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NAME OF THE PROGRAMME	BACHELOR OF COMMERCE (GENERAL)
PROGRAM CODE	IABOC01

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	Develop student competencies in the development, measurement, analysis, validation and communication of accounting, financial and other information.	PO1	Sound understanding and knowledge of the accounting concepts and principles and the context in which it operates.
PEO2	Expose students to global, legal, regulatory and ethical issues relating to business and accounting.	PO2	Ability to understand and apply the varied accounting techniques including cost and management accounting in decision making process.
PEO3	Equip students with the technological skills for performing various accounting & Finance operations.	PO3	Ability to use appropriate tools and techniques to evaluate the financial statements and apply the international accounting standards (IFRS) in preparation of the financial statements
PEO4	Equip students with entrepreneurial skills required for setting up various incubation centers and small-scale enterprises.	PO4	Sense of professional ethics, integrity and social responsibility.
PEO5	Increased student autonomy in the learning process, ability to self reflect and engage in lifelong learning.	PO5	Develop ability to self-reflect on accounting concepts and principles and engage in lifelong learning.

SEMESTER - I			
Course Code	BCM 1.1	Course Title	FINANCIAL ACCOUNTING
	Course Objectives		Course Outcomes (COs)
1	Acquaint students with the accounting concepts, tools and techniques influencing Business Organizations.	CO1	Develop the skill of recording financial transactions and preparation of Reports in accordance with IFRS and allied aspects of accounting.
2	Prepare organisation's financial accounts (statements) for a specific time.	CO2	Develop and understand the nature and purpose of financial statements in relation to decision making.
3	To improve clarity, consistency and comparability of the communication of financial information.	CO3	Enable the students to combine practice and theoretical knowledge of financial accounting.
		CO4	To enable the students to learn the basic concepts of Partnership accounting.
		CO5	Understand the methods of calculating profits under a single entry system.

Course Code	BCM 1.2	Course Title	INDIAN FINANCIAL SYSTEM
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with regard to structure, organization and working of the financial system in India.	**CO1**	Understand the role and function of the financial system with reference to the macro economy.
2	To understand the financial instruments available and their working in the financial system.	**CO2**	Demonstrate an awareness of the current structure and regulation of the Indian financial services sector.
3	To understand how the economic development of any country depends upon the existence of a well organised financial system.	**CO3**	Evaluate and create strategies to promote financial products and services.
		CO4	Evaluate the functioning of different financial institutions.
		CO5	Illustrate the functioning of financial market and government security market in the development of Indian financial system.
Course Code	**BCM 1.3**	**Course Title**	**PRINCIPLES OF MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students to the concepts and principles of organization management.	**CO1**	Understand the managerial concepts related to business & inculcate values & ethics for the same.
2	To understand the management of principles into management practice.	**CO2**	Demonstrate the roles, skills and functions of management.
3	To study the system and process of effective controlling in the organization.	**CO3**	Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.
		CO4	Understand the importance of planning and forecasting in the decision-making process of a given organization.
		CO5	Create the awareness of the principles to be followed in an organisation.
Course Code	**BCM 1.4**	**Course Title**	**CORPORATE ADMINISTRATION**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to get familiarized with the existing Company Law and Secretarial Procedure.	**CO1**	To make students to know about various company law.
2	Understand the various roles played by top executives.	**CO2**	The subjects provide knowledge to the students to different documents required to start-up company.
3	To familiarize students about the different types of meetings conducted by the company.	**CO3**	To gain knowledge about different meeting conducted by company.
		CO4	Various role executed by top level management.
		CO5	Understand the concept of the process of issue of shares and its subscription.

SEMESTER - II			
Course Code	**BCM 2.1**	**Course Title**	**ADVANCED FINANCIAL ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To help the students to acquire the knowledge and impart the skills about different kinds of Financial Accounting Methods.	**CO1**	To be able to compute fire insurance claims under both loss of stock method and loss of profit method and preparation of fire insurance claim.
2	To acquaint students with the accounting tools and Techniques influencing business organizations.	**CO2**	Record the Consignment transactions in the books of Consignor and Consignee and ascertain Profits.
3	To Understand the System of Keeping Financial Accounting Records.	**CO3**	Understand the concepts of Joint venture and prepare different set of accounts on Joint Venture.
		CO4	To familiarize the concept of Branch account and its system.
		CO5	Prepare Final Accounts of sole-traders and Non-Profit organisations and develop the skill of preparation of Trading and Profit and Loss Account and Balance sheet.
Course Code	**BCM 2.2**	**Course Title**	**MARKETING MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concepts of marketing management.	**CO1**	Understand the concept of Marketing and learn the recent trends in marketing.
2	To develop the knowledge towards the marketing environment.	**CO2**	To evaluate and analyse the environmental impact on Marketing.
3	To understand the tools used in managerial decision making.	**CO3**	Discuss the concept and types of Marketing Mix and its blend in Marketing Operation.
		CO4	To achieve the practical knowledge in Retail Operations.
		CO5	To understand the role of the Service sector and its importance in the present era.
Course Code	**BCM 2.3**	**Course Title**	**BANKING LAW AND OPERATIONS**
	Course Objectives		**Course Outcomes (COs)**
1	To enrich students with the knowledge of the functioning of banks.	**CO1**	To help to gather knowledge on banking and financial system in India.
2	To aim to familiarize banking system in India.	**CO2**	To provide knowledge about commercial banks and its products.
3	To enhance student's knowledge regarding new concepts and technologies introduced in the banking system.	**CO3**	To develop an understanding of different negotiable instruments and their management.
		CO4	To enable them to understand banker-customer relationship.
		CO5	To create awareness about modern banking services like e-banking, m-banking and internet banking.

Course Code	BCM 2.4	Course Title	QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS - I
	Course Objectives		**Course Outcomes (COs)**
1	Understand relevance & need of quantitative methods for making business decisions	**CO 1**	To understand basic concept of numerical analysis
2	Demonstrate a sound knowledge of fundamentals of statistics and statistical techniques	**CO 2**	To apply basic terms of dispersion and skewness in solving practical problems in the field of business.
3	Be able to apply quantitative methods to solve a variety of business problems	**CO 3**	Use business statistics for central measurements, frequency distributions, graphs and measure of dispersion and be able to select which method should be used for different problems
		CO 4	Apply the knowledge of principles and purpose of index number in finding out the difference between quantity and price.
		CO 5	To know how the information has to be collected through census method and it has to be applied in survey
SEMESTER - III			
Course Code	**BCM 3.1**	**Course Title**	**CORPORATE ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To acquire knowledge and understanding of the concepts, techniques and practices of Corporate accounting	**CO 1**	Gain knowledge on statutory provisions regarding preparation of Company Final Accounts.
2	To give them an exposure to calculate the value of Goodwill and shares.	**CO 2**	To provide knowledge on Goodwill & shares
3	To Impact Company Accounts to understand and appreciate the Provisions of the companies act 1956	**CO 3**	Enabling the students to get an idea on calculation of profit prior to incorporation
		CO 4	Creates awareness about the provisions in Companies Act with respect to Underwriting of Shares, underwriting commission.
		CO 5	Develop the application skills to computation of profit and loss account and preparation of balance sheet of companies (new format).
Course Code	**BCM 3.2**	**Course Title**	**E-BUSINESS AND ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	It provides an introduction to information systems for business and management	**CO 1**	Understand the fundamental and importance of E-commerce
2	To familiarize students with organizational and managerial foundations of systems	**CO 2**	To understand the concept of online shopping and models of the electronic market.
3	To explain various terminology used in internet	**CO 3**	Empower the students to access e-commerce requirement of a business
		CO 4	To introduce students with an accounting package (Tally ERP 9).

		CO 5	Perform computerized accounting using the Tally package.
Course Code	**BCM 3.3**	**Course Title**	**BUSINESS ETHICS**
	Course Objectives		**Course Outcomes (COs)**
1	To recognize organizational challenges to ethical behaviour.	**CO 1**	To understand Business Ethics and to provide best practices of Ethics.
2	To Demonstrate knowledge of established methodologies of solving ethical problems.	**CO 2**	To learn the values and implement in their careers to become best managers.
3	To understand the inherent conflict of interest in many business decisions.	**CO 3**	To develop various CSR policies and practice it in their professional life and adhere to ethical codes in Corporate Governance.
		CO 4	Students will analyze ethical codes.
		CO 5	Students will analyze employee conditions and ethical codes.
Course Code	**BCM 3.4**	**Course Title**	**QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS - II**
	Course Objectives		**Course Outcomes (COs)**
1	To highlight the benefits as well as the limits of quantitative analysis in a real-world context	**CO 1**	Students will clearly communicate quantitative ideas both orally and in writing of correlation and regression.
2	To orient the students to various hypothesis testing methods as to how and where appropriately they can be applied.	**CO 2**	Students will create quantitative models to solve real world problems in appropriate contexts
3	To enable better reporting for decision making.	**CO 3**	Students will frame problems using multiple mathematical and statistical representations of relevant structures and also find out missing values through interpolation and extrapolation
		CO 4	Students will formulate complete, concise, and correct sampling methods to select their sample for their reassert activities
		CO 5	familiarizing students with probability theorem
Course Code	**BCM 3.5**	**Course Title**	**PUBLIC RELATIONS AND CORPORATE COMMUNICATION**
	Course Objectives		**Course Outcomes (COs)**
1	To understand techniques of effective communication.	**CO 1**	Provides students with basic understanding of the concepts of business, communication and public relation.
2	To develop & improve various skills like communication, reading, listing, note making, persuasive speaking, body language & gestures	**CO 2**	Equips the students to learn the principles of effective communication so that they can communicate with confidence in the corporate world.
3	To make aware about barriers to communication with ethical context	**CO 3**	Enhance the creative abilities of the learners.
		CO 4	Develops critical understanding of different practices associated with business communication.

		CO 5	To make students understand the importance of soft skills required to plan and pursue a career and to empower them with employability skills.
SEMESTER - IV			
Course Code	**BCM 4.1**	**Course Title**	**ADVANCED CORPORATE ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to develop awareness about Advanced Corporate Accounting in conformity with the Provision of Companies' Act and latest amendments with adoption of Accounting Standards.	**CO 1**	Provides knowledge about the procedure and Provision of Redemption of Preference Shares and Debentures.
2	To enable the students to get an insight about the accounting of different sectors and its application.	**CO 2**	Creates awareness about the provisions in Companies Act with respect to Mergers and Acquisitions.
3	To provide the underlying framework and concepts of financial accounting in the context of how accounting fits into the overall business environment of contemporary society.	**CO 3**	Enable the students to understand the detailed concepts of internal reconstruction and understanding of financial situation and results of operations of the organization
		CO 4	Creates knowledge about the accounting procedures and methods regarding Liquidation of Companies
		CO 5	Familiarizes the students with the recent developments and techniques regarding HRA, Environmental accounting and social responsibility accounting.
Course Code	**BCM 4.2**	**Course Title**	**COST ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To Provide an understanding of basic techniques of cost accounting and to develop the skills necessary to apply those techniques	**CO 1**	To explain relevant cost concepts & classification of costs used in the manufacturing / service sector.
2	To provide an understanding of the use of cost accounting techniques in planning, control & decision making.	**CO 2**	To carry out various cost calculations using relevant costing techniques
3	To provide an understanding of proper recording, presentation of cost data to management for measuring efficiency in cost control & cost reduction.	**CO 3**	To apply costing principles in the decision making process.
		CO 4	To prepare the production cost statement & cost of goods sold statement.
		CO 5	To explain the relationship between cost & financial accounting.

Course Code	BCM 4.3	Course Title	FINANCIAL MANAGEMENT
	Course Objectives		**Course Outcomes (COs)**
1	To offer the students relevant, systematic, efficient and actual knowledge of financial management	**CO 1**	To familiarise students with the concept of fundamental financial concepts, especially time value of money
2	Develop knowledge on the allocation, management and funding of financial resources.	**CO 2**	To create an awareness about capital structure
3	Improving students' understanding of the time value of money concept and the role of a financial manager in the current competitive business scenario.	**CO 3**	To make them understand the cost of capital in wide aspects
		CO 4	To provide knowledge about dividend policies
		CO 5	To enable them to understand working capital management
Course Code	**BCM 4.4**	**Course Title**	**STOCK AND COMMODITY MARKET**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an elaborate understanding of Indian stock markets	**CO 1**	Familiarization with the constituents of the stock markets
2	To provide knowledge on the Money Market and the Capital Market in India.	**CO 2**	Understand the roles played by stock brokers, depositories etc
3	Understand the intricacies of operating in stock market	**CO 3**	To gain comprehensive knowledge of all aspects relating to financial services industry in India
		CO 4	Understand the functioning of trading mechanisms used by brokers.
		CO 5	to be able to participate in financial markets as an informed investor
Course Code	**BCM 4.5**	**Course Title**	**PRINCIPLES OF EVENT MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to be aware of event management as a profession	**CO 1**	Obtain a sense of responsibility for the multidisciplinary nature of event management
2	Students can gain basic knowledge about establishing and managing an event	**CO 2**	Gain confidence and enjoyment from involvement in the dynamic industry of event management
3	To Understand the key elements and develop soft skills that would help in event management	**CO 3**	Identify best practice in the development and delivery of successful conferences and corporate gatherings
		CO 4	Identify the key elements of a conference and the processes involved in venue selection, registration, catering, accommodation, transport, security and entertainment
		CO 5	Identify management essentials such as developing budgets, critical paths, work breakdown structures, risk mitigation and contingency planning.

SEMESTER - V			
Course Code	**BCM 5.1**	**Course Title**	**ENTREPRENEURSHIP DEVELOPMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To provide students with the knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings.	**CO 1**	To make students understand the importance of Entrepreneurship in the present era.
2	To enable students to be independent, capable, promising businessmen.	**CO 2**	To make students acquire knowledge on establishment and policies of small-scale Industries.
3	To enable students to understand the basic concepts of entrepreneurship and preparing a business plan to start a small industry	**CO 3**	To teach the formation and future prospects of small-scale Industries.
		CO 4	The practical exposure to prepare a Business plan for future Start-ups.
		CO 5	To analyse the role of Financial Institutions in encouraging future Entrepreneurs.
Course Code	**BCM 5.2**	**Course Title**	**INTERNATIONAL FINANCIAL REPORTING STANDARDS**
	Course Objectives		**Course Outcomes (COs)**
1	Expose the students to the international financial reporting standards	**CO 1**	Enable comparison of financial statements at an international level
2	Identify and apply disclosure requirements for companies in financial reports	**CO 2**	Familiarize and understand the International Financial Reporting Standards (IAS or IFRS) and their application to the companies who use them/
3	Develop the students' ability to analyse the statement using Ind-AS	**CO 3**	Prepare holding companies' consolidated books of accounts.
		CO 4	Work in the Finance Department of companies using IFRS.
		CO 5	Help to pursue Chartered Accountancy, ACCA
Course Code	**BCM 5.3**	**Course Title**	**INCOMETAX - I**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to gain knowledge about the provisions of Indian income tax 1961	**CO 1**	To make students understand the difference between Income tax bill and Act.
2	To make students aware about powers and Functions of central board of direct taxes	**CO 2**	To enable students to apply the knowledge of Provisions relating to various heads on Income.
3	To familiarise the students with availing deductions under section 24 and under section 16	**CO 3**	To enable students to analyze the taxability of various heads of income.
		CO 4	To understand the deductions and exemptions for various heads
		CO 5	To familiarise the students with the concept of calculating the tax liability of an individual.

Course Code	BCM 5.4	Course Title	COSTING METHODS
	Course Objectives		**Course Outcomes (COs)**
1	To enhance the abilities of learners to develop the concept of costing methods and its significance in the business	**CO 1**	To familiarize students with the basic concepts of cost and various methods and techniques of costing
2	To make the students develop competence with their usage in managerial decision making and control.	**CO 2**	Identify the specifics of different costing methods.
3	To enable the learners to understand, develop and apply the techniques of costing methods in the business corporates	**CO 3**	Application of costing methods to both manufacturing and service industry.
		CO 4	To be able to analyze and evaluate information for cost ascertainment, planning, Control and decision making
		CO 5	Summarize process, job, batch Costing and prepare a process cost report.
Course Code	**BCMA 5.5**	**Course Title**	**ADVANCED ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To acquaint students and make them familiar with the process and preparation of accounts of different types of organisations	**CO 1**	Identifies the financial transactions of Banking & Insurance companies & studies systematics recording of books of accounts
2	To familiarize students with accounting provisions under various sectors and their application	**CO 2**	Provides knowledge about Financial Statement of Insurance Companies (Life and General)
3	To make the students familiar with the advanced aspects of accounting along with their practical application.	**CO 3**	Enhances students' knowledge about various types of company accounts
		CO 4	To make them aware about accounts of Banking Companies and Insurance Companies as per the revised Accounting Standards.
		CO 5	Gain confidence in preparation of Farm accounts, Investment accounts, Inflation accounts independently
Course Code	**BCMF 5.5**	**Course Title**	**INTERNATIONAL FINANCIAL MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an in-depth view of the process in financial management of the firm	**CO 1**	To familiarize the students with the concept of Financial Management, Financial markets and intermediaries.
2	To develop knowledge on the allocation, management and funding of financial resources.	**CO 2**	Identify and appraise investment opportunities in the international environment.
3	Enhancing student's ability in dealing short-term and also longer-term dealing, which involves major capital investment decisions and raising long-term finance.	**CO 3**	Understanding host country's Environment, Application of the techniques of Investment

		CO 4	To enable them to know Capital structure theories, valuation of shares, debt and Risk
		CO 5	Understand international capital and foreign exchange markets.
Course Code	**BCMA 5.6 & BCMF 5.6**	**Course Title**	**GOODS AND SERVICES TAX**
	Course Objectives		**Course Outcomes (COs)**
1	To make students understand the procedure by the government to compute the tax liability on Imports and exports.	**CO 1**	Understanding the need and importance of GST in India over the old taxes
2	To enable student's analyse the provisions of taxability on businesses like Company and Partnership firms.	**CO 2**	Assessment and Payment of GST
3	To make students aware of the importance of E-filing of returns with availability of different forms and dates for payment and filing it.	**CO 3**	Availing the benefits of Input tax credit and adjustments
		CO 4	To understand the Dual GST structure in India.
		CO 5	To enable students to analyze the provisions under GST Act.
SEMESTER - IV			
Course Code	**BCM 6.1**	**Course Title**	**BUSINESS REGULATION**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students about relevant laws concerning business organizations.	**CO 1**	To familiarize students with primary sources of law.
2	To familiarize students about relevant laws concerning business organizations.	**CO 2**	To make students identify the principles and doctrines that guide contracts.
3	To familiarize students about relevant laws concerning business organizations.	**CO 3**	To teach students better and all-round protection to consumers and effective safeguards against different types of exploitation such as defective goods, deficient services and unfair trade practices.
		CO 4	The practical exposure to apply intellectual property law principles (including copyright, patents, designs and trademarks) to real problems and analyse the social impact of intellectual property law and policy.
		CO 5	To analyze the concept and scope of environmental law and also of its particular dominant issues.
Course Code	**BCM 6.2**	**Course Title**	**PRINCIPLES AND PRACTICES OF AUDITING**
	Course Objectives		**Course Outcomes (COs)**
1	To provide working knowledge of the framework of the auditing system in India.	**CO 1**	To familiarize and educate the students with the concepts of auditing in India.
2	To enable students to acquire an understanding of the tools, techniques and procedure of audit.	**CO 2**	Critically evaluate the role and responsibilities of the external auditor and the audit process

3	To develop an understanding of the duties, responsibilities and liabilities of a company auditor	**CO 3**	Appraise the legislative and professional provisions (auditing standards and ethical guidelines) that constitute the regulatory framework for the conduct of external auditing.
		CO 4	Formulate how the auditor obtains an understanding of the entity and its environment, when planning and assessing the risk of the audit.
		CO 5	To familiarize the students of the audit procedure of different types of undertakings.
Course Code	**BCM 6.3**	**Course Title**	**INCOME TAX - II**
	Course Objectives		**Course Outcomes (COs)**
1	To Create an awareness of legal principles of Direct Taxes	**CO 1**	To make students know Tax structure in India.
2	To familiarize students with Computations and Tax Levy.	**CO 2**	To make student understand the procedure adopted by government to compute the tax liability on Incomes
3	To familiarize students about relevant laws concerned to Indian Income Tax Act 1961	**CO 3**	To enable students analyse the various sources of Incomes which are taxable and which are exempt under the Act.
		CO 4	To make students aware of provisions of Income Tax Act 1961
		CO 5	To make students aware about the procedure of E filling and necessary documents required
Course Code	**BCM 6.4**	**Course Title**	**MANAGEMENT ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	Enhance the abilities of learners to develop the concept of management accounting and its significance in the business	**CO 1**	To familiarize the students with various principles and Techniques of Management Accounting.
2	enable the learners to understand, develop and apply the techniques of management accounting in the financial decision making in the business corporates.	**CO 2**	To make students apply accounting ratios to simplify interpretation of the financial statement
3	learn how accountants create, organize, interpret, and communicate information that improves internal processes and allows organizations to identify and leverage opportunities to create value within the supply chain and with customers.	**CO 3**	Enable students to prepare cash flow statements and understand the cash position of the company
		CO 4	Make inter-firm and inter-period comparison, of financial statements
		CO 5	To make the students develop competence with their usage in managerial decision making and control

Course Code	BCMA 6.5	Course Title	BUSINESS TAXATION
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students with Indirect tax Laws	**CO 1**	Identify and evaluate the impact of different tax planning scenarios.
2	To enable the learners to understand, develop and apply the tax procedures for business corporates tax liability.	**CO 2**	To make students aware of deductions to be availed u/s 80
3	To enable students to identify the key dates for submission of returns	**CO 3**	To familiarise students with AMT and MAT Provisions
		CO 4	To make student understand the procedure of filling the tax returns
		CO 5	To enable students to understand the tax avoidance and avoidance strategies practices.
Course Code	**BCMF 6.5**	**Course Title**	**PERFORMANCE MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students on the use of costing data for decision making	**CO 1**	Understanding the techniques of decision making like marginal costing and standard costing.
2	To enable students to evaluate different variance specially material variance and labour variance	**CO 2**	To make students understand the difference between the traditional costing system and how it will be effective in activity based costing.
3	To create awareness on the emerging cost management concepts.	**CO 3**	To make students understand the procedure of different methods applied in cost control and cost reduction.
		CO 4	Understanding different types of budgets
		CO 5	Understanding the concepts of management reporting and management information systems.
Course Code	**BCMA 6.6**	**Course Title**	**COST MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to understand techniques used to control as well as reduce the cost	**CO 1**	To know how to calculate different elements in marginal costing like ratios, fixed and variable cost
2	To familiarize the students on the use of costing data for decision making	**CO 2**	How to prepare different types of budget
3	To create awareness on the emerging cost management concepts.	**CO 3**	To make students understand the difference between the traditional costing system and how it will be effective in activity based costing.
		CO 4	To enable students to evaluate different variance specially material variance and labour variance
		CO 5	To make student understand the procedure of different methods applied in cost control and cost reduction,

Course Code	BCMF 6.6	Course Title	INTERNATIONAL AUDITING AND ASSURANCE
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to acquire an understanding of the tools, techniques and procedure of audit.	**CO1**	Evaluate the nature, purpose and scope of an audit and the legal, regulatory and ethical framework for auditing.
2	To develop an understanding of the duties, responsibilities and liabilities of a company auditor	**CO2**	Identify procedures required to evaluate control risk.
3	To provide working knowledge of the framework of auditing system Internationally	**CO3**	Analyse the nature of internal control systems related to audit including IT systems.
		CO4	Formulate how the auditor obtains an understanding of the entity and its environment, when planning and assessing the risk of the audit.
		CO5	To familiarize the students of the audit procedure and ethics of different types of undertakings.

NAME OF THE PROGRAMME	**BACHELOR OF COMMERCE (BANKING & INSURANCE)**
PROGRAM CODE	**IABOC02**

Programme Educational Objectives (PEOs)		**Programme Outcomes (POs)**	
PEO1	Develop student competencies in the development, measurement, analysis, validation and communication of Banking, Insurance and other financial & accounting information.	**PO1**	Sound understanding and knowledge of Banking, Insurance and accounting concepts, principles and the context in which it operates.
PEO2	Expose students to global, legal, regulatory and ethical issues relating to Banking and Insurance.	**PO2**	Ability to understand and apply the varied Banking and Insurance techniques including Life, General and Health Insurance concepts.
PEO3	Equip students with the technological skills for performing various Banking and Insurance operations.	**PO3**	Ability to use appropriate tools and techniques to evaluate the financial statements of Banking & Insurance sector and appl;y the international accounting standards (IFRS) in preparation of the financial statements.
PEO4	Equip students with entrepreneurial skills required for setting up various incubation centers and small scale enterprises.	**PO4**	Sense of professional ethics, integrity and social responsibility.
PEO5	Increased student autonomy in the learning process, ability to self-reflect and engage in lifelong learning.	**PO5**	Develop ability to self-reflect on Banking, Insurance and Accounting concepts and principles and engage in lifelong learning.

