 2	Lecture hours: 30
Objectives mapped: MIN101-Ob4 and MIN101-Ob5	Cognitive levels achieved through outcomes: Remembering: MIN101-CO5 and MIN101-CO6 Understanding: MIN101-CO5 and MIN101-CO6 Applying: MIN101-CO5 and MIN101-CO6	
DIFFERENTIAL EQUATIONS: Examples and formulations. General, particular, explicit, implicit and singular solutions of a differential equation. Exact differential equations and integrating factors, separable equations and equations reducible to this form, linear equation and Bernoulli equations, special integrating factors and transformations.		
General solution of homogeneous equation of second order, principle of super position for homogeneous equation, Wronskian: its properties and applications, Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation, method of undetermined coefficients, method of variation of parameters.		

Suggested readings

1. Mapa, S K, *Higher Algebra: Abstract and Linear*, Levant Books.
2. Ghosh, R K, and Maity, K C, *An Introduction to Differential Equations*, New Central Book Agency.
3. Raisinghania, M D, *Ordinary and Partial Differential Equation*, S Chand Publishing.

Reference books

1. Hoffman, K, and Kunze, R, *Linear Algebra*, Prentice Hall India Learning Private Limited.
2. Ross, S L, *Differential Equations*, Wiley.

3.1.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

3.2 23MATMIN201: Discrete Mathematics

3.2.1 Course description

<i>Course code:</i> 23MATMIN201				
<i>Course category:</i> Minor				
<i>Title of the course:</i> Discrete Mathematics				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
III	4	4	60	2023

Prerequisites

Before attending the course, students should be familiar with

- concepts of sets, functions and relations,
- basic concepts of permutations and combinations.

Objectives

At the end of the course, the students should be able to

- MIN201-Ob1 Describe the concepts of mathematical logic.
- MIN201-Ob2 Illustrate the concepts of sets, relations, and functions.
- MIN201-Ob3 Perform the operations associated with sets, functions, and relations.
- MIN201-Ob4 Relate practical examples to the appropriate set, function, or relation model, and interpret the associated operations and terminology in context.

Corresponding outcomes

The outcome corresponding to the learning objective **MIN201-Ob1**, is

MIN201-CO1: Applying mathematical logic to solve problems.

The outcome corresponding to the learning objective **MIN201-Ob2**, is

MIN201-CO2: Understanding sets, relations, functions and discrete structures.

The outcome corresponding to the learning objectives **MIN201-Ob3** and **MIN201-Ob4**, is

MIN201-CO3: Using logical notations to define and reason about fundamental mathematical concepts such as sets relations and functions.

Content

Unit: 1	Credits: 2	Lecture hours: 30
Objectives mapped: MIN201-Ob2 and MIN201-Ob3	Cognitive levels achieved through outcomes: Understanding: MIN201-CO2 Applying: MIN201-CO3	
Set theory, operations and algebra, switching circuits as an application. Relations and their properties, equivalence relations, partial order relations. Functions, domain, codomain, range, the properties of one-to-one and onto, composite and inverse functions.		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: MIN201-Ob1	Cognitive levels achieved through outcomes: Understanding: MIN201-CO1 Applying: MIN201-CO1	
Introduction to logic, quantifiers and conditional propositions. Truth tables. Tautology and contradiction.		

Unit: 3	Credits: 1	Lecture hours: 15
Objectives mapped: MIN201-Ob1	Cognitive levels achieved through outcomes: Understanding: MIN201-CO1 Applying: MIN201-CO1	
Fundamental Counting Principles: Permutations, Derangements, Combinations, Permutations and Combinations with repetitions, Binomial theorem. Generalised Inclusion Exclusion Principle. Pigeonhole principle.		

Suggested readings

1. Veerarajan, T, *Discrete Mathematics, with Graph Theory and Combinatorics*, McGraw Hill Education.
2. Rosen, K H, *Discrete Mathematics and its Applications*, 7th Ed, McGraw Hill Education (India) Pvt Ltd.
3. Grimaldi, R P, *Discrete and Combinatorial Mathematics*, Pearson.
4. Malik, D S, and Sen, M K, *Discrete Mathematics*, Revised edition, Cengage Learning.
5. Liu, C L, and Mohapatra, D P, *Elements of Discrete Mathematics*, 4th Ed, McGraw Hill Education (India) Private Limited.

3.2.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.

2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:

- (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
- (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
- (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

3.2.3 Approval (23MATMIN201)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Debdut Sengupta	Subhajit Paul	Subhajit Paul

SYLLABI FOR SKILL ENHANCEMENT COURSES

4.1 23MATSEC101: Typesetting in $\text{\LaTeX}$

4.1.1 Course description

<i>Course code:</i> 23MATSEC101				
<i>Course category:</i> Skill Enhancement				
<i>Title of the course:</i> Typesetting in $\text{\LaTeX}$				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
I	1(L)+2(P) = 3	5	75	2023

Prerequisites

To attend this course, the students should have access to a computer with internet facility.

Objectives

At the end of the course, the students should be able to

- SEC101-Ob1 Use the preamble of the `.tex` file to define document class and layout options.
- SEC101-Ob2 Include figures, tables, lists, and mathematical equations in a $\text{\LaTeX}$ document.
- SEC101-Ob3 Draw basic diagrams using `TikZ` package.
- SEC101-Ob4 Refer to different items within the document.
- SEC101-Ob5 Generate a bibliography for a particular document.

Corresponding outcomes

The outcome corresponding to the learning objectives **SEC101-Ob1**, is

SEC101-CO1: Create a $\text{\LaTeX}$ document with chapters, sections, subsections, etc., and also to manage the paper size and margins.

The outcome corresponding to the learning objective **SEC101-Ob2**, is

SEC101-CO2: Include figures, tables, **longtables**, enumerated and itemized lists, and mathematical equations at desired positions in a $\text{\LaTeX}$ document.

The outcome corresponding to the learning objective **SEC101-Ob3**, is

SEC101-CO3: Draw line joining two points, circle, ellipse, parabola, ellipse, and other plane geometry diagrams.

The outcome corresponding to the learning objective **SEC101-Ob4**, is

SEC101-CO4: Refer to different items within the document using **hyperref**, **cleveref**, **varioref** packages.

The outcome corresponding to the learning objective **SEC101-Ob5**, is

SEC101-CO5: Use **BibTeX** to maintain bibliographic information and to generate a bibliography for a particular document.

Content

Unit: 1	Credits: 1	Lecture hours: 25
Objectives mapped: SEC101-Ob1 and SEC101-Ob2	Cognitive levels achieved through outcomes: Remembering: SEC101-CO1 and SEC101-CO2 Understanding: SEC101-CO1 and SEC101-CO2 Applying: SEC101-CO1 and SEC101-CO2	
What is L ^A T _E X. Basics for document structuring, preamble preparation, saving a folder. L ^A T _E X commands for font colour, font size, make title, begin document, new page, sectioning. beamer document class.		
Creating Tables, Inserting figures, enumeration list, itemized list, inserting equations.		

Unit: 2	Credits: 1	Lecture hours: 20
Objectives mapped: SEC101-Ob3	Cognitive levels achieved through outcomes: Remembering: SEC101-CO3 Understanding: SEC101-CO3	
Ti&Kz PACKAGE: Draw line joining two points, circle, ellipse, parabola, ellipse, and other plane geometry diagrams. Use of nodes.		

Unit: 3	Credits: 1	Lecture hours: 30
Objectives mapped: SEC101-Ob4 and SEC101-Ob5	Cognitive levels achieved through outcomes: Remembering: SEC101-CO4 and SEC101-CO5 Understanding: SEC101-CO4 and SEC101-CO5	
REFERENCING: Use of hyperref, cleveref, and varioref packages. Inserting references, Manual reference, Reference using BibTeX, citing reference.		

Suggested readings

1. L^AT_EX for beginners Work book, 5th edition, Document Reference: 3722-2014, March 2014.
2. Kopka, H, and Daly, P W, *Guide to L^AT_EX*, Addison-Wesley.

Reference books

1. Griffiths, D F, and Higham, D J, *Learning L^AT_EX*, Siam, Philadelphia.
2. Kottwitz, S, *L^AT_EX Beginner's Guide*, Packt Publishing Ltd.

4.1.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, Practical. Rubrics are as follows:
 - (a) Lab report: 10 marks.
 - (b) Viva-voce: 10 marks.
 - (c) Prepare codes for two problems of 15 marks each, pulled from a pool of 10 questions.. $15 \times 2 = 30$.

4.2 23MATSEC102: Graph Theory

4.2.1 Course description

<i>Course code:</i> 23MATSEC102				
<i>Course category:</i> Skill Enhancement				
<i>Title of the course:</i> Graph Theory				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
II	3	3	45	2023

Objectives

At the end of the course, the students should be able to

SEC102-Ob1 Understand and apply the fundamental concepts in graph theory.

SEC102-Ob2 Apply graph theory based tools in solving practical problems.

Corresponding outcomes

The outcomes corresponding to the learning objective **SEC102-Ob1**, are

SEC102-CO1: Understanding relevance of graphs in different context, ranging from puzzles and games to social science/engineering/computer science.

SEC102-CO2: Solving real life problems based on graph theory.

The outcomes corresponding to the learning objective **SEC102-Ob2**, are

SEC102-CO3: Learning algorithms.

SEC102-CO4: knowing applications of Graph Theory.

Content

Unit: 1	Credits: 1	Lecture hours: 15
Objectives mapped: SEC102-Ob1	Cognitive levels achieved through outcomes: Understanding: SEC102-CO1 Applying: SEC102-CO2	
Definition, examples and basic properties of graphs, directed graphs, pseudo graphs, complete graphs, bipartite graphs, isomorphism of graphs. Trees and forests, paths and cycles.		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: SEC102-Ob1	Cognitive levels achieved through outcomes: Understanding: SEC102-CO1 Applying: SEC102-CO2	
Eulerian circuits, Eulerian graph, semi-Eulerian graph, theorems. Hamiltonian cycles, theorems Representation of a graph by matrix, the adjacency matrix, incidence matrix, weighted graph.		

Unit: 3	Credits: 1	Lecture hours: 15
Objectives mapped: SEC102-Ob2	Cognitive levels achieved through outcomes: Applying: SEC102-CO3 Analysing: SEC102-CO4	

Shortest path. Tree and their properties, spanning tree, Dijkstra's algorithm, Warshall algorithm, Prim's algorithm. Connectivity, matching in bipartite graphs, matching in general graphs.

Suggested readings

1. Ghosh, D N, *Discrete Mathematics*, Academic Publishers.
2. Rosen, K H, *Discrete Mathematics and its Applications*, 7th Ed, McGraw Hill Education (India) Pvt Ltd.
3. Deo, N, *Graph Theory with applications to Engineering and Computer Science*, PHI Learning.
4. West, D B, *Introduction to Graph theory*, 2nd Ed, Pearson Education India.
5. Sharma, J K, *Discrete Mathematics*, 4th Ed, Laxmi Publications.

4.2.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

4.2.3 Approval (23MATSEC102)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Snigdha Roy	Subhajit Paul	Subhajit Paul

4.3 23MATSEC201: Mathematical Modelling

4.3.1 Course description

<i>Course code:</i> 23MATSEC201				
<i>Course category:</i> Skill Enhancement				
<i>Title of the course:</i> Mathematical Modelling				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
III	3	3	45	2023

Prerequisites

Before attending the course, students should be familiar with

- basic Calculus,
- the course 23MATMAJ102.

Objectives

At the end of the course, the students should be able to

- SEC201-Ob1** Develop mathematical models to represent real-world phenomena across various domains such as Physics, Biology, Economics, Engineering, and Social sciences.
- SEC201-Ob2** Enhance problem-solving skills by enabling students to translate real-world problems into mathematical formulations and vice versa, using appropriate modelling techniques.
- SEC201-Ob3** Foster critical thinking skills by analysing the limitations, assumptions, and implications of mathematical models, and evaluating their effectiveness in addressing specific problems.

Corresponding outcomes

The outcome corresponding to the learning objective **SEC201-Ob1**, is

SEC201-CO1: Identifying real-world problems, define relevant variables, and formulate appropriate mathematical models to represent those problems.

The outcome corresponding to the learning objective **SEC201-Ob2**, is

SEC201-CO2: Analysing mathematical models using analytical techniques, numerical methods, and simulation to assess their accuracy, stability, and predictive capacity.

The outcome corresponding to the learning objective **SEC201-Ob3**, is

SEC201-CO3: Demonstrating critical thinking skills by questioning assumptions, exploring alternative modelling approaches, and adapting models to new situations or data.

Content

Unit: 1	Credits: 2	Lecture hours: 30
Objectives mapped: SEC201-Ob1 and SEC201-Ob2	Cognitive levels achieved through outcomes: Remembering: SEC201-CO1 and SEC201-CO2 Understanding: SEC201-CO2 Applying: SEC201-CO3	
Functions, modelling with linear and exponential functions. Average rate of change, linear functions with applications, Piecewise-linear functions with applications. Fitting linear models to data. Exponential growth functions with applications, Growth factors and rates, doubling time. Compound interest, Exponential decay functions with applications. Fitting exponential models to data, Decay factors and rates, Half-life. Modelling with logarithmic and polynomial functions, Logarithmic functions with applications, Fitting logarithmic models to data, Maxima and minima applications.		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: SEC201-Ob3	Cognitive levels achieved through outcomes: Analysing: SEC201-CO3 Evaluating: SEC201-CO3	
Introduction to continuous time models, limitations and advantages of the discrete-time model, the need for continuous time models. Modelling the growth of microorganisms, chemostat. Stability and linearisation methods for system of ODEs.		

Suggested readings

1. Myint, T, and Debnath, L, *Linear Partial Differential Equation for Scientists and Engineers*, Springer, Indian reprint, 2008.
2. Kapoor, J N, *Mathematical Modelling*, New Age International Pvt Ltd Publishers, 2011.
3. Kamalanand, K, and Jawahar, P M, *Mathematical Modelling of Systems and Analysis*, PHI Learning Pvt Ltd, 2018.
4. Giordano, F R, Fox, W P, and Horton, S B, *A First Course in Mathematical Modelling*, Brooks/Cole Cengage Learning, USA, 2013.

4.3.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.

- (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

4.3.3 Approval (23MATSEC201)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Snigdha Roy	Subhajit Paul	Subhajit Paul

SYLLABI FOR MULTI-DISCIPLINARY COURSES

5.1 23MATMDC101: Basic Mathematics

5.1.1 Course description

<i>Course code:</i> 23MATMDC101				
<i>Course category:</i> Multi-disciplinary				
<i>Title of the course:</i> Basic Mathematics				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
I / III	3	3	45	2023

Prerequisites

Before attending the course, students should be familiar with

- fundamental arithmetic operations like addition, subtraction, multiplication and division.
- derived arithmetic operations like simplifications, squares, square roots, cube and cube roots;
- factorisation of polynomials.

Objectives

At the end of the course, the students should be able to

MDC101-Ob1	Learn the relationship between logarithm and indices and perform basic calculations.
MDC101-Ob2	familiarise themselves with the binomial theorem, including the general formula for expanding the power of a binomial expression.
MDC101-Ob3	Develop the understanding of the fundamental concepts of matrices and determinants, including their definitions, properties, and basic operations among the students.

MDC101-Ob4 Learn various techniques for calculating derivatives, including the addition, product, quotient and chain rules.

MDC101-Ob5 Understand the various techniques for calculating integrals, including basic rules, substitution, integration by parts.

MDC101-Ob6 Calculate area under a curve.

Corresponding outcomes

The outcome corresponding to the learning objective **MDC101-Ob1**, is

MDC101-CO1: Learn and apply the formulæ of logarithm and indices to solve various basic sums.

The outcome corresponding to the learning objective **MDC101-Ob2**, is

MDC101-CO2: Learn and apply binomial theorem to expand a polynomial to a given power.

The outcomes corresponding to the learning objective **MDC101-Ob3**, are

MDC101-CO3: Identify different types of matrices and perform algebra.

MDC101-CO4: Understand the processes to determine adjoint, determinant and inverse (when exists) of a square matrix.

The outcome corresponding to the learning objectives **MDC101-Ob4**, is

MDC101-CO5: Remember and apply various techniques for calculating derivatives, including the addition, product, quotient and chain rules.

The outcome corresponding to the learning objectives **MDC101-Ob5**, is

MDC101-CO6: Remember and apply various techniques for calculating integrals by several techniques such as methods of substitution, by parts, and partial fractions.

The outcome corresponding to the learning objectives **MDC101-Ob6**, is

MDC101-CO7: Apply the Fundamental theorem of Calculus to calculate the area under a curve.

Content

Unit: 1	Credits: 1	Lecture hours: 15
Objectives mapped: MDC101-Ob1 to MDC101-Ob3	Cognitive levels achieved through outcomes: Remembering: MDC101-CO1 to MDC101-CO3 Understanding: MDC101-CO1 to MDC101-CO4 Applying: MDC101-CO1 to MDC101-CO4	

ALGEBRA: Definitions of indices and logarithms. Illustrations of basic relations and properties of indices and logarithms (integer and rational indices only).

Statement and proof of the binomial theorem for positive integral indices. Pascal's triangle, simple applications.

Concept, notation, order, equality of matrices. Types of matrices: zero and identity matrix, transpose of a matrix, symmetric and skew symmetric matrices. Operations on matrices: Addition and multiplication of matrices; multiplication with a scalar. Non-commutativity of multiplication and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2). Invertible matrices and proof of the uniqueness of inverse, if it exists; (all matrices will have real entries).

Determinant of a square matrix (up to 3×3 matrices), minors, co-factors, adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples, solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

Unit: 2	Credits: 2	Lecture hours: 30
Objectives mapped: MDC101-Ob4 to MDC101-Ob6	Cognitive levels achieved through outcomes: Remembering: MDC101-CO5 and MDC101-CO6 Understanding: MDC101-CO5 and MDC101-CO6 Applying: MDC101-CO5 to MDC101-CO7	
CALCULUS: Differentiation as the instantaneous rate of change. Derivative of sum, difference, product and quotient of functions. Derivatives of polynomials, logarithmic and exponential functions. Chain rule.		
Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, Evaluation of simple integrals and problems based on them. Statement (only) of Fundamental theorem of Calculus and its application to find the area under a curve.		

Suggested readings

1. Agarwal, R S, *Senior Secondary Mathematics For Class 11*, Bharti Bhawan.
2. Agarwal, R S, *Senior Secondary Mathematics For Class 12*, Bharti Bhawan.

Reference books

1. Sharma, R D, *Mathematics for Class 11 (Vols I & II)*, Dhanpat Rai Publications (P) Ltd.
2. Sharma, R D, *Mathematics for Class 12 (Vols I & II)*, Dhanpat Rai Publications (P) Ltd.
3. *Arihant All in One Mathematics CBSE Class 12*, Modern Publication.

5.1.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

5.2 23MATMDC102: Mathematics for Competitive Examinations

5.2.1 Course description

<i>Course code:</i> 23MATMDC102 <i>Course category:</i> Multi-disciplinary <i>Title of the course:</i> Quantitative Aptitude				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
II	3	3	45	2023

Prerequisites

Before attending the course, students should be familiar with

- different types of number system;
- fundamental arithmetic operations like addition, subtraction, multiplication and division;
- Basic operations like simplifications, squares, square roots, cube and cube roots;
- Terms like time, speed, distance, profit, loss;
- Basic geometric shapes like triangle, quadrilateral, circles.

Objectives

At the end of the course, the students should be able to

MDC102-Ob1	Develop a strong foundation in number systems and fundamental operations enabling students from various disciplines to enhance their mathematical reasoning, problem-solving skills.
MDC102-Ob2	Equip students with the necessary knowledge and techniques to solve a wide range of quantitative problems related to daily life, commonly encountered in competitive exams and real-world scenarios.
MDC102-Ob3	Foster critical thinking and logical reasoning skills by applying mathematical concepts to analyse and interpret numerical data.