SEMESTER - I			
Course Code	**BCB 1.1**	**Course Title**	**FINANCIAL ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	Acquaint students with the accounting concepts, tools and techniques influencing Business Organizations.	**CO1**	Develop the skill of recording financial transactions and preparation of Reports in accordance with IFRS. And allied aspects of accounting.
2	Prepare organisation's financial accounts (statements) for a specific time.	**CO2**	Develop and understand the nature and purpose of financial statements in relation to decision making.
3	To improve clarity, consistency and comparability of the communication of Financial information.	**CO3**	Enable the students to combine practice and theoretical knowledge of Financial accounting.
		CO4	To enable the students to learn the basic concepts of Partnership Accounting..
		CO5	Understand the methods of calculating profits under a single entry system.

Course Code	BCB 1.2	Course Title	INDIAN FINANCIAL SYSTEM
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with regard to structure, organization and working of the financial system in India.	**CO1**	Understand the role and function of the financial system with reference to the macro economy.
2	To understand the financial instruments available and their working in the financial system.	**CO2**	Demonstrate an awareness of the current structure and regulation of the Indian financial services sector.
3	To understand how the economic development of any country depends upon the existence of a well organised financial system.	**CO3**	Evaluate and create strategies to promote financial products and services
		CO4	Evaluate the functioning of different financial institutions
		CO5	Illustrate the functioning of financial market and government security market in the development of Indian financial system
Course Code	**BCB 1.3**	**Course Title**	**PRINCIPLES OF MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To enrich students with the knowledge of the functioning of banks	**CO1**	To help to gather knowledge on banking and financial system in India
2	To aim to familiarize banking system in India	**CO2**	To provide knowledge about commercial banks and its products
3	To enhance students' knowledge regarding new concepts and technologies introduced in the banking system.	**CO3**	To develop an understanding of different negotiable instruments and their management
		CO4	To enable them to understand banker-customer relationship
		CO5	To create awareness about modern banking services like e-banking, m-banking and internet banking
Course Code	**BCB 1.4**	**Course Title**	**CORPORATE ADMINISTRATION**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to get familiarized with the existing Company Law and Secretarial Procedure.	**CO1**	To make students to know about various company law
2	Understand the various roles played by top executives.	**CO2**	The subjects provides knowledge to the students to different documents required to startup a company
3	To familiarize students about the different types of meetings conducted by the company.	**CO3**	To gain knowledge about different meeting conducted by company
		CO4	Various roles executed by top level management
		CO5	Understand the concept of the process of issue of shares and its subscription .

SEMESTER - II			
Course Code	**BCB 2.1**	**Course Title**	**ADVANCED FINANCIAL ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To help the students to acquire the knowledge and impart the skills about different kinds of Financial Accounting Methods	**CO1**	To be able to compute fire insurance claims under both loss of stock method and loss of profit method and preparation of fire insurance claim.
2	To acquaint students with the accounting tools and Techniques influencing business organizations	**CO2**	Record the Consignment transactions in the books of Consignor and Consignee and ascertain Profits
3	To Understand the System of Keeping Financial Accounting Records.	**CO3**	Understand the concepts of Joint venture and prepare different set of accounts on Joint Venture
		CO4	To familiarize the concept of Branch account and its system.
		CO5	Prepare Final Accounts of sole-traders and Non-Profit organisations and develop the skill of preparation of Trading and Profit and Loss Account and Balance sheet
Course Code	**BCB 2.2**	**Course Title**	**PRINCIPLES OF LIFE INSURANCE**
	Course Objectives		**Course Outcomes (COs)**
1	To disseminate principles & concepts of life insurance practice among students.	**CO1**	Fundamental conceptual knowledge of Life Insurance.
2	To improve clarity, consistency and comparability of life insurance information.	**CO2**	Compare and contrast the types of life assurance available in the market.
3	To familiarize the students on process of claims and calculation of life insurance	**CO3**	Explain the legality and administrative issues of life policies
		CO4	Applying the life assurance knowledge and skills in different scenarios
		CO5	Understand the Underwriting Risk and its repercussions
Course Code	**BCB 2.3**	**Course Title**	**MARKETING MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concepts of marketing management	**CO1**	Understand the concept of Marketing and learn the recent trends in marketing.
2	To develop the knowledge towards the marketing environment	**CO2**	To evaluate and analyze the environmental impact on Marketing.
3	To understand the tools used in managerial decision making.	**CO3**	Discuss the concept and types of Marketing Mix and its blend in Marketing Operation
		CO4	To achieve the practical knowledge in Retail Operations
		CO5	To understand the role of the Service sector and its importance in the present era.

Course Code	BCB 2.4	Course Title	PUBLIC RELATIONS AND CORPORATE COMMUNICATION
	Course Objectives		**Course Outcomes (COs)**
1	To understand techniques of effective communication.	**CO 1**	Provides students with basic understanding of the concepts of business, Communication and public relations.
2	To develop & improve various skills like communication, reading, listing, note making, persuasive speaking, body language & gestures	**CO 2**	Equips the students to learn the principles of effective communication so that they can Communicate with confidence in the corporate world.
3	To make aware about barriers to communication with ethical context	**CO 3**	Enhance the creative abilities of the learners.
		CO 4	Develops critical understanding of different practices associated with business communication.
		CO 5	To make students understand the importance of soft skills required to plan and pursue a career and to empower them with employability skills.
SEMESTER - III			
Course Code	**BCB 3.1**	**Course Title**	**CORPORATE ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To acquire knowledge and understanding of the concepts, techniques and practices of Corporate accounting	**CO 1**	Gain knowledge on statutory provisions regarding preparation of Company Final Accounts.
2	To give them an exposure to calculate the value of Goodwill and shares.	**CO 2**	To provide knowledge on Goodwill & shares
3	To Impact Company Accounts to understand and appreciate the Provisions of the companies act 1956	**CO 3**	Enabling the students to get an idea on calculation of profit prior to incorporation
		CO 4	Creates awareness about the provisions in Companies Act with respect to Underwriting of Shares, underwriting commission.
		CO 5	Develop the application skills to computation of profit and loss account and preparation of balance sheet of companies (new format).
Course Code	**BCB 3.2**	**Course Title**	**COST ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To Provide an understanding of basic techniques of cost accounting and to develop the skills necessary to apply those techniques	**CO 1**	To explain relevant cost concepts & classification of costs used in the manufacturing / service sector.
2	To provide an understanding of the use of cost accounting techniques in planning, control & decision making.	**CO 2**	To carry out various cost calculations using relevant costing techniques
3	To provide an understanding of proper recording, presentation of cost data to	**CO 3**	To apply costing principles in the decision making process.

	management for measuring efficiency in cost control & cost reduction.		
		CO 4	To prepare the production cost statement & cost of goods sold statement.
		CO 5	To explain the relationship between cost & financial accounting.
Course Code	**BCB 3.3**	**Course Title**	**BUSINESS ETHICS**
	Course Objectives		**Course Outcomes (COs)**
1	To recognize organizational challenges to ethical behavior.	**CO 1**	To understand Business Ethics and to provide best practices of Ethics.
2	To Demonstrate knowledge of established methodologies of solving ethical problems.	**CO 2**	To learn the values and implement in their careers to become best managers.
3	To understand the inherent conflict of interest in many business decisions.	**CO 3**	To develop various CSR policies and practice it in their professional life and adhere to ethical codes in Corporate Governance.
		CO 4	Students will analyze ethical codes.
		CO 5	Students will analyze employee conditions and ethical codes.
Course Code	**BCB 3.4**	**Course Title**	**QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS - I**
	Course Objectives		**Course Outcomes (COs)**
1	Understand relevance & need of quantitative methods for making business decisions	**CO 1**	To understand basic concept of numerical analysis
2	Demonstrate a sound knowledge of fundamentals of statistics and statistical techniques	**CO 2**	To apply basic terms of dispersion and skewness in solving practical problems in the field of business.
3	Be able to apply quantitative methods to solve a variety of business problems	**CO 3**	Use business statistics for central measurements, frequency distributions, graphs, and measure of dispersion and be able to select which method should be used for different problems
		CO 4	Apply the knowledge of principles and purpose of index number in finding out the difference between quantity and price.
		CO 5	To know how the information has to be collected through census method and it has to be applied in survey.
Course Code	**BCB 3.5**	**Course Title**	**INDIAN BANKING SYSTEM**
	Course Objectives		**Course Outcomes (COs)**
1	The objective is to enable the students to get familiarized with the Indian Banking system prevalent in the country.	**CO 1**	Describe the context of banking: the financial system
2	To provide detailed information & clarity about banking regulation & its roles in personal finance.	**CO 2**	Elucidate the broad functions of banks
3	To familiarize the students with banking regime and technology	**CO 3**	Explain the role of Central bank: RBI

		CO 4	Understand the Banking structure in India
		CO 5	Practices on Banking Technology
SEMESTER - IV			
Course Code	**BCB 4.1**	**Course Title**	**ADVANCED CORPORATE ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to develop awareness about Advanced Corporate Accounting in conformity with the Provision of Companies' Act and latest amendments with adoption of Accounting Standards.	**CO 1**	Provides knowledge about the procedure and Provision of Redemption of Preference Shares and Debentures.
2	To enable the students to get an insight about the accounting of different sectors and its application.	**CO 2**	Creates awareness about the provisions in Companies Act with respect to Mergers and Acquisitions.
3	To provide the underlying framework and concepts of financial accounting in the context of how accounting fits into the overall business environment of contemporary society.	**CO 3**	Enable the students to understand the detailed concepts of internal reconstruction and understanding of financial situation and results of operations of the organization
		CO 4	Creates knowledge about the accounting procedures and methods regarding Liquidation of Companies
		CO 5	Familiarizes the students with the recent developments and techniques regarding HRA, Environmental accounting and social responsibility accounting.
Course Code	**BCB 4.2**	**Course Title**	**PRINCIPLES OF GENERAL INSURANCE**
	Course Objectives		**Course Outcomes (COs)**
1	To disseminate principles & concepts of general insurance practice among students.	**CO 1**	Demonstrate knowledge of insurance contracts and provisions
2	To improve clarity, consistency and comparability of general insurance information relevant to today's life.	**CO 2**	Elucidate features of Property Liability Insurance, Health Insurance.
3	To familiarize the students on process of claims and calculation premium of Accident, Marine and Fire insurance	**CO 3**	Knowledge of the operation and management of insurance entities
		CO 4	Understand Insurance Regulations prevalent in India
		CO 5	Underwriting of General Insurance business
Course Code	**BCB 4.3**	**Course Title**	**FINANCIAL MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To offer the students relevant, systematic, efficient and actual knowledge of financial management	**CO 1**	To familiarise students with the concept of fundamental financial concepts, especially time value of money

2	Develop knowledge on the allocation, management and funding of financial resources.	**CO 2**	To create an awareness about capital structure
3	Improving students' understanding of the time value of money concept and the role of a financial manager in the current competitive business scenario.	**CO 3**	To make them understand the cost of capital in wide aspects
		CO 4	To provide knowledge about dividend policies
		CO 5	To enable them to understand working capital management
Course Code	**BCB 4.4**	**Course Title**	**STOCKS AND COMMODITY MARKETS**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an elaborate understanding of Indian stock markets	**CO 1**	Familiarization with the constituents of the stock markets
2	To provide knowledge on the Money Market and the Capital Market in India.	**CO 2**	Understand the roles played by stock brokers, depositories etc.
3	Understand the intricacies of operating in stock market	**CO 3**	To gain comprehensive knowledge of all aspects relating to financial services industry in India
		CO 4	Understand the functioning of trading mechanisms used by brokers.
		CO 5	To be able to participate in financial markets as an informed investor
Course Code	**BCB 4.5**	**Course Title**	**QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS - II**
	Course Objectives		**Course Outcomes (COs)**
1	To highlight the benefits as well as the limits of quantitative analysis in a real-world context	**CO 1**	Students will clearly communicate quantitative ideas both orally and in writing of Correlation and regression.
2	To orient the students to various hypothesis testing methods as to how and where appropriately they can be applied.	**CO 2**	Students will create quantitative models to solve real world problems in appropriate contexts
3	To enable better reporting for decision making.	**CO 3**	Students will frame problems using multiple mathematical and statistical representations of relevant structures and also find out missing values through interpolation and extrapolation
		CO 4	Students will formulate complete, concise, and correct sampling methods to select their sample for their reassert activities
		CO 5	Familiarizing students with probability theorem
SEMESTER - V			
Course Code	**BCB 5.1**	**Course Title**	**PRINCIPLES & PRACTICES OF AUDITING**
	Course Objectives		**Course Outcomes (COs)**
1	To provide working knowledge of the framework of the auditing system in India.	**CO 1**	To familiarize and educate the students with the concepts of auditing in India.

2	To enable students to acquire an understanding of the tools, techniques and procedure of audit.	**CO 2**	Critically evaluate the role and responsibilities of the external auditor and the audit process
3	To develop an understanding of the duties, responsibilities and liabilities of a company auditor	**CO 3**	Appraise the legislative and professional provisions (auditing standards and ethical guidelines) that constitute the regulatory framework for the conduct of external auditing.
		CO 4	Formulate how the auditor obtains an understanding of the entity and its environment, when planning and assessing the risk of the audit.
		CO 5	To familiarize the students of the audit procedure of different types of undertakings.
Course Code	**BCB 5.2**	**Course Title**	**INTERNATIONAL FINANCIAL REPORTING STANDARDS**
	Course Objectives		**Course Outcomes (COs)**
1	Expose the students to the international financial reporting standards	**CO 1**	Enable comparison of financial statements at an international level
2	Identify and apply disclosure requirements for companies in financial reports	**CO 2**	Familiarize and understand the International Financial Reporting Standards (IAS or IFRS) and their application to the companies who use them
3	Develop the students' ability to analyse the statement using Ind-AS	**CO 3**	Prepare holding companies' consolidated books of accounts.
		CO 4	Work in the Finance Department of companies using IFRS.
		CO 5	Help to pursue Chartered Accountancy, ACCA
Course Code	**BCB 5.3**	**Course Title**	**INCOME TAX - I**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to gain knowledge about the provisions of Indian income tax 1961	**CO 1**	To make students understand the difference between Income tax bill and Act.
2	To make students aware about powers and Functions of central board of direct taxes	**CO 2**	To enable students to apply the knowledge of Provisions relating to various heads on Income.
3	To familiarise the students with availing deductions under section 24 and under section 16	**CO 3**	To enable students to analyze the taxability of various heads of income.
		CO 4	To understand the deductions and exemptions for various heads
		CO 5	To familiarise the students with the concept of calculating the tax liability of an individual.
Course Code	**BCB 5.4**	**Course Title**	**COSTING METHODS**
	Course Objectives		**Course Outcomes (COs)**
1	To enhance the abilities of learners to develop the concept of costing methods and its significance in the business	**CO 1**	To familiarize students with the basic concepts of cost and various methods and techniques of costing

2	To make the students develop competence with their usage in managerial decision making and control.	**CO 2**	Identify the specifics of different costing methods.
3	To enable the learners to understand, develop and apply the techniques of costing methods in the business corporates	**CO 3**	Application of costing methods to both manufacturing and service industry.
		CO 4	To be able to analyze and evaluate information for cost ascertainment, planning, Control and decision making
		CO 5	Summarize process, job, batch Costing and prepare a process cost report.
Course Code	**BCB 5.5**	**Course Title**	**INTERNATIONAL BANKING AND FOREX MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to understand the various concepts of international banking and foreign exchange rate determination.	**CO 1**	Demonstrate comprehensive knowledge of how international financial system operates
2	To Introduce the environment of international finance and its implications on international business, analyze the nature and functioning of foreign exchange markets.	**CO 2**	Understanding of Foreign Exchange concepts
3	To enable the students to study the foreign exchange risks and to identify risk management.	**CO 3**	Demand & supply of funds in the International Capital markets
		CO 4	Elucidate factors affecting exchange rate fluctuations
		CO 5	Examine the organization of the Foreign Exchange Market, the Spot Market, and the Forward Market etc.
Course Code	**BCBF 5.5**	**Course Title**	**INTERNATIONAL FINANCIAL MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an in-depth view of the process in financial management of the firm	**CO 1**	To familiarize the students with the concept of Financial Management, Financial markets and intermediaries.
2	To develop knowledge on the allocation, management and funding of financial resources.	**CO 2**	Identify and appraise investment opportunities in the international environment.
3	Enhancing student's ability in dealing short-term and also longer-term dealing, which involves major capital investment decisions and raising long-term finance.	**CO 3**	Understanding host country's Environment , Application of the techniques of Investment
		CO 4	To enable them to know Capital structure theories, valuation of shares, debt and Risk
		CO 5	Understand international capital and foreign exchange market.

Course Code	BCBF 5.6	Course Title	GOODS AND SERVICES TAX
	Course Objectives		**Course Outcomes (COs)**
1	To make students understand the procedure by the government to compute the tax liability on Imports and exports.	**CO 1**	Understanding the need and importance of GST in India over the old taxes
2	To enable students to analyze the provisions of taxability on businesses like Company and Partnership firms.	**CO 2**	Assessment and Payment of GST
3	To make students aware of the importance of E-filing of returns with availability of different forms and dates for payment and filing it.	**CO 3**	Availing the benefits of Input tax credit and adjustments
		CO 4	To understand the Dual GST structure in India.
		CO 5	To enable students to analyze the provisions under GST Act.
Course Code	**BCB 5.6**	**Course Title**	**MARKETING OF INSURANCE PRODUCT**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to acquire skills in Marketing of Insurance Products	**CO 1**	Understanding the Marketing concepts with relevance to Insurance Industry
2	Analyze insurance product and service development and positioning.	**CO 2**	Develop strategies for marketing of insurance products
3	Analyze the role of branding and communication in the marketing of insurance products and services.	**CO 3**	Elucidate the importance of Customer Relationship Management in Insurance business
		CO 4	To enable students to understand the concept of branding for Insurance products
		CO 5	To familiarise the concept and different pricing methods of Insurance products
Course Code	**BCB 5.7**	**Course Title**	**RISK MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To demonstrate the knowledge of the range of financial and non-financial related risks facing organisation	**CO 1**	Understanding of Risk & its elements
2	To understand the approach to risk management through risk identification, risk measurement and risk management	**CO 2**	Guidelines & Tools of Corporate Risk Management
3	To understand corporate risk and how to manage it	**CO 3**	Application of Risk management tools: Derivatives
		CO 4	Fundamentals & Currency & Interest rate swaps
		CO 5	Elucidate the limitations of Risk Management.

SEMESTER - VI			
Course Code	**BCB 6.1**	**Course Title**	**BUSINESS REGULATION**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students about relevant laws concerning business organizations.	**CO 1**	To familiarize students with primary sources of law.
2	To familiarize students about relevant laws concerning business organizations.	**CO 2**	To make students identify the principles and doctrines that guide contracts.
3	To familiarize students about relevant laws concerning business organizations.	**CO 3**	To teach students the better and all-round protection to consumers and effective safeguards against different types of exploitation such as defective goods, deficient services and unfair trade practices.
		CO 4	The practical exposure to apply intellectual property law principles (including copyright, patents, designs and trademarks) to real problems and analyse the social impact of intellectual property law and policy.
		CO 5	To analyze the concept and scope of environmental law and also of its particular dominant issues.
Course Code	**BCB 6.2**	**Course Title**	**ENTREPRENEURSHIP DEVELOPMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To provide students with the knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings.	**CO 1**	To make student understand the importance of Entrepreneurship in the present era.
2	To enable students to be independent, capable, promising businessmen.	**CO 2**	To make students acquire knowledge on establishment and policies of Small Scale Industries
3	To enable students to understand the basic concepts of entrepreneurship and preparing a business plan to start a small industry	**CO 3**	To teach the formation and future prospects of Small scale Industries.
		CO 4	The practical exposure to prepare Business plan for future Start-ups.
		CO 5	To analyse the role of Financial Institutions in encouraging future Entrepreneurs.
Course Code	**BCB 6.3**	**Course Title**	**INCOME TAX - II**
	Course Objectives		**Course Outcomes (COs)**
1	To Create an awareness of legal principles of Direct Taxes	**CO 1**	To make students know Tax structure in India.
2	To familiarize students with Computations and Tax Levy.	**CO 2**	To make student understand the procedure adopted by government to compute the tax liability on Incomes.
3	To familiarize students about relevant laws concerned to Indian Income Tax Act 1961	**CO 3**	To enable students analyse the various sources of Incomes which are taxable and which are exempt under the Act.

		CO 5	To make students aware about the procedure of E filling and necessary documents required
Course Code	**BCB 6.4**	**Course Title**	**MANAGEMENT ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To enhance the abilities of learners to develop the concept of management accounting and its significance in the business	**CO 1**	To familiarize the students with various principles and Techniques of Management Accounting.
2	To enable the learners to understand, develop and apply the techniques of management accounting in the financial decision making in the business corporates.	**CO 2**	To make students apply accounting ratios to simplify interpretation of the financial statement
3	Learn how accountants create, organize, interpret, and communicate information that improves internal processes and allows organizations to identify and leverage opportunities to create value within the supply chain and with customers.	**CO 3**	Enable students to prepare cash flow statements and understand the cash position of the company
		CO 4	Make inter-firm and inter-period comparison of financial statements
		CO 5	To make the students develop competence with their usage in managerial decision making and control.
Course Code	**BCB 6.5**	**Course Title**	**RETAIL BANKING**
	Course Objectives		**Course Outcomes (COs)**
1	To provide students with methods to improve experience and Interaction between customer and Bank.	**CO 1**	Customizing retail banking services
2	To create new Banking Products for one stop shop for all the financial and banking needs of clients	**CO 2**	Identify the components of customer relationship management to develop and increase customer loyalty
3	To create new avenues of banking income from retail clients	**CO 3**	Understand the role of corporate communication and how it is interpreted and delivered at a branch level
		CO 4	RBI guidelines & regulations towards retail banking.
		CO 5	Latest trends in Retail banking services
Course Code	**BCBF 6.5**	**Course Title**	**PERFORMANCE MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students on the use of costing data for decision making	**CO 1**	Understanding the techniques of decision making like marginal costing and standard costing.

2	To enable students to evaluate different variance specially material variance and labour variance	**CO 2**	To make students to understand the difference between the traditional costing system and how it will be effective in activity based costing.
3	To create awareness on the emerging cost management concepts.	**CO 3**	To make student understand the procedure of different methods applied in cost control and cost reduction
		CO 4	Understanding different types of budgets
		CO 5	Understanding the concepts of management reporting and management information systems.
Course Code	**BCB 6.6**	**Course Title**	**HEALTH INSURANCE**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the students with the ability to imitate and carry out principles pertaining to Health insurance.	**CO 1**	Understanding of Health Insurance concepts & business in India
2	To make them aware and clear of wide spectrum of miscellaneous policies.	**CO 2**	Elucidate the types of health Insurance products
3	To provide clarity, consistency and comparability related to Health insurance information useful in day today life.	**CO 3**	Principles & procedure in health Insurance underwriting
		CO 4	Framework of miscellaneous & other insurance businesses
		CO 5	Third Party Administrators: role & responsibilities
Course Code	**BCBF 6.6**	**Course Title**	**INTERNATIONAL AUDITING AND ASSURANCE**
	Course Objectives		**Course Outcomes (COs)**
1	To provide working knowledge of the framework of auditing system Internationally	**CO 1**	Evaluate the nature, purpose and scope of an audit and the legal, regulatory and ethical framework for auditing
2	To enable students, to acquire an understanding of the tools, techniques and procedure of audit.	**CO 2**	Identify procedures required to evaluate control risk.
3	To develop an understanding of the duties, responsibilities and liabilities of a company auditor	**CO 3**	Analyse the nature of internal control systems related to audit including IT systems
		CO 4	Formulate how the auditor obtains an understanding of the entity and its environment, when planning and assessing the risk of the audit
		CO 5	To familiarize the students of the audit procedure and ethics of different types of undertakings.