Corresponding outcomes

The outcomes corresponding to the learning objective **MDC102-Ob1**, are

MDC102-CO1: Remember and understand the different types of number system and the arithmetic operations on them.

MDC102-CO2: Develop an understanding of the processes to find the squares, square roots, cube, cube roots.

MDC102-CO3: Develop an understanding of permutation and combination and analyse them to solve simple problems.

The outcomes corresponding to the learning objective **MDC102-Ob2**, are

MDC102-CO4: Understand and analyse the concepts of Heights and Distances, Profit and Loss, Discount, Partnership Business, Mixture, Time and distance, Time & Work, Percentage problems, Boats and Streams, Ratio & Proportion, Pipes and Cistern, Problems on Trains, Simple and Compound Interest and use them in solving simple problems thereby enhance performance in competitive exams that include quantitative aptitude.

MDC102-CO5: Remember the different formulae to find the area and volume of simple geometric shapes and apply them in simple problems.

The outcome corresponding to the learning objective **MDC102-Ob3**, is

MDC102-CO6: Understand data interpretation and analyse complex data presented in various forms, such as tables, bar graphs, pie charts, and line graphs.

Content

Unit: 1	Credits: 1	Lecture hours: 15
Objectives mapped: MDC102-Ob1	Cognitive levels achieved through outcomes:	
	Remembering:	MDC102-CO1
	Understanding:	MDC102-CO2 and MDC102-CO3
	Applying:	MDC102-CO2 and MDC102-CO3
Numbers, HCF & LCM of numbers. Decimal fractions. Simplifications. Square & cube roots. Permutations and Combinations. Decimals problems, fractions problems. Numbers and Ages. Surds and Indices. Averages, Odd man out & Series. Calendar. Clocks.		

Unit: 2	Credits: 2	Lecture hours: 30
Objectives mapped: MDC102-Ob2 and MDC102-Ob3	Cognitive levels achieved through outcomes: Remembering: MDC102-CO5 Understanding: MDC102-CO4 and MDC102-CO6 Applying: MDC102-CO4 to MDC102-CO6	

Heights and distances. Profit and loss. Discounts. Partnership business. Mixture. Time and distance. Time & work. Percentage problems. Boats and streams. Ratio & proportion. Pipes and cistern. Problems on trains. Simple and compound interest. Volume & surface areas.

Data interpretation, tabulation, bar graphs, pie charts, line graphs.

Suggested readings

1. Agarwal, R S, *Quantitative Aptitude*, S Chand.
2. Oswal Publishers, *Quantitative Aptitude For Competitive Examinations : IBPS, SSC, SBI, RBI, AFCAT, CDS, UPSC, UPPSC, CAT, MAT, XAT, Railways*, Oswal Printers & Publishers Pvt Ltd.

Reference books

1. Khattar, D, *The Pearson Guide to Quantitative Aptitude for Competitive Examinations*, Pearson.
2. FACE, *Aptipedia: Aptitude Encyclopedia*, Wiley.

5.2.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*: 50 marks, 2 hours. Marks distribution as follows:
 - (a) Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - (b) Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - (c) Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.

SYLLABI FOR VALUE ADDED COURSES

6.1 23MATVAC101: Introduction to Number Systems

6.1.1 Course description

<i>Course code:</i> 23MATVAC101				
<i>Course category:</i> Value added				
<i>Title of the course:</i> Introduction to Number Systems				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
I	1	2	30	2023

Prerequisites

Before attending the course, students should be familiar with

- basic arithmetic and algebraic calculations.

Objectives

At the end of the course, the students should be able to

VAC101-Ob1 Present a problem oriented introductory knowledge of Number systems and its applications to binary arithmetic.

VAC101-Ob2 Focus on the study of Boolean algebra and its applications to logic gates.

VAC101-Ob3 Understand the concept of Sum of Products (S.O.P) and product of sums (P.O.S) and its applications to Karnaugh map.

Corresponding outcomes

The outcome corresponding to the learning objective **VAC101-Ob1**, is

VAC101-CO1: Acquire basic knowledge of number systems and its applications to binary arithmetic.

The outcome corresponding to the learning objective **VAC101-Ob2**, is

VAC101-CO2: Employ Boolean algebra and its applications to logic gates.

The outcome corresponding to the learning objective **VAC101-Ob3**, is

VAC101-CO3: Understand the concept of Sum of Products (SOP) and product of sums (POS) and its applications to Karnaugh map.

Content

Unit: 1	Credits: 1	Lecture hours: 30
Objectives mapped: VAC101-Ob1 to VAC101-Ob3	Cognitive levels achieved through outcomes: Remembering: VAC101-CO1 and VAC101-CO2 Understanding: VAC101-CO1 to VAC101-CO3 Applying: VAC101-CO1 to VAC101-CO3	
INTRODUCTION TO CONVENTIONAL NUMBER SYSTEMS: Base, place value, digits available for a particular base. Binary, octal, decimal, hexadecimal number systems and conversions. Gray Code, Excess-3 code, code conversion. ASCII, EBCDIC codes and their conversions. Binary arithmetic and applications. Signed and unsigned binary numbers. 1's complement and 2's complement representation. Simple problems.		
BOOLEAN ALGEBRA AND LOGIC GATES: Basic logic circuits, logic gates, truth tables. Laws and properties of Boolean algebra. De Morgan's theorem and its applications. Min term, Max term with their applications. Conjunctive Normal Form (POS), Disjunctive Normal Form (SOP) and their inter-conversions. K-map and its applications. Simplifications of K-maps by Boolean theorems.		

Suggested readings

1. Mano, M Morris, *Digital Logic and Computer Design*, Pearson Education.
2. Salivahanan, S and Arivazhagan, S, *Digital Circuits And Design*, Oxford University Press.

6.1.2 Assessment

1. *Summative Assessment*: 50 marks. Assignment based.

6.2 23MATVAC102: Prerequisites to Linear Algebra

6.2.1 Course description

<i>Course code:</i>	23MATVAC102
<i>Course category:</i>	Value Added
<i>Title of the course:</i>	Prerequisites to Linear Algebra

<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
II	1	2	30	2023

Prerequisites

Before attending the course, students should be familiar with

- basic arithmetic and algebraic calculations.

Objectives

At the end of the course, the students should be able to

VAC102-Ob1 Learn and manipulate different types of matrices in its general form.

VAC102-Ob2 Define determinants and manipulate them using various formulæ.

Corresponding outcomes

The outcomes corresponding to the learning objective **VAC102-Ob1**, are

VAC102-CO1: Multiply two compatible matrices.

VAC102-CO2: Compute transpose of a matrix.

VAC102-CO3: Identify symmetric, skew symmetric, nilpotent, idempotent matrices.

VAC102-CO4: Find inverse of a matrix using elementary transformations.

The outcomes corresponding to the learning objective **VAC102-Ob2**, are

VAC102-CO5: Define determinants using permutation definition.

VAC102-CO6: Compute determinants using various formulæ.

Content

Unit: 1	Credits: 1	Lecture hours: 30
Objectives mapped: VAC102-Ob1 and VAC102-Ob2	Cognitive levels achieved through outcomes: Applying: VAC102-CO1 to VAC102-CO5	
MATRICES: Algebraic operations on matrices. Block multiplication of matrices. Transpose of a matrix. Symmetric and Skew-symmetric matrices. Types of matrices: orthogonal, idempotent, nilpotent matrix. Adjoint of a matrix, Inverse of a matrix, complex matrices.		
DETERMINANTS: Definition of determinant using permutations. Minors and Co-factors, complementary minor, multiplications of determinants, determinants of symmetric and skew-symmetric matrices, Cramer's Rule.		

Suggested readings

1. Mapa, S K, *Higher Algebra: Abstract and Linear*, Sarat Book House.

6.2.2 Assessment

1. *Summative Assessment*: 50 marks, Assignment based.

6.2.3 Approval (23MATVAC102)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Manoj Ray Bakshi	Subhajit Paul	Subhajit Paul

6.3 23MATVAC201: Graphing using GeoGebra

6.3.1 Course description

<i>Course code:</i> 23MATVAC201				
<i>Course category:</i> Value Added				
<i>Title of the course:</i> Graphing using GeoGebra				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
III	1	2	30	2023

Prerequisites

Before attending the course, students should be familiar with

- fundamental mathematical concepts, including algebra, geometry, and trigonometry;
- basic calculus concepts, including limits, derivatives, and integrals.
- basic computer literacy, including proficiency in using computer software and navigating interfaces.

Objectives

At the end of the course, the students should be able to

VAC201-Ob1 Learn and manipulate GeoGebra interface to create graphs of various functions.

VAC201-Ob2 Showcase the educational applications of GeoGebra in teaching and learning.

Corresponding outcomes

The outcomes corresponding to the learning objective **VAC201-Ob1** and **VAC201-Ob2**, are

VAC201-CO1: Students will proficiently navigate GeoGebra, utilising its basic tools for mathematical exploration.

VAC201-CO2: Dynamic geometry construction skills will allow students to visualise and manipulate geometric objects dynamically.

VAC201-CO3: The ability to connect algebraic and graphical representations will enable students to explore and analyse mathematical relationships effectively.

VAC201-CO4: Applying GeoGebra to investigate functions and calculus concepts dynamically, gaining insights into mathematical ideas.

VAC201-CO5: The creation of interactive demonstrations and simulations will allow students to communicate mathematical concepts effectively.

VAC201-CO6: The creation of custom tools and scripts in GeoGebra, tailoring the software to address specific mathematical problems.

VAC201-CO7: The course will demonstrate the diverse educational applications of GeoGebra in teaching and learning mathematics.

Content

Unit: 1	Credits: 1	Lecture hours: 30
Objectives mapped: VAC201-Ob1 and VAC201-Ob2	Cognitive levels achieved through outcomes: Applying: VAC201-CO1 to VAC201-CO7	
INTRODUCTION TO GEOGEBRA: Overview of GeoGebra interface: Introduction to GeoGebra software; navigation and basic tools. Dynamic geometry construction: Creating points, lines, and circles, exploring dynamic constructions with sliders. Algebraic and graphical representations: Inputting algebraic expressions and equations, connecting algebraic and graphical representations. Exploring functions in GeoGebra: Graphical analysis of functions, dynamic exploration of function transformations.		
ADVANCED FEATURES AND CUSTOMISATIONS: Advanced dynamic geometry: Using advanced geometric tools, exploring 3D geometry in GeoGebra. Calculus concepts in GeoGebra: Investigating limits graphically, dynamic exploration of derivatives and integrals. Interactive demonstrations: Designing interactive demonstrations, showcasing GeoGebra applications in mathematics.		

Suggested readings

1. GeoGebra Tutorials by official GeoGebra website: Beginner Tutorials – GeoGebra at <https://www.geogebra.org/m/ys2eur3x>.
2. YouTube Khan Academy – GeoGebra at <https://www.geogebra.org/m/rZHGcANX>.
3. GeoGebra Tube at <https://www.geogebra.org/?lang=en>.

4. Coursera: GeoGebra Course at <https://www.geogebra.org/m/kMm1U3DQ>.

6.3.2 Assessment

1. *Summative Assessment*: 50 marks, Assignment based.

6.3.3 Approval (23MATVAC201)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Bikiran Das	Subhajit Paul	Subhajit Paul

6.4 23MATVAC202: Poster Presentation

6.4.1 Course description

<i>Course code:</i> 23MATVAC202				
<i>Course category:</i> Value Added				
<i>Title of the course:</i> Poster Presentation				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
IV	1	2	30	2023

Prerequisites

Before attending the course, students should be familiar with

- basics of computer literacy.
- the course 23MATSEC101.

Objectives

At the end of the course, the students should be able to

VAC202-Ob1 Create and present a poster on a given topic.

Corresponding outcomes

The outcomes corresponding to the learning objective **VAC202-Ob1**, are

VAC202-CO1: Create a poster using a presentation software.

VAC202-CO2: Present the poster with vocal clarity and confidence.

VAC202-CO3: Answer questions from the audience.

Content

Unit: 1	Credits: 1	Lecture hours: 30
Objectives mapped: VAC202-Ob1	Cognitive levels achieved through outcomes: Applying: VAC202-CO1 to VAC202-CO3	
PRESENTATION SOFTWARE MS POWERPOINT OR EQUIVALENT: Creating a poster using available templates. PRESENTATION SOFTWARE L^AT_EX: Creating a poster using tikzposter or beamerposter document classes. Language and vocabulary for presenting the poster: outline, summary, background, problem, materials, methods, and processes. Explaining and discussing data in the form of figures and tables. Understanding and answering questions from the audience.		

Suggested readings

1. `tikzposter` and `beamerposter` tutorials at <https://www.overleaf.com/learn/latex/Posters>.
2. PowerPoint tutorials at https://youtube.com/playlist?list=PLpQQipWcxwt_KvhjMTsADzon_GY_vBGRL&si=vJFkOC2XPq0XCTAU.
3. Anthony, L, *Presenting Research in Science and Engineering*, 2nd Ed, DTP Publishing, Tokyo, Japan, 2010.

6.4.2 Assessment

1. *Summative Assessment*: 50 marks, Assignment based.

6.4.3 Approval (23MATVAC202)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Snigdha Roy	Subhajit Paul	Subhajit Paul

SYLLABI FOR STATISTICS MINOR COURSES

7.1 23STAMIN101: Statistical Methods

7.1.1 Course description

<i>Course code:</i> 23STAMIN101				
<i>Course category:</i> Minor				
<i>Title of the course:</i> Statistical Methods				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
I / II	3(L)+1(P) = 4	5	75	2023

Prerequisites

Before attending the course, students should be familiar with

- basic arithmetic and algebraic calculations.
- coordinate geometry, concept of straight lines.

Objectives

At the end of the course, the students should be able to

STAMIN101-Ob1	Demonstrate the history of statistics and present the data in various forms.
STAMIN101-Ob2	Understand and analyse the concepts of central tendency and dispersion.
STAMIN101-Ob3	Apply the concept of correlation and regression for relating two or more related variables.
STAMIN101-Ob4	Analyse data to measure association of attributes.

Corresponding outcomes

The outcome corresponding to the learning objective [STAMIN101-Ob1](#), is

STAMIN101-CO1: Demonstrate the history of statistics and present the data in various forms.

The outcome corresponding to the learning objective [STAMIN101-Ob2](#), is

STAMIN101-CO2: Understand and analyse the concepts of central tendency and dispersion.

The outcome corresponding to the learning objective [STAMIN101-Ob3](#), is

STAMIN101-CO3: Apply the concept of correlation and regression for relating two or more related variables.

The outcome corresponding to the learning objective [STAMIN101-Ob4](#), is

STAMIN101-CO4: Analyse data to measure association of attributes.

Content

Unit: 1	Credits: 1	Lecture hours: 15
Objectives mapped: STAMIN101-Ob1	Cognitive levels achieved through outcomes: Remembering: STAMIN101-CO1 Understanding: STAMIN101-CO1 Applying: STAMIN101-CO1	
TYPE OF DATA: Primary and secondary data, quantitative and qualitative data, nominal and ordinal data, cross section and time series data, discrete and continuous data. PRESENTATION OF DATA: Presentation by tables and by diagrams, construction of tables with one, two and three factors of classification, diagrammatic representations, frequency distributions for discrete and continuous data, representing distributions graphical by histogram and frequency polygon, stem & leaf and box-plot; cumulative frequency distributions (inclusive and representation of a frequency conclusive method and Ogive. Stem-leaf and Box-plot diagrams. Horizontal and vertical bar charts.		

Unit: 2	Credits: 1	Lecture hours: 15
Objectives mapped: STAMIN101-Ob2	Cognitive levels achieved through outcomes:	
	Remembering:	STAMIN101-CO2
	Understanding:	STAMIN101-CO2
	Applying:	STAMIN101-CO2
DESCRIPTIVE STATISTICS: Measure of central tendency; measures of dispersion, moments and quartiles, measure of skewness and kurtosis for both grouped and ungrouped data.		

Unit: 3	Credits: 1	Lecture hours: 20
Objectives mapped: STAMIN101-Ob3	Cognitive levels achieved through outcomes:	
	Remembering:	STAMIN101-CO3
	Understanding:	STAMIN101-CO3
	Applying:	STAMIN101-CO3
BIVARIATE ANALYSIS: Scatter diagram, regression, curve between two variables and concept of error in regression, principles of least squares; fitting of first, second and third degree. Concept of correlation coefficient and its properties.		

Unit: 4	Credits: 1	Lecture hours: 25
Objectives mapped: STAMIN101-Ob4	Cognitive levels achieved through outcomes:	
	Remembering:	STAMIN101-CO4
	Understanding:	STAMIN101-CO4
	Applying:	STAMIN101-CO4
ANALYSIS OF CATEGORICAL DATA: Fundamental set of frequencies, consistency of data; Measures of association and contingency-table; Association of attributes and various measurement of association; Analysis of data on two characters and three characters.		

List of practicals

Following problems are to be done using calculators, or spreadsheet programme software.

1. Charts and diagrams.
2. Grouping of data.
3. Preparation of Histogram, frequency polygon and ogive from a set of given data.
4. Measure of central tendency, dispersion, moments, skewness and kurtosis of frequency distribution.
5. Calculation of correlation co-efficient from bivariate data. Interpretation of data and diagram.
6. Calculation of Spearman's rank correlation co-efficient from qualitative data.
7. Fitting of regression line by least square method.

Suggested readings

1. Gun, A M, Gupta, M K and Dasgupta, B, *Fundamentals of Statistics (Volume One)*, World Press Private Ltd.
2. Gupta, S C and Kapoor, V K, *Fundamentals of Mathematical Statistics*, S Chand & Sons.

3. Bhattacharya, D and Roychowdhury, S, *Statistics – Theory and Practice*, U N Dhar Publications.
4. Mukherjee, A, *Fundamental Treatise On Probability And Statistics*, Shreetara Prakashani.
5. Kendall, M G and Stuart, A, *Advanced Theory of Statistics*, John Wiley & Sons Inc.
6. Gupta, S C, *Fundamentals of Statistics*, Himalaya Publishing House.

7.1.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*:
 - (a) *Theory examination*: 50 marks, 2 hours; weighed down to 50% (25 marks). Marks distribution as follows:
 - i. Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - ii. Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - iii. Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.
 - (b) *Practical examination*: 50 marks; weighed down to 50% (25 marks). Marks distribution as follows:
 - i. Lab report: 10 marks.
 - ii. Viva-voce: 10 marks.
 - iii. Solve three questions for 10 marks each, chosen randomly from a pool of ten questions. $10 \times 3 = 30$.

7.2 23STAMIN201: Fundamentals of Probability

7.2.1 Course description

<i>Course code:</i> 23STAMIN201				
<i>Course category:</i> Minor				
<i>Title of the course:</i> Fundamentals of Probability				
<i>Semester</i>	<i>Credits</i>	<i>Lecture hours in a week</i>	<i>Total lecture hours</i>	<i>Regulation year</i>
III / IV	3(L)+1(P) = 4	5	75	2023

Prerequisites

Before attending the course, students should be familiar with

- basic arithmetic and algebraic calculations.
- coordinate geometry, concept of straight lines.
- basic calculus.
- the course 23STAMIN101.

Objectives

At the end of the course, the students should be able to

STAMIN201-Ob1	Understand the preliminary ideas of probability.
STAMIN201-Ob2	Have the concept of random variables.
STAMIN201-Ob3	Manipulate different standard probability distributions of both discrete and continuous types.
STAMIN201-Ob4	Manipulate two dimensional random variables.
STAMIN201-Ob5	Have an idea about the mathematical expectation of random variables along with bivariate random variables.

Corresponding outcomes

The outcomes corresponding to the learning objective **STAMIN201-Ob1**, are

STAMIN201-CO1: Learn and understand the differences among different definitions of probability and apply various results therein.

STAMIN201-CO2: Demonstrate the use of Bayes' theorem in decision making.

The outcome corresponding to the learning objectives **STAMIN201-Ob2** and **STAMIN201-Ob3**, is

STAMIN201-CO3: Distinguish between a discrete and a continuous random variable.

The outcome corresponding to the learning objective **STAMIN201-Ob4**, is

STAMIN201-CO4: Demonstrate the concept of joint, marginal and conditional probability distributions and the bivariate transformations.

The outcome corresponding to the learning objective **STAMIN201-Ob5**, is

STAMIN201-CO5: State and prove various properties of expectation, variance and covariance.

Content

Unit: 1	Credits: 1	Lecture hours: 10
Objectives mapped: STAMIN201-Ob1	Cognitive levels achieved through outcomes: Understanding: STAMIN201-CO1 Applying: STAMIN201-CO2	

Concept of deterministic and non-deterministic experiments. Sample space, events. Definitions of Probability: classical, statistical, and axiomatic. Conditional Probability, independent events. Laws of addition and multiplication. Theorem of total probability, Bayes' theorem and its applications.

Unit: 2	Credits: 1	Lecture hours: 25
Objectives mapped: STAMIN201-Ob2 , STAMIN201-Ob3 and STAMIN201-Ob5	Cognitive levels achieved through outcomes: Understanding: STAMIN201-CO3 Applying: STAMIN201-CO5	
Random variables. Probability distributions: probability density and probability mass functions, cumulative distribution functions. Mathematical expectation in one and two dimensional distribution with its related results. Moments generating and characteristic functions, Cauchy-Schwartz inequality. Standard discrete probability distributions: Uniform, Geometric, Binomial, Poisson, and Hyper-geometric. Standard continuous probability distributions: Uniform, Gamma, Beta, Exponential and Normal. Transformation of random variables.		

Unit: 3	Credits: 1	Lecture hours: 10
Objectives mapped: STAMIN201-Ob4	Cognitive levels achieved through outcomes: Understanding: STAMIN201-CO4 Applying: STAMIN201-CO4	
Two dimensional Random variables and bi-variate distributions. Marginal and conditional distributions, independence of variables. Bivariate transformations with illustrations.		

List of practicals (Credit: 1)

Following problems are to be done using calculators.

1. Application problems based on binomial distribution.
2. Application problems based on Poisson distribution.
3. Problems based on area property of normal distribution.
4. Fitting of binomial distributions for given n .
5. Fitting of Poisson distributions.
6. Fitting of normal distribution when parameters are not given.
7. Approximation of hypergeometric distribution by binomial distribution.
8. Approximation of binomial distribution by Poisson distribution.
9. Approximation of Poisson distribution by Normal distribution.

Suggested readings

1. Gun, A M, Gupta, M K and Dasgupta, B, *Fundamentals of Statistics (Volume One)*, World Press Private Ltd.
2. Gupta, S C and Kapoor, V K, *Fundamentals of Mathematical Statistics*, S Chand & Sons.
3. Das, N G, *Statistical Methods*, Combined edition: volume 1 & 2, McGraw Hill Education.
4. Bhattacharya, D and Roychowdhury, S, *Statistics – Theory and Practice*, U N Dhar Publications.
5. Mukherjee, A, *Fundamental Treatise On Probability And Statistics*, Shreetara Prakashani.
6. Kendall, M G and Stuart, A, *Advanced Theory of Statistics*, John Wiley & Sons Inc.
7. Gupta, S C, *Fundamentals of Statistics*, Himalaya Publishing House.

7.2.2 Assessment

1. *Formative Assessment*: 50 marks, as per Assessment & Evaluation Framework Document of Salesian College.
2. *Summative Assessment*:
 - (a) *Theory examination*: 50 marks, 2 hours; weighed down to 50% (25 marks). Marks distribution as follows:
 - i. Five questions of 2 marks each, out of eight questions. Remembering and Understanding levels of Revised Bloom's Taxonomy (RBT). $2 \times 5 = 10$.
 - ii. Four questions of 5 marks each, out of six questions. Analysis, and Applying levels of RBT. $5 \times 4 = 20$.
 - iii. Two questions of 10 marks each, out of four questions. Analysis, Application and Evaluation levels of RBT. $10 \times 2 = 20$.
 - (b) *Practical examination*: 50 marks; weighed down to 50% (25 marks). Marks distribution as follows:
 - i. Lab report: 10 marks.
 - ii. Viva-voce: 10 marks.
 - iii. Solve three questions for 10 marks each, chosen randomly from a pool of ten questions. $10 \times 3 = 30$.

7.2.3 Approval (23STAMIN201)

(Prepared by) Course Faculty	(Checked and verified by) Head of the Dept	(Approved by) Dean
Manoj Ray Bakshi	Subhajit Paul	Subhajit Paul

APPROVAL BY BOS MEMBERS

The above syllabi are discussed thoroughly and found to be fit for the students in Semesters I – IV (Regulation year: 2023) in Mathematics Major, Mathematics Minor and Statistics Minor (as applicable) studying in Salesian College (Autonomous) Siliguri.

Subhajit Paul Vice Chairperson, BoS, Mathematics & Statistics	
Bikiran Das Secretary, BoS, Mathematics & Statistics	
Debdut Sengupta Member, BoS, Mathematics & Statistics	
Snigdha Roy Member, BoS, Mathematics & Statistics	
Manoj Ray Baksi Member, BoS, Mathematics & Statistics	
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Dr Bibaswan Dey Asst Prof, Dept of Mathematics, University of North Bengal (NBU); Nominated by Vice Chancellor (NBU), BoS, Mathematics & Statistics	
Anuj Kumar Bhagat Senior Research Fellow, Dept of Mathematics, IIT Delhi; Alumni Representative, BoS, Mathematics & Statistics	
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UNIVERSITY OF NORTH BENGAL

**Revised Syllabus for B.Sc. Three-year Honours/Programme Course
under CBCS**

in

MATHEMATICS

(w.e.f. 02.01.2023 and Onward Session)



**Raja Rammohunpur, P.O. - NBU Campus
District - Darjeeling, Pin - 734013, West Bengal, India**

SYLLABUS FOR B.SC. MATHEMATICS HONOURS & PROGRAMME
COURSE UNDER CBCS

OLD SYLLABUS		2018 B.SC. SYLLABUS IN MATHEMATICS HONS/PROG COURSE
NEW SYLLABUS		2023 REVISED B.SC. SYLLABUS IN MATHEMATICS HONS/PROG COURSE

SESSION	1 ST SEM	2 ND SEM	3 RD SEM	4 TH SEM	5 TH SEM	6 TH SEM
2018-2021						
2019-2022						
2020-2023						
2021-2024						
2022-2025						
ONWARDS						



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REVISED SYLLABUS FOR B.SC. MATHEMATICS HONOURS COURSE
UNDER CBCS SYSTEM 2023



CREDIT DISTRIBUTION

Sl. No.	Course Type	Total Papers	Credits		Marks
			Theory + Tutorial	Theory + Practical	
1	Core Courses (CC)	14	$(13 \times 5) + (13 \times 1) = 78$	----	75 (60 + 10 + 5)
			----	$(1 \times 4) + (1 \times 2) = 6$	75 (40 + 20 + 10 + 5)
2	Discipline Specific Electives (DSE)	4	$(4 \times 5) + (4 \times 1) = 24$	----	75 (60 + 10 + 5)
3	Generic Electives (GE)	4	$(4 \times 5) + (4 \times 1) = 24$	----	75 (60 + 10 + 5)
4	Skill Enhancement Courses (SEC)	2	$2 \times 2 = 4$	----	75 (60 + 10 + 5)
5	Ability Enhancement Language Courses (AE)	2	$2 \times 2 = 4$	----	100 (AE-I) (80 + 15 + 5) 50 (AE-II) (35 + 10 + 5)
Total		26	140		1950

SEMESTER-1				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATH 15 AE-I	AE-I	Eng. Com./EVS	2	----
MATH 11 HCC-I	HCC-I	Calculus and Geometry	5 + 1	1
MATH 11 HCC-II	HCC-II	Algebra	5 + 1	2
MATH 13 GE-I	GE-I	Other Department	5 + 1	----
SEMESTER-2				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATH 25 AE-II	AE-II	Eng. Com/EVS	2	----
MATH 21 HCC-III	HCC-III	Real Analysis	5 + 1	3
MATH 21 HCC-IV	HCC-IV	Differential Equation & Vector Calculus	5 + 1	4
MATH 23 GE-II	GE-II	Other Department	5 + 1	----
SEMESTER-3				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATH 31 HCC-V	HCC-V	Theory of Real Functions & Introduction of the Metric Space	5 + 1	5
MATH 31 HCC-VI	HCC-VI	Group Theory-I	5 + 1	6
MATH 31 HCC-VII	HCC-VII	Riemann Integration & Series of Functions	5 + 1	7
MATH 33 GE-III	GE-III	Other Department	5 + 1	----
MATH 34 SE-I	SEC-I	Logic & Sets/Graph Theory	2	8 - 9
SEMESTER-4				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATH 41 HCC-VIII	HCC-VIII	Multivariate Calculus	5 + 1	10
MATH 41 HCC-IX	HCC-IX	Ring Theory & Linear Algebra-I	5 + 1	11
MATH 41 HCC-X	HCC-X	Metric Spaces & Complex Theory	5 + 1	12
MATH 43 GE-IV	GE-IV	Other Department	5 + 1	----
MATH 44 SE-II	SEC-II	C Programming Language/ Operating System: Linux	2	13 – 14
SEMESTER-5				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATH 51 HCC-XI	HCC-XI	Group Theory-II	5 + 1	15
MATH 51 HCC-XII	HCC-XII	Numerical Methods + LAB	4 + 2	16-17
MATH 52 DSE-I	DSE-I	Probability & Statistics / Differential Geometry	5 + 1	18 – 19
MATH 52 DSE-II	DSE-II	Mechanics / Number Theory	5 + 1	20 – 21
SEMESTER-6				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATH 61 HCC-XIII	HCC-XIII	Ring Theory & Linear Algebra-II	5 + 1	22
MATH 61 HCC-XIV	HCC-XIV	Partial Differential Equations & Applications	5 + 1	23
MATH 62 DSE-III	DSE-III	Linear Programming / Point Set Topology	5 + 1	24 – 25
MATH 62 DSE-IV	DSE-IV	Mathematical Modelling/ Boolean Algebra & Automata Theory	5 + 1	26 – 27

DETAILED HONOURS SYLLABUS

Semester 1					
Course Name	Calculus and Geometry			Total Credit	5+1=6
Subject Course No.	MATH 11 HCC-I	Core Course	HCC-I	Total Marks	60+10+5=75

CALCULUS AND GEOMETRY

Unit 1 : Calculus

Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to the problems of the type $e^{ax+b} \sin x$, $e^{ax+b} \cos x$, $(ax + b)^n \sin x$, $(ax + b)^n \cos x$. L'Hospital's rule and its applications. Concept of plane, simple and closed curves, parameterizing a curve. Pedal equation, envelopes, evolute, asymptotes, radius of curvature, curve tracing in Cartesian and polar coordinates of standard curves. Concavity, convexity, cusps and inflection points.

Unit 2

Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x \, dx$, $\int \cos^n x \, dx$, $\int \sec^n x \, dx$, $\int \tan^n x \, dx$, $\int (\log x)^n \, dx$, $\sin \int \sin nx \cos mx \, dx$ etc. Arc length of a curve, arc length of parametric curves, area enclosed by a curve, area between two curves, area and volume of revolution.

Unit 3 : Geometry

2D: Reflection properties of conics, rotation of axes and second degree equations, classification of conics using the discriminant, tangent and normal, polar equations of conics.

Unit 4

3D: Spheres, cylindrical surfaces, central conicoids, paraboloids, hyperboloids, plane sections of conicoids, generating lines, classification of quadrics, illustrations of graphing standard quadric surfaces like cone, ellipsoid.

Reference Books

- G. B. Thomas and R. L. Finney, Calculus, 9th Ed., Pearson education, Delhi, 2005.
- M. J. Strauss, G. L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.
- H. Anton, I. Bivens and S. Davis, Calculus, 7th Ed., John Wiley and Sons (Asia) P. Ltd., Singapore, 2002.
- R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), Springer Verlag, New York, Inc., 1989.
- T. Apostol, Calculus, Volumes I and II.
- S. Goldberg, Calculus and mathematical analysis.
- The Elements of Co-ordinate Geometry: S. L. Loney (New Age International Publishers)
- Advanced Analytical Geometry: J. G. Chakravorty and P. R. Ghosh (U. N. Dhur and Sons)

Semester 1					
Course Name	Algebra			Total Credit	5+1=6
Subject Course No.	MATH 11 HCC-II	Core Course	HCC-II	Total Marks	60+10+5=75

ALGEBRA

Unit 1

Complex numbers: Polar representation, De Moivre's theorem for rational indices and its applications. Trigonometric, logarithm, exponential and hyperbolic functions of complex variable.

Theory of equations: Fundamental theorem of Classical Algebra (statement only), relation between roots and coefficients, symmetric functions of roots, transformation of equation, Descartes' rule of signs, Sturms' theorem, cubic equation (Cardan's method), biquadratic equation (Ferrari's method), graphical representation of a polynomial.

Inequality: $AM \geq GM \geq HM$, theorem of weighted means and m -th power theorem (statement only), Cauchy-Schwartz inequality (statements only) and its application.

Unit 2

Equivalence relations, partition, partially ordered relation, functions, composition of functions, permutations, even and odd permutations, invertible functions.

Well-ordering property of positive integers, principles of mathematical induction, division algorithm, divisibility and Euclidean algorithm, congruence relation between integers, Fundamental Theorem of Arithmetic (statement only), solution of linear congruence equations.

Unit 3

Matrices: Inverse of a matrix, characterizations of invertible matrices, elementary operations and matrices, echelon matrix, row/column reduced echelon matrix, rank of matrix, normal forms, equivalency and congruency of matrices. Eigen values and eigen vectors of a square matrix, characteristic equation of a matrix, Cayley-Hamilton theorem and its use in finding the inverse of a matrix.

Unit 4

Systems of linear equations: Consistency, the matrix equation $AX = B$ of a system of linear equations, solution sets of linear systems, solution of linear systems using row reduced form.

Reference Books

- T. Andreescu and D. Andrica, Complex Numbers from A to Z, Birkhauser, 2006.
- E. G. Goodaire and M. M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.
- D. C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.
- K. B. Dutta, Matrix and linear algebra.
- K. Hoffman, R. Kunze, Linear algebra.
- W. S. Burnstine and A. W. Panton, Theory of equations.

Semester 2					
Course Name	Real Analysis			Total Credit	5+1=6
Subject Course No.	MATH 21 HCC-III	Core Course	HCC-III	Total Marks	60+10+5=75

REAL ANALYSIS

Unit 1

Review of Algebraic and order properties of $\mathbb{R}$, ε -neighborhood of a point in $\mathbb{R}$. Idea of countable sets, uncountable sets and uncountability of $\mathbb{R}$. Bounded above sets, bounded below sets, bounded sets, unbounded sets. Suprema and infima. Completeness property of $\mathbb{R}$ and its equivalent properties. Archimedean property, density of rational (and irrational) numbers in $\mathbb{R}$, intervals. Limit points of a set, isolated points, open set, closed set, derived set, illustrations of Bolzano-Weierstrass theorem for sets, compact sets in $\mathbb{R}$, Heine-Borel Theorem.

Unit 2

Sequences: Sequence, bounded sequence, convergent sequence, limit of a sequence, $\liminf$, $\limsup$. Limit theorems. Monotone sequences, monotone convergence theorem. Subsequences, divergence criteria. Monotone subsequence theorem (statement only), Bolzano Weierstrass theorem for sequences. Cauchy sequence, Cauchy's convergence criterion.

Unit 3

Series: Infinite series, convergence and divergence of infinite series, Cauchy criterion, tests for convergence: comparison test, limit comparison test, ratio test, Cauchy's n th root test, integral test. Alternating series, Leibniz test. Absolute and conditional convergence.

Reference Books

- R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
- G. G. Bilodeau, P. R. Thie, G. E. Keough, An Introduction to Analysis, 2nd ed., Jones & Bartlett, 2010.
- B. S. Thomson, A. M. Bruckner and J. B. Bruckner, Elementary Real Analysis, Prentice Hall, 2001.
- S. K. Berberian, a First Course in Real Analysis, Springer Verlag, New York, 1994.
- T. Apostol, Mathematical Analysis, Narosa Publishing House.
- Courant and John, Introduction to Calculus and Analysis, Vol I, Springer.
- W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill.
- T. Tao, Analysis I, Hindustan Book Agency, 2006.
- S. Goldberg, Calculus and mathematical analysis.

Semester 2					
Course Name	Differential Equations and Vector Calculus			Total Credit	5+1=6
Subject Course No.	MATH 21 HCC-IV	Core Course	HCC-IV	Total Marks	60+10+5=75

DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

Unit 1 : Differential Equations

Differential equations and mathematical models. General, particular, explicit, implicit and singular solutions of a differential equation. Exact differential equations and integrating factors, separable equations and equations reducible to this form, linear equation and Bernoulli equations, special integrating factors and transformations.

General solution of homogeneous equation of second order, principle of super position for homogeneous equation, Wronskian: its properties and applications, Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation, method of undetermined coefficients, method of variation of parameters.

Unit 2

Systems of linear differential equations, types of linear systems, differential operators, an operator method for linear systems with constant coefficients. Basic theory of linear systems in normal form, homogeneous linear systems with constant coefficients: Two Equations in two unknown functions.

Unit 3

Lipschitz condition and Picard's Theorem (Statement only). Autonomous system, Equilibrium points, Interpretation of the phase plane.

Unit 4 : Vector Calculus

Triple product, introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions.

Reference Books

- B. Barnes and G. R. Fulford, Mathematical Modeling with Case Studies, A Differential Equation Approach using Maple and Matlab, Taylor and Francis, London and New York, 2009.
- C. H. Edwards and D. E. Penny, Differential Equations and Boundary Value problems Computing and Modeling, Pearson Education India, 2005.
- S. L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, India, 2004.
- M. L. Abell, James P Braselton, Differential Equations with MATHEMATICA, 3rd Ed., Elsevier Academic Press, 2004.
- D. Murray, Introductory Course in Differential Equations, Longmans Green and Co.
- Boyce and DiPrima, Elementary Differential equations and boundary Value problems, Wiley.
- G. F. Simmons, Differential Equations, Tata McGraw Hill.
- J. Marsden, and Tromba, Vector Calculus, McGraw Hill.
- K. C. Maity, and R. K. Ghosh, Vector Analysis, New Central Book Agency (P) Ltd. Kolkata.

Semester 3					
Course Name	Theory of Real Functions and Introduction to Metric Space			Total Credit	5+1=6
Subject Course No.	MATH 31 HCC-V	Core Course	HCC-V	Total Marks	60+10+5=75

THEORY OF REAL FUNCTIONS AND INTRODUCTION TO METRIC SPACE

Unit 1 : Theory of Real Functions

Limits of functions (ϵ - δ approach), sequential criterion for limits, divergence criteria. Limit theorems, one sided limits. Infinite limits and limits at infinity. Continuous functions, sequential criterion for continuity. Algebra of continuous functions. Continuous functions on an interval, intermediate value theorem, location of roots theorem, preservation of intervals theorem. Uniform continuity, non-uniform continuity criteria, uniform continuity theorem.

Unit 2

Differentiability of a function at a point and in an interval, Caratheodory's theorem, algebra of differentiable functions. Relative extrema, absolute extremum theorem. Rolle's theorem. Mean value theorem, intermediate value property of derivatives, darboux's theorem. Applications of mean value theorem to inequalities and approximation of polynomials.