Course Code	BCB 6.7	Course Title	INSURANCE SALESMANSHIP
	Course Objectives		**Course Outcomes (COs)**
1	To provide the conceptual basis of sales management in general.	**CO 1**	Ability to understand the requirements of potential clients.
2	To familiarize the student with the practice of salesmanship in the insurance sector.	**CO 2**	Understanding the concept of Matching the right insurance product for the right customer
3	To make students aware of miss selling of Insurance products and how to control it.	**CO 3**	Understand procedure that is to be followed to write a policy
		CO 4	Knowledge on Regulatory and Statutory filings related to selling insurance.
		CO 5	Explore new segments to develop sales.

PROGRAMME NAME	BACHELOR OF BUSINESS ADMINISTRATION
PROGRAM CODE	IABBA01

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	Provide essential professional managerial skills that make them confident in managerial decision making and provide solutions in various business domains under realistic constraints	PO1	Demonstrate an understanding of the knowledge of finance, accountancy, law, statistics, HR, operations, IT and management subjects required for business decisions and apply knowledge to integrate concepts from various disciplines, to identify and develop business strategies for effective problem-solving and decision-making in a contemporary organization environment
PEO2	Engage and succeed in their professional careers through team work, ethical behaviour, proactive involvement, and effective communication	PO2	Apply the necessary competencies and skills with a creative mind set, to undertake entrepreneurship as a desirable and feasible career option and able to adapt effectively as an individual and as a member or leader in teams, and in multidisciplinary settings by demonstrating life skills, coping skills and human values
PEO3	Demonstrate an understanding of the importance of life-long learning through professional development, practical training, and specialized knowledge in functional areas of management	PO3	Demonstrate the requisite competencies and critical thinking to solve business problems through research analysis and interpretation and student will exhibit excellent communication and authoritative skills as a result of an all-round personality development approach
PEO4	Assume progressively managerial, leading, and influential roles in the organizations and communities both locally and globally	PO4	Imbibe ethical practices in profession and appreciate sustainability and evince a sense of social responsibility in their respective environments, by becoming citizens working for the welfare and benefit of the society, at large
PEO5	Equip students with entrepreneurial skills required for setting up various incubation centres and small-scale enterprise.	PO5	Achieve higher levels of proficiency and self-actualization through the pursuit of life-long learning.

SEMESTER - I			
Course Code:	BAM 1.1	Course Title:	Fundamentals of Accounting
	Course Objectives		Course Outcomes (COs)
1	The objective of this subject is to acquaint students with the accounting concepts, tools and techniques influencing business organizations.	CO1	The students should be able to know different communication theories
2	To equip the students to maintain Books of Accounts and to prepare Final Accounts independently.	CO2	To familiarize the students with different facets of mass communication including its characteristics

3	To impart knowledge about fundamental principles of accounting.	**CO3**	To recognize the changes in the practice of media in recent times
		CO4	The Paper provides historical contribution of theoreticians of mass communication through their models
		CO5	Enlighten the students with theories of mass communication which provide strong foundation for its study
Course Code:	**BAM 1.2**	**Course Title:**	**Business Economics**
	Course Objectives		**Course Outcomes (COs)**
1	Create written texts in a variety of literary genres that demonstrate an ability to apply aesthetic values of theoretical perspectives	**CO1**	Demonstrate an ability to apply various statistical tool to solve business problem
2	Understanding the key aspects of the subject, develop independent and creativity thinking and enhance communicative skills	**CO2**	Structure business problems, and create models for analysis
3	Cognitive strategy of learning, thinking, organize and behave which motors the contrast between piece of art to frame sense of identity for effective communication	**CO3**	Develop and use business analysis model on computers
		CO4	Organize data, conduct analysis with theories and models, assess and present results
		CO5	Gain proficiency in quantitative techniques.
Course Code:	**BAM 1.3**	**Course Title:**	**Quantitative Methods for Business - I**
	Course Objectives		**Course Outcomes (COs)**
1	Get an overview of all functional areas of running a business, and their role in the process.	**CO1**	Understand various quantitative & statistical methods
2	The use of basic quantitative (both statistical and OR) techniques will be incorporated in the course mainly for showing where quantitative methods can be used to model and solve real-life business problems.	**CO2**	Understand data and draw inference from data
3	Be able to read and interpret statistical information	**CO3**	Calculate and interpret statistical values by using statistical tool
		CO4	Apply quantitative techniques to business problems

		CO5	Build a sound quantitative foundation
Course Code:	**BAM 1.4**	**Course Title:**	**Management Process**
	Course Objectives		**Course Outcomes (COs)**
1	Demonstrate theoretical knowledge in management course.	**CO1**	To understand the basic concepts of management
2	Describe the various forms of structure available to an organization. Describe the control process including: the importance of control, tools for measuring organizational performance, and managerial actions.	**CO2**	Discuss the planning process to make decisions
3	Understand analytical, developmental, managerial and technical skills related to Managing organizations.	**CO3**	To know the different organizational structures.
		CO4	To understand the different leadership styles.
		CO5	Interpret different types of control process.
SEMESTER - II			
Course Code:	**BAM 2.1**	**Course Title:**	**Financial Accounting**
	Course Objectives		**Course Outcomes (COs)**
1	The objective of this subject is to acquaint students with the accounting concepts, tools and Techniques influencing Business Organizations.	**CO1**	Students are able to make necessary journal entries in the books of record under hire purchase method.
2	Acquaint student to calculate insurance claim regarding damage goods under average clause of Fire Insurance.	**CO2**	Able to maintain royalty and joint venture accounts
3	The objective of this subject is to ascertain various missing values, required while accounting the hire purchase transactions, on the basis of given information.	**CO3**	Easily can prepare the journal entries of issue of shares, also students will know how arrears, Re-issue, and forfeiture of shares will be adjusted
		CO4	Students are able to prepare Fire Insurance claims.
		CO5	Students are able to understand the underwriting process and its applications.'

Course Code:	BAM 2.2	Course Title:	Quantitative Methods for Business - II
	Course Objectives		**Course Outcomes (COs)**
1	Demonstrate a sound knowledge of fundamentals of statistics and mathematical techniques	**CO1**	Demonstrate an ability to apply various statistical tool to solve business problem
2	Be able to apply quantitative methods to solve a variety of business problems	**CO2**	Structure business problems, and create models for analysis
3	Understand relevance & need of quantitative methods for making business decisions	**CO3**	Develop and use business analysis model on computers
		CO4	Organize data, conduct analysis with theories and models, assess and present results
		CO5	Gain proficiency in quantitative techniques.

Course Code:	BAM 2.3	Course Title:	ORGANISATIONAL BEHAVIOUR
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to understand the organisational behaviour and organisational change and dynamics of the group.	**CO1**	Students will be able to identify behavioural issues in an organization
2	To enable the students to understand the importance of attitude and personality	**CO2**	Demonstrate the applicability of the concept of Perception, attitudes and personality to understand the behaviour of people in the organization.
3	To enable the students to understand the principles of learning.	**CO3**	To analyse different types of learning followed by each individual.
		CO4	To Understand different types of groups in an organization and how it influences the behaviour of the individuals.
		CO5	To understand the resistance for change, its causes and how to overcome it.
Course Code:	**BAM 2.4**	**Course Title:**	**MARKETING MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concepts of marketing management	**CO1**	To become familiar with the fundamentals of marketing to enable them to make better marketing decisions.
2	To understand the marketing environment	**CO2**	To observe and understand the nuances and complexities involved in the environment.

3	Identify the roles of advertising, sales promotion, public relations, personal selling and direct marketing in the promotion mix; compare and contrast integrated marketing communications with a non-integrated approach to the promotional mix.	**CO3**	To develop the skills needed to take better distribution decisions and also to critically analyse the 4P's.
		CO4	The ability to take decisions and plan, develop, execute and control the marketing process.
		CO5	To explore the emerging trends in marketing for enabling those to take proactive measures while taking marketing decisions.
SEMESTER - III			
Course Code:	**BAM 3.1**	**Course Title:**	**SOFT SKILLS FOR BUSINESS**
	Course Objectives		**Course Outcomes (COs)**
1	To assist students in becoming well-versed, responsible, creative communicators;	**CO1**	To effectively communicate through verbal/oral communication and improve the listening skills
2	To develop students' knowledge of communication skills in the structure, elucidation, and delivery of message in diverse cultural and global communities	**CO2**	To become more effective individual through goal/target setting, self- motivation and practicing creative thinking
3	To promote theoretical understanding and professional/personal practice of effective and ethical human communication between and within a broad range of contexts and communities.	**CO3**	To recognize career success, competitive job markets, recruitment criteria to enhance technical ability and specialist knowledge.
		CO4	To make active participation in group discussion / meetings / interviews and prepare & deliver presentations to overcome hurdles that are faced.
		CO5	To nurture the minds by writing Letters, quotations, precise briefs or reports and technical documents.
Course Code:	**BAM 3.2**	**Course Title:**	**INTERNATIONAL BUSINESS**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the impact international business has on the modern world.	**CO1**	Able to understand the stages of Internationalization.
2	To enable the student to identify the various factors that must be considered by an international concern prior to entering a different country.	**CO2**	Analyse to understand the best form of entry into International Business.
3	To gain an understanding of how international trade impacts economic growth	**CO3**	Analyse the strategies and related aspects adopted by firms to expand globally.
		CO4	To seek information required in international business and to apply International Marketing information.
		CO5	Analyse the procedures followed in India's Export trade and means of Export financing.

Course Code:	BAM 3.3	Course Title:	Corporate Accounting
	Course Objectives		**Course Outcomes (COs)**
1	To provide a comprehensive understanding of all aspects relating to corporate accounting practices and presentation of financial statements in organizations.	**CO1**	To know about the meaning of companies and working style of companies Know about the final accounts of the companies.
2	To know how the companies, issue shares and debentures. To acquaint students with the legal formats and procedures pertaining to buyback and redemptions of preference shares and debentures.	**CO2**	Learn about the valuation method of shares and goodwill and measurement of performance of companies.
3	To familiarize the students about the procedure of revaluation of assets and liabilities by the subsidiary companies.	**CO3**	Students are able to prepare Different methods of financial statement analysis after successful completion of the course.
		CO4	Students are able to prepare Branch Accounts after successful completion of the course.
		CO5	Work with profit prior to incorporation and post incorporation profits in Holding companies accounts.
Course Code:	**BAM 3.4**	**Course Title:**	**Human Resource Management**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with concepts and principles of Human Resource Management.	**CO1**	Identify the basic concepts of Human resource management
2	To help the students focus on and analyse the issues and strategies required to select and develop manpower resources	**CO2**	Critically analyse the need for human resources that will improve the planning skills. Illustrate the importance of recruitment and selection procedure in an organization.
3	To develop relevant skills necessary for application in HR related issues	**CO3**	Demonstrate the kinds of Training and development.
		CO4	General understanding of HR concepts – Performance Appraisal, Compensation.
		CO5	Outline the Promotion, Succession planning and Career planning.
Course Code:	**BAM 3.5**	**Course Title:**	**Production And Operations Management**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students understand the concepts of production and operations management and benefits of automations	**CO1**	Understanding the concepts of production and operation management in an industry and system of automation.
2	To understand the quality circles in an industry.	**CO2**	Analyse the plant location and layout and types of facilities required for running an industry.
3	To make the students understand about maintenance and waste management.	**CO3**	Explaining how to manage the materials available in the industry and principles and practices adopted.
		CO4	Maintaining a quality control of a product and planning before production takes place.

		CO5	The concept of waste management and disposal of surplus and maintenance of equipment in an industry.
Course Code:	**BAM 3.6**	**Course Title:**	**Business Regulations**
	Course Objectives		**Course Outcomes (COs)**
1	The Objective is to introduce the students to various regulations affecting business and to familiarize the students with such regulations.	**CO1**	Understand in details various laws related to business and able to work as legal adviser of business enterprises.
2	Understand the laws related to consumer protection.	**CO2**	Demonstrate recognition of the requirements of the contract agreement, understanding of contract. Consideration and capacity, identify contract remedies.
3	The objective of this course is to provide the students with practical legal knowledge of general business law issues.	**CO3**	Apply basic legal provisions of IT act 2005.
		CO4	Learn how to pursue the consumer rights under consumer protection act 1982.
		CO5	Understand the characteristics of legal environment and practice business ethics. Understand the characteristics of different intellectual properties and protect them.
SEMESTER - IV			
Course Code:	**BAM 4.1**	**Course Title:**	**Business Research Methods**
	Course Objectives		**Course Outcomes (COs)**
1	To create an awareness of the Process of Research, the tools and techniques of research and generation of reports.	**CO1**	Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
2	To familiarize students with basic of research and the research process.	**CO2**	Analyse the sampling techniques for project and predict its impact in business.
3	To help students in conducting research work and making research reports.	**CO3**	Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis.
		CO4	Have basic awareness of data analysis-and hypothesis testing procedures.
		CO5	To enable the participants in conducting research work and formulating research synopsis and report.
Course Code:	**BAM 4.2**	**Course Title:**	**Financial Management**
	Course Objectives		**Course Outcomes (COs)**
1	To offer the students relevant, systematic, efficient and actual knowledge of financial management	**CO1**	To familiarise students with the concept of fundamental financial concepts, especially time value of money
2	Develop knowledge on the allocation, management and funding of financial resources.	**CO2**	To create an awareness about capital structure
3	Improving students' understanding of the time value of money concept and the role	**CO3**	To make them understand the cost of capital in wide aspects

	of a financial manager in the current competitive business scenario.		
		CO4	To provide knowledge about dividend policies
		CO5	To enable them to understand working capital management
Course Code:	**BAM 4.3**	**Course Title:**	**Service Management**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarise the students with different services and prepare them with requisite skills to manage skills	**CO1**	Students will have in depth knowledge of services as an essential economic activity.
2	To enable students to identify the various employment opportunities available in the service industry	**CO2**	Students get overall understanding about special features of services, various concepts and issues related with management of services.
3	To facilitate students to gain an understanding with regard to the workings of the service industry.	**CO3**	Students will learn about ITES, Tourism, Hospitality, Healthcare, Banking and Insurance Services.
		CO4	Students will be able to widen their perspectives on the opportunities available in the service industry
		CO5	Understand the 7 P's of marketing and apply them.
Course Code:	**BAM 4.4**	**Course Title:**	**Business Ethics & CSR**
	Course Objectives		**Course Outcomes (COs)**
1	To raise students' general awareness of ethical dilemmas at work	**CO1**	To imbibe the basic knowledge of business ethics.
2	To better understand differing perceptions of interests in business-related situations	**CO2**	To elucidate the interaction between evolution of moral and social instruction.
3	To enhance and improve the ability of students to reason toward a satisfactory resolution of an ethical dilemma.	**CO3**	To understand the Business Ethics and to provide best practices in the functional areas of business
		CO4	To create presentations and business plans that articulate and apply financial, organizational, market, and sales knowledge to identify paths to create value.
		CO5	The student will be able to analyse various ethical codes in corporate governance.
Course Code:	**BAM 4.5**	**Course Title:**	**Banking Regulations and Operations**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to understand the concepts of Banking and its operations	**CO1**	Students are able to understand different types of Banking system operating in India
2	To equip them with the concepts of Negotiable Instruments	**CO2**	To understand the relationship between banker and customer and to handle different types of Accounts
3	To educate students on the concepts of NPA and consequences of NAP	**CO3**	Functions of Negotiable Instruments, how when and where to use these and what are the legal aspects and procedures WRT NI

		CO4	Role and importance of paying banker and collecting banker and protections available to them
		CO5	Will be able to understand loans and advances and non-performing advances.
Course Code:	**BAM 4.6**	**Course Title:**	**Cost Accounting**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students understand the concept of costing in different areas.	**CO1**	Define the various components of total cost of a product i.e. Direct & indirect cost and fixed & flexible cost. Use cost-sheet to compute unit cost of product. Determine basis for computing tender price of a product.
2	To make the students understand the labour costing techniques and calculation of wages	**CO2**	Determine various levels of material ie. reorder level, minimum level, maximum level & EOQ for managing working capital.
3	The analytical study on overhead costing and Reconciliation statement of financial accounts and cost accounts.	**CO3**	Use methods of time-keeping & time-booking and manage idle & overtime and to know how labour cost will be computed.
		CO4	Define the features of overhead or indirect cost of production and basis of allocation and apportionment.
		CO5	Students will able to solve reconciliation of financial and cost Books.
SEMESTER - V			
Course Code	**BAM 5.1**	**Course Title**	**Entrepreneurial Management**
	Course Objectives		**Course Outcomes (COs)**
1	Understanding basic concepts in the area of entrepreneurship,	**CO1**	To create the ability to sell themselves and their ideas. The interest among the students master oral and visual presentation skills and establish a foundation of confidence in the skills necessary to cause others to act.
2	Understanding the role and importance of entrepreneurship for economic development,	**CO2**	To give the insight about the Small-Scale Industries that can help themselves to choose their area of Business Interest.
3	Developing personal creativity and entrepreneurial initiative	**CO3**	To mobilize people and resources that makes them to identify and secure customers, stakeholders, and team members through networks, primary customer research, and competitive and industry analyses in order to prioritize and pursue an initial target market in real-world projects.
		CO4	To create presentations and business plans that articulate and apply financial, organizational, market, and sales knowledge to identify paths to create value.
		CO5	To increase the awareness and to generate the employability and capital expansion which plays a significant role in the growth process of the Indian Economy.

Course Code	BAM 5.2	Course Title	Computer Application in Business
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concept of information system	**CO 1**	Information system and its uses in the business and various components necessary in business information systems.
2	To make the students practically analyse on working on tally software	**CO 2**	The various types of information systems to collect and store information or data and case studies involved.
3	To make the students practically work on MS-Excel and preparation of PowerPoint presentation and MS-word documents	**CO 3**	Working on MS Office, MS Excel, slide shows, presentations and data entry worksheets with simple problems.
		CO 4	Examine the database management system, users of database and overall system structure.
		CO 5	Explaining the accounting software for safety of accounts and preparation of trial balance, subsidiary books and Balance sheet.
Course Code	**BAM 5.3**	**Course Title**	**Management Accounting**
	Course Objectives		**Course Outcomes (COs)**
1	Understand management accounting and various tools of financial analysis and Analyse profitability and financial status of a business based on accounting ratios	**CO 1**	Recognize the relationship between Cost, Financial and Management Accounting.
2	Understand the preparation of Funds flow statement and Cash flow statement and analyse the results	**CO 2**	Able to explain accounting statements and can analyse the financial statement with accounting ratios
3	Apply marginal costing technique in managerial decision making problems and evaluate different proposals and Understand different types of budgets and analyse budgets	**CO 3**	Prepare Funds flow statement and make inferences
		CO 4	Prepare Cash flow statement based on Revised Accounting Standard and make inferences
		CO 5	Explain the nature, source and purpose of management information and apply cost accounting techniques, prepare budgets for planning and control. Compare actual costs with standard costs and analyse any variance and apply performance measurements and monitor business performance.
Course Code	**BAM 5.4**	**Course Title**	**Investment Management**
	Course Objectives		**Course Outcomes (COs)**
1	To gain an understanding about the types and nature of the various investment opportunities available.	**CO 1**	To identify the basis of selection of various investment avenues based on pros and cons.
2	To develop the skills to perform a preliminary analysis of securities.	**CO 2**	To evaluate risk, uncertainty and return associated with
3	To understand the various tools available for analysis.	**CO 3**	To evaluate securities through Technical and Fundamental

		CO 4	To identify the securities for portfolio management using different models.
		CO 5	To identify strategies for stock selection.
Course Code	**BAMF 5.5**	**Course Title**	**Advanced Financial Management**
	Course Objectives		**Course Outcomes (COs)**
1	The students are able to analyse financial decision on the strategic direction. Understand Capital Budgeting-project Planning & Risk Analysis	**CO 1**	Understand the foundations of financial management, risk return framework and role of a finance manager. Analyse and evaluate capital projects under different situations using appropriate capital budgeting techniques.
2	Students should be equipped to assess investments and capital structure, dividend policies, working capital and dividend theories.	**CO 2**	Critically examine various theories and determinants of capital structure, analyse financial plans and determine optimal capital structure
3	Understand and apply the working capital management, inventory management, receivables management and to understand various forms of corporate restructuring and analyse various types of mergers and acquisitions	**CO 3**	Critically examine various theories and policies of dividend and determine optimal payout policy.
		CO 4	Understand the intricacies of working capital management and effectively manage cash, receivables and inventories.
		CO 5	Understand various forms of corporate restructuring and analyse various types of mergers and acquisitions.
Course Code	**BAMH 5.5**	**Course Title**	**Employee welfare & Industrial Relations**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize with the role of management and unions in the promotions of industrial relations.	**CO 1**	Demonstrate an understanding of the nature of the laws regarding safety, health, welfare measures apart from other provisions.
2	Examine the labour relation issues and its management.	**CO 2**	Identify the employee's liability for compensation to the workmen for injury or accident.
3	To acquire skills in handling employer-employee relations.	**CO 3**	Outline the guidelines under social assistance, social insurance and social security involved for Industrial employees.
		CO 4	General understanding of the concept of Labour Welfare & Labour Administration.
		CO 5	Recall the laws regarding registration of unions, their rights and duties of a registered trade union. Create understanding about the role of Govt., society and trade union in IR.
Course Code	**BAMM 5.5**	**Course Title**	**CONSUMER BEHAVIOUR**
	Course Objectives		**Course Outcomes (COs)**

1	Students will examine how businesses do this by looking into psychological, social, and cultural aspects of consumers and the impact of marketing strategies on buyer attitudes, decision-making, and behaviour.	**CO 1**	Demonstrate how knowledge of consumer behaviour can be applied to marketing.
2	Students will build their marketing knowledge by applying theory into practical, realistic contexts and will build skills in understanding human behaviour.	**CO 2**	Identify and explain factors which influence consumer behaviour.
3	To enable students in designing and evaluating the marketing strategies based on fundamentals of consumer buying behaviour.	**CO 3**	Relate internal dynamics such as personality, perception, learning motivation and attitude to the choices consumers make.
		CO 4	Describe and understand the Decision - Making Process.
		CO 5	Identify the customer's liability for compensation for defect products.
Course Code	**BAMF 5.6**	**Course Title**	**FINANCIAL MARKETS AND SERVICES**
	Course Objectives		**Course Outcomes (COs)**
1	The Objective is to familiarize the students with traditional and modern financial services.	**CO 1**	Students will be able to understand the financial markets and its operations and various types of financial markets.
2	To objective is to introduce students to the world of financial services	**CO 2**	Students will be able to describe the various types of mutual funds and they will be able to analyse the benefits.
3	To equip students with the knowledge and skills necessary to become employable in the financial service industry.	**CO 3**	Students will be able to apply different company valuation techniques to determine share prices.
		CO 4	Students will be able to describe the characteristics of different types of debt securities and be able to price them.
		CO 5	Students will be able to describe recent trends in financial services given by the financial institutions.
Course Code	**BAMH 5.6**	**Course Title**	**STRATEGIC HUMAN RESOURCE MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To acquire the skills and knowledge to work in a culturally diverse corporate setting.	**CO 1**	A strategic perspective of HRM
2	To understand core HR concepts and understand their application in businesses.	**CO 2**	Able to analyse ways to improve Training and Retention.
3	To understand the strategic role HR plays in an organisation and tools available to handle HR related challenges.	**CO 3**	Ability to understand the measures to facilitate change.
		CO 4	Analyse different compensation plans and trends.