Unit 3

Cauchy's mean value theorem. Taylor's theorem with Lagrange's form of remainder, Taylor's theorem with Cauchy's form of reminder, application of Taylor's theorem to convex functions. Taylor's series and Maclaurin's series expansions of exponential and trigonometric functions, $\log(1+x)$, $1/(ax+b)$ and $(x+1)^n$. Application of Taylor's theorem to inequalities.

Unit 4 : Introduction to Metric Space

Metric spaces: Definition and examples. Open and closed balls, neighbourhood, open set, interior of a set. Limit point of a set, closed set, diameter of a set, subspaces, dense sets, separable spaces. Sequences in metric spaces, Cauchy sequences. Complete metric spaces, Cantor's theorem.

Reference Books

- R. Bartle and D.R. Sherbert, Introduction to Real Analysis, John Wiley and Sons, 2003.
- K. A. Ross, Elementary Analysis : The Theory of Calculus, Springer, 2004.
- A. Mattuck, Introduction to Analysis, Prentice Hall, 1999.
- S. R. Ghorpade and B. V. Limaye, a Course in Calculus and Real Analysis, Springer, 2006.
- T. Apostol, Mathematical Analysis, Narosa Publishing House.
- Courant and John, Introduction to Calculus and Analysis, Voll II, Springer.
- W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill
- T. Tao, Analysis II, Hindustan Book Agency, 2006
- S Shirali and H. L. Vasudeva, Metric Spaces, Springer Verlag, London, 2006.
- S. Kumareasan, Topology of Metric Spaces, 2nd Ed., Narosa Publishing House, 2011.
- G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill, 2004.

Semester 3					
Course Name	Group Theory – I			Total Credit	5+1=6
Subject Course No.	MATH 31 HCC-VI	Core Course	HCC-VI	Total Marks	60+10+5=75

GROUP THEORY-I

Unit 1

Groupoid, semigroup, monoid, groups, commutative groups, elementary properties of groups, finite semigroup with cancellation properties is a group, semigroup containing unique solution of $ax = b$ and $xa = b$ is a group. Particularly, $\mathbb{Z}_n$ group, U_n group, Klein's 4 group, symmetric group S_n , alternating group A_n , matrix group $M_n(R)$, multiplicative group of n -th roots of unity, Dihedral group, quaternion group (through matrices) etc.

Unit 2

Subgroups and examples of subgroups, necessary and sufficient conditions for a subset of a group to be a subgroup, union and intersection of subgroups, centralizer, normalizer, center of a group, product of two subgroups.

Unit 3

Order of an element and a group. Generators, cyclic group and its properties, necessary and sufficient condition. Cosets, properties of cosets, Lagrange's theorem and consequences including Fermat's Little theorem, normal subgroups, factor/quotient groups, Cauchy's theorem for finite abelian groups, necessary and sufficient conditions for a subgroup of a group to be a normal subgroup.

Unit 4

Group homomorphisms, properties of homomorphisms, Cayley's theorem, properties of isomorphisms. First, Second and Third isomorphism theorems.

Reference Books

- J. B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- J. A. Gallian, Contemporary Abstract Algebra, Narosa Publishing House, New Delhi, 1999.
- J. J. Rotman, An Introduction to the Theory of Groups, 4th Ed., Springer Verlag, 1995.
- I. N. Herstein, Topics in Algebra, Wiley Eastern Limited, India, 1975.
- D. S. Malik, John M. Mordeson and M. K. Sen, Fundamentals of abstract algebra.

Semester 3					
Course Name	Riemann Integration and Series of Functions			Total Credit	5+1=6
Subject Course No.	MATH 31 HCC-VII	Core Course	HCC-VII	Total Marks	60+10+5=75

RIEMANN INTEGRATION AND SERIES OF FUNCTIONS

Unit 1

Riemann integration: inequalities of upper and lower sums, Darboux integration, Darboux theorem, Riemann conditions of integrability, Riemann sum and definition of Riemann integral through Riemann sums, equivalence of two definitions. Riemann integrability of monotone and continuous functions, properties of the Riemann integral; definition and integrability of piecewise continuous and monotone functions. Intermediate Value theorem for Integrals; Fundamental theorem of Integral Calculus.

Improper integrals. Convergence of Beta and Gamma functions.

Unit 2

Pointwise and uniform convergence of sequence of functions. Theorems on continuity, derivability and integrability of the limit function of a sequence of functions. Series of functions.

Theorems on the continuity and derivability of the sum function of a series of functions; Cauchy criterion for uniform convergence and Weierstrass M-Test.

Unit 3

Fourier series: Definitions of Fourier coefficients and series, Riemann Lebesgue lemma, Bessel's inequality, Parseval's identity, Dirichlet's condition. Examples of Fourier expansions and summation results for series.

Unit 4

Power series, radius of convergence, Cauchy Hadamard theorem. Differentiation and integration of power series, Abel's theorem, Weierstrass approximation theorem.

Reference Books

- K. A. Ross, Elementary Analysis, The Theory of Calculus, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
- R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
- C. G. Denlinger, Elements of Real Analysis, Jones & Bartlett (Student Edition), 2011.
- S. Goldberg, Calculus and mathematical analysis.
- S. Narayan, Integral calculus.
- T. Apostol, Calculus I, II.

Semester 3					
Course Name	Logic and Sets			Total Credit	2
Subject Course No.	MATH 34 SEC-I	Skill Enhancement Course	SEC-I	Total Marks	60+10+5=75

LOGIC AND SETS

Unit 1 : Logic

Introduction, propositions, truth table, logical connectives: Negation, conjunction, disjunction, implications. Biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators. Propositional equivalence: Logical equivalences. Predicates and quantifiers: Introduction, quantifiers, binding variables and negations.

Unit 2 : Sets

The natural number sequence, Proof and definition by induction, cardinal numbers, countable sets, cardinal arithmetic, order types, well-ordered sets and ordinal numbers, the axiom of choice, the well-ordering theorem, and Zorn's lemma, further properties of cardinal numbers, Some theorems equivalent to the axiom of choice.

Reference Books

- R.P. Grimaldi, Discrete Mathematics and Combinatorial Mathematics, Pearson Education, 1998.
- P.R. Halmos, Naive Set Theory, Springer, 1974.
- E. Kamke, Theory of Sets, Dover Publishers, 1950.
- R. P. Grimaldi, Discrete Mathematics and Combinatorial Mathematics, Pearson Educ., 1998.
- R. R. Stoll, Set Theory and Logic, Dover Publishers, 1979.

OR

Semester 3					
Course Name	Graph Theory			Total Credit	2
Subject Course No.	MATH 34 SEC-I	Skill Enhancement Course	SEC-I	Total Marks	60+10+5=75

GRAPH THEORY

Unit 1

Definition, examples and basic properties of graphs, pseudo graphs, complete graphs, bipartite graphs, isomorphism of graphs. Trees and forests, paths and cycles.

Unit 2

Eulerian circuits, Eulerian graph, semi-Eulerian graph, theorems, Hamiltonian cycles, theorems. Representation of a graph by matrix, the adjacency matrix, incidence matrix, weighted graph.

Unit 3

Travelling salesman's problem, shortest path, Tree and their properties, spanning tree, Dijkstra's algorithm, Warshall algorithm. Connectivity, matching in bipartite graphs, matching in general graphs.

Reference Books

- B.A. Davey and H.A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
- E. G. Goodaire and M. M. Parmenter, Discrete Mathematics with Graph Theory, 2nd Edition, Pearson Education (Singapore) P. Ltd., Indian Reprint 2003.
- R. Lidl and G. Pilz, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
- N. Deo, Graph Theory with Applications to Engineering and Computer Science, Prentice-Hall of India Pvt. Ltd., New Delhi.
- R. Diestel, Graph Theory, Springer-Verlag, 2000.

Semester 4					
Course Name	Multivariate Calculus			Total Credit	5+1=6
Subject Course No.	MATH 41 HCC-VIII	Core Course	HCC-VIII	Total Marks	60+10+5=75

MULTIVARIATE CALCULUS

Unit 1

Functions of several variables, limit and continuity of functions of two or more variables

Partial differentiation, total differentiability and differentiability, sufficient condition for differentiability. Chain rule for one and two independent parameters, directional derivatives, the gradient, maximal and normal property of the gradient, tangent planes, extrema of functions of two variables, method of Lagrange multipliers, constrained optimization problems.

Unit 2

Double integration over rectangular region, double integration over non-rectangular region, double integrals in polar co-ordinates, triple integrals, triple integral over a parallelepiped and solid regions. Volume by triple integrals, cylindrical and spherical co-ordinates. Change of variables in double integrals and triple integrals.

Unit 3

Definition of vector field, divergence and curl.

Line integrals, applications of line integrals: mass and work. Fundamental theorem for line integrals, conservative vector fields, independence of path.

Unit 4

Green's theorem, surface integrals, integrals over parametrically defined surfaces. Stoke's theorem, Divergence theorem.

Reference Books

- G. B. Thomas and R. L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005.
- M. J. Strauss, G.L. Bradley and K. J. Smith, Calculus, 3rd Ed., D. K. (India) Pvt. Ltd., Delhi, 2007.
- E. Marsden, A. J. Tromba and A. Weinstein, Basic Multivariable Calculus, Springer (SIE), 2005.
- J. Stewart, Multivariable Calculus, Concepts and Contexts, Brooks/ Cole, Learning, USA, 2001.
- T. Apostol, Mathematical Analysis, Narosa Publishing House.
- Courant and John, Introduction to Calculus and Analysis, Vol II, Springer.
- W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill.
- J. Marsden and Tromba, Vector Calculus, McGraw Hill.
- K. C. Maity and R. K. Ghosh, Vector Analysis, New Central Book Agency(P) Ltd. Kolkata (India).
- T. Tao, Analysis II, Hindustan Book Agency, 2006.
- M. R. Spiegel, Schaum's outline of Vector Analysis.

Semester 4					
Course Name	Ring Theory and Linear Algebra-I			Total Credit	5+1=6
Subject Course No.	MATH 41 HCC-IX	Core Course	HCC-IX	Total Marks	60+10+5=75

RING THEORY AND LINEAR ALGEBRA-I

Unit 1 : Ring Theory

Definition and examples of rings, properties of rings, subrings, integral domains and fields. Necessary and sufficient conditions for subrings and subfields. Characteristics of a ring. Ideal, ideal generated by a subset of a ring, operations on ideals, prime and maximal ideals, factor/ quotient rings.

Unit 2

Ring homomorphisms, properties of ring homomorphisms. Isomorphism theorems I, II and III.

Unit 3 : Linear Algebra

Vector spaces, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, basis and dimension, existence; extension and replacement theorems for basis of a finite dimensional vector space.

Unit 4

Linear transformations, null space, range space, rank and nullity of a linear transformation, matrix representation of a linear transformation relative to ordered bases, algebra of linear transformations, correspondence between LTs and matrices. Linear transformation is non-singular if its representation matrix is non-singular. Invertibility and isomorphisms, isomorphism theorems, change of coordinate matrix.

Reference Books

- J. B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- S. H. Friedberg, A. J. Insel, Lawrence E. Spence, Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004.
- J. A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, New Delhi, 1999.
- S. Lang, Introduction to Linear Algebra, 2nd Ed., Springer, 2005.
- G. Strang, Linear Algebra and its Applications, Thomson, 2007.
- S. Kumaresan, Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.
- K. Hoffman, R. A. Kunze, Linear Algebra, Prentice – Hall of India Pvt. Ltd., 1971.
- D. A. R. Wallace, Groups, Rings and Fields, Springer Verlag London Ltd., 1998.
- D. S. Malik, J. M. Mordeson and M. K. Sen, Fundamentals of Abstract Algebra.

Semester 4					
Course Name	Metric Spaces and Complex Analysis			Total Credit	5+1=6
Subject Course No.	MATH 41 HCC-X	Core Course	HCC-X	Total Marks	60+10+5=75

METRIC SPACES AND COMPLEX ANALYSIS

Unit 1 : Metric Spaces

Continuous mapping, sequential criterion and other characterizations of continuity. Uniform continuity. Connectedness, connected subsets of $\mathbb{R}$.

Compactness: Sequential compactness, Heine-Borel property, totally bounded spaces, finite intersection property and continuous functions on compact sets.

Homeomorphism. Contraction mappings. Banach fixed point theorem and its application to ordinary differential equation.

Unit 2 : Complex Analysis

Limits, limits involving the point at infinity, continuity. Properties of complex numbers, regions in the complex plane, functions of complex variable, mappings.

Derivatives, differentiation formulas, Cauchy-Riemann equations, sufficient conditions for differentiability.

Unit 3

Analytic functions, examples of analytic functions, derivatives of functions, and definite integrals of functions. Contours, Contour integrals and its examples, upper bounds for moduli of contour integrals. Cauchy-Goursat theorem, Cauchy integral formula.

Unit 4

Liouville's theorem and the fundamental theorem of algebra. Convergence of sequences and series, Taylor series and its examples.

Unit 5

Laurent series and its examples, absolute and uniform convergence of power series.

Reference Books

- S. Shirali and H. L. Vasudeva, Metric Spaces, Springer Verlag, London, 2006.
- S. Kumaresan, Topology of Metric Spaces, 2nd Ed., Narosa Publishing House, 2011.
- G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill, 2004.
- J. W. Brown and R. V. Churchill, Complex Variables and Applications, McGraw-Hill Int. Edi. 2009.
- J. Bak and D. J. Newman, Complex Analysis, 2nd Ed., Undergraduate texts in Mathematics, Springer-Verlag New York, Inc., New York, 1997.
- S. Ponnusamy, Foundations of Complex analysis.
- E. M. Stein and R. Shakrachi, Complex Analysis, Princeton University Press.

Semester 4					
Course Name	C Programming Language			Total Credit	2
Subject Course No.	MATH 44 SEC-II	Skill Enhancement Course	SEC-II	Total Marks	60+10+5=75

C PROGRAMMING LANGUAGE

Unit 1

An overview of history of computers and architecture of computer. Concept of compiler, assembler, machine language, high level language, object-oriented language, programming language and importance of C programming.

Unit 2

Characters, Constants and variables data types. Expression, statements, declaration. Operators: Arithmetic operators, increment and decrement operators, relational operators, logical operators, assignment operators, conditional operators.

Unit 3

Conditional control statements: If, if-else, nested if-else statements. Switch, break and continue statements. Loop control statements: For, while and do-while statements.

Unit 4

Arrays, One-dimension, two-dimension and multidimensional arrays, declaration and type of arrays. Reading and displaying elements of arrays.

User-defined Functions: Function Prototype, Definition of functions, Type of functions, local and global variables in a function, type of return values, function declaration, nesting of functions, main () function, recurrence of function. Library functions, e.g. stdio.h, math.h, string.h, stdlib.h, etc. No arguments and no return values, arguments but no return values, arguments with return values, no arguments but returns a value.

Reference Books

- B. W. Kernighan and D. M. Ritchi : The C-Programming Language, 2nd Edi.(ANSI Refresher), Prentice Hall, 1977.
- E. Balagurnsamy : Programming in ANSI C, Tata McGraw Hill, 2004.
- Y. Kanetkar : Let Us C ; BPB Publication, 1999.
- C. Xavier : C-Language and Numerical Methods, New Age International.
- V. Rajaraman : Computer Oriented Numerical Methods, Prentice Hall of India, 1980.

OR

Semester 4					
Course Name	Operating System: Linux			Total Credit	2
Subject Course No.	MATH 44 SEC-II	Skill Enhancement Course	SEC-II	Total Marks	60+10+5=75

OPERATING SYSTEM: LINUX

Unit 1

Linux – The operating system: Linux history, Linux features, Linux distributions, Linux's relationship to Unix, overview of Linux architecture, installation, start up scripts, system processes (an overview), Linux security.

Unit 2

The Ext2 and Ext3 file systems: General characteristics of the Ext3 file system, file permissions. User management: types of users, the powers of root, managing users (adding and deleting): using the command line and GUI tools.

Unit 3

Resource management in Linux: file and directory management, system calls for files process Management, signals, IPC: Pipes, FIFOs, System V IPC, message queues, system calls for processes, memory management.

Reference Books

- A. Robbins, Linux Programming by Examples The Fundamentals, 2nd Ed., Pearson Education, 2008.
- K. Cox, Red Hat Linux Administrator's Guide, PHI, 2009.
- R. Stevens, UNIX Network Programming, 3rd Ed., PHI, 2008.
- S. Das, UNIX Concepts and Applications, 4th Ed., TMH, 2009.
- E. Siever, S. Figgins, R. Love, A. Robbins, Linux in a Nutshell, 6th Ed., O'Reilly Media, 2009.
- N. Matthew, R. Stones, A. Cox, Beginning Linux Programming, 3rd Ed., 2004.

Semester 5					
Course Name	Group Theory-II			Total Credit	5+1=6
Subject Course No.	MATH 51 HCC-XI	Core Course	HCC-XI	Total Marks	60+10+5=75

GROUP THEORY-II

Unit 1

Automorphism, inner automorphism, automorphism groups, automorphism groups of finite and infinite cyclic groups, applications of factor groups to automorphism groups, Characteristic subgroups, Commutator subgroup and its properties.

Unit 2

External and internal direct product of groups and its properties. The group of units modulo n as an external direct product, converse of Lagrange's theorem for finite Abelian group, Fundamental theorem of finite abelian groups.

Unit 3

Group actions, stabilizers and kernels, permutation representation associated with a given group action. Applications of group actions. Generalized Cayley's theorem. Index theorem.

Unit 4

Groups acting on themselves by conjugation, class equation and consequences, conjugacy in S_n , p -groups, Sylow's theorems and consequences, Cauchy's theorem, Simplicity of A_n for $n \geq 5$, non-simplicity tests.

Reference Books

- J. B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- J. A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, 1999.
- D. S. Dummit and R. M. Foote, Abstract Algebra, John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2004.
- J. R. Durbin, Modern Algebra, John Wiley & Sons, New York Inc., 2000.
- D. A. R. Wallace, Groups, Rings and Fields, Springer Verlag London Ltd., 1998.
- D.S. Malik, John M. Mordeson and M.K. Sen, Fundamentals of abstract algebra.
- I. N. Herstein, Topics in Algebra, Wiley Eastern Limited, India, 1975.

Semester 5					
Course Name	Numerical Methods			Total Credit	4
Subject Course No.	MATH 51 HCC-XII	Core Course	HCC-XII	Total Marks	40+10+5=55

NUMERICAL METHODS

Unit 1

Algorithms. Convergence. Errors: Absolute, relative, percentage, inherent, round off, truncation errors. Significant figures approximate number. Operators: Δ , ∇ , μ , E , δ .

Unit 2

Transcendental and polynomial equations: Bisection method, secant method, Regula-falsi method, fixed point iteration, Newton-Raphson method for simple and multiple roots. Rate of convergence and conditions of convergence of these methods.

Unit 3

System of linear algebraic equations: Gaussian elimination and Gauss Jordan methods. Gauss Jacobi method, Gauss Seidel method and their convergence analysis. LU decomposition.

Unit 4

Interpolation: Lagrange and Newton's methods. Error bounds. Finite difference operators. Gregory forward and backward difference interpolation. Numerical differentiation: Methods based on interpolations, methods based on finite differences.

Unit 5

Numerical Integration: Newton Cotes formula, Trapezoidal rule, Simpson's 1/3rd rule, Simpsons 3/8th rule, Weddle's rule, Composite trapezoidal rule, composite Simpson's 1/3rd rule, Gauss quadrature formula, Romberg integration.

The algebraic eigen value problem: Power method.

Unit 6

Ordinary differential equations: The method of successive approximations, Euler's method, the modified Euler method, Runge-Kutta methods of orders 2 (for order 4 statement only).

Reference Books

- B. Bradie, A Friendly Introduction to Numerical Analysis, Pearson Education, India, 2007.
- M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, 6th Ed., New age International Publisher, India, 2007.
- C.F. Gerald and P.O. Wheatley, Applied Numerical Analysis, Pearson Education, India, 2008.
- U. M. Ascher and C. Greif, A First Course in Numerical Methods, 7th Ed., PHI Learning Private Limited, 2013.

Semester 5					
Course Name	Numerical Methods LAB			Total Credit	2
Subject Course No.	MATH 51 HCC-XII	Core Course	HCC-XII	Total Marks	20

NUMERICAL METHODS LAB **(PRACTICAL)**

1. Solution of transcendental and algebraic equations by

- a) Bisection method
- b) Newton Raphson method (for simple root).
- c) Secant method.
- d) Regula Falsi method.

2. Solution of system of linear equations

- a) Gaussian elimination method
- b) Gauss-Jacobi method
- c) Gauss-Seidel method

3. Interpolation

- a) Lagrange Interpolation
- b) Newton Forward and Backward Interpolation

4. Numerical Integration

- a) Trapezoidal Rule
- b) Simpson's one third rule
- c) Weddle's Rule
- d) Gauss Quadrature

5. Solution of ordinary differential equations

- a) Euler method
- b) Modified Euler method
- c) Runge-Kutta method (4th order only)

Semester 5					
Course Name	Probability and Statistics			Total Credit	5+1=6
Subject Course No.	MATH 52 DSE-I	Discipline Specific Electives	DSE-I	Total Marks	60+10+5=75

PROBABILITY AND STATISTICS

Unit 1 : Probability

Sample space, probability axioms, real random variables (discrete and continuous), cumulative distribution function, probability mass/density functions, mathematical expectation, moments, moment generating function, characteristic function. Discrete distributions: Uniform, binomial, Poisson, geometric, negative binomial. Continuous distributions: Uniform, normal, exponential.

Unit 2

Joint cumulative distribution function and its properties, joint probability density functions, marginal and conditional distributions, expectation of function of two random variables, conditional expectations, independent random variables, bivariate normal distribution. Correlation coefficient, joint moment generating function (jmgf) and calculation of covariance (from jmgf). Linear regression for two variables.

Unit 3

Chi-square, t-distributions and their properties (statement only), Chebyshev's inequality, statement and interpretation of (weak) law of large numbers and strong law of large numbers. Central limit theorem for independent and identically distributed random variables with finite variance.

Unit 4 : Statistics

Sampling Distributions: Sample moments. Sample variance, Sampling from the normal distributions, Chi-square and t-distributions.

Estimation of parameters: Point estimation. Interval Estimation: Confidence intervals for mean and variance of normal population. Method of Maximum likelihood: Likelihood function, ML estimators for discrete and continuous models.

Statistical hypothesis: Simple and composite hypotheses, null hypotheses, alternative hypotheses. Best critical region of a test, type-I and type-II errors, level of significance. Neyman-Pearson theorem (statement only) and its application to normal population. Likelihood ratio testing.

Reference Books

- R. V. Hogg, J. W. McKean and A. T. Craig, Introduction to Mathematical Statistics, Pearson Education, Asia, 2007.
- I. Miller and M. Miller, J. E. Freund, Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia, 2006.
- S. Ross, Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007.
- A. M. Mood, F. A. Graybill and Duane C. Boes, Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007.
- A. Gupta, Ground work of Mathematical Probability and Statistics, Academic publishers.

OR

Semester 5					
Course Name	Differential Geometry			Total Credit	5+1=6
Subject Course No.	MATH 52 DSE-I	Discipline Specific Electives	DSE-I	Total Marks	60+10+5=75

DIFFERENTIAL GEOMETRY

Unit 1

Theory of curves: Parametrization and reparametrization of curves, plane curves, space curves, regular curves, curvature, torsion and relation between curvature and torsion, Serret-Frenet formula. Osculating plane, osculating circles and osculating spheres. Evolutes and involutes of curves.

Unit 2

Theory of surfaces: Regular surfaces, tangent plane, First and second Fundamental forms. Principal and Gaussian curvatures. Rodrigue's formula. Conjugate and asymptotic lines.

Unit 3

Developable: Developable associated with space curves and curves on surfaces. Minimal surfaces. Geodesics: Canonical geodesic equations. Nature of geodesics on a surface of revolution. Clairaut's theorem. Normal property of geodesics. Geodesic curvature. Gauss-Bonnet theorem.

Reference Books

- A. Pressley, Elementary Differential Geometry, Springer, 2012.
- T. J. Willmore, An Introduction to Differential Geometry, Dover Publications, 2012.
- B. O'Neill, Elementary Differential Geometry, 2nd Ed., Academic Press, 2006.
- C. E. Weatherburn, Differential Geometry of Three Dimensions, Cambridge University Press 2003.
- D. J. Struik, Lectures on Classical Differential Geometry, Dover Publications, 1988.
- S. Lang, Fundamentals of Differential Geometry, Springer, 1999.
- B. Spain, Tensorh. Calculus: A Concise Course, Dover Publications, 2003.

Semester 5					
Course Name	Mechanics			Total Credit	5+1=6
Subject Course No.	MATH 52 DSE-II	Discipline Specific Electives	DSE-II	Total Marks	60+10+5=75

MECHANICS

Unit 1

Co-planar forces. Astatic equilibrium. Friction. Equilibrium of a particle on a rough curve. Virtual work. Forces in three dimensions. General conditions of equilibrium. Centre of gravity for different bodies. Stable and unstable equilibrium.

Unit 2

Equations of motion referred to a set of rotating axes. Motion of a projectile in a resisting medium. Stability of nearly circular orbits. Motion under the inverse square law. Slightly disturbed orbits. Motion of artificial satellites. Motion of a particle in three dimensions. Motion on a smooth sphere, cone and on any surface of revolution.

Unit 3

Degrees of freedom. Moments and products of inertia. Momental Ellipsoid. Principal axes. D'Alembert's principle. Motion about a fixed axis. Compound pendulum. Motion of a rigid body in two dimensions under finite and impulsive forces. Conservation of momentum and energy.

Reference Books

- I. H. Shames and G. Krishna Mohan Rao, Engineering Mechanics: Statics and Dynamics, (4th Ed.), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2009.
- R. C. Hibbeler and Ashok Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
- F. Chorlton, Textbook of Dynamics.
- S. L. Loney, An Elementary Treatise on the Dynamics of particle and of Rigid Bodies, Loney Press.
- S. L. Loney, S. L., Elements of Statics and Dynamics I and II.

OR

Semester 5					
Course Name	Number Theory			Total Credit	5+1=6
Subject Course No.	MATH 52 DSE-II	Discipline Specific Electives	DSE-II	Total Marks	60+10+5=75

NUMBER THEORY

Unit 1

Euclidean Algorithm for GCD, linear representation of GCD. Prime numbers, Fundamental Theorem of Arithmetic and its consequences. Linear Diophantine Equation. Gaussian integers, Divisibility and primes in $\mathbb{Z}$ and $\mathbb{Z}[i]$.

Unit 2

Linear congruences, Chinese Remainder Theorem. Inverse modulo a prime, Fermats' Little Theorem, congruence theorem of Wilson and Lagrange.

Unit 3

Primitive roots, Quadratic residues, Legendre symbol, Quadratic reciprocity law, Pythagorean triples, Fermat's Two Square Theorem.

Reference Books

- J. Stillwell, Elements of Number Theory, Springer, 2003.
- Niven and Zuckerman An introduction to theory of numbers, Wiley 1991.
- D. M. Burton, Elementary Number Theory, 6th Ed., Tata McGraw-Hill, Indian reprint, 2007.
- N. Robinns, Beginning Number Theory, Narosa Publishing House Pvt. Ltd., Delhi, 2007.

Semester 6					
Course Name	Ring Theory and Linear Algebra-II			Total Credit	5+1=6
Subject Course No.	MATH 61 HCC-XIII	Core Course	HCC-XIII	Total Marks	60+10+5=75

RING THEORY AND LINEAR ALGEBRA-II

Unit 1

Irreducible and prime elements, divisibility in integral domains, Euclidean domains, principal ideal domains, unique factorization domains and their relations. Greatest common divisor and least common multiple.

Polynomial rings over commutative rings, division algorithm and consequences, factorization of polynomials, irreducibility tests, Eisenstein criterion and unique factorization in $\mathbb{Z}[x]$.

Unit 2

Dual spaces, dual basis, double dual, transpose of a linear transformation and its matrix in the dual basis, annihilators. Eigen spaces of a linear operator, diagonalizability, invariant subspaces and Cayley-Hamilton theorem, the minimal polynomial for a linear operator, canonical forms.

Unit 3

Inner product spaces and norms, Gram-Schmidt orthogonalisation process, orthogonal complements, Bessel's inequality, the adjoint of a linear operator. Least squares approximation, minimal solutions to systems of linear equations. Normal and self-adjoint operators. Orthogonal projections and Spectral theorem.

Reference Books

- J. B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- J. A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, 1999.
- S. H. Friedberg, A. J. Insel, Lawrence E. Spence, Linear Algebra, 4th Ed., Prentice- Hall of India Pvt. Ltd., New Delhi, 2004.
- S. Lang, Introduction to Linear Algebra, 2nd Ed., Springer, 2005.
- G. Strang, Linear Algebra and its Applications, Thomson, 2007.
- S. Kumaresan, Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.
- K. Hoffman, R. A. Kunze, Linear Algebra, Prentice-Hall of India Pvt. Ltd., 1971.
- S.H. Friedberg, A.L. Insel and L.E. Spence, Linear Algebra, Prentice Hall of India Pvt. Ltd., 2004.

Semester 6					
Course Name	Partial Differential Equations and Applications			Total Credit	5+1=6
Subject Course No.	MATH 61 HCC-XIV	Core Course	HCC-XIV	Total Marks	60+10+5=75

PARTIAL DIFFERENTIAL EQUATIONS AND APPLICATIONS

Unit 1

Partial differential equations – Basic concepts and definitions. Mathematical problems. First- order equations: classification, construction and geometrical interpretation. Method of characteristics for obtaining general solution of quasi linear equations. Canonical forms of first order linear equations. Method of separation of variables for solving first order partial differential equations.

Unit 2

Derivation of heat equation, wave equation and Laplace equation. Classification of second order linear equations as hyperbolic, parabolic or elliptic. Reduction of second order linear equations to canonical forms.

Unit 3

The Cauchy problem, Cauchy-Kowalewskaya theorem, Cauchy problem of an infinite string. Initial boundary value problems. Semi-infinite string with a fixed end, semi-infinite string with a free end. Equations with non-homogeneous boundary conditions. Non-homogeneous wave equation. Method of separation of variables, solving the vibrating string problem. Solving the heat conduction problem

Unit 4

Central force. Constrained motion, varying mass, tangent and normal components of acceleration, modelling ballistics and planetary motion, Kepler's second law.

Reference Books

- T. Myint-U and L. Debnath, Linear Partial Differential Equations for Scientists and Engineers, 4th edition, Springer, Indian reprint, 2006.
- S.L. Ross, Differential equations, 3rd Ed., John Wiley and Sons, India, 2004.
- M. L Abell, James P Braselton, Differential equations with MATHEMATICA, 3rd Ed., Elsevier Academic Press, 2004.
- I. N. Sneddon, Elements of Partial Differential Equations, McGraw Hill.
- F. H. Miller, Partial Differential Equations, John Wiley and Sons.
- S. L. Loney, An Elementary Treatise on the Dynamics of particle and of Rigid Bodies, Loney Press.

Semester 6					
Course Name	Linear Programming			Total Credit	5+1=6
Subject Course No.	MATH 62 DSE-III	Discipline Specific Electives	DSE-III	Total Marks	60+10+5=75

LINEAR PROGRAMMING

Unit 1

Introduction to linear programming problem (LPP), Problem formation, Type of solutions: Basic solution (BS), feasible solution (FS), basic feasible solution (BFS), degenerate and non-degenerate BFS. Matrix notation of LPP, graphical solution of LPP.

Unit 2

Theory of simplex method, convex sets, optimality and unboundedness, the simplex algorithm, simplex method in tableau format, introduction to artificial variables. Two-phase method, Big-M method and their comparison.

Duality, formulation of the dual problem, primal-dual relationships, economic interpretation of the dual.

Unit 4

Transportation and assignment problems: Mathematical formulation. North-west corner method, Least cost method and Vogel approximation method for determination of solution. Algorithm for solving transportation problem. Hungarian method for solving assignment problem.

Unit 4

Game theory: Formulation of two-person zero sum games, solving two-person zero sum games, games with mixed strategies, graphical solution procedure, linear programming solution of games.

Reference Books

- M. S. Bazaraa, J. J. Jarvis and H. D. Sherali, Linear Programming and Network Flows, 2nd Ed., John Wiley and Sons, India, 2004.
- F.S. Hillier and G.J. Lieberman, Introduction to Operations Research, 9th Ed., Tata McGraw Hill, Singapore, 2009.
- H. A. Taha, Operations Research, An Introduction, 8th Ed., Prentice-Hall India, 2006.
- G. Hadley, Linear Programming, Narosa Publishing House, New Delhi, 2002.

OR

Semester 6					
Course Name	Point Set Topology			Total Credit	5+1=6
Subject Course No.	MATH 62 DSE-III	Discipline Specific Electives	DSE-III	Total Marks	60+10+5=75

POINT SET TOPOLOGY

Unit 1

Countable and Uncountable Sets, Schroeder-Bernstein Theorem, Cantor's Theorem. Cardinal numbers and cardinal arithmetic. Continuum Hypothesis, Zorns Lemma, Axiom of Choice. Well-ordered sets, Hausdorff's maximal principle.

Unit 2

Topological spaces, basis and Sub basis for a topology, subspace topology, interior points, limit points, derived set, boundary of a set, closed sets, closure and interior of a set. Continuous functions, open maps, closed maps and homeomorphisms. Product topology, metric topology, Baire category theorem.

Unit 3

Connectedness. Distinguishing topological spaces via connectedness, intermediate value theorem, path connectedness, compact spaces, compact subspaces of the real line, limit point compactness.

Reference Books

- J. R. Munkres, Topology: A First Course, Prentice Hall of India Pvt. Ltd., New Delhi, 2000.
- J. Dugundji, Topology, Allyn and Bacon, 1966.
- G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw Hill, 1963.
- J. L. Kelley, General Topology, Van Nostrand Reinhold Co., New York, 1955.
- J. Hocking, G. Young, Topology, Addison-Wesley Reading, 1961.
- L. Steen, J. Seebach, Counter Examples in Topology, Holt, Reinhart and Winston, New York, 1970.
- Adams and Franzosa, Introduction to topology, Pearson 2008.

Semester 6					
Course Name	Mathematical Modelling			Total Credit	5+1=6
Subject Course No.	MATH 62 DSE-IV	Discipline Specific Electives	DSE-IV	Total Marks	60+10+5=75

MATHEMATICAL MODELLING

Unit 1

Functions, modelling with linear and exponential functions. Average rate of change, linear functions with applications, Piecewise-linear functions with applications. Fitting linear models to data. Exponential growth functions with applications, Growth factors and rates, doubling time. Compound interest, Exponential decay functions with applications. Fitting exponential models to data, Decay factors and rates, Half-life. Modeling with logarithmic and polynomial functions, Logarithmic functions with applications, Fitting logarithmic models to data, Maxima and minima applications.

Unit 2

Introduction to continuous time models, limitations & advantages of the discrete-time model, the need for continuous time models, Continuous time models: the model for the growth of microorganisms, chemostat; Stability and linearization methods for system of ODE's.

Unit 3

Power series solution of Bessel's equation and Legendre's equation, Laplace transform and inverse transform, application to initial value problem up to second order.

Unit 4

Monte Carlo simulation modelling: simulating deterministic behavior (area under a curve, volume under a surface), generating random numbers: middle square method, queuing models. Overview of optimization modelling.

References Books

- T. Myint and L. Debnath, Linear Partial Differential Equation for Scientists and Engineers, Springer, Indian reprint, 2008.
- J. N. Kapoor, Mathematical Modelling, New Age International Pvt Ltd Publishers, 2011.
- K. Kamalanand and P. M. Jawahar, Mathematical Modelling of Systems and Analysis, PHI Learning Pvt Ltd, 2018.
- F. R. Giordano, W. P. Fox, S. B. Horton, A First Course in Mathematical Modeling, Brooks/Cole Cengage Learning, USA, 2013.

OR

Semester 6					
Course Name	Boolean Algebra and Automata Theory			Total Credit	5+1=6
Subject Course No.	MATH 62 DSE-IV	Discipline Specific Electives	DSE-IV	Total Marks	60+10+5=75

BOOLEAN ALGEBRA AND AUTOMATA THEORY

Unit 1 : Boolean Algebra

Lattice: Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, lattices as ordered sets, lattices as algebraic structures, sublattices, products and homomorphisms. Definition, examples and properties of modular and distributive lattices.

Unit 2

Boolean algebra, Boolean polynomials, minimal and maximal forms of Boolean polynomials, Quinn-McCluskey method, Karnaugh diagrams. Logic gates, switching circuits and applications of switching circuits.

Unit 3 : Automata Theory

Introduction: Alphabets, strings and languages. Finite automata and regular languages: deterministic and non-deterministic finite automata, regular expressions, regular languages and their relationship with finite automata, pumping lemma and closure properties of regular languages.

Unit 4

Context free grammars and pushdown automata: Context free grammars (CFG), parse trees, ambiguities in grammars and languages, pushdown automaton (PDA) and the language accepted by PDA, deterministic PDA, Non deterministic PDA, properties of context free languages, normal forms, pumping lemma, closure properties, decision properties.

Unit 5

Turing Machines: Turing machine as a model of computation, programming with a Turing machine, variants of Turing machine and their equivalence.

References Books

- B. A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge 1990.
- E. G. Goodaire and M. M. Parmenter, Discrete Mathematics with Graph Theory, (2nd Ed.), Pearson Education (Singapore) P. Ltd., Indian Reprint 2003.
- R. Lidl and G. Pilz, Applied Abstract Algebra, 2nd Edition, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
- J. E. Hopcroft, R. Motwani and J. D. Ullman, Introduction to Automata Theory, Languages and Computation, 2nd Ed., Addison-Wesley, 2001.
- H. R. Lewis, C. H. Papadimitriou, C. Papadimitriou, Elements of the Theory of Computation, 2nd Ed., Prentice-Hall, NJ, 1997.
- J. A. Anderson, Automata Theory with Modern Applications, Cambridge University Press, 2006.

ANNEXURE

Generic Elective (GE) Course only taken by the Honours Students other than Mathematics Honours

Semester 1					
Course Name	Calculus, Geometry and Differential Equation (GE-1) OR Group Theory (GE-4)			Total Credit	5+1=6
Subject Course No.	MATH 13 GE-I	Generic Electives	GE-I	Total Marks	60+10+5=75
Semester 2					
Course Name	Algebra (GE-2) OR Differential Equation and Vector Calculus (GE-3) OR Numerical Methods (GE-5)			Total Credit	5+1=6
Subject Course No.	MATH 23 GE-II	Generic Electives	GE-II	Total Marks	60+10+5=75
Semester 3					
Course Name	Calculus, Geometry and Differential Equation (GE-1) OR Group Theory (GE-4)			Total Credit	5+1=6
Subject Course No.	MATH 33 GE-III	Generic Electives	GE-III	Total Marks	60+10+5=75
Semester 4					
Course Name	Algebra (GE-2) OR Differential Equation and Vector Calculus (GE-3) OR Numerical Methods (GE-5)			Total Credit	5+1=6
Subject Course No.	MATH 43 GE-IV	Generic Electives	GE-IV	Total Marks	60+10+5=75

Generic Electives Course	Course Subcode	Course	Credit	Page No.
	GE-1	Calculus, Geometry and Differential Equation	5 + 1	28
	GE-2	Algebra	5 + 1	29
	GE-3	Differential Equation and Vector Calculus	5 + 1	30
	GE-4	Group Theory	5 + 1	31
	GE-5	Numerical Methods	5 + 1	32

Semester 1 & Semester 3					
Course Name	Calculus, Geometry and Differential Equation			Total Credit	5+1=6
Subject Course No.	MATH 13 GE-I	Course Subcode	GE-1	Total Marks	60+10+5=75
	MATH 33 GE-III				

CALCULUS, GEOMETRY AND DIFFERENTIAL EQUATION

Unit 1 : Calculus

Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to the problems of the type $e^{ax+b} \sin x$, $e^{ax+b} \cos x$, $(ax + b)^n \sin x$, $(ax + b)^n \cos x$. L'Hospital's rule and its applications. Concept of plane, simple and closed curves, parameterizing a curve. Pedal equation, envelopes, evolute, asymptotes, radius of curvature, curve tracing in Cartesian and polar coordinates of standard curves. Concavity, convexity, cusps and inflection points.