		CO 5	To understand recent techniques and practices followed to develop and maintain staff.
Course Code	**BAMM 5.6**	**Course Title**	**ADVERTISING MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	Advertising Management offer student's ample opportunities to prepare for a career in this field & enable student to acquire skills in Advertising Management.	**CO 1**	General understanding of the concept of Advertising objectives, Advertising strategy.
2	To learn the value of an ethical approach to promotion and advertising	**CO 2**	To acquaint the students with concepts and techniques in the application for developing and designing an effective advertising and sales promotion program.
3	To Understand and analyse the relevant research in advertising and marketing communication.	**CO 3**	Identify and make decisions regarding the most feasible advertising appeal and media mix.
		CO 4	Identify the dealer-oriented promotion techniques, customer-oriented promotion techniques and the salesmen-oriented promotion techniques.
SEMESTER - VI			
Course Code	**BAM 6.1**	**Course Title**	**INCOME TAX**
	Course Objectives		**Course Outcomes (COs)**
1	The objective of this subject is to expose the students to the various provisions of Income Tax Act relating to computation of Income individual assesses only.	**CO 1**	Acquire complete knowledge of basic concepts of income tax. Understand the concept of exempted incomes. Understand the provisions of agricultural incomes. Calculate Residential status of a person. Identify and comply with the relevant provisions of the Income Tax Act as it relates to the income tax of individuals.
2	The objective of this subject is to make students compute the net total taxable income of an individual.	**CO 2**	Students are able to know about salary and how it will be taxable and also, they can analyse various categories of salary, allowance, perquisites and computation of taxable salary.
3	Connect the students with Tax planning skills to minimize the Tax liability by adhering to the provisions of Legal enactments governing Taxes in India.	**CO 3**	Students are able to compute income under the head Income from House Property
		CO 4	Students are able to compute income under the head income, Business or Profession and also, they will get practical knowledge about computation of business income.
		CO 5	The students will be able to find the taxable income of an individual after the deduction's u/s 10, 80C, D, G as per income tax.
Course Code	**BAM 6.2**	**Course Title**	**BUSINESS POLICIES AND STRATEGY**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the students with the opportunity to develop an understanding of	**CO 1**	Understand concepts of strategic management.

	strategic management and managerial policy concepts, techniques and methodologies.		
2	To develop the necessary conceptual and analytical skills to collect and analyze data, to make rational and strategic decisions	**CO 2**	Conceptualize environmental appraisal and strategic planning.
3	To integrate and apply the previously learned and accumulated knowledge to deal with the complex business problems through case analyses and a simulation exercise.	**CO 3**	Develop understanding of implementation of strategies.
		CO 4	Analyze concepts of strategic evaluation and understand various strategic issues
		CO 5	Evaluate the formulation of business
Course Code	**BAM 6.3**	**Course Title**	**E Business**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students understand about the online trading	**CO 1**	Students will have knowledge about fundamentals of e-business & different e-business models.
2	The analyse the concept of cyber-crimes and security measures	**CO 2**	Students will learn about the different security protocols available to protect the e-commerce business.
3	To make the students understand about the Information Technology Act of 2000.	**CO 3**	Students get an overall understanding about various e-payment options, students will be aware of various e-business marketing technologies.
		CO 4	students will acquire knowledge about the information technology act of 2000 and its amendments
		CO 5	The students will know about the different cybercrime and security protocols implemented.
Course Code	**BAMF 6.5**	**Course Title**	**International Finance**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an overview of the international finance including forex markets, risks and various avenues.	**CO 1**	Able to discuss about foreign exchange markets and international financial markets
2	To familiarize the students with the operations in foreign exchange markets.	**CO 2**	Explain the various instruments traded in forex markets
3	To sensitize students with complexities of managing finance of multinational firms.	**CO 3**	Analyse international investment avenues
		CO 4	Analyse foreign exchange risks and risk management strategies
		CO 5	Students will be able to analyse the various policy perspectives in the international regulatory environment.

Course Code	BAMH 6.5	Course Title	Human Resource Development
	Course Objectives		**Course Outcomes (COs)**
1	To make students aware of the concepts, techniques and practices of human resource development.	**CO 1**	To build an understanding and perspective of Human Resource Development as a discipline appreciating learning.
2	It makes students capable of applying the principles and techniques as professionals for developing human resources in an organization.	**CO 2**	To learn the skills of developing a detailed plan for the need and implementation of an HRD program in the organization.
3	To enable the students to understand the HRD at various levels in general and in certain specific industries or organizations.	**CO 3**	Understanding the need for Organizational Change and Development, Organizational environment for Creativity & Innovation.
		CO 4	To develop a perspective of HRD beyond organizational realities including national HRD.
		CO 5	To comprehend designing and evaluation of different types of transactional and strokes to address organization's survival.
Course Code	**BAMM 6.5**	**Course Title**	**Brand Management**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to acquire skills in Product & Brand Management.	**CO 1**	Infer the product mix, branding, packaging.
2	To develop student knowledge of branding frameworks, strategies and branding's role within business and society	**CO 2**	Analyse the new product development for strategic decision making and predict its impact in business.
3	To create awareness to evaluate the scope of brand management activity across the overall organisational context and analyse how it relates to other business areas.	**CO 3**	To introduce different approaches to measuring brand equity.
		CO 4	To provide a conceptual framework for managing brands strategically.
		CO 5	To emphasize the role of brands, the concept of brand equity and the advantages of creating strong brands.
Course Code	**BAMF 6.6**	**Course Title**	**Stock And Commodity Market**
	Course Objectives		**Course Outcomes (COs)**
1	To provide students with a conceptual framework of Stock Markets, Commodity Markets, functionaries in these Markets and their mode of trading.	**CO 1**	To students will be able to understand with the constituents of the stock markets
2	To introduce them to various procedures to invest in the commodity & Derivative Markets	**CO 2**	Understand the basic concept of the derivative market and to Understand the forward and futures market. Understand the roles played by stock brokers, depositories etc
3	To familiarize the student with the latest commodity & Derivative Market	**CO 3**	The course will help the students to know the current trends in the Commodity & Derivative Market
		CO 4	Understand the functioning of trading mechanism used by brokers.

		CO 5	It will enable the students to participate in financial market as an informed investor.
Course Code	**BAMH 6.6**	**Course Title**	**Performance & Compensation Management**
	Course Objectives		**Course Outcomes (COs)**
1	The objective is to enable the students to understand the various aspects of Compensation Management.	**CO 1**	To understand job-based compensation scheme and performance management system and appraisals.
2	To enable the students towards achievement of superior standards of work performance.	**CO 2**	To acquaint with the basic legal framework envisaged under the statutes for compensation and welfare of employees in different modes.
3	To help the students in identifying the knowledge and skills required for performing the job efficiently as this would drive their focus towards performing the right task in the right way.	**CO 3**	To understand the principles involved and premise of the grant of bonus, wages, and minimum wages to workers.
		CO 4	To be well versed with working in the maintenance and compliance vertical of compensation structuring department.
		CO 5	To handle the organizations scenarios having large scale variation of minimum wages both within the country and internationally.
Course Code	**BAMM 6.6**	**Course Title**	**RETAIL MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	The Objective is to enable students to acquire skills in Retail Management.	**CO 1**	Describe the retail management decision process and functions of retailers in satisfying customer needs in a rapidly changing and competitive environment.
2	The course gives real world understanding of the complete retail sector with focus on FDI and prepares the participants to get ready for the rewarding career in the retail sector.	**CO 2**	Illustrate the theories of retailing and its relevance in analysing the retailing environment.
3	The students become good retail planners and decision makers and help focus on change and adaptation to change.	**CO 3**	Design retail location strategy and store loyalty strategy in accordance with type of customers and profiling.
		CO 4	Differentiate the role and responsibilities of the merchandiser from that of the buyer in the context of merchandise management.
		CO 5	Develop a category management process for a retail store of your choice. Justify the indispensable role of logistics management and supply chain management in retail management.

NAME OF THE PROGRAMME	BACHELOR OF COMPUTER APPLICATIONS
PROGRAMME CODE	IABCA01

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	Provide a strong foundation in both software and hardware aspects of computing	PO1	Design, implement and evaluate a computational system to meet desired needs within realistic constraints
PEO2	Develop core competencies to design and develop computing based solutions to real world problems	PO2	Apply the computing and mathematical knowledge as well as standard software engineering practices and strategies to develop applications to support societal needs
PEO3	Provide opportunities to students to learn and apply modern techniques of data storage and analytics as well as apply problem solving techniques to create cutting-edge technology in various domains	PO3	Acquaint with the contemporary trends in industrial/research settings and thereby create innovative solutions to existing problems
PEO4	Equip students with excellent technical and communication skills to work independently on software projects or collaborate as an effective team member	PO4	Use research methods including design of experiments, analysis, interpretation of data, synthesis of information, developing GUI applications to provide valid conclusions
PEO5	Encourage students to practice continuous learning in order to achieve professional and personal excellence	PO5	Adapt to technological advances through active participation in life-long learning

SEMESTER - I			
Course Code	CAP 1.1	Course Title	PROBLEM SOLVING TECHNIQUES USING C
	Course Objectives		Course Outcomes (COs)
1	Acquire necessary skills to design algorithms and flowcharts for developing applications in order to solve real world problems	CO1	Gain ability to devise algorithms and draw flow charts in order to design solutions to problems
2	Acquire good knowledge of structured programming concepts using C apply the concepts wisely	CO2	Capability to wisely use the program constructs and develop efficient C programs
3	Ability to develop modular programs in C and subsequently develop small projects in C language	CO3	Acquire knowledge efficiently, storing data in memory and retrieving using proper data structure
		CO4	Gain ability to develop modular programs to solve real world problems
		CO5	Capability to develop C programs for real world applications by applying suitable constructs and modularity.

Course Code	CAP 1.2	Course Title	DIGITAL ELECTRONICS
	Course Objectives		**Course Outcomes (COs)**
1	To learn the fundamentals of electrical systems and number systems.	**CO1**	To understand Conversion of number systems and types of binary codes which are used in digital communication
2	To acquire knowledge about combinational and sequential circuits.	**CO2**	To understand boolean algebra to simplify the digital circuits, various logic gates and logic families.
3	Understand the logic gates in digital electronics.	**CO3**	To understand and design combinational and sequential logic circuits.
		CO4	To understand counters and its applications.
		CO5	To understand 8085 Microprocessor architecture & its operation. Basic interfacing concepts, interfacing I/O devices
Course Code	**CAP 1.3**	**Course Title**	**DISCRETE MATHEMATICS**
	Course Objectives		**Course Outcomes (COs)**
1	Demonstrate the concepts of sets, relations and functions	**CO1**	Demonstrate the concepts of sets, relations and functions.
2	Provide students with the foundations of probabilities and statistical analysis	**CO2**	Understand the mathematical logic and find logarithms.
3	To distinguish between discrete and continuous random variable and to compute probabilities using discrete and continuous distribution	**CO3**	Solve the matrix problems and apply them to solve simultaneous linear equations.
		CO4	Acquire knowledge of basic ideas in groups and vectors.
		CO5	Get aware of the concepts of permutations and combinations.
Course Code	**CAP 1.4**	**Course Title**	**C PROGRAMMING LAB**
	Course Objectives		**Course Outcomes (COs)**
1	Acquire practical knowledge of structured programming concepts using C	**CO1**	Gain ability to design C programs to solve problems
2	Acquire the ability to implement the derived data types using C language	**CO2**	Capability to wisely use the program constructs and develop efficient C programs
3	Gain ability to develop modular programs in C	**CO3**	Acquire practical knowledge of efficiently storing data in memory and retrieving using proper data structure
		CO4	Capability to design modular programs to solve real world problems
		CO5	Capability to develop C programs for real world applications by applying suitable constructs and modularity
Course Code	**CAP 1.5**	**Course Title**	**DIGITAL ELECTRONICS LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To learn the working of logic gates, adder and subtractor	**CO1**	Learn the basics of logic gates.

2	To understand the functions of Flip Flops	**CO2**	Construct basic combinational circuits and verify their functionalities.
3	To learn the working of Multiplexers.	**CO3**	Design and realization of sequential circuits.
		CO4	Develop programming skills in assembly language.
		CO5	Develop arithmetic and logical operations in the program.
SEMESTER - II			
Course Code	**CAP 2.1**	**Course Title**	**DATA STRUCTURES**
	Course Objectives		**Course Outcomes (COs)**
1	To impart knowledge on storing and managing data in various structures	**CO1**	Gain good understanding of the concepts, types and operations of data structures
2	To emphasize the importance of data structures in developing and implementing efficient algorithms	**CO2**	Acquire skills to implement sorting, searching and implementation of higher order data structure using arrays
3	To understand the operations on different data structures and their applications	**CO3**	Understand the concept of dynamic memory allocation, types of linked lists and gain the ability to use linked list in developing solutions to real world problems
		CO4	Apply the concept of Stacks and Queues in real world applications
		CO5	Analyse and apply graph and tree data structure in the problems where non-linear data structures are required
			Gain good understanding of the concepts, types and operations of data structures
Course Code	**CAP 2.2**	**Course Title**	**DATABASE MANAGEMENT SYSTEMS**
	Course Objectives		**Course Outcomes (COs)**
1	Emphasize on how to organize and maintain data in a database	**CO 1**	Gain good knowledge of the fundamental elements of relational database management systems
2	Understand the underlying mathematical principles and concepts implemented in DBMS	**CO 2**	Acquire knowledge of the concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL
3	Gain knowledge to store, manipulate and retrieve efficiently and effectively the data using DBMS	**CO 3**	Capability to design ER-models to represent simple database application scenarios
		CO 4	Ability to convert the ER-model to relational tables, populate relational database and formulate SQL queries on data
		CO 5	Acquire skills to improve the database design by normalization and familiarize themselves with transaction processing

Course Code	CAP 2.3	Course Title	STATISTICAL METHODS AND GRAPH THEORY
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic concepts of statistics and probability.	**CO 1**	To understand the standard deviation and rank correlation.
2	To acquire knowledge on Graphs types and paths.	**CO 2**	To study the laws of probability and Bayes theorem.
3	Gain knowledge about trees, binary trees and spanning tree.	**CO 3**	Understand the discrete and continuous random variables, expectation of random variables and theorems.
		CO 4	To understand the concepts in Graphs.
		CO 5	To acquire knowledge of trees and its distances.
Course Code	**CAP 2.4**	**Course Title**	**DATA STRUCTURES USING C LAB**
	Course Objectives		**Course Outcomes (COs)**
1	Acquire practical knowledge of storing and managing data in various structures	**CO 1**	Gain good understanding of the concepts, types and operations of data structures by practically implementing them
2	To understand the importance of data structures and practically implementing efficient algorithms	**CO 2**	Acquire programming skills to implement sorting, searching and higher order data structure using array
3	Gain ability to practically implement the operations on different data structures and their applications	**CO 3**	Gain ability to create programs using linked list to develop real world applications
		CO 4	Capability to apply the concept of Stacks and Queues in real world applications
		CO 5	Capability to analyse and apply graph and tree data structure in the problems where non-linear data structures are required
Course Code	**CAP 2.5**	**Course Title**	**DATABASE MANAGEMENT SYSTEMS LAB**
	Course Objectives		**Course Outcomes (COs)**
1	Gain hands-on experience on how to organize and maintain data in a database	**CO 1**	Gain hands on experience of designing relational database management system applications
2	Acquire skills to implement relational algebra concepts while creating a database	**CO 2**	Acquire practical knowledge of implementing the concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL
3	Gain knowledge to store, manipulate and retrieve efficiently and effectively the data using DBMS	**CO 3**	Capability to implement relationships in simple database application
		CO 4	Ability to convert the ER-model to relational tables, populate relational database and formulate SQL queries on data
		CO 5	Acquire skills to improve the database design by normalization and familiarize themselves with transaction processing

SEMESTER – III			
Course Code	**CAP 3.1**	**Course Title**	**OBJECT ORIENTED PROGRAMMING USING C++**
	Course Objectives		**Course Outcomes (COs)**
1	Object Oriented concepts, to develop the skills of programming in C++	**CO 1**	Implement the concepts of procedural and object-oriented paradigm, object-oriented concepts, structure of C++ program, functions, inline function and function overloading
2	Learn Classes & Objects and to familiarize the object oriented concepts Inheritance, Polymorphism.	**CO 2**	Understand classes, objects, constructors, destructors, friend functions and friend classes with the help of programs.
3	Understand Templates, Streams, Files	**CO 3**	Describe the concept of operator overloading, inheritance and containership and design applications on it
		CO 4	Demonstrate the use of streams, files and command line arguments concepts with the help of programs.
		CO 5	Apply the concepts and principles of the programming language to the real-world problems and solve the problems through project-based learning.
Course Code	**CAP 3.2**	**Course Title**	**ACCOUNTING AND FINANCIAL MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To learn the basics of accounting concepts and its functions.	**CO 1**	Demonstrate a critical understanding and the ability to use and interpret financial and non-financial information in management planning and decision making, in operational control, and performance evaluation.
2	To understand the Financial Accounting process.	**CO 2**	Recognise and apply the appropriate techniques and tools used by managers in complex domains of decision making.
3	To acquire knowledge about trading, profit and loss of balance sheet.	**CO 3**	Demonstrate a critical understanding of nature of the information provided by the accounting system of a company and systematically evaluate the characteristics of this information that make it most useful for decision making.
		CO 4	Demonstrate a comprehensive understanding of the key role of financial management in making sound financial decisions such as fund raising and investing.
		CO 5	Critically assess and evaluate the principle concepts and techniques used in the area of accounting and financial management
Course Code	**CAP 3.3**	**Course Title**	**OPERATING SYSTEMS**
	Course Objectives		**Course Outcomes (COs)**
1	To make aware of basic concepts and functions of operating systems.	**CO 1**	Analyse the structure of OS and basic architectural components involved in OS design

2	To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.	**CO 2**	Analyse and design the applications to run in parallel either using process or thread models of different OS
3	To know virtual memory concepts and learn secondary memory management	**CO 3**	Analyse the various device and resource management techniques for timesharing and distributed systems.
		CO 4	Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system
		CO 5	Interpret the mechanisms adopted for file sharing in distributed Applications
Course Code	**CAP 3.4**	**Course Title**	**C++ PROGRAMMING LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To learn the fundamental programming concepts and methodologies using c++ code.	**CO 1**	Read, understand and trace the execution of programs written in C++ language
2	To develop object oriented concepts in programming using C++.	**CO 2**	Write the program for the given problem
3	To write reusable modules (collections of functions).	**CO 3**	Implement the programs using Control and looping statements, class, sub-class concepts
		CO 4	Develop the programs using friend function, abstract class
		CO 5	Implement files concepts to read and write operations
Course Code	**CAP 3.5**	**Course Title**	**ACCOUNTING PACKAGE LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the Basic of Accounts and the usage of Tally for accounting purposes	**CO 1**	Ability to use and interpret financial and non-financial information in management planning and decision making.
2	Students are also familiarized with the Sale and Payroll features of Tally.	**CO 2**	Recognise and apply the appropriate techniques and tools for handling data.
3	Able to understand the working of a trading account and its profit-loss.	**CO 3**	Demonstrate a critical understanding of the nature of the information by using the software.
		CO 4	Understanding of the key role of financial management in making financial decisions such as fund raising and investing.
		CO 5	Evaluate techniques used in the area of accounting and financial management.
SEMESTER – IV			
Course Code	**CAP 4.1**	**Course Title**	**VISUAL PROGRAMMING**
	Course Objectives		**Course Outcomes (COs)**
1	To understand Visual Programming Concepts	**CO 1**	Identify and use the features of a Visual Basic (VB) development environment.
2	Understand Event driven programs and implementation using controls of Visual Studio Environment.	**CO 2**	Use the properties and methods of forms and controls to create VB programs

3	To design a Windows application user interface and access the databases	**CO 3**	Write procedures to perform input, processing, and output.
		CO 4	Declare and use variables of different data types in a VB program.
		CO 5	Design a Windows application user interface and access the databases
Course Code	**CAP 4.2**	**Course Title**	**UNIX PROGRAMMING**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students with the concepts, design and structure of Unix Operating System	**CO 1**	Acquired Concepts of UNIX Operating System, its kernel and different subsystems of kernel, types of shells.
2	Understand Process concepts in Unix Operating System.	**CO 2**	Understand Process Control subsystem, its State diagram, types of scheduling and memory management policies.
3	To understand unix utilities and commands	**CO 3**	Execute various types of commands on the standard shell viz. basic commands, directory and file related, pipe and filter related, process related, user communication related and the system administration related commands.
		CO 4	Execute user communication related and the system administration related commands.
		CO 5	Implement shell scripts using the editor involving decision control, looping and control flow statements.
Course Code	**CAP 4.3**	**Course Title**	**OPERATIONS RESEARCH**
	Course Objectives		**Course Outcomes (COs)**
1	To impart knowledge in concepts and tools of Operations Research	**CO 1**	To understand how to translate a real-world problem, given in words, into a mathematical formulation.
2	To understand mathematical models used in Operations Research	**CO 2**	To make decisions effectively using the concepts like L.P.P, Transportation problem, Assignment problem, Game theory, Network analysis.
3	To apply these techniques constructively to make effective business decisions	**CO 3**	formulate and solve problems as networks and graphs.
		CO 4	Construct linear integer programming models and discuss the solution techniques.
		CO 5	Ability to analyse the general nonlinear programming problems.
Course Code	**CAP 4.4**	**Course Title**	**VISUAL PROGRAMMING LAB C**
	Course Objectives		**Course Outcomes (COs)**
1	To design windows based applications using Visual Studio IDE	**CO 1**	Creating Window based applications.
2	To understand the design concept	**CO 2**	Design an application connecting with Databases.
3	To design and build database applications	**CO 3**	Generating Reports from the databases.
		CO 4	Design real time applications.

		CO 5	Design Windows application user interface and access the databases.
Course Code	**CAP 4.5**	**Course Title**	**UNIX LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To learn the fundamentals of shell scripting/programming	**CO 1**	To introduce basic understanding of UNIX OS, UNIX commands.
2	Ability to write programs using shell scripts.	**CO 2**	To understand File system and to familiarize students with the Linux environment
3	To Facilitate students with UNIX command syntax and semantics and implementation of those internal and external commands	**CO 3**	To make students learn fundamentals of shell scripting and shell programming.
		CO 4	Working with filters: grep, sed and awk
		CO 5	Programming with standard I/O
SEMESTER - V			
Course Code	**CAP 5.1**	**Course Title**	**DATA COMMUNICATIONS AND NETWORKS**
	Course Objectives		**Course Outcomes (COs)**
1	Build an understanding of the fundamental concepts of data communication and computer networking	**CO 1**	Understand the fundamental concepts of networking, transmission media and multiplexing techniques.
2	To understand the basic concepts of data communication, layered model, protocols and interworking between computer networks and switching components in telecommunication systems	**CO 2**	Understand the error detection, correction methods and concept of network topology.
3	Know about routing mechanisms and different routing protocols	**CO 3**	Understand digital technologies, WANs, layered model, routing principles and algorithms, layers of OSI model and TCP/IP model.
		CO 4	Understand internetworking principles Internet protocols and IP addressing.
		CO 5	Apply the concepts of networking and set up the right network for the given environment
Course Code	**CAP 5.2**	**Course Title**	**SOFTWARE ENGINEERING**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the idea of decomposing the given problem into Analysis, Designing, Implementation, Testing and Maintenance phases.	**CO 1**	Describe the SDLC process models, Requirement Engineering process, Requirement elicitation and analysis, Requirement specification and system models.
2	To provide the idea of decomposing the given problem into Analysis, Designing, Implementation, Testing and Maintenance phases.	**CO 2**	Understands the concept of Design architecture, Design principles, Design quality and software prototyping.
3	Understanding of the role of project management including planning, scheduling, risk management, etc.	**CO 3**	Developing applications using Object Oriented and Function oriented approach.

		CO 4	Creating User Interface design, reuse driven software development, software reliability.
		CO 5	Describes the concept of software verification, testing process, testing strategies, types of testing, levels of testing. Mathematical based verification and cleanroom software development.
Course Code	**CAP 5.3**	**Course Title**	**COMPUTER ARCHITECTURE**
	Course Objectives		**Course Outcomes (COs)**
1	Discuss the basic concepts and structure of computers	**CO 1**	To enable the students to learn the basic functions, principles and concepts of Computer Architecture.
2	To explain the function of each element of a memory hierarchy,	**CO 2**	To learn the fundamental aspects of Computer Architecture and design.
3	To identify and compare different methods for computer I/O.	**CO 3**	To focus on processor design, control unit design techniques.
		CO 4	To study on I/O interfacing.
		CO 5	To learn about Organization of Memory.
Course Code	**CAP 5.4**	**Course Title**	**JAVA PROGRAMMING**
	Course Objectives		**Course Outcomes (COs)**
1	Analyze the concepts of Inheritance, Exception and Packages in java	**CO 1**	Understand fundamentals of Java programming
2	Study how to handle events and multi-threaded programming in java.	**CO 2**	Gain good knowledge of object oriented concepts
3	Learn how GUI can be designed and developed in Java using Applets	**CO 3**	Ability to write programs which implement the features of Java
		CO 4	To design and implement both console based and GUI based Java applications
		CO 5	Ability to develop graphics applications and animations in Java
Course Code	**CAP 5.5**	**Course Title**	**MICROPROCESSOR AND ASSEMBLY LANGUAGE**
	Course Objectives		**Course Outcomes (COs)**
1	Understand and internal architecture of 8085	**CO 1**	Understanding 8085 Microprocessor architecture & its operation. Basic interfacing concepts, interfacing I/O devices
2	Understand and realize the Interfacing of memory & various I/O devices with 8085 microprocessor	**CO 2**	Instruction classification ,Instruction format, addressing modes, writing assembly level programs.
3	To familiarize the students with the programming microprocessors	**CO 3**	Looping Counting, Indexing and Time delays. Stacks and subroutines-conditional CALL and RETURN instructions.
		CO 4	BCD to Binary and Binary to BCD conversions - BCD to HEX and HEX to BCD conversions, ASCII to BCD and BCD to ASCII conversions, BCD to 7 segment conversion, Binary to ASCII and ASCII to Binary code conversion.