Unit 2

Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x \, dx$, $\int \cos^n x \, dx$, $\int \sec^n x \, dx$, $\int \tan^n x \, dx$, $\int (\log x)^n \, dx$, $\int \sin nx \cos mx \, dx$ etc. Arc length of a curve, arc length of parametric curves, area enclosed by a curve, area between two curves, area and volume of revolution.

Unit 3 : Geometry

2D: Properties of conics, rotation of axes and second degree equations, classification of conics using the discriminant, polar equations of conics.

3D: Spheres. Cylindrical surfaces. Central conicoids, paraboloids, plane sections of conicoids, generating lines, classification of quadrics.

Unit 4 : Differential Equation

Differential equations and mathematical models. General, particular, explicit, implicit and singular solutions of a differential equation. Exact differential equations and integrating factors, separable equations and equations reducible to this form, linear equation and Bernoulli equations, special integrating factors and transformations.

Reference Books

- G. B. Thomas and R. L. Finney, Calculus, 9th Ed., Pearson education, Delhi, 2005.
- M. J. Strauss, G. L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.
- H. Anton, I. Bivens and S. Davis, Calculus, John Wiley and Sons (Asia) P. Ltd., Singapore, 2002.
- R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), Springer Verlag, New York, Inc., 1989.
- S. L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, India, 2004.
- D. Murray, Introductory Course in Differential Equations, Longmans Green and Co.
- G. F. Simmons, Differential Equations, Tata Mcgraw Hill.
- T. Apostol, Calculus, Volumes I and II.
- S. Goldberg, Calculus and mathematical analysis.

Semester 2 & Semester 4					
Course Name	Algebra			Total Credit	5+1=6
Subject Course No.	MATH 23 GE-II	Course Subcode	GE-2	Total Marks	60+10+5=75
	MATH 43 GE-IV				

ALGEBRA

Unit 1

Complex numbers: Polar representation, De Moivre's theorem for rational indices and its applications. Trigonometric, logarithm, exponential and hyperbolic functions of complex variable.

Theory of equations: Fundamental theorem of Classical Algebra (statement only), relation between roots and coefficients, symmetric functions of roots, transformation of equation, Descartes' rule of signs, Sturms' theorem, cubic equation (Cardan's method), biquadratic equation (Ferrari's method), graphical representation of a polynomial.

Inequality: $AM \geq GM \geq HM$, theorem of weighted means and m -th power theorem (statement only), Cauchy-Schwartz inequality (statements only) and its application.

Unit 2

Equivalence relations, partition, partially ordered relation, functions, composition of functions, permutations, even and odd permutations, invertible functions.

Well-ordering property of positive integers, principles of mathematical induction, division algorithm, divisibility and Euclidean algorithm, congruence relation between integers, Fundamental Theorem of Arithmetic (statement only), solution of linear congruence equations.

Unit 3

Matrices: Inverse of a matrix, characterizations of invertible matrices, elementary operations and matrices, echelon matrix, row/column reduced echelon matrix, rank of matrix, normal forms, equivalency and congruency of matrices. Eigen values and eigen vectors of a square matrix, characteristic equation of a matrix, Cayley-Hamilton theorem and its use in finding the inverse of a matrix.

Unit 4

Systems of linear equations: Consistency, the matrix equation $AX = B$ of a system of linear equations, solution sets of linear systems, solution of linear systems using row reduced form.

Reference Books

- T. Andreescu and D. Andrica, Complex Numbers from A to Z, Birkhauser, 2006.
- E. G. Goodaire and M. M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.
- D. C. Lay, Linear Algebra and its Applications, Pearson Education Asia, Indian Reprint, 2007.
- K. B. Dutta, Matrix and linear algebra.
- K. Hoffman, R. Kunze, Linear algebra.
- W. S. Burnstine and A. W. Panton, Theory of equations

Semester 2 & Semester 4					
Course Name	Differential Equation and Vector Calculus			Total Credit	5+1=6
Subject Course No.	MATH 23 GE-II	Course Subcode	GE-3	Total Marks	60+10+5=75
	MATH 43 GE-IV				

DIFFERENTIAL EQUATION AND VECTOR CALCULUS

Unit 1 : Differential Equations

General solution of homogeneous equation of second order, principle of super position for homogeneous equation, Wronskian: its properties and applications, Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation, method of undetermined coefficients, method of variation of parameters.

Unit 2

Systems of linear differential equations, types of linear systems, differential operators, an operator method for linear systems with constant coefficients. Basic theory of linear systems in normal form, homogeneous linear systems with constant coefficients: Two Equations in two unknown functions.

Unit 3

Power series solution of a differential equation about an ordinary point, solution about a regular singular point.

Unit 4 : Vector Calculus

Triple product, introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions.

Reference Books

- B. Barnes and G. R. Fulford, Mathematical Modeling with Case Studies, A Differential Equation Approach using Maple and Matlab, 2nd Ed., Taylor and Francis group, London and New York, 2009.
- C. H. Edwards and D. E. Penny, Differential Equations and Boundary Value problems Computing and Modeling, Pearson Education India, 2005.
- S. L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, India, 2004.
- M. L. Abell, James P. Braselton, Differential Equations with MATHEMATICA, 3rd Ed., Elsevier Academic Press, 2004.
- D. Murray, Introductory Course in Differential Equations, Longmans Green and Co.
- Boyce and DiPrima, Elementary Differential equations and boundary Value problems, Wiley.
- G. F. Simmons, Differential Equations, Tata McGraw Hill.
- J. Marsden, and Tromba, Vector Calculus, McGraw Hill.
- K. C. Maity and R. K. Ghosh, Vector Analysis, New Central Book Agency (P) Ltd. Kolkata (India).

Semester 1 & Semester 3					
Course Name	Group Theory			Total Credit	5+1=6
Subject Course No.	MATH 13 GE-I	Course Subcode	GE-4	Total Marks	60+10+5=75
	MATH 33 GE-III				

GROUP THEORY

Unit 1

Groupoid, semigroup, monoid, groups, commutative groups, elementary properties of groups, finite semigroup with cancellation properties is a group, semigroup containing unique solution of $ax = b$ and $xa = b$ is a group. Particularly, $\mathbb{Z}_n$ group, U_n group, Klein's 4 group, symmetric group S_n , alternating group A_n , matrix group $M_n(R)$, multiplicative group of n -th roots of unity, Dihedral group, quaternion group (through matrices) etc.

Unit 2

Subgroups and examples of subgroups, necessary and sufficient conditions for a subset of a group to be a subgroup, union and intersection of subgroups, centralizer, normalizer, center of a group, product of two subgroups.

Unit 3

Order of an element and a group. Generators, cyclic group and its properties, necessary and sufficient condition. Cosets, properties of cosets, Lagrange's theorem and consequences including Fermat's Little theorem, normal subgroups, factor/quotient groups, Cauchy's theorem for finite abelian groups, necessary and sufficient conditions for a subgroup of a group to be a normal subgroup.

Unit 4

Group homomorphisms, properties of homomorphisms, Cayley's theorem, properties of isomorphisms. First, Second and Third isomorphism theorems (statement only).

Reference Books

- J. B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- J. A. Gallian, Contemporary Abstract Algebra, 4th Ed., Narosa Publishing House, New Delhi, 1999.
- J. J. Rotman, An Introduction to the Theory of Groups, 4th Ed., Springer Verlag, 1995.
- I. N. Herstein, Topics in Algebra, Wiley Eastern Limited, India, 1975.
- D. S. Malik, J. M. Mordeson and M. K. Sen, Fundamentals of abstract algebra.

Semester 2 & Semester 4					
Course Name	Numerical Methods			Total Credit	5+1=6
Subject Course No.	MATH 23 GE-II	Course Subcode	GE-5	Total Marks	60+10+5=75
	MATH 43 GE-IV				

NUMERICAL METHODS

Unit 1

Algorithms. Convergence. Errors: Absolute, relative, percentage, inherent, round off, truncation errors. Significant figures approximate number. Operators: Δ , ∇ , μ , E , δ .

Unit 2

Transcendental and polynomial equations: Bisection method, secant method, Regula-falsi method, fixed point iteration, Newton-Raphson method for simple and multiple roots. Rate of convergence and conditions of convergence of these methods.

Unit 3

System of linear algebraic equations: Gaussian elimination and Gauss Jordan methods. Gauss Jacobi method, Gauss Seidel method and their convergence analysis.

Unit 4

Interpolation: Lagrange and Newton's methods. Error bounds. Finite difference operators. Gregory forward and backward difference interpolation. Numerical differentiation: Methods based on interpolations; methods based on finite differences.

Unit 5

Numerical Integration: Newton Cotes formula, Trapezoidal rule, Simpson's 1/3rd rule, Simpsons 3/8th rule, Weddle's rule, Composite trapezoidal rule, composite Simpson's 1/3rd rule.

Unit 6

Ordinary differential equations: The method of successive approximations, Euler's method, the modified Euler method, Runge-Kutta methods of orders 2 (for order 4 statement only).

Reference Books

- B. Bradie, A Friendly Introduction to Numerical Analysis, Pearson Education, India, 2007.
- M.K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, 6th Ed., New age International Publisher, India, 2007.
- C.F. Gerald and P.O. Wheatley, Applied Numerical Analysis, Pearson Education, India, 2008.
- U. M. Ascher and C. Greif, A First Course in Numerical Methods, 7th Ed., PHI Learning Private Limited, 2013.

Dr. Paltu Sarkar (Chairman)
UG Board of Studies in Mathematics
University of North Bengal

REVISED B.SC. MATHEMATICS PROGRAMME COURSE SYLLABUS
UNDER CBCS SYSTEM 2023



CREDIT DISTRIBUTION

Sl. No.	Course Type	Total Papers	Credits	Marks
			Theory + Tutorial	
1	Discipline Specific Core (DSC)	12	$(12 \times 5) + (12 \times 1) = 72$	75 (60 + 10 + 5)
2	Discipline Specific Electives (DSE)	6	$(6 \times 5) + (6 \times 1) = 36$	75 (60 + 10 + 5)
3	Skill Enhancement Courses (SEC)	4	$4 \times 2 = 8$	75 (60 + 10 + 5)
4	Ability Enhancement Compulsory Courses (AECC)	2	$2 \times 2 = 4$	100 (AE-I) (80 + 15 + 5) 50 (AE-II) (35 + 10 + 5)
Total		24	120	1800

SEMESTER-1				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATP 14 AE-I	AE-I	Eng Com/EVS	2	----
MATP 11 DSC	DSC Paper 1	Calculus and Geometry	5 + 1	33
	DSC	Other Department	----	----
	DSC	Other Department	----	----
SEMESTER-2				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATP 24 AE-I	AE-I	Eng Com/EVS	2	----
MATP 21 DSC	DSC Paper 2	Real Analysis	5 + 1	34
	DSC	Other Department	----	----
	DSC	Other Department	----	----
SEMESTER-3				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATP 31 DSC	DSC Paper 3	Algebra	5 + 1	35
	DSC	Other Department	----	----
	DSC	Other Department	----	----
MATP 33 SEC	SEC SEM 3 Paper 1	Logic & Sets / Graph Theory	2	36 - 37
SEMESTER-4				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATP 41 DSC	DSC Paper 4	Differential Equation and Vector Calculus	5 + 1	38
	DSC	Other Department	----	----
	DSC	Other Department	----	----
MATP 43 SEC	SEC SEM 4 Paper 2	Theory of Equations/ C Programming Language	2	39 - 40
SEMESTER-5				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATP 52 DSE	DSE Paper 1	Numerical Methods + LAB/ Group Theory and Linear Algebra	4 + 2 5 + 1	41 - 43
	DSE	Other Department	----	----
	DSE	Other Department	----	----
MATP 53 SEC	SEC SEM 5 Paper 1	Theory of Probability / Differential Geometry	2	44 - 45
SEMESTER-6				
Subject Course No.	Syllabus Code	Course	Credit	Page No.
MATP 62 DSE	DSE Paper 2	Metric Spaces & Complex Analysis / Linear Programming	5 + 1	46 - 47
	DSE	Other Department	----	----
	DSE	Other Department	----	----
MATP 63 SEC	SEC SEM 6 Paper 2	Mechanics / Boolean Algebra & Automata Theory	2	48 - 49

DETAILED PROGRAMME SYLLABUS

Semester 1					
Course Name	Calculus and Geometry			Total Credit	5+1=6
Subject Course No.	MATP 11 DSC	Discipline Specific Core	DSC Paper 1	Total Marks	60+10+5=75

CALCULUS AND GEOMETRY

Unit 1 : Calculus

Hyperbolic functions, higher order derivatives, Leibnitz rule and its applications to the problems of the type $e^{ax+b} \sin x$, $e^{ax+b} \cos x$, $(ax + b)^n \sin x$, $(ax + b)^n \cos x$. L'Hospital's rule and its applications. Concept of plane, simple and closed curves, parameterizing a curve. Pedal equation, envelopes, evolute, asymptotes, radius of curvature, curve tracing in Cartesian and polar coordinates of standard curves. Concavity, convexity, cusps and inflection points.

Unit 2

Reduction formulae, derivations and illustrations of reduction formulae of the type $\int \sin^n x \, dx$, $\int \cos^n x \, dx$, $\int \sec^n x \, dx$, $\int \tan^n x \, dx$, $\int (\log x)^n \, dx$, $\int \sin nx \cos mx \, dx$ etc. Arc length of a curve, arc length of parametric curves, area enclosed by a curve, area between two curves, area and volume of revolution.

Unit 3 : Geometry

2D: Reflection properties of conics, rotation of axes and second degree equations, classification of conics using the discriminant, polar equations of conics.

Unit 4

3D: Spheres, cylindrical surfaces, central conicoids, paraboloids, hyperboloids, plane sections of conicoids, generating lines, classification of quadrics.

Reference Books

- G. B. Thomas and R. L. Finney, Calculus, 9th Ed., Pearson education, Delhi, 2005.
- M. J. Strauss, G. L. Bradley and K. J. Smith, Calculus, 3rd Ed., Dorling Kindersley (India) P. Ltd. (Pearson Education), Delhi, 2007.
- H. Anton, I. Bivens and S. Davis, Calculus, John Wiley and Sons (Asia) P. Ltd., Singapore, 2002.
- R. Courant and F. John, Introduction to Calculus and Analysis (Volumes I & II), Springer Verlag, New York, Inc., 1989.
- S. L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, India, 2004.
- Murray, D., Introductory Course in Differential Equations, Longmans Green and Co.
- G. F. Simmons, Differential Equations, Tata Mcgraw Hill.
- T. Apostol, Calculus, Volumes I and II.
- S. Goldberg, Calculus and mathematical analysis.

Semester 2					
Course Name	Real Analysis			Total Credit	5+1=6
Subject Course No.	MATP 21 DSC	Discipline Specific Core	DSC Paper 2	Total Marks	60+10+5=75

REAL ANALYSIS

Unit 1

Review of Algebraic and order properties of $\mathbb{R}$, ε -neighborhood of a point in $\mathbb{R}$. Idea of countable sets, uncountable sets and uncountability of $\mathbb{R}$. Bounded above sets, bounded below sets, bounded sets, unbounded sets. Suprema and infima. Completeness property of $\mathbb{R}$ and its equivalent properties. Archimedean property, density of rational (and irrational) numbers in $\mathbb{R}$, intervals. Limit points of a set, isolated points, open set, closed set, derived set, illustrations of Bolzano-Weierstrass theorem for sets, compact sets in $\mathbb{R}$, Heine-Borel Theorem.

Unit 2

Sequences: Sequence, bounded sequence, convergent sequence, limit of a sequence, $\liminf$, $\limsup$. Limit theorems. Monotone sequences, monotone convergence theorem. Subsequences, divergence criteria. Monotone subsequence theorem (statement only), Bolzano Weierstrass theorem for sequences. Cauchy sequence, Cauchy's convergence criterion.

Unit 3

Series: Infinite series, convergence and divergence of infinite series, Cauchy criterion. Tests for convergence: Comparison test, limit comparison test, ratio test, Cauchy's n th root test, integral test. Alternating series, Leibniz test. Absolute and conditional convergence.

Reference Books

- R. G. Bartle and D. R. Sherbert, Introduction to Real Analysis, 3rd Ed., John Wiley and Sons (Asia) Pvt. Ltd., Singapore, 2002.
- G. G. Bilodeau, P. R. Thie, G. E. Keough, An Introduction to Analysis, 2nd ed., Jones & Bartlett, 2010.
- B. S. Thomson, A. M. Bruckner and J. B. Bruckner, Elementary Real Analysis, Prentice Hall, 2001.
- S. K. Berberian, a First Course in Real Analysis, Springer Verlag, New York, 1994.
- T. Apostol, Mathematical Analysis, Narosa Publishing House.
- Courant and John, Introduction to Calculus and Analysis, Vol I, Springer.
- W. Rudin, Principles of Mathematical Analysis, Tata McGraw-Hill.
- T. Tao, Analysis I, Hindustan Book Agency, 2006 .
- S. Goldberg, Calculus and mathematical analysis.

Semester 3					
Course Name	Algebra			Total Credit	5+1=6
Subject Course No.	MATP 31 DSC	Discipline Specific Core	DSC Paper 3	Total Marks	60+10+5=75

ALGEBRA

Unit 1

Complex numbers: Polar representation, De Moivre's theorem for rational indices and its applications. Trigonometric, logarithm, exponential and hyperbolic functions of complex variable.

Theory of equations: Fundamental theorem of Classical Algebra (statement only), relation between roots and coefficients, symmetric functions of roots, transformation of equation, Descartes' rule of signs, Sturms' theorem, cubic equation (Cardan's method), biquadratic equation (Ferrari's method), graphical representation of a polynomial.

Inequality: $AM \geq GM \geq HM$, theorem of weighted means and m -th power theorem (statement only), Cauchy-Schwartz inequality (statements only) and its application.

Unit 2

Equivalence relations, partition, partially ordered relation, functions, composition of functions, permutations, even and odd permutations, invertible functions.

Well-ordering property of positive integers, principles of mathematical induction, division algorithm, divisibility and Euclidean algorithm, congruence relation between integers, Fundamental Theorem of Arithmetic (statement only), solution of linear congruence equations.

Unit 3

Matrices: Inverse of a matrix, characterizations of invertible matrices, elementary operations and matrices, echelon matrix, row/column reduced echelon matrix, rank of matrix, normal forms, equivalency and congruency of matrices. Eigen values and eigen vectors of a square matrix, characteristic equation of a matrix, Cayley-Hamilton theorem and its use in finding the inverse of a matrix.

Unit 4

Systems of linear equations: Consistency, the matrix equation $AX = B$ of a system of linear equations, solution sets of linear systems, solution of linear systems using row reduced form.