		CO 5	Describing Memory and I/O mapping and interfacing concepts. Interrupt - Implementing interrupts, Multiple interrupts.
Course Code	**CAP 5.6**	**Course Title**	**JAVA PROGRAMMING LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To emphasise on event-driven programming methods, including creating and manipulating objects, classes, graphics concepts,	**CO 1**	Gain clarity on fundamentals of Java programming
2	To familiarize with applet programming concepts etc	**CO 2**	Gain good knowledge of object oriented concepts through programming
3	To write multithreaded programs in JAVA	**CO 3**	through programming
		CO 4	Experience the creation of animations in Java
		CO 5	To design and implement GUI based Java applications
Course Code	**CAP 5.7**	**Course Title**	**ASSEMBLY LANGUAGE PROGRAMMING LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To study programming based on 8085 microprocessor	**CO 1**	To become familiar with the architecture and Instruction set of Intel 8085 microprocessor.
2	To understand the processing and execution of instructions in 805	**CO 2**	To provide practical hands on experience with Assembly Language Programming
3	To implement execution of different types of instructions	**CO 3**	Set up programming strategies and select proper mnemonics and run their program on the training boards.
		CO 4	simulation software.
		CO 5	Develop arithmetic and logical operations in program.
Course Code	**CAP 5.8**	**Course Title**	**PROJECT**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the data flow of a project	**CO 1**	Understand the System development lifecycle and implement it phase by phase
2	Ability to analyse requirements of a project	**CO 2**	Gain ability to understand the requirements of a new system or modification required in case of existing system
3	Design and develop software projects	**CO 3**	Acquire skills to design a system using the system designing techniques
		CO 4	Acquire skills to efficiently code and test a system
		CO 5	Gain ability to implement the right software model for the project

SEMESTER - VI			
Course Code	**CAP 6.1**	**Course Title**	**THEORY OF COMPUTATION**
	Course Objectives		**Course Outcomes (COs)**
1	To better understand the development of formal mathematical models of computation that reflect the real-world of computer	**CO 1**	Understanding the basic concepts of complexity theory. Defining machine models formally. Defining finite automata.
2	To understand the concept of formal languages, grammars, finite automata, pushdown automata, and Turing machines.	**CO 2**	Regular languages and Closure properties of regular languages, Minimization automata
3	Helps to develop mathematical and logical models that run efficiently and to the point of halting	**CO 3**	Understanding Grammar, Parse trees, ambiguity in grammars and Languages. Defining and studying Pushdown automata.
		CO 4	Understanding Normal forms for CFGs; The pumping lemma for CFGs; Closure properties of CFLs.
		CO 5	Defining and understanding Turing machines. An Undecidable problem, Post‟s Correspondence problem.
Course Code	**CAP 6.2**	**Course Title**	**DESIGN AND ANALYSIS OF ALGORITHMS**
	Course Objectives		**Course Outcomes (COs)**
1	To provide a solid background in the design and analysis of the major classes of algorithms	**CO 1**	Understand the terminology used in Analysis of Algorithms
2	To be able to carry out the Analysis of various Algorithms	**CO 2**	Gain knowledge on analyzing small algorithms manually
3	To learn various design techniques in order to develop efficient algorithms	**CO 3**	Ability to analyze recursive and non-recursive algorithms
		CO 4	Gain knowledge of different design techniques and their implementation.
		CO 5	Understand algorithm efficiency computation and write effective algorithms.
Course Code	**CAP 6.3**	**Course Title**	**CRYPTOGRAPHY AND NETWORK SECURITY**
	Course Objectives		**Course Outcomes (COs)**
1	To understand basics of Cryptography and Network Security	**CO 1**	Explain goals of security and mathematics of cryptography, types of attacks
2	Apply methods for authentication, access control, intrusion detection and prevention.	**CO 2**	Understand symmetric key ciphers, DES and AES in detail
3	To understand various protocols for network security to protect against the threats in the networks	**CO 3**	Understand Modern symmetric key encryption, RSA cryptosystem, Chinese remainder theorem
		CO 4	Understand SHA, digital signature, kerberos and hijacking
		CO 5	Understand application layer security like PGP, S/MIME SSL and TLS security protocols

Course Code	CAP 6.4	Course Title	WEB PROGRAMMING
	Course Objectives		**Course Outcomes (COs)**
1	Explain how the client-server model of Internet programming works.	**CO 1**	Explain the internet and related concepts that are vital in understanding web development, HTML program structure and few formatting tags.
2	Design and develop interactive, client-side, executable web applications.	**CO 2**	Demonstrate the important HTML tags: forms and frames, for designing static pages and separate design from content using Cascading Style sheet.
3	To learn to write, test, and debug web pages using HTML and JavaScript & CSS	**CO 3**	Understand the basic concepts of JavaScript including structure, arrays, functions. Constructors and error handling.
		CO 4	Demonstrate DOM, various events & event handling and DOM tree traversal & modifications.
		CO 5	Create dynamic documents with JavaScript and demonstrate basic usage of XML.
Course Code	**CAP 6.5**	**Course Title**	**WEB PROGRAMMING LAB**
	Course Objectives		**Course Outcomes (COs)**
1	Create web pages using XHTML and Cascading Style Sheets	**CO 1**	Creating web pages using html and xhtml
2	Build dynamic web pages using JavaScript (Client side programming)	**CO 2**	Creating web pages using CSS
3	Create XML documents and Schemas.	**CO 3**	Build dynamic web pages using JavaScripts
		CO 4	Ability to create interactive web pages
		CO 5	Able to design and implement real time applications using javascript, css,html.
Course Code	**CAP 6.6**	**Course Title**	**PROJECT WORK**
	Course Objectives		**Course Outcomes (COs)**
1	To understand System development life cycle	**CO 1**	Understand the System development lifecycle and implement it phase by phase
2	Gain knowledge to apply the software model based on the project	**CO 2**	Gain ability to understand the requirements of a new system or modification required in case of existing system
3	To get confidence for implementing the project inorder to solve real time problems	**CO 3**	Acquire skills to design a system using the system designing techniques
		CO 4	Acquire skills to efficiently code and test a system
		CO 5	Gain ability to implement the right software model for the project

NAME OF THE PROGRAMME	BACHELOR OF SCIENCE (Physics, Maths, Computer Science)
PROGRAMME CODE	IABOS06

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To impart quality education both in theoretical as well as experimental physics with special emphasis on 'learning by doing' to produce quality manpower for teaching as well as research.	PO1	Understand the terminology used in Classical Mechanics, Quantum mechanics, Statistical mechanics, Electrodynamics, Physics of Solids, Nanotechnology.
PEO2	To enable the students to acquire deep knowledge in fundamental aspects of all branches of Physics.	PO2	Gain knowledge on important concepts in Mathematical Physics, Quantum mechanics, Laser and Optics, Numerical analysis, Atomic, molecular and particle physics and design realistic circuits to perform specified operations.
PEO3	To inculcate scientific bent of mind and attitude relevant to science such as concern for efficiency, accuracy and precision, objectivity, integrity, enquiry, effective communication, ethical responsibilities, Initiative and Inventiveness	PO3	Understand the important connections between theory and experiment.
PEO4	To develop abilities and skills that encourages research and development activities and is useful in everyday life.	PO4	Learn laboratory skills, enabling them to take measurements in a physics laboratory and estimate sources of error in a measurement. Develop written and oral communication skills in communicating physics and research oriented topics.
PEO5	To develop abilities and skills that encourages research and development activities and is useful in everyday life.	PO5	Understand ethical aspects of their role as a professional in the field of physics and its applications.

SEMESTER - I			
Course Code	PHY 1.1 & 1.2	Course Title	MECHANICS-I, HEAT AND THERMODYNAMICS - I
	Course Objectives		Course Outcomes (COs)
1	To provide the understanding of basics of Newtonian mechanics, system of particles and rigid body dynamics.	CO1	Analyse the systems with many particles, apply the conservation laws in case of elastic and inelastic collisions and summarize the behaviour of systems with mass varying.
2	To explain the basic concepts and laws of thermodynamics, thermodynamic potentials and methods of achieving low temperature.	CO2	Recall Newton's laws of motion and analyse a few systems with friction and drag.
3	To discuss the concept of elasticity, elastic moduli and their relation.	CO3	Interpret the various theories associated with Black body radiation, explain the various concepts related to Kinetic theory of gases and transport phenomena.

		CO4	Understand the important connections between theory and experiment.
		CO5	Able to evaluate the expressions for Planck's law and other thermodynamic laws
Course Code	**MAT 1.1 & 1.2**	**Course Title**	**MATHEMATICS-I**
	Course Objectives		**Course Outcomes (COs)**
1	To equip students with knowledge and insight in matrices, nth derivatives and reduction formulae of standard functions.	**CO1**	Students will be able to solve problems related to row reduced echelon form, normal form, rank of the matrix, eigenvalues and eigenvectors of the matrix in Algebra.
2	To provide basic subject knowledge of Mathematical applications in three dimensional analytical geometry.	**CO2**	Students will be able to prove theorems and solve problems related to nth derivatives of some standard functions, Jacobian, Euler's formula in differential Calculus.
3	To develop the ability to use computer software as an aid and as a tool to study and solve problems in Mathematics.	**CO3**	Students would have understood theorems and solved problems related to reduction formulae of standard functions and congruence.
		CO4	Students will be able to derive the derivations and solve problems related to sphere, cylinder and cone in three dimensional analytical geometry.
		CO5	Students will be familiar with FOSS tools such as Scilab and Maxima to solve the problems related to the topics in Mathematics-I.
Course Code	**CSC 1.1 & 1.2**	**Course Title**	**PROGRAMMING CONCEPTS USING C**
	Course Objectives		**Course Outcomes (COs)**
1	Acquire necessary skills to design algorithms and flowcharts for developing applications in order to solve real world problems	**CO1**	Gain ability to devise algorithms and draw flow charts in order to design solutions to problems
2	Acquire good knowledge of structured programming concepts using C apply the concepts wisely	**CO2**	Capability to wisely use the program constructs and develop efficient C programs
3	Ability to develop modular programs in C and subsequently develop small projects in C language	**CO3**	Acquire knowledge of efficiently storing data in memory and retrieving using proper data structure
		CO4	Gain ability to develop modular programs to solve real world problems
		CO5	Capability to develop C programs for real world applications by applying suitable constructs and modularity
SEMESTER - II			
Course Code	**PHY 2.1 & 2.2**	**Course Title**	**MECHANICS-II, HEAT THERMODYNAMICS - II**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the knowledge of waves and oscillations.	**CO1**	Define Simple harmonic motion and determine kinetic and potential energy
2	To explain the concept of frames of reference, transformations and	**CO2**	Relate the three moduli of elasticity; determine the work done in stretching a wire and

	consequences of Special Theory of Relativity.		describe the bending of beams, cantilever and torsional oscillations.
3	To provide hands-on experience in doing experiments in mechanics, thermodynamics and relate the experimental observations with theory.	**CO3**	Illustrate the methods to produce low temperatures- Joule Thomson cooling and adiabatic demagnetization and liquefy gas by regenerative cooling and adiabatic expansion.
		CO4	Review the dynamics of rigid bodies, apply Parallel and Perpendicular axis theorems to find the moment of inertias of simple bodies and relate the conservation of angular momentum to everyday processes.
		CO5	Develop the wave equation, analyse the speed of transverse waves on a uniform string and speed of longitudinal waves in a fluid, explain group velocity and phase velocity – relation between them.
Course Code	**MAT 2.1 & 2.2**	**Course Title**	**MATHEMATICS-II**
	Course Objectives		**Course Outcomes (COs)**
1	To equip students with knowledge and insight in group theory, Differential calculus and Integral Calculus.	**CO1**	Students will be able to prove theorems and solve problems related to the concepts of groups and subgroups.
2	To provide basic subject knowledge of Mathematical applications in Geometry and Differential equations.	**CO2**	Students will be able to derive standard derivations and solve problems related to tangent, normal, sub tangent, subnormal to the curve, pedal equations, envelopes, evolutes, asymptotes and tracing of curves in differential calculus.
3	To develop the ability to use computer software as an aid and as a tool to study and solve problems in Mathematics.	**CO3**	Students will be able to derive standard derivations and solve problems related to arc length, surface area and volume in integral calculus.
		CO4	Students will be able to derive standard derivations and solve problems related to linear differential equations and non-linear first order with higher degree in differential equations.
		CO5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 2.1 & 2.2**	**Course Title**	**DATA STRUCTURES**
	Course Objectives		**Course Outcomes (COs)**
1	Acquire practical knowledge of structured programming concepts using C	**CO1**	Ability to design C programs to solve problems
2	Acquire the ability to implement the derived data types using C language	**CO2**	Capability to develop efficient C programs.
3	Gain ability to develop modular programs in C	**CO3**	Acquire practical knowledge on using proper data structure
		CO4	Capability to design modular programs to solve real world problems
		CO5	Capability to develop C programs for certain applications.

SEMESTER - III			
Course Code	**PHY 3.1 & 3.2**	**Course Title**	**ELECTRICITY AND MAGNETISM**
	Course Objectives		**Course Outcomes (COs)**
1	To gain the knowledge on solving complex networks using networks theorems	**CO 1**	Ability to calculate current and resistance in complex electrical circuits by the use of Kirchhoff's law
2	To understand the static and dynamic of electric and magnetic fields. Also understand the dynamics of electromagnetic waves in different media	**CO 2**	Understand the knowledge of networks theorems to solve complex electrical networks
3	To acquire knowledge on thermal current and its applications	**CO 3**	Estimate the magnitude of electric and magnetic fields.
		CO 4	Gain the knowledge of LCR with ac source using j operator method.
		CO 5	Adapt the concept of Seebeck effect, Thomson effect and Peltier effect to design thermal sensors
Course Code	**MAT 3.1 & 3.2**	**Course Title**	**MATHEMATICS-III**
	Course Objectives		**Course Outcomes (COs)**
1	To understand concepts of cosets, cyclic group, sequence and series.	**CO 1**	Students will be able to prove theorems and solve problems related to order of an element, cosets, cyclic groups, Lagrange's theorem in Algebra.
2	To provide basic knowledge of limits, continuity, differentiability, mean value theorems and to evaluate limits using L'Hospital's rule.	**CO 2**	Students will be able to prove theorems and analyze the given sequence and series for convergence, divergence and oscillatory. Also they can find the summation of infinite series of different types.
3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues	**CO 3**	Students will be able to prove theorems and solve problems related to continuity, differentiability, evaluate limits involving various indeterminate forms using L'Hospital rule.
		CO 4	Students will be able to verify Rolle's, Lagrange's and Cauchy's mean value theorems, to express the given function as an infinite series by using Taylor's and Maclauin's theorems.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 3.1 & 3.2**	**Course Title**	**DATABASE MANAGEMENT SYSTEM AND SOFTWARE ENGINEERING**
	Course Objectives		**Course Outcomes (COs)**
1	Emphasize on how to organize and maintain data in a database and understand the underlying mathematical	**CO 1**	Gain good knowledge of the fundamental elements of relational database management systems

	principles and concepts implemented in DBMS		
2	Gain knowledge to store , manipulate and retrieve efficiently and effectively the data using DBMS	**CO 2**	Acquire knowledge of the concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL
3	To provide the idea of decomposing the given problem into Analysis, Desging, Implementation, Testing and Maintenance phases also provide an idea of using various process models in the software industry.	**CO 3**	Capability to design ER-models to represent simple database application scenarios
		CO 4	Describe the SDLC process models, Requirement Engineering process, Requirement elicitation and analysis, Requirement specification and system models.
		CO 5	Describes the concept of software verification, testing process, testing strategies, types of testing, levels of testing. Mathematical based verification and cleanroom software development.
SEMESTER - IV			
Course Code	**PHY 4.1 & 4.2**	**Course Title**	**OPTICS AND FOURIER SERIES**
	Course Objectives		**Course Outcomes (COs)**
1	To study properties of light waves through light phenomena's	**CO 1**	Explain the phenomena exhibited by light – reflection and refraction using Huygens's Principle.
2	To know the process of producing laser light and learn technique of Fourier series	**CO 2**	Develop the ability to analyze the data/results
3	To understand the dynamics of light propagation in optical fibre	**CO 3**	Identify the coherent sources, and their generation, explain theory of interference by division of amplitude and division of wave front
		CO 4	Determination of the wavelength of light and find the resolving power of telescope
		CO 5	Explain the principle and working of optical fiber
Course Code	**MAT 4.1 & 4.2**	**Course Title**	**MATHEMATICS-IV**
	Course Objectives		**Course Outcomes (COs)**
1	To master the ideas and techniques in groups and Fourier series.	**CO 1**	Students will be able to prove theorems and solve problems on Normal subgroups, Quotient groups, homomorphism, isomorphism and related concepts of group theory in Algebra.
2	To learn and work with Taylor's series, maximum, minimum values of functions of two variables, Laplace transforms and its applications to differential equations	**CO 2**	Students will be able to prove theorems and solve problems related to Fourier series and half range Fourier series.
3	To develop the ability to utilize the Mathematical problem solving methods	**CO 3**	Students will be able to prove theorems and solve problems related to Taylor's series, maximum, minimum values of functions of two

	through FOSS tools in addressing practical issues.		variables, Laplace transforms and its applications to differential equations.
		CO 4	Students will be able to prove theorems and solve problems related to various types of ordinary differential equations.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 4.1 & 4.2**	**Course Title**	**OPERATING SYSTEM AND UNIX**
	Course Objectives		**Course Outcomes (COs)**
1	To make aware of basic concepts and functions of operating systems.	**CO 1**	Analyse the structure of OS and basic architectural components involved in OS design
2	To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.	**CO 2**	Analyse the various device and resource management techniques for timesharing and distributed systems.
3	Understand Process concepts in Unix Operating System.and unix utilities and commands	**CO 3**	Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system
		CO 4	Acquired Concepts of UNIX Operating System, its kernel and different subsystems of kernel, types of shells, scripting in it and programming, also working with filters: grep, sed and awk
		CO 5	Understand Process Control subsystem, its state diagram, types of scheduling and memory management policies, Programming with standard I/O
SEMESTER - V			
Course Code	**PHY 5.1 & 5.2**	**Course Title**	**STATISTICAL PHYSICS, QUANTUM MECHANICS-I, ATMOSPHERIC PHYSICS AND NANOMATERIALS**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the knowledge of statistical mechanics, the distribution laws and apply them to analyse statistical systems	**CO 1**	Students will be able to explain the basic concepts like phase space, ensembles and probability distribution and postulates.
2	To become familiar with drawbacks of classical mechanics and know need of quantum theory	**CO 2**	Describe the Maxwell- Boltzmann distribution function, M-B energy and velocity distribution and limitations.
3	To provide a basic knowledge of atmospheric physics and climate science.	**CO 3**	Recognize the importance of de Broglie wave hypothesis, supported by Thomson experiment and Davisson and Germer expt.
		CO 4	Build connections between mathematical development and conceptual understanding
		CO 5	Identify the composition of the atmosphere, factors affecting the temperature and pressure and Explain the importance of Nanomaterials – synthesis by ball milling, sol gel methods and characterization by SEM, TEM and AFM.

Course Code	PHY 6.1 & 6.2	Course Title	ASTROPHYSICS, SOLID STATE PHYSICS AND SEMICONDUCTOR PHYSICS
	Course Objectives		**Course Outcomes (COs)**
1	To provide knowledge of evolution, physical parameters of stars and their life cycles	**CO 1**	Students will be able to explain luminosity, magnitude scale to assess a star and formation of stars from protostar to supernova explosion
2	To know the theories and phenomena associated with atomic, molecular and analyse the properties of materials.	**CO 2**	Understand basic concepts and mathematical methods of solid state physics.
3	To develop and design circuits to examine the working of semiconducting devices	**CO 3**	Practice problem solving by using selected problems in solid state physics.
		CO 4	Describe different types power semiconductor devices and their characteristics
		CO 5	Describe the general method for analyzing and predicting the performance of operational amplifiers and related integrated circuits.
Course Code	**MAT 5.1 & 5.2**	**COURSE TITLE**	**MATHEMATICS-V**
	Course Objectives		**Course Outcomes (COs)**
1	To acquire knowledge about rings, types, integral domains and fields and to develop the mathematical skills of the students in the areas of numerical methods in finite differences, interpolation and numerical integration.	**CO 1**	Students would have understood the concepts, types and theorems of Rings, integral domain and fields.
2	To motivate students to gain knowledge about gradient, curl, laplacian, directional derivatives and orthogonal curvilinear co-ordinates.	**CO 2**	Students would have understood Scalar field, Directional derivatives, Angle between surfaces, vector field, divergence and curl, Laplacian, Harmonic functions and related problems.
3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues.	**CO 3**	Students will be familiar with Fundamental vectors or base vectors, speherical, cylindrical and orthogonal curvilinear co-ordinate system.
		CO 4	Students will be able to apply various interpolation methods, finite difference concepts and numerical integration whenever routine methods are not applicable.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**MAT 6.1 & 6.2**	**Course Title**	**MATHEMATICS-VI**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concept of calculus of variations, geodesics, Brachistochrone problem, isoperimetric problems and problems on line and multiple integrals.	**CO 1**	Students will be able to obtain the derivations and solve problems on calculus of variation such as geodesics, Brachistochrone problem and isoperimetric problems.
2	To learn and understand integral theorems such as Green's theorem,	**CO 2**	Students will be able to solve problems on line and multiple integrals

	Stokes' theorem and Gauss divergence theorem and to solve problems related		
3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues.	**CO 3**	Students will be able to solve application problems on line and multiple integrals.
		CO 4	Students will be able to obtain the derivations and solve problems related to the three integral theorems: Green's, Gauss divergence and Stokes' theorems.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 5.1 & 5.2**	**Course Title**	**OBJECT ORIENTED PROGRAMMING USING JAVA**
	Course Objectives		**Course Outcomes (COs)**
1	Analyze the concepts of Inheritance, Exception and Packages in java	**CO 1**	Understand fundamentals of Java programming
2	Study how to handle events and multi-threaded programming in java.	**CO 2**	Gain good knowledge of object oriented concepts
3	Learn how GUI can be designed and developed in Java using Applets	**CO 3**	Ability to write programs which implement the features of Java
		CO 4	To design and implement both console based and GUI based Java applications
		CO 5	Ability to develop graphics applications and animations in Java
Course Code	**CSC 6.1 & 6.2**	**Course Title**	**DOT NET FRAMEWORK AND C#.NET**
	Course Objectives		**Course Outcomes (COs)**
1	To Understand the concept of enterprise computing systems	**CO 1**	Knowledge about enterprise business view.
2	To gain knowledge of object-oriented paradigm in the C # programming language,	**CO 2**	Ability develop software applications in C # and SQL server
3	Ability to understand .NET framework tools	**CO 3**	Design real time applications using the controls of .Net frameworks.
		CO 4	Able to retrieve and update the information in RDBMS using windows application using .Net
		CO 5	Ability to understand and design real time database applications.
SEMESTER - VI			
Course Code	**PHY 7.1 & 7.2**	**Course Title**	**ATOMIC, MOLECULAR AND NUCLEAR PHYSICS**
	Course Objectives		**Course Outcomes (COs)**
1	To acquire knowledge in the content areas of atomic, molecular and nuclear physics, focusing on concepts that are commonly used in this area.	**CO 1**	Acquired knowledge in the content areas of atomic, molecular and nuclear physics, focusing on concepts that are commonly used in this area.
2	To explain the different types of nuclear decays and construction and working of	**CO 2**	Develop familiarity with the vast areas of nuclear and particle physics as well as develop an interest in these subjects.

	nuclear particle detectors and particle accelerators		
3	To explain and identify the different types of nuclear reactions and possible nuclear reactions using the conservation laws	**CO 3**	Discuss the elastic and inelastic scattering of light, explain Raman Effect quantum mechanically and identify its potential applications
		CO 4	Able to relate theory and experiment
		CO 5	Identify the possible nuclear reactions using the conservation laws and explain endoergic and exoergic reactions and determine the energy released in the nuclear reactions.
Course Code	**PHY 8.1 & 8.2**	**Course Title**	**ELECTRONICS, MAGNETIC MATERIALS, DIELECTRICS AND QUANTUM MECHANICS - II**
	Course Objectives		**Course Outcomes (COs)**
1	To verify and evaluate Boolean algebraic expressions and to realise the applications of Op-amps.	**CO 1**	Able to describe the general method for analyzing and predicting the performance of operational amplifiers and related integrated circuits.
2	To classify materials based on their magnetic behaviour and explain the variation of magnetic susceptibility of magnetic materials with temperature using Langevins' and Weiss theories	**CO 2**	Able to design realistic circuits to perform specified operations.
3	To explain the types of polarization in dielectrics, the different methods of dielectric breakdown and its applications	**CO 3**	Able to classify materials based on their magnetic behaviour and explain the variation of magnetic susceptibility with temperature using Langevins' and Weiss theories and also analyse the B-H curve.
		CO 4	Able to explain the different methods for dielectric breakdown and understand the applications of piezoelectric materials.
		CO 5	Able to solve problems in Quantum Mechanics and getting a clear idea of eigen value and eigen functions and also solving problems in more than one dimension and multi-particle systems.

Course Code	**MAT 7.1 & 7.2**	**Course Title**	**MATHEMATICS-VII**
	Course Objectives		**Course Outcomes (COs)**
1	To acquire the knowledge about basics of Linear Algebra such as Vector space, subspaces, basis, dimension and to verify Rank-Nullity theorem.	**CO 1**	Students will be able to prove the theorems and solve problems related to Basics of Linear Algebra such as Vector space, subspaces, basis, dimension and to verify Rank-Nullity theorem.
2	To develop the mathematical skills of the students in the field of partial differential equations and number theory.	**CO 2**	Students will be able to prove theorems and solve problems related to various types of partial differential equations.

3	To develop the ability to utilize the Mathematical problem solving methods Through FOSS tools in addressing practical issues.	**CO 3**	Students will be able to prove theorems and solve problems related to applications of partial differential equations to the real world.
		CO 4	Students will be able to prove theorems and solve problems related to basic number theory.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**MAT 8.1 & 8.2**	**Course Title**	**MATHEMATICS-VIII**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the fundamental ideas of function of complex variables and developing a clear understanding of the fundamental concepts of complex analysis such as analytic functions, complex integrals and bilinear transformation.	**CO 1**	Students will be able to understand the basic concept of complex analysis such as analytic functions, harmonic functions and the role of Cauchy-Riemann equations.
2	To develop the mathematical skills of the students in the field of numerical methods such as solving algebraic, transcendental equations, simultaneous equations and ordinary differential equations numerically.	**CO 2**	Students will be able to understand the basic concept of bi-linear transformation, basics of complex integration, Cauchy's theorem, Cauchy's integral formula and their consequences.
3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues.	**CO 3**	Students will be able to know the methods of solving the system of linear equations numerically.
		CO 4	Students will be able to know the methods of solving the system of ordinary differential equations numerically.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 7.1 & 7.2**	**Course Title**	**WEB PROGRAMMING**
	Course Objectives		**Course Outcomes (COs)**
1	Explain how the client-server model of Internet programming works.	**CO 1**	Explain the internet and related concepts that are vital in understanding web development, HTML program structure and few formatting tags.
2	Design and develop interactive, client-side, executable web applications.	**CO 2**	Demonstrate the important HTML tags: forms and frames, for designing static pages and separate design from content using Cascading Style sheet.
3	To learn to write, test, and debug web pages using HTML and JavaScript & CSS	**CO 3**	Understand the basic concepts of JavaScript including structure, arrays, functions. Constructors and error handling.
		CO 4	Demonstrate DOM, various events & event handling and DOM tree traversal & modifications.

		CO 5	Create dynamic documents with JavaScript and demonstrate basic usage of XML.
Course Code	**CSC 8.1**	**Course Title**	**COMPUTER NETWORKS**
	Course Objectives		**Course Outcomes (COs)**
1	Build an understanding of the fundamental concepts of computer networking and transmission media.	**CO 1**	Understand the fundamental concepts of networking, transmission media and multiplexing techniques.
2	To understand the basic concepts of data communication, layered model, protocols and interworking between computer networks and switching components in telecommunication systems	**CO 2**	Understand the error detection, correction methods and concept of network topology.
3	Know about routing mechanisms and different routing protocols of LAN and WAN technologies.	**CO 3**	Understand digital technologies, LAN,WAN, TCP/IP model.
		CO 4	Understand internetworking principles Internet protocols and IP addressing.
		CO 5	Understand routing principles and algorithms. Concepts of transmission of packets in TCP and UDP.
Course Code	**CSC 8.2**	**Course Title**	**PROJECT LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To understand and select the task based on their core skills.	**CO 1**	Perform Requirements Analysis and the need to develop the application
2	To get the knowledge about analytical skill for solving the selected task	**CO 2**	Design the application using design tools and techniques
3	To get confidence for implementing the task and solving the real time problems	**CO 3**	Develop code using latest and apt programming language
		CO 4	Perform validation and testing
		CO 5	Gain confidence to develop projects

NAME OF THE PROGRAMME	BACHELOR OF SCIENCE (Chemistry, Microbiology, Zoology)
PROGRAMME CODE	IABOS02

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To provide in-depth knowledge on core areas of biosciences in a wide-ranging context at affordable costs which involves the use of evolved and practicable skills for a lifelong learning.	PO1	After completion, students will able to strongly articulate theoretical and practical concepts in the core areas of study.
PEO2	To make students competent in the field of biosciences and allied areas by providing them hands-on experience using multifarious tools and techniques.	PO2	Students develop ability to solve, analyse and interpret data generated from laboratory work and research activities that help to develop critical understanding of the latest development in the core areas of biosciences.
PEO3	To inculcate, facilitate, motivate and promote knowledge to critically evaluate, and apply technical skills to validate and solve environmental, industrial and agricultural issues through core bio-scientific interventions.	PO3	Students are able to use skills required for the extraction, separation DNA and synthesis of a variety of biomolecules utilized in clinical diagnosis, pharmaceutical, industrial, agricultural sector or in research laboratories.
PEO4	To develop graduates with a strong professional ethics and moral duties combined with enhanced vocabulary that will positively affect their profession, community, society nation and international level at large extent.	PO4	Students may able to apply knowledge and understandings of biological sciences and skills to new and unfamiliar contexts to identify, analyse problems, issues and seek solutions to real-life problems
PEO5	To equip students so as to take up a suitable career in industry or research or from a multidisciplinary environment from the imbibed communicative, linguistic, analytical and bioinstrumentation competencies.	PO5	Students are equipped to undertake hands on laboratory work and activities that help to develop practical knowledge and skills that are required for pursuing career in food and beverage industry, clinical diagnosis & research, clinical data management, drug design, vaccine development, pharmaceutical industry, teaching, research and environmental monitoring sectors.

SEMESTER - I			
Course Code	CHE 1.1 & 1.2	Course Title	CHEMISTRY-I
	Course Objectives		Course Outcomes (COs)
1	To understand the periodic law and significance of atomic no and electronic configuration as the basic for periodic classification	CO1	Learn the basic mathematics concepts like logarithms, differentiation, and integration
2	To acquire the knowledge of terms, facts, concepts, processes techniques and principles of the subject.	CO2	Study the concepts of gases like Maxwell-Boltzmann's law, rms, average and most probable speeds and concepts of critical constant
3	To understand the concept of organic reactions mechanism.	CO3	Understand the importance laws of photochemistry, Quantum yield and its application

		CO4	Study about properties of liquids, CST, distillation, fractional distillation, distribution law.
		CO5	Learn about periodic table and properties
Course Code	**MIB 1.1 & 1.2**	**Course Title**	**BASIC MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To provide a strong, fundamental foundation in microorganisms for advanced studies in biological sciences, particularly microbiology	**CO1**	Understand the discoveries and inventions in the field of microbiology
2	To learn about Instrumentation techniques used in Microbiology field	**CO2**	Apply the Instruments used in Microbiological Techniques
3	To discuss the importance of sterilization methods, staining methods and antibiotics	**CO3**	Evaluate the quality standard for sterilization methods used in microbiology
		CO4	Learn about staining methods
		CO5	Discuss the antibiotics and mode of actions
Course Code	**ZOO 1.1 & 1.2**	**Course Title**	**NON CHORDATA-I**
	Course Objectives		**Course Outcomes (COs)**
1	To have in depth knowledge about invertebrates of different phyla	**CO1**	To learn the diagnostic characteristics of different phyla and classify them
2	To understand the taxonomic position of Protozoa to Annelida	**CO2**	To comprehend the anatomical features of non-chordates through their type study
3	To understand the body organization and general characteristics of animals belonging to different phylums	**CO3**	To describe the systematic position, habit, habitat, morphology of different non chordates
		CO4	To identify a range of non-chordates and to To gain conceptual knowledge of non-chordates
		CO5	To illustrate the life cycle of parasitic protozoans and transmission route of the diseases they cause
SEMESTER - II			
Course Code	**CHE 2.1 & 2.2**	**Course Title**	**CHEMISTRY-II**
	Course Objectives		**Course Outcomes (COs)**
1	The course aims to give the knowledge of principles of quantum mechanics so that the students will be able to apply quantum mechanical principles to solve simple systems.	**CO1**	Learn about Postulates of quantum mechanics. Significance of operators, Application of Schrodinger equation.
2	Explain the formation of bond in terms of potential energy diagram and octet rule	**CO2**	Study about Lattice energy, VSEPR theory, Polarization concept
3	To study the properties of aliphatic and aromatic hydrocarbons.	**CO3**	Classification of silicates based on the structure, applications of Noble gases, Transition elements and properties

		CO4	Lanthanides and Actinides, Ion exchange method for separation of Lanthanides.
		CO5	Learn about mechanism of nitration of benzene, Aromatic nucleophilic substitution reaction
Course Code	**MIB 2.1 & 2.2**	**Course Title**	**MICROBIAL TAXONOMY & CULTURE TECHNIQUES**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic concepts of prokaryotes and their three domains classification of organisms	**CO1**	Understand the classification and cultivation and significance of viruses and atypical prokaryotes
2	To analyze the characteristics of cyanobacteria and fungi	**CO2**	Comparison of the three domains of organisms based on their characteristics
3	To apply the techniques to make use of cultivation of pure culture and to evaluate the biological techniques in microbial growth	**CO3**	Analyze the characteristics of cyanobacteria and fungi
		CO4	Apply the techniques to make use of cultivation of pure culture
		CO5	Evaluate the applications of biological techniques in microbial growth
Course Code	**ZOO 2.1 & 2.2**	**Course Title**	**NON CHORDATA - II**
	Course Objectives		**Course Outcomes (COs)**
1	To have in depth knowledge about invertebrates of different phyla.	**CO1**	To study animals of different phyla, their distribution
2	To understand the taxonomic position of Arthropoda to Echinodermata.	**CO2**	To describe the systematic position, habit, habitat, morphology and anatomical features of different non chordates
3	To understand the body organization and general characteristics of animals belonging to different phylums	**CO3**	To comprehend the anatomical features of non-chordates through their type study
		CO4	To obtain overview of economically important invertebrates
		CO5	To obtain overview of economically important invertebrates
SEMESTER - III			
Course Code	**CHE 3.1 & 3.2**	**Course Title**	**CHEMISTRY-III**
	Course Objectives		**Course Outcomes (COs)**
1	Analyse principles of kinetics and mechanisms of surface reactions.	**CO 1**	Learn about order , molecularity of a reaction, half-life period, Simple collisions theory
2	To apply the thermodynamic concepts like heat energy and entropy to the principles of extraction of metals to evaluate thermodynamic quantities such as Gibb's free energy, enthalpy, entropy, internal energy and work.	**CO 2**	Learn about law of Thermodynamics, Spontaneous and non-spontaneous processes, Carnot's cycle.
3	To state the units for the rate of chemical reactions and derive the rate equation for first and second order reactions.	**CO 3**	Study about Gibb's-Helmholtz equation, van't Hoff isotherm.

		CO 4	Theories of adsorption, Heterogeneous catalysis.
		CO 5	Preparation and applications of polymers
Course Code	**MIB 3.1 & 3.2**	**Course Title**	**MICROBIAL PHYSIOLOGY AND MICROBIAL GENETICS**
	Course Objectives		**Course Outcomes (COs)**
1	To give brief description on biomolecules	**CO 1**	Explain the structure, properties and classification, functions of biomolecules
2	To learn the enzyme kinetics, microbial metabolism and its energetics	**CO 2**	Apply the enzyme kinetics in chemical reaction
3	To evaluate the gene transfer, recombinations, mutations	**CO 3**	Evaluate the biosynthetic pathways
		CO 4	Understand the genomic organizations and nucleic acid replication
		CO 5	Analyze the gene transfer, recombinations, mutations
Course Code	**ZOO 3.1 & 3.2**	**Course Title**	**CHORDATA**
	Course Objectives		**Course Outcomes (COs)**
1	To obtain comprehensive knowledge on the taxonomy and characteristics of chordates	**CO 1**	To enumerate characters of protochordates, urochordates, and cephalochordates and classify chordates
2	To understand and identify morphological and anatomical structure for the major groups of vertebrates from an evolutionary point of view.	**CO 2**	To describe the morphology, habit and habitat, systematic position and various organ systems in *Scoliodon*
3	To study the general features, distribution and economic importance of chordates	**CO 3**	To distinguish unique characters of Pisces, amphibians, reptiles, aves and mammals.
		CO 4	To introduce the livestock industry and the various species of animal livestock.
		CO 5	To gain knowledge on economic zoology like poultry, dairy, the basic management practices, products and by-products.
SEMESTER - IV			
Course Code	**CHE 4.1 & 4.2**	**Course Title**	**CHEMISTRY-IV**
	Course Objectives		**Course Outcomes (COs)**
1	To impart the students the knowledge on phase rule, its applications and alloys, their importance, composition and applications.	**CO 1**	Study the phase diagram and applications, X-ray diffraction, Liquid crystals.
2	Controlling steel chemistry and processing allows grades to be developed for specific applications	**CO 2**	Understand the treatment of water for domestic and Industrial purpose.
3	Study about the chemistry of Aromatic aldehyde, aromatic ketones and acids.	**CO 3**	Learn the natural and artificial radioactivity, nuclear reactor and breeder reactor.
		CO 4	Study the production of metal powders, applications of powder metallurgy.
		CO 5	Learn the production of ferroalloys, carbon steels.

Course Code	MIB 4.1 & 4.2	Course Title	MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY
	Course Objectives		**Course Outcomes (COs)**
1	To analyze the central dogma and gene expression	**CO 1**	Understand the central dogma
2	To discuss operon model and molecular techniques	**CO 2**	Analyze the regulation of gene expression
3	To evaluate the applications of recombinant DNA technology in various fields	**CO 3**	Discuss the operon model
		CO 4	Apply the recombinant DNA technology in the agricultural, medical and industrial and environmental field
		CO 5	Evaluate the molecular techniques with different samples
Course Code	**ZOO 4.1 & 4.2**	**Course Title**	**COMPARATIVE ANATOMY, CELL BIOLOGY, IMMUNOLOGY & HISTOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To develop a proper understanding of evolution and structure of the vertebrates	**CO 1**	To compare and contrast the anatomical systems of different vertebrates
2	To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells and to identify the cellular and molecular basis of immune responsiveness	**CO 2**	To analyse and critically evaluate the structure and function of vertebrate systems and assess the functional significance of morphological adaptations
3	To provide knowledge of the microscopic structure and function of human tissues	**CO 3**	To impart knowledge on structure of cells and cell organelles, general properties of immune response mechanisms, structure& function of tissues
		CO 4	To impart knowledge on chromosomal aberrations, mechanism of mutations and understand the properties and treatment of cancer cells.
		CO 5	To categorize mammalian tissue types and functions of various organs.
SEMESTER - V			
Course Code	**CHE 5.1 & 5.2**	**Course Title**	**CHEMISTRY-V**
	Course Objectives		**Course Outcomes (COs)**
1	Depict various types of isomerism exhibited by organic compounds and their representation	**CO 1**	Learn the stereochemistry of the organic molecule
2	Provide both synthesis and applications of amines.	**CO 2**	Study the synthetic applications of amines
3	Understand the basic design and operating principles of some modern	**CO 3**	Understand the importance of heterocyclic compounds

	instruments used in chemical analysis(spectroscopy)		
		CO 4	Understand the structure of natural products, mode of action and synthesis of drugs.
		CO 5	Study the applications of spectroscopy of organic molecules, Learn the synthetic dyes and drugs
Course Code	**CHE 6.1 & 6.2**	**Course Title**	**CHEMISTRY-VI**
	Course Objectives		**Course Outcomes (COs)**
1	The learners will be able to identify a redox reaction based on changes in oxidation and reduction.	**CO 1**	Study the electrolytes and conductance
2	To understand the preparations of buffers and its mechanism and its biological applications.	**CO 2**	Understand the electrodes and batteries
3	To demonstrate the application of spectroscopic and electrochemical methods in mechanistic studies	**CO 3**	Learn the common ion effect, buffers
		CO 4	Study the polarization and dipole moment of a molecule.
		CO 5	Understand the physical spectroscopy of the molecule.
Course Code	**MIB 5.1 & 5.2**	**COURS E TITLE**	**AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To study the properties of soil, their microbial diversity and plant microbe interaction	**CO 1**	Understand the structure of soil profile and its microorganisms
2	To understand the involvement of various microbes in biogeochemical cycls and plant diseases	**CO 2**	Evaluate the plant microbe interaction
3	To evaluate the air and water quality using different methods of quality parameters	**CO 3**	Discuss the mechanisms of pathogenesis, symptoms and control measures of plant diseases
		CO 4	Applications of various techniques to understand the microbial diversity in the air
		CO 5	Evaluation of water quality using different methods of quality parameters
Course Code	**MIB 6.1 & 6.2**	**Course Title**	**FOOD AND DAIRY MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To describe the role of microorganisms in food spoilage and principles food preservation	**CO 1**	Food as a substrate and the role of microorganisms in causing food spoilage and food poisoning
2	To understand microbiology of fermented food commodities	**CO 2**	Analyze the character of microbes in food spoilage using various examination
3	To analyze the microbiological quality control, and quality schemes	**CO 3**	Apply the preservation techniques for food
		CO 4	Evaluate the microbiology of fermented milk products

		CO 5	Discuss the government regulatory practices and policies in food quality and safety
Course Code	**ZOO 5.1 & 5.2**	**Course Title**	**ENVIRONMENTAL BIOLOGY & ETHOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To instill the basic concepts of Environmental Sciences, toxicology, Ecosystems, Natural Resources and protection	**CO 1**	To understand various laws of ecology, types of ecosystem, population and community characteristics and dynamics, wild life conservation biology
2	To teach the basic concepts of toxicology, their impact on human health and remedial measures	**CO 2**	To learn in depth about wildlife, biodiversity and conservation biology
3	To impart basic knowledge on animal behavioural patterns and their role	**CO 3**	To understand various laws of ecology, types of ecosystem, population and community characteristics and dynamics
		CO 4	To comprehend the consequences of environmental pollutions due to toxic materials and their effects over ecosystem and learn about sustainable development
		CO 5	Able to differentiate the types of animal behaviour and achieve knowledge in sociobiology
Course Code	**ZOO 6.1 & 6.2**	**Course Title**	**DEVELOPMENTAL BIOLOGY & ORGANIC EVOLUTION**
	Course Objectives		**Course Outcomes (COs)**
1	To provide a comprehensive understanding of the concepts of early animal development	**CO 1**	To understand how organisms maintain gametic population, fertilization process, cleavage and different patterns to form zygote, fundamental embryonic development.
2	To develop a critical appreciation of methodologies specifically used to study the process of embryonic development in animals	**CO 2**	To describe the stages and cellular mechanisms for blastulation, gastrulation, role or organizers, placentation and regeneration.
3	To recognize the pattern of biological evolution, to differentiate between evolutionary mechanisms (natural selection, random genetic drift, mutation, and migration).	**CO 3**	To impart knowledge on the complete process of formation of germ layers.
		CO 4	To describe how the evolutionary forces leads to speciation
		CO 5	To discuss evidence regarding evolution of man.
SEMESTER – VI			
Course Code	**CHE 7.1 & 7.2**	**Course Title**	**CHEMISTRY-VII**
	Course Objectives		**Course Outcomes (Cos)**
1	To understand the key features of coordination compounds	**CO 1**	Understand the concepts of Coordination compounds
2	To make the students mathematically strong for solving engineering and scientific problems.	**CO 2**	Study the application and importance of industrial materials

3	To describe some of the roles of trace elements in biological systems.	**CO 3**	Learn the importance of Essential and trace elements in biological systems
		CO 4	Study the Chemistry of Newer materials
		CO 5	Understand the Structure and Chemical reactions of C-60
Course Code	**CHE 8.1 & 8.2**	**Course Title**	**CHEMISTRY-VIII**
	Course Objectives		**Course Outcomes (Cos)**
1	Demonstrate knowledge and understanding of the molecular machinery of living cells	**CO 1**	Learn the structures and biological applications of carbohydrates and lipids.
2	Understanding of the principles that govern the structures of macromolecules and their biological functions	**CO 2**	Understand the importance of proteins, nucleic acids and hormones in biological systems.
3	Understanding of the principles and basic mechanisms of metabolism in biological systems	**CO 3**	Understand the importance and concept of organic spectroscopy and their various applications.
		CO 4	Understand the concept and importance of bioenergetics and metabolism in biological systems.
		CO 5	Learn the principles and applications of biochemical techniques.
Course Code	**MIB 7.1 & 7.2**	**Course Title**	**IMMUNOLOGY AND MEDICAL MICROBIOLOGY**
	Course Objectives		**Course Outcomes (Cos)**
1	To demonstrate an understanding of key concepts in immunology and organization of the immune system	**CO 1**	Illustrate the cells, tissues, organs of immune system and types of immunity
2	To understand the salient features of antigen antibody reaction & its uses in diagnostics and various other studies	**CO 2**	Understand the properties, functions of Antigens, antibodies and complement system
3	To understand the role of pathogenic microorganisms in human disease with respect to infections of the respiratory tract, gastrointestinal tract, urinary tract, skin and soft tissue	**CO 3**	Apply the antigen and antibody reactions in the diagnosis of diseases
		CO 4	Remember the medically important bacteria, virus, fungi and protozoa
		CO 5	Analyze the symptoms, pathogenesis, laboratory diagnosis and control measures of bacterial, fungal, viral and protozoa
Course Code	**MIB 8.1 & 8.2**	**Course Title**	**INDUSTRIAL MICROBIOLOGY AND MICROBIAL TECHNOLOGY**
	Course Objectives		**Course Outcomes (Cos)**
1	To understand the principles of fermentation process associated with the production and recovery of different bio-products	**CO 1**	Analyze the steps involved in different types of fermentation process
2	To impart theoretical knowledge on design of fermenters and types of fermentors	**CO 2**	Understand the types, working mechanism and importance of various fermentors

3	To evaluate the significance of immobilization and role of microorganisms in the production of various industrial important products	**CO 3**	Construct the fermentable product recovery process and solid state fermentation
		CO 4	Evaluate the necessity of immobilization
		CO 5	Apply the microbial technology in the industrial products production
Course Code	**ZOO 7.1 & 7.2**	**Course Title**	**GENETICS & BIOTECHNOLOGY**
	Course Objectives		**Course Outcomes (Cos)**
1	To understand the inheritance and expression of human genetics and understanding of the genetic terminology	**CO 1**	To infer the behaviour of chromosomes during meiosis to explain Mendel's law.
2	To solve transmission genetics problems, make accurate predictions about inheritance of genetic traits, and map the locations of genes	**CO 2**	To indicate the inheritance patterns are affected by position on chromosomes and gene interactions.
3	To describe what causes and consequences of DNA sequence changes and how cells prevent these changes, as well as make predictions about the causes and effects of changes in DNA	**CO 3**	To extend the deviations of Mendel's and gene frequency and mutation.
		CO 4	To become familiar with the tools and techniques of Genetics and Biotechnology
		CO 5	To sketch the applications of biotechnology in different fields.
Course Code	**ZOO 8.1 & 8.2**	**Course Title**	**ANIMAL PHYSIOLOGY & TECHNIQUES IN BIOLOGY**
	Course Objectives		**Course Outcomes (Cos)**
1	To provide students with a basic understanding of the fundamental processes and mechanisms that serve and control the various functions of the body	**CO 1**	To understand the concepts of various physiology processes like digestion, circulation, respiration, excretion, muscle contraction, nerve conduction in animals
2	To develop understanding for the fundamental concepts of physiology of digestion	**CO 2**	To correlate the physiological and biochemical processes of animals
3	To acquire knowledge about the basic principles of microscopy, chromatography, centrifugation, electrophoresis, biostatistics	**CO 3**	To gain knowledge about hormones and endocrine mechanisms
		CO 4	To explain the principle of different techniques in biology like separation techniques, immunoassay, autoradiography and working of microscopy
		CO 5	To justify the selection of fixatives for histological procedures. To solve problems using basic statistical tools.