Reference Books

- T. Andreescu and D. Andrica, Complex Numbers from A to Z, Birkhauser, 2006.
- E. G. Goodaire and M. M. Parmenter, Discrete Mathematics with Graph Theory, 3rd Ed., Pearson Education (Singapore) P. Ltd., Indian Reprint, 2005.
- D. C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007.
- K. B. Dutta, Matrix and linear algebra.
- K. Hoffman, R. Kunze, Linear algebra.
- W. S. Burnstine and A. W. Panton, Theory of equations

Semester 3					
Course Name	Logic and Sets			Total Credit	2
Subject Course No.	MATP 33 SEC	Skill Enhancement Courses	SEC SEM 3 Paper 1	Total Marks	60+10+5=75

LOGIC AND SETS

Unit 1 : Logic

Introduction, propositions, truth table, logical connectives: Negation, conjunction, disjunction, implications. Biconditional propositions, converse, contra positive and inverse propositions and precedence of logical operators. Propositional equivalence: Logical equivalences. Predicates and quantifiers: Introduction, quantifiers, binding variables and negations.

Unit 2 : Sets

The natural number sequence, Proof and definition by induction, cardinal numbers, countable sets, cardinal arithmetic, order types, well-ordered sets and ordinal numbers, the axiom of choice, the well-ordering theorem, and Zorn's lemma, further properties of cardinal numbers, Some theorems equivalent to the axiom of choice.

Reference Books

- R.P. Grimaldi, Discrete Mathematics and Combinatorial Mathematics, Pearson Education, 1998.
- P.R. Halmos, Naive Set Theory, Springer, 1974.
- E. Kamke, Theory of Sets, Dover Publishers, 1950.
- R. P. Grimaldi, Discrete Mathematics and Combinatorial Mathematics, Pearson Educ., 1998.
- R. R. Stoll, Set Theory and Logic, Dover Publishers, 1979.

OR

Semester 3					
Course Name	Graph Theory			Total Credit	2
Subject Course No.	MATP 33 SEC	Skill Enhancement Courses	SEC SEM 3 Paper 1	Total Marks	60+10+5=75

GRAPH THEORY

Unit 1

Definition, examples and basic properties of graphs, pseudo graphs, complete graphs, bipartite graphs, isomorphism of graphs. Trees and forests, paths and cycles.

Unit 2

Eulerian circuits, Eulerian graph, semi-Eulerian graph, theorems, Hamiltonian cycles, theorems Representation of a graph by matrix, the adjacency matrix, incidence matrix, weighted graph.

Unit 3

Travelling salesman's problem, shortest path, Tree and their properties, spanning tree, Dijkstra's algorithm.

Reference Books

- B. A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge, 1990.
- E. G. Goodaire and M. M. Parmenter, Discrete Mathematics with Graph Theory, 2nd Edition, Pearson Education (Singapore) P. Ltd., Indian Reprint 2003.
- R. Lidl and P. Gunter, Applied Abstract Algebra, 2nd Ed., Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
- N. Deo, Graph Theory with Applications to Engineering and Computer Science, Prentice-Hall of India Pvt. Ltd., New Delhi.
- R. Diestel, Graph Theory, Springer-Verlag, 2000.

Semester 4					
Course Name	Differential Equation and Vector Calculus			Total Credit	5+1=6
Subject Course No.	MATP 41 DSC	Skill Enhancement Courses	DSC Paper 4	Total Marks	60+10+5=75

DIFFERENTIAL EQUATION AND VECTOR CALCULUS

Unit 1 : Differential Equation

Differential equations and mathematical models. General, particular, explicit, implicit and singular solutions of a differential equation. Exact differential equations and integrating factors, separable equations and equations reducible to this form, linear equation and Bernoulli equations, special integrating factors and transformations.

General solution of homogeneous equation of second order, principle of super position for homogeneous equation, Wronskian: its properties and applications, Linear homogeneous and non-homogeneous equations of higher order with constant coefficients, Euler's equation, method of undetermined coefficients, method of variation of parameters.

Unit 2

Systems of linear differential equations, types of linear systems, differential operators, an operator method for linear systems with constant coefficients. Basic theory of linear systems in normal form, homogeneous linear systems with constant coefficients: Two Equations in two unknown functions.

Unit 3

Lipschitz condition and Picard's Theorem (Statement only). Equilibrium points, Interpretation of the phase plane.

Unit 4 : Vector Calculus

Triple product, introduction to vector functions, operations with vector-valued functions, limits and continuity of vector functions, differentiation and integration of vector functions.

Reference Books

- B. Barnes and G. R. Fulford, Mathematical Modeling with Case Studies, A Differential Equation Approach using Maple and Matlab, Taylor and Francis group, London and New York, 2009.
- C. H. Edwards and D. E. Penny, Differential Equations and Boundary Value problems Computing and Modeling, Pearson Education India, 2005.
- S. L. Ross, Differential Equations, 3rd Ed., John Wiley and Sons, India, 2004.
- M. L. Abell, James P Braselton, Differential Equations with MATHEMATICA, 3rd Ed., Elsevier Academic Press, 2004.
- D. Murray, Introductory Course in Differential Equations, Longmans Green and Co.
- Boyce and DiPrima, Elementary Differential equations and boundary Value problems, Wiley.
- G. F. Simmons, Differential Equations, Tata McGraw Hill.

Semester 4					
Course Name	Theory of Equations			Total Credit	2
Subject Course No.	MATP 43 SEC	Skill Enhancement Courses	SEC SEM 4 Paper 2	Total Marks	60+10+5=75

THEORY OF EQUATIONS

Unit 1

General properties of polynomials, Graphical representation of a polynomial, maximum and minimum values of a polynomials, General properties of equations, Descarte's rule of signs positive and negative rule, Relation between the roots and the coefficients of equations.

Unit 2

Symmetric functions. Applications of symmetric function of the roots. Transformation of equations. Solutions of reciprocal and binomial equations. Algebraic solutions of the cubic and biquadratic. Properties of the derived functions, Newton's theorem on the sums of powers of roots, homogeneous products, limits of the roots of equations.

Unit 3

Separation of the roots of equations, Strums theorem. Applications of Strum's theorem, conditions for reality of the roots of an equation. Solution of numerical equations.

Reference Books

- W.S. Burnside and A.W. Panton, The Theory of Equations, Dublin University Press, 1954.
- C. C. MacDuffee, Theory of Equations, John Wiley & Sons Inc., 1954.

OR

Semester 4					
Course Name	C Programming Language			Total Credit	2
Subject Course No.	MATP 43 SEC	Skill Enhancement Courses	SEC SEM 4 Paper 2	Total Marks	60+10+5=75

C PROGRAMMING LANGUAGE

Unit 1

An overview of history of computers and architecture of computer. Concept of compiler, assembler, machine language, high level language, object-oriented language, programming language and importance of C programming.

Unit 2

Characters, Constants and variables data types. Expression, statements, declaration. Operators: Arithmetic operators, increment and decrement operators, relational operators, logical operators, assignment operators, conditional operators.

Unit 3

Conditional control statements: If, if-else, nested if-else statements. Switch, break and continue statements. Loop control statements: For, while and do-while statements.

Unit 4

Arrays, One-dimension, two-dimension and multidimensional arrays, declaration and type of arrays. Reading and displaying elements of arrays.

User-defined Functions: Function Prototype, Definition of functions, Type of functions, local and global variables in a function, type of return values, function declaration, nesting of functions, main () function, recurrence of function. Library functions, e.g. stdio.h, math.h, string.h, stdlib.h, etc. No arguments and no return values, arguments but no return values, arguments with return values, no arguments but returns a value.

Reference Books

- B. W. Kernighan and D. M. Ritchi, The C-Programming Language, 2nd Edi. (ANSI Refresher), Prentice Hall, 1977.
- E. Balagurnsamy, Programming in ANSI C, Tata McGraw Hill, 2004.
- Y. Kanetkar, Let Us C, BPB Publication, 1999.
- C. Xavier, C-Language and Numerical Methods, New Age International.
- V. Rajaraman, Computer Oriented Numerical Methods, Prentice Hall of India, 1980.

Semester 5					
Course Name	Numerical Methods			Total Credit	4
Subject Course No.	MATP 52 DSE	Core Course	DSE Paper 1	Total Marks	40+10+5=55

NUMERICAL METHODS

Unit 1

Algorithms. Convergence. Errors: Absolute, relative, percentage, inherent, round off, truncation errors. Significant figures, approximate number. Operators: Δ , ∇ , μ , E , δ .

Unit 2

Transcendental and polynomial equations: Bisection method, secant method, Regula-falsi method, fixed point iteration, Newton-Raphson method for simple and multiple roots. Rate of convergence and conditions of convergence of these methods.

Unit 3

System of linear algebraic equations: Gaussian elimination, Gauss Jordan methods, Gauss Jacobi method, Gauss Seidel method and their convergence analysis.

Unit 4

Interpolation: Lagrange and Newton's methods. Error bounds. Finite difference operators. Gregory forward and backward difference interpolation. Numerical differentiation: Methods based on interpolations methods based on finite differences.

Unit 5

Numerical Integration: Newton Cotes formula, Trapezoidal rule, Simpson's 1/3rd rule, Simpsons 3/8th rule, Weddle's rule, Composite trapezoidal rule, composite Simpson's 1/3rd rule.

Unit 6

Ordinary differential equations: The method of successive approximations, Euler's method, the modified Euler method, Runge-Kutta methods of order 2 (for order 4 statement only).

Reference Books

- B. Bradie, A Friendly Introduction to Numerical Analysis, Pearson Education, India, 2007.
- M. K. Jain, S. R. K. Iyengar and R. K. Jain, Numerical Methods for Scientific and Engineering Computation, 6th Ed., New age International Publisher, India, 2007.
- C.F. Gerald and P.O. Wheatley, Applied Numerical Analysis, Pearson Education, India, 2008.
- U. M. Ascher and C. Greif, A First Course in Numerical Methods, 7th Ed., PHI Learning Private Limited, 2013.

Semester 5					
Course Name	Numerical Methods LAB			Total Credit	2
Subject Course No.	MATP 52 DSE	Core Course	DSE Paper 1	Total Marks	20

NUMERICAL METHODS LAB
(PRACTICAL)

1. Solution of transcendental and algebraic equations by
 - a) Bisection method
 - b) Newton Raphson method (for simple root).
 - c) Regula-Falsi method.
2. Interpolation
 - a) Lagrange Interpolation
 - b) Newton Forward Interpolation
 - c) Newton Backward Interpolation
3. Numerical Integration by
 - a) Trapezoidal Rule
 - b) Simpson's one third rule
4. Solution of ordinary differential equations by
 - a) Euler method
 - b) Runge-Kutta method (4th order only)

OR

Semester 5					
Course Name	Group Theory and Linear Algebra			Total Credit	5+1=6
Subject Course No.	MATP 52 DSE	Discipline Specific Electives	DSE Paper 1	Total Marks	60+10+5=75

GROUP THEORY AND LINEAR ALGEBRA

Unit 1 : Group Theory

Groupoid, semigroup, monoid, groups, commutative groups, elementary properties of groups, finite semigroup with cancellation properties is a group, semigroup containing unique solution of $ax = b$ and $xa = b$ is a group. Particularly, $\mathbb{Z}_n$ group, U_n group, Klein's 4 group, symmetric group S_n , alternating group A_n , matrix group $M_n(R)$, multiplicative group of n -th roots of unity, Dihedral group, quaternion group (through matrices) etc.

Unit 2

Subgroups and examples of subgroups, necessary and sufficient conditions for a subset of a group to be a subgroup, union and intersection of subgroups, centralizer, normalizer, center of a group, product of two subgroups.

Unit 3

Order of an element and a group. Generators, cyclic group and its properties, necessary and sufficient condition. Cosets, properties of cosets, Lagrange's theorem and consequences including Fermat's Little theorem.

Unit 4 : Linear Algebra

Vector spaces, subspaces, algebra of subspaces, quotient spaces, linear combination of vectors, linear span, linear independence, basis and dimension of a vector space, dimension of subspaces.

Unit 4

Linear transformations, null space, range space, rank and nullity of a linear transformation, matrix representation of a linear transformation relative to ordered bases, algebra of linear transformations, correspondence between LTs and matrices. Isomorphisms.

Reference Books

- J. B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002.
- I. Herstein, Abstract Algebra.
- M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011.
- S. H. Friedberg, A. J. Insel, L. E. Spence, Linear Algebra, PHI Pvt. Ltd., New Delhi, 2004.
- J. A. Gallian, Contemporary Abstract Algebra, Narosa Publishing House, New Delhi, 1999.
- S. Lang, Introduction to Linear Algebra, 2nd Ed., Springer, 2005.
- S. Kumaresan, Linear Algebra- A Geometric Approach, Prentice Hall of India, 1999.
- K. Hoffman, R. A. Kunze, Linear Algebra, Prentice – Hall of India Pvt. Ltd., 1997.

Semester 5					
Course Name	Theory of Probability			Total Credit	2
Subject Course No.	MATP 53 SEC	Skill Enhancement Courses	SEC SEM 5 Paper 1	Total Marks	60+10+5=75

THEORY OF PROBABILITY

Unit 1

Sample space, probability axioms, real random variables (discrete and continuous), cumulative distribution function, probability mass/density functions, mathematical expectation, moments, moment generating function, characteristic function. Discrete distributions: Uniform, binomial, Poisson distribution. Continuous distributions: uniform, normal, exponential distribution.

Unit 2

Joint cumulative distribution function and its properties, joint probability density functions, marginal and conditional distributions, expectation of function of two random variables, conditional expectations, independent random variables, bivariate normal distribution, correlation coefficient, joint moment generating function (jmgf) and calculation of covariance (from jmgf), linear regression for two variables.

Unit 3

Chebyshev's inequality, statement and interpretation of (weak) law of large numbers and strong law of large numbers. Central limit theorem for independent and identically distributed random variables with finite variance.

Reference Books

- R. V. Hogg, J. W. McKean and A. T. Craig, Introduction to Mathematical Statistics, Pearson Education, Asia, 2007.
- I. Miller and M. Miller, J. E. Freund, Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia, 2006.
- S. Ross, Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint, 2007.
- A. M. Mood, F. A. Graybill and D. C. Boes, Introduction to the Theory of Statistics, 3rd Ed., Tata McGraw- Hill, Reprint 2007.
- A. Gupta, Ground work of Mathematical Probability and Statistics, Academic publishers.

OR

Semester 5					
Course Name	Differential Geometry			Total Credit	2
Subject Course No.	MATP 53 SEC	Skill Enhancement Courses	SEC SEM 5 Paper 1	Total Marks	60+10+5=75

DIFFERENTIAL GEOMETRY

Unit 1

Theory of curves: Parametrization and reparametrization of curves, plane curves, space curves, regular curves, curvature, torsion and relation between curvature and torsion, Serret-Frenet formula. Osculating plane, osculating circles and osculating spheres. Evolutes and involutes of curves.

Unit 2

Theory of surfaces: Regular surfaces, tangent plane, First and second Fundamental forms. Principal and Gaussian curvatures. Rodrigue's formula. Conjugate and asymptotic lines.

Unit 3

Developable: Developable associated with space curves and curves on surfaces, minimal surfaces, canonical geodesic equations.

Reference Books

- A. Pressley, Elementary Differential Geometry, Springer, 2012.
- T. J. Willmore, An Introduction to Differential Geometry, Dover Publications, 2012.
- B. O'Neill, Elementary Differential Geometry, 2nd Ed., Academic Press, 2006.
- C. E. Weatherburn, Differential Geometry of Three Dimensions, Cambridge University Press 2003.
- D. J. Struik, Lectures on Classical Differential Geometry, Dover Publications, 1988.
- S. Lang, Fundamentals of Differential Geometry, Springer, 1999.
- B. Spain, Tensor Calculus: A Concise Course, Dover Publications, 2003.

Semester 6					
Course Name	Metric Spaces and Complex Analysis			Total Credit	5+1=6
Subject Course No.	MATP 62 DSE	Discipline Specific Electives	DSE Paper 2	Total Marks	60+10+5=75

METRIC SPACES AND COMPLEX ANALYSIS

Unit 1 : Metric Spaces

Metric spaces: Definition and examples. Open and closed balls, neighbourhood, open set, interior of a set. Limit point of a set, closed set, diameter of a set, subspaces, dense sets, separable spaces. Sequences in metric spaces, Cauchy sequences. Complete metric spaces, Cantor's theorem.

Unit 2 : Complex Analysis

Limits, limits involving the point at infinity, continuity. Properties of complex numbers, regions in the complex plane, functions of complex variable, mappings.

Derivatives, differentiation formulas, Cauchy-Riemann equations, sufficient conditions for differentiability.

Unit 3

Analytic functions, examples of analytic functions. Derivatives of functions and definite integrals of functions. Contours, Contour integrals and its examples. Upper bounds for moduli of contour integrals. Cauchy- Goursat theorem, Cauchy integral formula.

Unit 4

Liouville's theorem and the fundamental theorem of algebra. Convergence of sequences and series, Taylor series and its examples.

Reference Books

- S. Shirali and H. L. Vasudeva, Metric Spaces, Springer Verlag, London, 2006.
- S. Kumaresan, Topology of Metric Spaces, 2nd Ed., Narosa Publishing House, 2011.
- G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill, 2004.
- J. W. Brown and R. V. Churchill, Complex Variables and Applications, 8th Ed., McGraw – Hill International Edition, 2009.
- J. Bak and D. J. Newman, Complex Analysis, 2nd Ed., Undergraduate texts in Mathematics, Springer-Verlag New York, Inc., New York, 1997.
- S. Ponnusamy, Foundations of Complex analysis.
- E. M. Stein and R. Shakrachi, Complex Analysis, Princeton University Press.

OR

Semester 6					
Course Name	Linear Programming			Total Credit	5+1=6
Subject Course No.	MATP 62 DSE	Discipline Specific Electives	DSE Paper 2	Total Marks	60+10+5=75

LINEAR PROGRAMMING

Unit 1

Introduction to linear programming problem (LPP), Problem formation, Type of solutions: Basic solution (BS), feasible solution (FS), basic feasible solution (BFS), degenerate and non-degenerate BFS. Matrix notation of LPP, graphical solution of LPP.

Unit 2

Theory of simplex method, convex sets, optimality and unboundedness, the simplex algorithm, simplex method in tableau format, introduction to artificial variables. Two-phase method, Big-M method and their comparison.

Duality, formulation of the dual problem, primal-dual relationships, economic interpretation of the dual.

Unit 3

Transportation and assignment problems: Mathematical formulation. North-west corner method, least cost method and Vogel approximation method for determination of solution of transportation problem. Algorithm for solving transportation problem. Hungarian method for solving assignment problem.

Unit 4

Game theory: Formulation of two-person zero sum games, solving two-person zero sum games, games with mixed strategies, graphical solution procedure, linear programming solution of games.

Reference Books

- M. S. Bazaraa, J. J. Jarvis and H. D. Sherali, Linear Programming and Network Flows, 2nd Ed., John Wiley and Sons, India, 2004.
- F. S. Hillier and G. J. Lieberman, Introduction to Operations Research, 9th Ed., Tata McGraw Hill, Singapore, 2009.
- H. A. Taha, Operations Research, An Introduction, 8th Ed., Prentice-Hall India, 2006.
- G. Hadley, Linear Programming, Narosa Publishing House, New Delhi, 2002.

Semester 6					
Course Name	Mechanics			Total Credit	2
Subject Course No.	MATP 63 SEC	Skill Enhancement Courses	SEC SEM 6 Paper 2	Total Marks	60+10+5=75

MECHANICS

Unit 1

Co-planar forces. Astatic equilibrium. Friction. Equilibrium of a particle on a rough curve. Virtual work. Forces in three dimensions. General conditions of equilibrium. Centre of gravity for different bodies. Stable and unstable equilibrium.

Unit 2

Equations of motion referred to a set of rotating axes. Motion of a projectile in a resisting medium. Stability of nearly circular orbits. Motion under the inverse square law. Slightly disturbed orbits. Motion of artificial satellites. Motion of a particle in three dimensions. Motion on a smooth sphere, cone and on any surface of revolution.

Unit 3

Degrees of freedom. Moments and products of inertia. Momental Ellipsoid. Principal axes. D'Alembert's principle. Motion about a fixed axis. Compound pendulum. Motion of a rigid body in two dimensions under finite and impulsive forces. Conservation of momentum and energy.

Reference Books

- I. H. Shames and G. K. Mohan Rao, Engineering Mechanics: Statics and Dynamics, (4th Ed.), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2009.
- R. C. Hibbeler and A. Gupta, Engineering Mechanics: Statics and Dynamics, 11th Ed., Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi.
- F. Chorlton, Textbook of Dynamics.
- S. L. Loney, An Elementary Treatise on the Dynamics of particle and of Rigid Bodies, Loney Press.
- S. L. Loney, Elements of Statics and Dynamics I and II.
- M. C. Ghosh, Analytical Statics.

OR

Semester 6					
Course Name	Boolean Algebra and Automata Theory			Total Credit	2
Subject Course No.	MATP 63 SEC	Skill Enhancement Courses	SEC SEM 6 Paper 2	Total Marks	60+10+5=75

BOOLEAN ALGEBRA AND AUTOMATA THEORY

Unit 1 : Boolean Algebra

Lattice: Definition, examples and basic properties of ordered sets, maps between ordered sets, duality principle, lattices as ordered sets, lattices as algebraic structures, sublattices, products and homomorphisms. Definition, examples and properties of modular and distributive lattices.

Unit 2

Boolean algebra: Definition of Boolean algebra, Boolean polynomials, minimal and maximal forms of Boolean polynomials, Quinn-McCluskey method, Karnaugh diagrams. Logic gates, switching circuits and applications of switching circuits.

Unit 3 : Automata Theory

Introduction: Alphabets, strings and languages. Finite automata and regular languages: deterministic and non-deterministic finite automata, regular expressions, regular languages and their relationship with finite automata, pumping lemma and closure properties of regular languages.

References Books

- B. A. Davey and H. A. Priestley, Introduction to Lattices and Order, Cambridge University Press, Cambridge 1990.
- E. G. Goodaire and Michael M. Parmenter, Discrete Mathematics with Graph Theory, (2nd Ed.), Pearson Education (Singapore) P. Ltd., Indian Reprint 2003.
- R. Lidl and G. Pilz, Applied Abstract Algebra, 2nd Edition, Undergraduate Texts in Mathematics, Springer (SIE), Indian reprint, 2004.
- J. E. Hopcroft, R. Motwani and J. D. Ullman, Introduction to Automata Theory, Languages and Computation, 2nd Ed., Addison-Wesley, 2001.
- H. R. Lewis, C. H. Papadimitriou, C. Papadimitriou, Elements of the Theory of Computation, 2nd Ed., Prentice-Hall, NJ, 1997.
- J. A. Anderson, Automata Theory with Modern Applications, Cambridge University Press, 2006.

Dr. Paltu Sarkar
Chairman
UG Board of Studies in Mathematics
University of North Bengal

B.Sc. Three Year Hons. /Prog. Course in Mathematics under CBCS (2023) NBU

Honours Course			Programme Course		
Subject Course No.	Syllabus Code	Course	Subject Course No.	Syllabus Code	Course
1 ST SEMESTER					
MATH 11 HCC-I	HCC-I	Calculus and Geometry	MATP 11 DSC	DSC Paper 1	Calculus and Geometry
MATH 11 HCC-II	HCC-II	Algebra			
MATH 13 GE-I	GE-I	Other Department			
2 ND SEMESTER					
MATH 21 HCC-III	HCC-III	Real Analysis	MATP 21 DSC	DSC Paper 2	Real Analysis
MATH 21 HCC-IV	HCC-IV	Differential Equation & Vector Calculus			
MATH 23 GE-II	GE-II	Other Department			
3 RD SEMESTER					
MATH 31 HCC-V	HCC-V	Theory of Real Functions & Introduction of the Metric Space	MATP 31 DSC	DSC Paper 3	Algebra
MATH 31 HCC-VI	HCC-VI	Group Theory-I			
MATH 31 HCC-VII	HCC-VII	Riemann Integration & Series of Functions	MATP 33 SEC	SEC SEM 3 Paper 1	Logic & Sets / Graph Theory
MATH 33 GE-III	GE-III	Other Department			
MATH 34 SEC-I	SEC-I	Logic & Sets/Graph Theory			
4 TH SEMESTER					
MATH 41 HCC-VIII	HCC-VIII	Multivariate Calculus	MATP 41 DSC	DSC Paper 4	Differential Equation and Vector Calculus
MATH 41 HCC-IX	HCC-IX	Ring Theory & Linear Algebra-I			
MATH 41 HCC-X	HCC-X	Metric Spaces & Complex Theory	MATP 43 SEC	SEC SEM 4 Paper 2	C Programming Language/ Theory of Equations
MATH 43 GE-IV	GE-IV	Other Department			
MATH 44 SEC-II	SEC-II	C Programming Language/ Operating System: Linux			
5 TH SEMESTER					
MATH 51 HCC-XI	HCC-XI	Group Theory-II	MATP 52 DSE	DSE Paper 1	Numerical Methods + LAB / Group Theory and Linear Algebra
MATH 51 HCC-XII	HCC-XII	Numerical Methods + Lab			
MATH 52 DSE-I	DSE-I	Probability & Statistics/ Differential Geometry	MATP 53 SEC	SEC SEM 5 Paper 1	Theory of Probability/ Differential Geometry
MATH 52 DSE-II	DSE-II	Mechanics/ Number Theory			
6 TH SEMESTER					
MATH 61 HCC-XIII	HCC-XIII	Ring Theory & Linear Algebra-II	MATP 62 DSE	DSE Paper 2	Metric Spaces & Complex Analysis / Linear Programming
MATH 61 HCC-XIV	HCC-XIV	Partial Differential Equations & Applications			
MATH 62 DSE-III	DSE-III	Linear Programming/ Point Set Topology/	MATP 63 SEC	SEC SEM 6 Paper 2	Mechanics / Boolean Algebra & Automata Theory
MATH 62 DSE-IV	DSE-IV	Mathematical Modelling/ Boolean Algebra & Automata Theory			

B.Sc. Three Year Hons. /Prog. Course in Mathematics under CBCS (2018) NBU

Honours Course			Programme Course		
Subject Course No.	Syllabus Code	Course	Subject Course No.	Syllabus Code	Course
1 ST SEMESTER					
MATH 11 HCC-I	HCC-I	Cal, Geo & D.E.	MATP 11 DSC	DSC Paper 1	Calculus and Geometry
MATH 11 HCC-II	HCC-II	Algebra			
MATH 13 GE-I	GE-I	Other Department			
2 ND SEMESTER					
MATH 21 HCC-III	HCC-III	Real Analysis	MATP 21 DSC	DSC Paper 2	Algebra
MATH 21 HCC-IV	HCC-IV	D.E & Vector Calculus			
MATH 23 GE-II	GE-II	Other Department			
3 RD SEMESTER					
MATH 31 HCC-V	HCC-V	Theory Of Real Functions & Introduction of the Metric Space	MATP 31 DSC	DSC Paper 3	Real Analysis
MATH 31 HCC-VI	HCC-VI	Group Theory-I			
MATH 31 HCC-VII	HCC-VII	Riemann Integration & Series of Functions	MATP 33 SEC	SEC SEM 3 Paper 1	Logic & Sets / C++
MATH 33 GE-III	GE-III	Other Department			
MATH 34 SE-I	SE-I	Logic & Sets/ C++			
4 TH SEMESTER					
MATH 41 HCC-VIII	HCC-VIII	Multivariate Calculus	MATP 41 DSC	DSC Paper 4	Differential Equation and Vector Calculus
MATH 41 HCC-IX	HCC-IX	Ring Theory & Linear Algebra-I			
MATH 41 HCC-X	HCC-X	Metric Spaces & Complex Theory	MATP 43 SEC	SEC SEM 4 Paper 2	Theory of Equations/ Number Theory
MATH 43 GE-IV	GE-IV	Other Department			
MATH 44 SE-II	SE-II	Graph Theory/ Operating System: Linux			
5 TH SEMESTER					
MATH 51 HCC-XI	HCC-XI	Group Theory-II	MATP 52 DSE	DSE Paper 1	Mechanics / Group Theory and Linear Algebra
MATH 51 HCC-XII	HCC-XII	Numerical Methods + Lab			
MATH 52 DSE-I	DSE-I	Probability & Statistics / Linear Programming	MATP 53 SEC	SEC SEM 5 Paper 1	Probability & Statistics/ Differential Geometry
MATH 52 DSE-II	DSE-II	Number Theory/ Mechanics			
6 TH SEMESTER					
MATH 61 HCC-XIII	HCC-XIII	Ring Theory & Linear Algebra-II	MATP 62 DSE	DSE Paper 2	Metric Space & Complex Analysis / Linear Programming
MATH 61 HCC-XIV	HCC-XIV	Partial Differential Equations & Applications			
MATH 62 DSE-III	DSE-III	Point Set Topology/ Boolean Algebra & Automata Theory	MATP 63 SEC	SEC SEM 6 Paper 2	Graph Theory/ Boolean Algebra & Automata Theory
MATH 62 DSE-IV	DSE-IV	Differential Geometry/ Theory of Equation			

QUESTION PATTERN

THEORY

For 60 Marks paper:

Group	Total Questions	Question to be answered	Mark of each Question	Total Marks
A	6	4	3	$12 = 4 \times 3$
B	6	4	6	$24 = 4 \times 6$
C	4	2	12	$24 = 2 \times 12$
Total Marks				60

For 35 Marks paper:

Group	Total Questions	Question to be answered	Mark of each Question	Total Marks
A	8	5	1	$5 = 5 \times 1$
B	3	2	5	$10 = 2 \times 5$
C	4	2	10	$20 = 2 \times 10$
Total Marks				35

For 40 Marks paper:

Group	Total Questions	Question to be answered	Mark of each Question	Total Marks
A	8	5	1	$5 = 5 \times 1$
B	5	3	5	$15 = 3 \times 5$
C	4	2	10	$20 = 2 \times 10$
Total Marks				40

PRACTICAL

For 20 Marks Honours Paper:

Course	Note Book + Viva	6 Marks
Numerical Methods LAB HCC-XII	2 Problems $\times$ 7 Marks Each	14 Marks

For 20 Marks Programme Paper:

Course	Note Book + Viva	6 Marks
Numerical Methods LAB DSE Paper 1	2 Problems $\times$ 7 Marks Each	14 Marks

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ANNEXURE

Further Reference Book List for Mathematics Honours/ Programme Course

Algebra, Linear Algebra, Group Theory, Ring Theory, Boolean Algebra

1. Topics in Algebra: I. N. Herstein (*Wiley Eastern Ltd.*)
2. Topics in Abstract Algebra: M. K. Sen, S. Ghosh, P. Mukhopadhyay and S. K. Maity (*Universities Press*)
3. Abstract Algebra: N. P. Chaudhuri (*Tata McGraw Hill*)
4. A First Course in Abstract Algebra: J. B. Fraleigh (*Pearson Education*)
5. Algebra: R. M. Khan (*New Central Book Agency*)
6. Higher Algebra: Classical: S. K. Mapa (*Sarat Book House*)
7. Higher Algebra: Abstract & Linear: S. K. Mapa (*Sarat BookHouse*)
8. University Algebra: N. S. Gopala Krishnan (*New Age International*)

Integral and Differential Calculus

9. Introduction to Real Analysis, S. K. Mapa (*Sarat Book House*)
10. Mathematical Analysis: S. C. Malik and S. Arora (*New Age International*)
11. Introduction to Real Analysis: D. R. Sherbert and R. G. Bartle (*Wiley*)
12. Advanced Mathematical Analysis: Utpal Chatterjee (*Academic Publishers*)
13. Mathematical Analysis: Problems and Solutions: S. Bandyopadhyay (*Academic Publishers*)
14. Mathematical Analysis: S. N. Mukhopadhyay and A. K. Layek (*U. N. Dhur and Sons*)
15. A Course of Mathematical Analysis: S. Narayan (*S. Chand & Co.*)
16. Problems in Mathematical Analysis: B. P. Demidovich (*Mir Publication*)
17. An Introduction to Analysis-Differential Calculus, Part I & II: R. K. Ghosh and K. C. Maity (*New Central Book Agency*)
18. Integral Calculus & Differential Equations: B. C. Das and B. N. Mukherjee (*U.N. Dhur and Sons*)
19. Differential Calculus: B. C. Das & B. N. Mukherjee (*U.N. Dhur and Sons*)
20. Differential Calculus: S. Narayan (*S. Chand & Co.*)
21. Application of Calculus: S. K. Maity & S. Bandyopadhyay (*Academic Publishers*)
22. Application of Calculus: D. Sengupta (*Books & Allied*)
23. Calculus and its Applications: Goldstein, Lay, Schneider, Asmar (*Pearson Education*)
24. Integral Calculus: S. Narayan (*S. Chand & Co.*)
25. An Introduction to Analysis-Integral Calculus: R. K. Ghosh and K. C. Maity (*New Central Book Agency*)
26. Integral Calculus and Differential Equations: D. Chatterjee (*Tata McGraw Hill*)
27. Calculus: Volume I and II: T. Apostol (*Narosa Publishing House*)

Differential Equation

28. An Introduction to Differential Equations: R. K. Ghosh and K. C. Maity (*New Central Book Agency*)
29. Differential Equations: J. G. Chakravorty and P. R. Ghosh (*U. N. Dhur and Sons*)

30. Differential Equation and Laplace Transform: A. N. Das (*New Central Book Agency*)
31. Differential Equations: G. F. Simmons (*Tata McGraw*)
32. Ordinary and Partial Differential Equations: M. D. Raisinghania (*S. Chand & Co.*)

Complex Analysis and Metric Spaces

33. Complex Analysis: S. Ganguly (*Academic Publishers*)
34. Theory of Functions of a Complex Variable: S. Narayan and P. K. Mittal (*S. Chand & Co.*)
35. Complex Variables: M. R. Spiegel (*McGraw Hill*)
36. Complex Analysis: U. C. De (*U. N. Dhur and Sons*)
37. Complex Analysis and Metric Spaces: U.C. De and J. Sengupta (*U. N. Dhur and Sons*)
38. Elements of Metric Spaces: M. N. Mukherjee (*Academic Publishers*)
39. Topology of Metric Spaces: S. Kumareasan (*Narisa Publishing House*)

Analytical Geometry (Two & Three Dimension) and Vector Analysis

40. Analytical Geometry and Vector Algebra: N. Datta and R. N. Jana (*Shreedhar Prakashani*)
41. Co-ordinate Solid Geometry: B. Nand, B. S. Tyagi and B. D. Sharma (*Kedar Nath Ram Nath*)
42. Analytical Geometry of two and three Dimensions: A. N. Das (*New Central Book Agency*)
43. Advanced Analytical Geometry of Two and Three Dimensions: U. Chatterjee and N. Chatterjee (*Academic Publishers*)
44. Analytical Geometry of Two and Three Dimensions & Vector Analysis: R.M. Khan (*New Central Book Agency*)
45. Vector Analysis: R. K. Ghosh and K. C. Maity (*New Central Book Agency*)
46. Vector Analysis: J. G. Chakravorty and P. R. Ghosh (*U.N. Dhur and Sons*)
47. Vector Analysis- Introduction to Tensor Analysis: A. N. Das (*U.N. Dhur and Sons*)
48. Vector Analysis and An Introduction to Tensor Analysis: M. R. Spiegel (*McGrawHill*)

Particle Dynamics, Rigid Dynamics, Analytical Static and Classical Mechanics

49. Dynamics of a Particle: N. Datta and R. N. Jana (*Shreedhar Prakashani*)
50. Analytical Dynamics of a Particle: S. Ganguly and S. Saha (*New Central Book Agency*)
51. Advanced Analytical Dynamics: J. G. Chakravorty and P. R. Ghosh (*U.N. Dhur and Sons*)
52. Dynamics of a Particle and of Rigid Bodies: S. L. Loney (*Indian Edition-Radha Publishing House*)
53. Dynamics of Rigid Bodies: S. Mollah (*Books & Allied*)
54. Rigid Dynamics: M. M. Rahaman (*New Central Book Agency*)
55. Analytical Statics: M. C. Ghosh (*Shreedhar Prakashani*)
56. Analytical Statics: S. A. Mollah (*Books & Allied*)
57. Statics: B. C. Das and B. N. Mukherjee (*U.N. Dhur and Sons*)
58. Statics: S. L. Loney (*Radha Publishing House*)
59. Advanced Analytical Statics: S. Mondal (*U.N. Dhur and Sons*)
60. Classical Mechanics: H. Goldstein (*Narosa Publishing House*)

61. Classical Mechanics: S. L. Gupta, V. Kumar and H. V. Sharma (*Pragati Prakashan*)
62. Theoretical Mechanics: M. R. Spiegel (*McGraw Hill*)
63. Classical Mechanics: R. N. Tiwari and B. S. Thakur (*Prentice Hall of India*)

Linear Programming

64. Linear Programming: P. M. Karak (*New Central Book Agency*)
65. Linear Programming: J. G. Chakravorty and P. R. Ghosh (*U.N. Dhur & Sons*)
66. Introduction to Linear Programming: D. C. Sanyal and K. Das (*Dhur & Sons*)

Probability and Statistics

67. Groundwork of Mathematical Probability and Statistics: A. Gupta (*Academic Publishers*)
68. Mathematical Probability: A. Banerjee, S. K. De and S. Sen (*U.N. Dhur & Sons*)
69. Probability & Statistics-volume I & II: D. Biswas (*New Central Book Agency*)
70. Statistical Methods-part I & II: N. G. Das (*M. Das & Co.*)
71. Fundamentals of Mathematical Statistics: S. C. Gupta & V. K. Kapoor (*Sultan Chand & Sons*)
72. Mathematical Statistics S. K. De and S. Sen (*U.N. Dhur and Sons*)
73. A First Course in Probability: Sheldon Ross (*Pearson*)
74. Introduction to Probability and Statistics: Lipschutz (*Tata McGraw Hill*)

Numerical Analysis and C Programming Language

75. An Introduction to Numerical Analysis: Atkinson (*John Wiley and Sons*)
76. Numerical Analysis: N. Datta and R. N. Jana (*Shreedhar Prakashani*)
77. Numerical Analysis: S. A. Mollah (*Books & Allied*)
78. A Textbook of Numerical Analysis: D. C. Sanyal and K. Das (*U.N. Dhur and sons*)
79. Numerical Analysis: A. N. Das (*U.N. Dhur and Sons*)
80. Let us C: Y. Kanetkar (*BPB Publications*)
81. Programming in ANSI C: E. Balagurusamy (*Tata McGraw-Hill*)
82. Programming in C: V. Krishnamoorthy and K. R. Radhakrishnan (*Tata McGrawHill*)

Discrete Mathematics and Graph Theory

83. Introduction to Graph Theory: D. B. West (*Prentice Hall of India*)
84. Discrete Mathematics: J. K. Sharma (*Macmillan*)
85. Introduction to Discrete Mathematics: M. K. Sen and B. C. Chakraborty (*Books & Allied*)
86. Graph Theory with Applications to Engineering and Computer Science: N. Deo (*Prentice-Hall of India*)
87. Discrete Mathematics with Graph Theory: E. G. Goodaire and M. M. Parmenter (*Pearson Education*)

*******THE END*******