NAME OF THE PROGRAMME	BACHELOR OF SCIENCE (Biochemistry, Genetics, Microbiology)
PROGRAMME CODE	IABOS03

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To provide in-depth knowledge on core areas of biosciences in a wide-ranging context at affordable costs which involves the use of evolved and practicable skills for a lifelong learning.	PO1	After completion, students will be able to strongly articulate theoretical and practical concepts in the core areas of study.
PEO2	To make students competent in the field of biosciences and allied areas by providing them hands-on experience using multifarious tools and techniques.	PO2	Students develop the ability to solve, analyse and interpret data generated from laboratory work and research activities that help to develop critical understanding of the latest development in the core areas of biosciences.
PEO3	To inculcate, facilitate, motivate and promote knowledge to critically evaluate, and apply technical skills to validate and solve environmental, industrial and agricultural issues through core bio-scientific interventions.	PO3	Students are able to use skills required for the extraction, separation of DNA and synthesis of a variety of biomolecules utilized in clinical diagnosis, pharmaceutical, industrial, agricultural sector or in research laboratories.
PEO4	To develop graduates with a strong professional ethics and moral duties combined with enhanced vocabulary that will positively affect their profession, community, society, nation and international level to a large extent.	PO4	Students may able to apply knowledge and understandings of biological sciences and skills to new and unfamiliar contexts to identify, analyse problems, issues and seek solutions to real-life problems
PEO5	To equip students so as to take up a suitable career in industry or research or from a multidisciplinary environment from the imbibed communicative, linguistic, analytical and bioinstrumentation competencies.	PO5	Students are equipped to undertake hands-on laboratory work and activities that help to develop practical knowledge and skills that are required for pursuing a career in food and beverage industry, clinical diagnosis & research, clinical data management, drug design, vaccine development, pharmaceutical industry, teaching, research and environmental monitoring sectors.

SEMESTER – I			
Course Code	BIC 1.1 & 1.2	Course Title	FUNDAMENTALS OF CHEMISTRY -I
	Course Objectives		Course Outcomes (Cos)
1	Educate the students on basic definitions, formulas and units involved in biochemical calculations	CO1	To understand the basic concepts of measurements and atomic structure.
2	Educate students to learn and understand the structure of atoms, chemical bonding and nuclear chemistry.	CO2	To learn the detailed theory related to chemical bonding and to understand the concepts related to nuclear chemistry and radioactivity.
3	Enable the students to learn the concepts related to solutions, colligative properties, electrochemistry, acids, bases, buffers and properties of liquids.	CO3	To learn the principle, theory and terms related to solutions and understand the concepts of colligative properties.

		CO4	To learn the basic concepts of electrochemistry emphasizing on electrolytes, electrochemical cells and electrode potentials.
		CO5	To understand the concepts of acids, bases and buffers and also to learn the definition, formulas and experiments involved in studying the properties of liquids.
Course Code	**GEN 1.1 & 1.2**	**Course Title**	**FUNDAMENTALS OF CELL BIOLOGY**
	Course Objectives		**Course Outcomes (Cos)**
1	To enable students to comprehend the structures and functions of various cellular components, especially the membrane and organelles.	**CO1**	Apply a basic core of scientific knowledge to augment understanding of cell structure and function at the molecular level.
2	To enable students to understand the molecular regulation of cell cycle and programmed cell death.	**CO2**	Outline the processes that regulate the events of the cell cycle.
3	To enable students to evaluate and expand their comprehension of genetics by applying this knowledge in a variety of problem-solving situations	**CO3**	Compare and contrast the events of cell division and programmed cell death.
		CO4	Apply the general concepts of cell biology to relevant specific problems.
		CO5	Integrate the basic knowledge in cell biology with other related disciplines.
Course Code	**MIB 1.1 & 1.2**	**Course Title**	**BASIC MICROBIOLOGY**
	Course Objectives		**Course Outcomes (Cos)**
1	To provide a strong, fundamental foundation in microorganisms for advanced studies in biological sciences, particularly microbiology	**CO1**	Understand the discoveries and inventions in the field of microbiology
2	To learn about Instrumentation techniques used in Microbiology field	**CO2**	Apply the Instruments used in Microbiological Techniques
3	To discuss the importance of sterilization methods, staining methods and antibiotics	**CO3**	Evaluate the quality standard for sterilization methods used in microbiology
		CO4	Learn about staining methods
		CO5	Discuss the antibiotics and mode of actions
SEMESTER – II			
Course Code	**BIC 2.1 & 2.2**	**Course Title**	**FUNDAMENTALS OF CHEMISTRY – II**
	Course Objectives		**Course Outcomes (Cos)**
1	To learn about properties of solids, crystalline systems and their analysis, and properties of liquids and solutions	**CO1**	To understand properties of solids, their crystalline systems and methods of analysis, and properties of liquids in mixtures and solutions, their separation and applications

2	To describe features of chemical reactions, equilibrium and related laws, laws of chemical transformations and basics of catalysis	**CO2**	To discuss reversible and irreversible chemical reactions, systems at chemical equilibrium and related laws
3	To summarize organic compounds and their characteristics, structure, reactivity and mechanism	**CO3**	To comprehend the rate laws of chemical transformations, significance of determining rates of reactions as well as be able to understand different types of adsorption processes and basics of catalysis
		CO4	To describe organic compounds, their nomenclature and properties, structure, reactivity and mechanism of hydrocarbons
		CO5	To learn about properties of carbonyl compounds, alcohols, halides and organic metallics and their applications
Course Code	**GEN 2.1 & 2.2**	**Course Title**	**PRINCIPLES OF GENETICS**
	Course Objectives		**Course Outcomes (Cos)**
1	To obtain an in-depth knowledge of various patterns of inheritance and the experimental and practical basis of those concepts.	**CO1**	The students gain an in-depth knowledge of various patterns of inheritance and the experimental and practical basis of those concepts.
2	To Analyse various non-mendelian inheritance patterns.	**CO2**	The students develop an understanding of various mechanisms of sex determination.
3	To Comprehend the use of statistical and biometric methods of analysis like Chi square test, probability, measures of central tendency.	**CO3**	The students gain a thorough understanding of various non-mendelian inheritance patterns including maternal inheritance, maternal effects and imprinting
		CO4	The students are adept in the use of statistical and biometric methods of analysis like Chi square test, probability, measures of central tendency.
		CO5	Students study the direct applications of biometric methods in solving problems related to statistics in biology.

Course Code	**MIB 2.1 & 2.2**	**Course Title**	**MICROBIAL TAXONOMY & CULTURE TECHNIQUES**
	Course Objectives		**Course Outcomes (Cos)**
1	To understand the basic concepts of prokaryotes and their three domains classification of organisms	**CO1**	Understand the classification and cultivation and significance of viruses and atypical prokaryotes
2	To analyse the characteristics of cyanobacteria and fungi	**CO2**	Comparison of the three domains of organisms based on their characteristics
3	To apply the techniques to make use of cultivation of pure culture and to evaluate the biological techniques in microbial growth	**CO3**	Analyse the characteristics of cyanobacteria and fungi
		CO4	Apply the techniques to make use of cultivation of pure culture
		CO5	Evaluate the applications of biological techniques in microbial growth

SEMESTER – III			
Course Code	**BIC 3.1 & 3.2**	**Course Title**	**BIOORGANIC CHEMISTRY**
	Course Objectives		**Course Outcomes (Cos)**
1	To gain knowledge about bio-inorganic, environmental chemistry, and environmental toxicology,	**CO 1**	Understand the concept of metal ions in biological systems, biochemical toxicology, water pollution, pesticides hazards, bioremediation and phytoremediation.
2	In depth understanding on carboxylic acids, amines, alkaloids, terpenes, heterocyclic compounds, drugs, colloids, photochemistry and steriochemistry.	**CO 2**	Learn about the structure and properties of hydroxy acids, dicarboxyllic acids, keto acids. Classification, isomerism and biologically important amines, nicotine, atropine and LSD.
3	Comprehensive theoretical and foundational concept about biochemistry and separation techniques.	**CO 3**	Understand the properties, structure and biological roles of plant hormones and steriods. Structure, nomenclature, reaction of furan, pyrrole, imidazole. Classification of drugs, antibiotics and its action.
		CO 4	Learn about collidal system, emulsions, emulsifier, chemilumiscence, bioluminiscence, photocatalysis, sterioisomerism, mutarotation and chirality.
		CO 5	Understand about the biochemical composition of living organism, properties of water, spectroscopic methods, centrifugation, electrophoretic techniques, and chromatography.
Course Code	**GEN 3.1 & 3.2**	**Course Title**	**CYTOGENETICS**
	Course Objectives		**Course Outcomes (Cos)**
1	To Build a stable foundation of sound knowledge in the field of Cytogenetics	**CO 1**	Students gain a solid foundational knowledge of Cytogenetics
2	To Attain a sound knowledge of chromosome organization, linkage, sex linkage, crossing over and chromosomal abnormalities and its linked pathologies.	**CO 2**	Students demonstrate working knowledge in Cytogenetics, Karyotyping, Linkage maps and linkage analysis, tetrad analysis and chromosomal aberrations.
3	To identify the types of chromatin and the evolutionary significance of heterochromatin and the chromatin modification mechanisms in heterochromatin.	**CO 3**	The students Attain a sound knowledge of chromosome organization and structure, special types of chromosomes, linkage, sex linkage, extra-chromosomal inheritance, crossing over and its mechanism and numerical and structural chromosomal abnormalities and the description of the pathologies caused by them.
		CO 4	The students gain an in-depth knowledge of polytene chromosomes, lampbrush chromosomes and B chromosomes and understand their evolutionary significance and their role in development
		CO 5	Students are able to explain the features and evolutionary significance of heterochromatin and the chromatin

			modification mechanisms in heterochromatin.
Course Code	**MIB 3.1 & 3.2**	**Course Title**	**MICROBIAL PHYSIOLOGY AND MICROBIAL GENETICS**
	Course Objectives		**Course Outcomes (Cos)**
1	To give brief description on biomolecules	**CO 1**	Explain the structure, properties and classification, functions of biomolecules
2	To learn the enzyme kinetics, microbial metabolism and its energetics	**CO 2**	Apply the enzyme kinetics in chemical reaction
3	To evaluate the gene transfer, recombinations, mutations	**CO 3**	Evaluate the biosynthetic pathways
		CO 4	Understand the genomic organizations and nucleic acid replication
		CO 5	Analyze the gene transfer, recombinations, mutations
SEMESTER – IV			
Course Code	**BIC 4.1 & 4.2**	**Course Title**	**HUMAN PHYSIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	Gain knowledge about organisation of body tissues and body fluids.	**CO 1**	Understand a detailed concept about the tissues, bone remodelling, blood, body fluids, erythropoiesis, blood clotting mechanism.
2	In depth understanding on the physiological role of body organs such as lungs, stomach, kidney, heart, nerves and muscle.	**CO 2**	Learn about the mechanism of respiration, acid base regulation, digestion and absorption mechanisms, kidney structure, structure of nephron, formation, composition & concentration of urine.
3	Comprehensive theoretical and foundational concept about the significant role of nutrients required for normal wellbeing.	**CO 3**	Understand a detailed concept about local hormones, types, synthesis, storage, circulation, functions, mechanism, regulation and its disorders. Cardiac activity, its regulation, structure of vein, arteries and capillary. nerve signalling, membrane potential, neurotransmitters, its receptors and mechanism of action potential, structure of different types of muscle tissues, its energetics, mechanism of muscle contraction and its regulation.
		CO 4	Learn about Nutrition and Learn the concept about proximate analysis of food, BMR, RQ, SDA and RDA.
		CO 5	Understand about the importance of macronutrients & micronutrients with their sources, functions, deficiency disorders and the concept of malnutrition.
Course Code	**GEN 4.1 & 4.2**	**Course Title**	**MOLECULAR GENETICS**
	Course Objectives		**Course Outcomes (COs)**
1	To provide comprehensive understanding of salient features and structure of nucleic acids.	**CO 1**	Outline the structure and function of biomolecules in living organisms.

2	To impart elaborate understanding of the key events of prokaryotic and eukaryotic replication, transcription, translation and mechanism of gene regulation.	**CO 2**	Describe the synthesis of DNA, RNA and protein through specific mechanisms.
3	To develop adequate understanding of mutations and DNA repair mechanisms and their role in various genetic disorders.	**CO 3**	Expound the structural organization of genes and the control of gene expression.
		CO 4	Distinguish the types and mechanisms of mutations involving responses to environmental or physiological changes responsible for alterations of cell function due to mutations.
		CO 5	Apply the knowledge and link rapid advances in molecular biology to comprehend the mechanisms involved in various genetic diseases.
Course Code	**MIB 4.1 & 4.2**	**Course Title**	**MOLECULAR BIOLOGY AND RECOMBINANT DNA TECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To analyze the central dogma and gene expression	**CO 1**	Understand the central dogma
2	To discuss operon model and molecular techniques	**CO 2**	Analyze the regulation of gene expression
3	To evaluate the applications of recombinant DNA technology in various fields	**CO 3**	Discuss the operon model
		CO 4	Apply the recombinant DNA technology in the agricultural, medical and industrial and environmental field
		CO 5	Evaluate the molecular techniques with different samples
SEMESTER - V			
Course Code	**BIC 5.1 & 5.2**	**Course Title**	**BIOMOLECULES**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic structure of all biomolecules in the organization of life	**CO 1**	To determine the structures of carbohydrates that exist in the biological system like the blood group antigens and bacterial cell components
2	To analyse the significance of structures and characteristics of major biomolecules	**CO 2**	To classify and illustrate the basic structure of amino acid and different levels of the protein structure
3	To familiarize students with the classification, functions and applications of biomolecules	**CO 3**	To evaluate the importance of lipids as storage molecules and as structural component of biomembranes and summarize different types of lipids
		CO 4	To comprehend composition and structure of bio membranes and discuss the principle of saponification value and iodine value of fats
		CO 5	To assess the importance of high energy compounds, thermodynamic and electron

			transport chain components in ATP generation
Course Code	**BIC 6.1 & 6.2**	**Course Title**	**ENZYMOLOGY AND MOLECULAR BIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	Enable the students to learn the concepts of enzymes in detail and its importance in biochemical reactions.	**CO 1**	To learn the fundamental knowledge on enzymes and their importance in biological reactions.
2	To emphasize on the structure, isolation and characterization of nucleic acids with an overview of experimental proofs related to DNA as genetic material..	**CO 2**	To learn the structures of nucleic acids and to understand methodologies for isolation and characterization.
3	To illustrate the phenomenon of central dogma.	**CO 3**	To get exposed to key contributions of scientists and related experiments to prove DNA as the genetic material and also to learn the concept of replication process.
		CO 4	To understand various types of mutagens. Understand the different types of mutations and their effects in metabolism.
		CO 5	To learn the mechanisms of transcription and translation at molecular level in both eukaryotes and prokaryote.
Course Code	**GEN 5.1 & 5.2**	**Course Title**	**RECOMBINANT DNA TECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To provide adequate knowledge on salient features and applications of tools used in RDT.	**CO 1**	Elucidate the features of various tools used in genetic engineering.
2	To enable students to understand the methodology involved and the various techniques used in construction of recombinant DNA.	**CO 2**	Understand the steps involved in recombinant DNA technology.
3	To enable students to comprehend the various applications of RDT.	**CO 3**	Analyse and implement the PCR technique in molecular biology and recombinant DNA technology.
		CO 4	Understand the applications of recombinant DNA technology.
		CO 5	Execute laboratory experiments using the standard methods and techniques in molecular biology, with the appropriate analysis and interpretation of results obtained.
Course Code	**GEN 6.1 & 6.2**	**Course Title**	**BASIC HUMAN GENETICS**
	Course Objectives		**Course Outcomes (COs)**
1	To apply the knowledge of on the structure of chromosomes and karyotyping in the identification of the types and nature of chromosomal aberrations	**CO 1**	Integrate the basic knowledge of Human chromosome with Paris Nomenclature, Karyotyping, FACS.
2	Enable the students to understand genetic diseases and the development of effective treatment	**CO 2**	Expound understanding of the Genetic diseases and inheritance pattern.

3	Educate the students about inheritance of characteristics and genetic diseases by children from parents through pedigree analysis.	**CO 3**	Analyse and predetermine Genetic diseases with Pedigree studies and Genetic Counselling.
		CO 4	Acquire in-depth understanding of Cell of immune system and immune responses.
		CO 5	Identify and apply experimental procedure of MHC, Tissue transplantation, graft versus host disease, cornea grafting and inherited immunodeficiency diseases.
Course Code	**MIB 5.1 & 5.2**	**Course Title**	**AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To study the properties of soil, their microbial diversity and plant microbe interaction	**CO 1**	Understand the structure of soil profile and its microorganisms
2	To understand the involvement of various microbes in biogeochemical cycles and plant diseases	**CO 2**	Evaluate the plant microbe interaction
3	To evaluate the air and water quality using different methods of quality parameters	**CO 3**	Discuss the mechanisms of pathogenesis, symptoms and control measures of plant diseases
		CO 4	Applications of various techniques to understand the microbial diversity in the air
		CO 5	Evaluation of water quality using different methods of quality parameters
Course Code	**MIB 6.1 & 6.2**	**Course Title**	**FOOD AND DAIRY MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To describe the role of microorganisms in food spoilage and principles food preservation	**CO 1**	Food as a substrate and the role of microorganisms in causing food spoilage and food poisoning
2	To understand microbiology of fermented food commodities	**CO 2**	Analyse the character of microbes in food spoilage using various examination
3	To analyse the microbiological quality control, and quality schemes	**CO 3**	Apply the preservation techniques for food
		CO 4	Evaluate the microbiology of fermented milk products
		CO 5	Discuss the government regulatory practices and policies in food quality and safety
SEMESTER - VI			
Course Code	**BIC 7.1 & 7.2**	**Course Title**	**INTERMEDIATE METABOLISM**
	Course Objectives		**Course Outcomes (COs)**
1	To appreciate the integrated approach of interrelated pathways of catabolism and anabolism	**CO 1**	To demonstrate how energy is synthesized by glycolysis, TCA cycles and other related pathways

2	To emphasize on metabolic disorders at the molecular level	**CO 2**	To describe the oxidation of lipids to generate energy as well as lipid biosynthetic pathways
3	To interpret the regulatory aspects of metabolism for better understanding of physiology and therapy	**CO 3**	To determine anabolism and catabolism of amino acids, peptide biosynthesis and some related genetic disorders
		CO 4	To evaluate nucleic acid metabolic pathways and their relationships with certain disorders like gout
		CO 5	To appreciate the mechanisms of photosynthesis and nitrogen fixation
Course Code	**BIC 8.1 & 8.2**	**Course Title**	**MICROBIOLOGY, IMMUNOLOGY AND GENETIC ENGINEERING**
	Course Objectives		**Course Outcomes (COs)**
1	To understand and apply microbiological techniques in sterilization, preservation and fermentation for product development as well as analysis of biomolecules using molecular biology and immunological techniques	**CO 1**	To comprehend and appraise the basic microbiology techniques like sterilization, preservation and fermentation and the biological products obtained using fermentor equipment.
2	To apprise the students about components associated with immune system and molecular mechanism of their working leading to development of vaccines	**CO 2**	To summarize the concepts of PCR techniques, blotting techniques, and assess the principles and applications of immunological techniques of precipitation, agglutination, diffusion, immune-electrophoresis
3	To illustrate creative use of modern tools and techniques for manipulation and analysis of genomic sequences and to expose students to application of recombinant DNA technology in biotechnological research	**CO 3**	To analyse the significance of organs and cells in immune system, antibody structures, role of MHC, and the concepts behind vaccine production
		CO 4	To describe the tools used in recombinant technology like enzymes, plasmid vectors and cloning hosts in both prokaryotes and eukaryotes
		CO 5	To discuss gene cloning strategies, gene libraries and transformation
Course Code	**GEN 7.1 & 7.2**	**Course Title**	**DEVELOPMENTAL AND EVOLUTIONARY GENETICS**
	Course Objectives		**Course Outcomes (COs)**
1	To understand and appreciate significance of Nuclear transplantation in the development of Organisms	**CO 1**	Understand the significance of Nuclear transplantation in the development of Amphibians and Acetabularia.
2	To provide comprehensive understanding of Darwinism, Methods of formation of new species, isolating mechanisms.	**CO 2**	Apply and appropriate methods to find Gene pool, Gene frequency and the methods adopted to find their relationship in the inheritance of characters.
3	To be familiarized with quantitative and qualitative traits and their inheritance pattern and genetic significance. Also to understand the significance of polygenes.	**CO 3**	Describe Darwinism, Methods of formation of new species, isolating mechanisms.

		CO 4	Distinguish between Quantitative and Qualitative traits and apply the concepts in the better breed of plant and animal species.
		CO 5	Expound understanding of Quantitative inheritance and assumptions of polygenes.
Course Code	**GEN 8.1 & 8.2**	**Course Title**	
	Course Objectives		**Course Outcomes (COs)**
1	To provide a comprehensive understanding of applications of genetics in biomedical research and industry.	**CO 1**	Illustrate the production of recombinant proteins and their application in the medical field.
2	Identify appropriate biological databases for specific analyses and apply appropriate methods to determine sequence similarities.	**CO 2**	Identify appropriate biological databases for specific analyses and apply appropriate methods to determine sequence similarities.
3	To enable students to comprehend the methodology of maintaining genetic resources, plant tissue culture and their applications.	**CO 3**	Describe the utilization of cell cultures for *in vitro* studies and commercial applications.
		CO 4	Identify the problems associated with culturing and maintenance of various plant tissues or cell types.
		CO 5	Identify and apply experimental procedures in breeding strategies to solve biological problems.
Course Code	**MIB 7.1 & 7.2**	**Course Title**	**IMMUNOLOGY AND MEDICAL MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To demonstrate an understanding of key concepts in immunology and organization of the immune system	**CO 1**	Illustrate the cells, tissues, organs of immune system and types of immunity
2	To understand the salient features of antigen antibody reaction & its uses in diagnostics and various other studies	**CO 2**	Understand the properties, functions of Antigens, antibodies and complement system
3	To understand the role of pathogenic microorganisms in human disease with respect to infections of the respiratory tract, gastrointestinal tract, urinary tract, skin and soft tissue	**CO 3**	Apply the antigen and antibody reactions in the diagnosis of diseases
		CO 4	Remember the medically important bacteria, virus, fungi and protozoa
		CO 5	Analyse the symptoms, pathogenesis, laboratory diagnosis and control measures of bacterial, fungal, viral and protozoa
Course Code	**MIB 8.1 & 8.2**	**Course Title**	**INDUSTRIAL MICROBIOLOGY AND MICROBIAL TECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the principles of fermentation process associated with the production and recovery of different bio-products	**CO 1**	Analyse the steps involved in different types of fermentation process
2	To impart theoretical knowledge on design of fermenters and types of fermentors	**CO 2**	Understand the types, working mechanism and importance of various fermentors

3	To evaluate the significance of immobilization and role of microorganisms in the production of various industrial important products	**CO 3**	Construct the fermentable product recovery process and solid state fermentation
		CO 4	Evaluate the necessity of immobilization
		CO 5	Apply the microbial technology in the industrial products production

NAME OF THE PROGRAMME	**BACHELOR OF SCIENCE (Chemistry, Zoology, Biotechnology)**
PROGRAMME CODE	**IABOS04**

Programme Educational Objectives (PEOs)		**Programme Outcomes (POs)**	
PEO1	Facilitate value-based holistic and comprehensive learning by integrating traditional and innovative learning practices to match the highest quality standards and train students to be effective leaders in their chosen fields and career	**PO1**	Demonstrate comprehensive knowledge of the disciplines that form a part of a graduate programme. Execute strong theoretical and practical understanding generated from the specific graduate programme in the area of work.
PEO2	Provide a conducive environment to unleash their hidden talents, creative potential, nurture the spirit of critical thinking and encourage them towards higher education.	**PO2**	Exhibit the skills of analysis, inference, interpretation and problem-solving by observing the situation closely and design the solutions.
PEO3	Equip students with skills needed to adapt better to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.	**PO3**	Display the understanding, behavioural skills needed for successful social adaptation , work in groups, exhibit thoughts and ideas effectively in writing and orally.
PEO4	Develop a sense of social responsibility, ethics and equity to transform students into commitment-oriented professionals having a strong attitude towards sustainable development of the nation.	**PO4**	Develop the working knowledge and applications of instrumentation and laboratory techniques. Able to apply skills to design and conduct independent experiments, interpret, establish hypotheses and inquisitiveness towards research.
PEO5	Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.	**PO5**	Integrate different disciplines to uplift the domains of cognitive abilities and transcend beyond discipline-specific approaches to address a common problem.

SEMESTER - I			
Course Code	**CHE 1.1 & 1.2**	**Course Title**	**CHEMISTRY-I**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the periodic law and significance of atomic no and electronic configuration as the basic for periodic classification	**CO1**	Learn the basic mathematics concepts like logarithms, differentiation, and integration
2	To acquire the knowledge of terms, facts, concepts, processes techniques and principles of the subject.	**CO2**	Study the concepts of gases like Maxwell-Boltzmann's law, rms, average and most probable speeds and concepts of critical constant
3	To understand the concept of organic reactions mechanism.	**CO3**	Understand the importance laws of photochemistry, Quantum yield and its application
		CO4	Study about properties of liquids, CST, distillation, fractional distillation, distribution law.
		CO5	Learn about periodic table and properties
Course Code	**ZOO 1.1 & 1.2**	**Course Title**	**NON CHORDATA-I**
	Course Objectives		**Course Outcomes (COs)**
1	To have in depth knowledge about invertebrates of different phyla	**CO1**	To learn the diagnostic characteristics of different phyla and classify them
2	To understand the taxonomic position of Protozoa to Annelida	**CO2**	To comprehend the anatomical features of non-chordates through their type study
3	To understand the body organization and general characteristics of animals belonging to different phylums	**CO3**	To describe the systematic position, habit, habitat, morphology of different non chordates
		CO4	To identify a range of non-chordates and to gain conceptual knowledge of non-chordates
		CO5	To illustrate the life cycle of parasitic protozoans and transmission route of the diseases they cause
Course Code	**BIT1.1**	**Course Title**	**BIOTECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce classical genetics to comprehend various inheritance patterns.	**CO 1**	To familiarize with the structure and functions of different cell organelles of the cell.
2	The fundamentals of Cell Biology are highlighted to describe the origin and reproduction of cells.	**CO 2**	To develop an understanding of cell growth and reproduction.
3	To understand the various types of mutations and how it could be utilized in research.	**CO 3**	To explore the mechanism of aging and death in a cell.
		CO 4	To distinguish between mutation and evolution.

		CO 5	To critically analyse and interpret the cellular responses.
SEMESTER - II			
Course Code	**CHE 2.1 & 2.2**	**Course Title**	**CHEMISTRY-II**
	Course Objectives		**Course Outcomes (COs)**
1	The course aims to give the knowledge of principles of quantum mechanics so that the students will be able to apply quantum mechanical principles to solve simple systems.	**CO1**	Learn about Postulates of quantum mechanics. Significance of operators, Application of Schrodinger equation.
2	Explain the formation of bond in terms of potential energy diagram and octet rule	**CO2**	Study about Lattice energy, VSEPR theory, Polarization concept
3	To study the properties of aliphatic and aromatic hydrocarbons.	**CO3**	Classification of silicates based on the structure, applications of Noble gases, Transition elements and properties
		CO4	Lanthanides and Actinides, Ion exchange method for separation of Lanthanides.
		CO5	Learn about mechanism of nitration of benzene, Aromatic nucleophilic substitution reaction
Course Code	**ZOO 2.1 & 2.2**	**Course Title**	**NON CHORDATA -II**
	Course Objectives		**Course Outcomes (COs)**
1	To have in depth knowledge about invertebrates of different phyla.	**CO1**	To study animals of different phyla, their distribution
2	To understand the taxonomic position of Arthropoda to Echinodermata.	**CO2**	To describe the systematic position, habit, habitat, morphology and anatomical features of different non chordates
3	To understand the body organization and general characteristics of animals belonging to different phylums	**CO3**	To comprehend the anatomical features of non-chordates through their type study
		CO4	To obtain overview of economically important invertebrates
		CO5	To obtain overview of economically important invertebrates
Course Code	**BIT 2.1 BIOTECHNOLOGY II**	**Course Title**	**GENERAL BIOTECHNOLOGY AND BIOSTATISTICS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the fundamental techniques of Microbiology.	**CO 1**	To students will gain basic knowledge about the fundamental techniques of microbiology like microscopy and sterilization techniques
2	To educate the students about the diversity, salient features, and the importance of the various microorganisms.	**CO 2**	The student will obtain a basic understanding about the diversity of the microorganisms, their molecular structure and their fundamental biochemical processes.
3	The familiarize the students regarding the fundamental concepts of biostatistics	**CO 3**	The students will be familiar with the pathogenesis and treatment modalities of

			various microbial and viral diseases of human.
		CO 4	The students will be familiar with the various techniques of handling biological samples and generate data
		CO 5	The students will be able to apply statistical knowledge in data handling derive statistical significance of the data set obtained
SEMESTER - III			
Course Code	**CHE 3.1 & 3.2**	**Course Title**	**CHEMISTRY-III**
	Course Objectives		**Course Outcomes (COs)**
1	Analyse principles of kinetics and mechanisms of surface reactions.	**CO 1**	Learn about order , molecularity of a reaction, half-life period, Simple collisions theory
2	To apply the thermodynamic concepts like heat energy and entropy to the principles of extraction of metals to evaluate thermodynamic quantities such as Gibb's free energy, enthalpy, entropy, internal energy and work.	**CO 2**	Learn about law of Thermodynamics, Spontaneous and non-spontaneous processes, Carnot's cycle.
3	To state the units for the rate of chemical reactions and derive the rate equation for first and second order reactions.	**CO 3**	Study about Gibb's-Helmholtz equation, van't Hoff isotherm.
		CO 4	Theories of adsorption, Heterogeneous catalysis.
		CO 5	Preparation and applications of polymers
Course Code	**ZOO 3.1 & 3.2**	**Course Title**	**CHORDATA**
	Course Objectives		**Course Outcomes (COs)**
1	To obtain comprehensive knowledge on the taxonomy and characteristics of chordates	**CO 1**	To enumerate characters of protochordates, urochordates, and cephalochordates and classify chordates
2	To understand and identify morphological and anatomical structure for the major groups of vertebrates from an evolutionary point of view.	**CO 2**	To describe the morphology, habit and habitat, systematic position and various organ systems in *Scoliodon*
3	To study the general features, distribution and economic importance of chordates	**CO 3**	To distinguish unique characters of Pisces, amphibians, reptiles, aves and mammals.
		CO 4	To introduce the livestock industry and the various species of animal livestock.
		CO 5	To gain knowledge on economic zoology like poultry, dairy, the basic management practices, products and by-products.
Course Code	**BIT 3.1 Biotechnology III**	**Course Title**	**General Biochemistry and Biophysics**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the principal biomolecules.	**CO 1**	The students will gain a fundamental knowledge about the structure and chemistry of the principal biomolecules

			like carbohydrate, proteins and lipids as well as the importance of these biomolecules in living organisms.
2	To familiarize the students with the basic knowledge about the functioning of specialized molecules like enzymes and hormones.	**CO 2**	Students will develop an understanding regarding the diversity of the biomolecules, and their roles in organisms.
3	To provide the students with the basic concept of biophysics and familiarize them with methodologies employed to detect and quantitate different biomolecules	**CO 3**	The students will develop a basic understanding about the diversity, structure, and importance of specialized molecules like enzymes and hormones in living organisms.
		CO 4	The students will develop fundamental concepts like—pH and chemical bonding— that are crucial for the functioning of the biomolecules.
		CO 5	The students will become familiar with basic detection and separation techniques like spectroscopy, chromatography, centrifugation etc.
SEMESTER - IV			
Course Code	**CHE 4.1 & 4.2**	**Course Title**	**CHEMISTRY-IV**
	Course Objectives		**Course Outcomes (COs)**
1	To impart the students the knowledge on phase rule, its applications and alloys, their importance, composition and applications.	**CO 1**	Study the phase diagram and applications, X-ray diffraction, Liquid crystals.
2	Controlling steel chemistry and processing allows grades to be developed for specific applications	**CO 2**	Understand the treatment of water for domestic and Industrial purpose.
3	Study about the chemistry of Aromatic aldehyde, aromatic ketones and acids.	**CO 3**	Learn the natural and artificial radioactivity, nuclear reactor and breeder reactor.
		CO 4	Study the production of metal powders, applications of powder metallurgy.
		CO 5	Learn the production of ferroalloys, carbon steels.
Course Code	**ZOO 4.1 & 4.2**	**Course Title**	**COMPARATIVE ANATOMY, CELL BIOLOGY, IMMUNOLOGY & HISTOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To develop a proper understanding of evolution and structure of the vertebrates	**CO 1**	To compare and contrast the anatomical systems of different vertebrates
2	To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells and to identify the cellular and molecular basis of immune responsiveness	**CO 2**	To analyse and critically evaluate the structure and function of vertebrate systems and assess the functional significance of morphological adaptations

3	To provide knowledge of the microscopic structure and function of human tissues	**CO 3**	To impart knowledge on structure of cells and cell organelles, general properties of immune response mechanisms, structure& function of tissues
		CO 4	To impart knowledge on chromosomal aberrations, mechanism of mutations and understand the properties and treatment of cancer cells.
		CO 5	To categorize mammalian tissue types and functions of various organs.
Course Code	**BIT 4.1 Biotechnology IV**	**Course Title**	**Molecular Biology**
	Course Objectives		**Course Outcomes (COs)**
1	To have basic knowledge of transmission genetics, hereditary mechanism and mutations.	**CO 1**	To have a firm foundation in the fundamentals of Molecular Biology.
2	To know the complex organization of the genetic material of prokaryotes and eukaryotes and gene expression studies.	**CO 2**	To develop an understanding of the cells, Cell organelles and its various cellular mechanisms
3	To understand the significance of central dogma of Molecular Biology.	**CO 3**	To analyze the mechanisms associated with Gene Expression at the level of Transcription and Translation.
		CO 4	To explore the mechanisms associated with Regulation of Gene Expression in Prokaryotes and Eukaryotes.
		CO 5	To analyze the genotypic and phenotypic relationship of normal and mutant types.
SEMESTER - V			
Course Code	**CHE 5.1 & 5.2**	**Course Title**	**CHEMISTRY-V**
	Course Objectives		**Course Outcomes (COs)**
1	Depict various types of isomerism exhibited by organic compounds and their representation	**CO 1**	Learn the stereochemistry of the organic molecule
2	Provide both synthesis and applications of amines.	**CO 2**	Study the synthetic applications of amines
3	Understand the basic design and operating principles of some modern instruments used in chemical analysis(spectroscopy)	**CO 3**	Understand the importance of heterocyclic compounds
		CO 4	Understand the structure of natural products, mode of action and synthesis of drugs.
		CO 5	Study the applications of spectroscopy of organic molecules, Learn the synthetic dyes and drugs

Course Code	CHE 6.1 & 6.2	Course Title	CHEMISTRY-VI
	Course Objectives		**Course Outcomes (COs)**
1	The learners will be able to identify a redox reaction based on changes in oxidation and reduction.	**CO 1**	Study the electrolytes and conductance
2	To understand the preparations of buffers and its mechanism and its biological applications.	**CO 2**	Understand the electrodes and batteries
3	To demonstrate the application of spectroscopic and electrochemical methods in mechanistic studies	**CO 3**	Learn the common ion effect, buffers.
		CO 4	Study the polarization and dipole moment of a molecule.
		CO 5	Understand the physical spectroscopy of the molecule.
Course Code	**ZOO 5.1 & 5.2**	**Course Title**	**ENVIRONMENTAL BIOLOGY & ETHOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To instill the basic concepts of Environmental Sciences, toxicology, Ecosystems, Natural Resources and protection	**CO 1**	To understand various laws of ecology, types of ecosystem, population and community characteristics and dynamics, wild life conservation biology
2	To teach the basic concepts of toxicology, their impact on human health and remedial measures	**CO 2**	To learn in depth about wildlife, biodiversity and conservation biology
3	To impart basic knowledge on animal behavioural patterns and their role	**CO 3**	To understand various laws of ecology, types of ecosystem, population and community characteristics and dynamics
		CO 4	To comprehend the consequences of environmental pollutions due to toxic materials and their effects over ecosystem and learn about sustainable development
		CO 5	Able to differentiate the types of animal behaviour and achieve knowledge in sociobiology.
Course Code	**ZOO 6.1 & 6.2**	**Course Title**	**DEVELOPMENTAL BIOLOGY & ORGANIC EVOLUTION**
	Course Objectives		**Course Outcomes (COs)**
1	To provide a comprehensive understanding of the concepts of early animal development	**CO 1**	To understand how organisms maintain gametic population, fertilization process, cleavage and different patterns to form zygote, fundamental embryonic development.
2	To develop a critical appreciation of methodologies specifically used to study the process of embryonic development in animals	**CO 2**	To describe the stages and cellular mechanisms for blastulation, gastrulation, role or organizers, placentation and regeneration.
3	To recognize the pattern of biological evolution, to differentiate between evolutionary mechanisms (natural	**CO 3**	To impart knowledge on the complete process of formation of germ layers.

	selection, random genetic drift, mutation, and migration).		
		CO 4	To describe how the evolutionary forces leads to speciation
		CO 5	To discuss evidence regarding evolution of man.
Course Code	**BIT 5.1**	**Course Title**	**GENETIC ENGINEERING & ENVIRONMENTAL BT**
	Course Objectives		**Course Outcomes (COs)**
1	To demonstrate the innovative utilization of manipulating enzymes, various cloning and expression vectors and analysis of genomic sequences.	**CO 1**	The students will have knowledge of tools and strategies used in genetic engineering.
2	To interpret the applications of genetic engineering in biotechnological research.	**CO 2**	They will get acquainted with the applications of recombinant DNA technology and genetic engineering from both academic and industrial perspective.
3	To educate the students in strategizing research methodologies employing recombinant DNA techniques.	**CO 3**	They also can use and apply the knowledge of genetic engineering in problem solving and in practice.
		CO 4	Students will be able to explore the biological and technological principles which govern diagnosis and therapeutic applications
		CO 5	Students will be able to apply biotechnological principles and techniques in Environmental Bioremediation and conservation methods
Course Code	**BIT 6.1**	**Course Title**	**IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students with fundamental understanding of immunity, vaccines, animal cell culture,cells and orgas with immune response.	**CO 1**	To understand brief history of animal cell culture; cell culture media and reagents; culture of mammalian cells, tissues and organs; primary culture, secondary culture, continuous cell lines, suspension cultures; and application of animal cell culture .
2	To impart the basic knowledge of antigen, antibody, haptens, epitopes, production of antibodies, immunogenicity, antigenicity, serological tests in vitro to screen the samples.	**CO 2**	To make familiar with the topics on virus isolation and in vitro testing of drugs, testing of toxicity of environmental pollutants in cell culture, application of cell culture technology in production of human and animal viral vaccines and pharmaceutical proteins.

3	To prepare students with application and understanding of terminologies, different medium, animal cell culture methods, cell ines, screening methodologies with suitable applications in medical field.	**CO 3**	To learn about basic details on antigen, antibody, epitope, adjuvant, hapten, antibody production, blood grouping, and In vitro serological tests.
		CO 4	To impart the knowledge on history and scope, understanding of immunity types, cells and organs of immune response and their functions.
		CO 5	To have the basic understanding on vaccines, and immunization, types of vaccines, and their applications in medical science.
SEMESTER - VI			
Course Code	**CHE 7.1 & 7.2**	**Course Title**	**CHEMISTRY-VII**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the key features of coordination compounds	**CO 1**	Understand the concepts of Coordination compounds
2	To make the students mathematically strong for solving engineering and scientific problems.	**CO 2**	Study the application and importance of industrial materials
3	To describe some of the roles of trace elements in biological systems.	**CO 3**	Learn the importance of Essential and trace elements in biological systems
		CO 4	Study the Chemistry of Newer materials
		CO 5	Understand the Structure and Chemical reactions of C-60
Course Code	**CHE 8.1 & 8.2**	**Course Title**	**CHEMISTRY-VIII**
	Course Objectives		**Course Outcomes (COs)**
1	Demonstrate knowledge and understanding of the molecular machinery of living cells	**CO 1**	Learn the structures and biological applications of carbohydrates and lipids.
2	Understanding of the principles that govern the structures of macromolecules and their biological functions	**CO 2**	Understand the importance of proteins, nucleic acids and hormones in biological systems.
3	Understanding of the principles and basic mechanisms of metabolism in biological systems	**CO 3**	Understand the importance and concept of organic spectroscopy and their various applications.
		CO 4	Understand the concept and importance of bioenergetics and metabolism in biological systems.
		CO 5	Learn the principles and applications of biochemical techniques.

Course Code	ZOO 7.1 & 7.2	Course Title	GENETICS & BIOTECHNOLOGY
	Course Objectives		**Course Outcomes (COs)**
1	To understand the inheritance and expression of human genetics and understanding of the genetic terminology	**CO 1**	To infer the behaviour of chromosomes during meiosis to explain Mendel's law.
2	To solve transmission genetics problems, make accurate predictions about inheritance of genetic traits, and map the locations of genes	**CO 2**	To indicate the inheritance patterns are affected by position on chromosomes and gene interactions.
3	To describe what causes and consequences of DNA sequence changes and how cells prevent these changes, as well as make predictions about the causes and effects of changes in DNA	**CO 3**	To extend the deviations of Mendel's and gene frequency and mutation.
		CO 4	To become familiar with the tools and techniques of Genetics and Biotechnology
		CO 5	To sketch the applications of biotechnology in different fields.
Course Code	**ZOO 8.1 & 8.2**	**Course Title**	**ANIMAL PHYSIOLOGY & TECHNIQUES IN BIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To provide students with a basic understanding of the fundamental processes and mechanisms that serve and control the various functions of the body	**CO 1**	To understand the concepts of various physiology processes like digestion, circulation, respiration, excretion, muscle contraction, nerve conduction in animals
2	To develop understanding for the fundamental concepts of physiology of digestion	**CO 2**	To correlate the physiological and biochemical processes of animals
3	To acquire knowledge about the basic principles of microscopy, chromatography, centrifugation, electrophoresis, biostatistics	**CO 3**	To gain knowledge about hormones and endocrine mechanisms
		CO 4	To explain the principle of different techniques in biology like separation techniques, immunoassay, autoradiography and working of microscopy
		CO 5	To justify the selection of fixatives for histological procedures. To solve problems using basic statistical tools.
Course Code	**BIT 7.1**	**Course Title**	**PLANT BIOTECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To prepare students with basic principles, concepts, use, and application of the same in different plant tissue and organ culture techniques.	**CO 1**	Students will be able to understand the biotechnological principles and applications of plant tissue and organ culture, transgenic plants production, and IPR related titles.
2	To enable the students to learn and	**CO 2**	Students will be able to learn the basic

	understand the basic biotechnology techniques in production, isolation, screening, analysis, confirmation and forwarding the transgenic plants for different traits and need based target modifications.		biotechnological techniques to explore plant molecular biological processes of plants.
3	To impart the students with the basic working knowledge on Intellectual Property Rights, Patent laws, Plant breeders rights, pt genetic resources with different agreements across the timeline, biosafety ethics, rules and concerns regarding transgenic plants.	**CO 3**	The students will be imparted with the basic skills and working knowledge of various plant cell and organ culture techniques with pros and cons with related topics.
		CO 4	Vast knowledge on production of transgenic plants with different methods and application of transgenic plants in different problematic areas will be learnt by students.
		CO 5	Thorough learning on Intellectual Property Rights, Trade secrets, patent methodologies, safety rules, concerns, regulations at different hierarchy will be achieved.
Course Code	**BIT 8.1**	**Course Title**	**INDUSTRIAL BIOTECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To teach students about the ability to apply biotechnology in industrial processes	**CO 1**	Students will be able to develop key practical skills in fermenting biotechnology and better understand operations and commercial opportunities in fermentation-based biotechnology.
2	They will be able to propose about creating new and exciting products	**CO 2**	Students will be able to increase their understanding that 'industrial biotechnology' is based on using machines to control the growth of microorganisms
3	To teach students the basic principles of processing of bioproducts from biological resources in the areas of Industrial Biotechnology and to expose students to relevant and recent advances in industrial biotechnology.	**CO 3**	Students will be able to develop knowledge of a variety of fermentation strategies.
		CO 4	Students will be able to analyse potential business opportunities in fermentation-based biotechnology

		CO 5	Students will be able to explore the biological and technological principles which govern actual and potential biobusiness

NAME OF THE PROGRAMME	**BACHELOR OF SCIENCE (Genetics, Biochemistry, Biotechnology)**

PROGRAMME CODE	IABOS05

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To provide in-depth knowledge on core areas of biosciences in a wide-ranging context at affordable costs which involves the use of evolved and practicable skills for a lifelong learning.	**PO1**	After completion, students will able to strongly articulate theoretical and practical concepts in the core areas of study.
PEO2	To make students competent in the field of biosciences and allied areas by providing them hands-on experience using multifarious tools and techniques.	**PO2**	Students develop ability to solve, analyze and interpret data generated from laboratory work and research activities that help to develop critical understanding of the latest development in the core areas of biosciences.
PEO3	To inculcate, facilitate, motivate and promote knowledge to critically evaluate, and apply technical skills to validate and solve environmental, industrial and agricultural issues through core bio-scientific interventions.	**PO3**	Students are able to use skills required for the extraction, separation DNA and synthesis of a variety of biomolecules utilized in clinical diagnosis, pharmaceutical, industrial, agricultural sector or in research laboratories.
PEO4	To develop graduates with a strong professional ethics and moral duties combined with enhanced vocabulary that will positively affect their profession, community, society, nation and international level at large.	**PO4**	Students may able to apply knowledge and understandings of biological sciences and skills to new and unfamiliar contexts to identify, analyze problems, issues and seek solutions to real-life problems
PEO5	To equip students so as to take up a suitable career in industry or research or from a multidisciplinary environment from the imbibed communicative, linguistic, analytical and bioinstrumentation competencies.	**PO5**	Students are able to understand the role of biological technologies in industries related to biotechnology, Biochemistry, Genomics, pharmaceuticals, energy, and other fields.

SEMESTER - I

Course Code	GEN 1.1	Course Title	FUNDAMENTALS OF CELL BIOLOGY
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to comprehend the structures and functions of various cellular components, especially the membrane and organelles.	**CO 1**	Apply a basic core of scientific knowledge to augment understanding of cell structure and function at the molecular level.
2	To enable students to understand the molecular regulation of cell cycle and programmed cell death.	**CO 2**	Outline the processes that regulate the events of cell cycle.
3	To enable students to evaluate and expand their comprehension of genetics by applying this knowledge in a variety of problem-solving situations	**CO 3**	Compare and contrast the events of cell division and programmed cell death.
		CO 4	Apply the general concepts of cell biology to relevant specific problems.
		CO 5	Integrate the basic knowledge in cell biology with other related disciplines.
Course Code	**BIC 1.1**	**Course Title**	**FUNDAMENTALS OF CHEMISTRY -I**
	Course Objectives		**Course Outcomes (COs)**
1	Educate the students on basic definitions, formulas and units involved in biochemical calculations	CO 1	To understand the basic concepts of measurements and atomic structure.
2	Educate students to learn and understand the structure of atom, chemical bonding and nuclear chemistry.	CO 2	To learn the detailed theory related to chemical bonding and to understand the concepts related to nuclear chemistry and radioactivity.
3	Enable the students to learn the concepts related to solutions, colligative properties, electrochemistry, acids, bases, buffers and properties of liquids.	CO 3	To learn the principle, theory and terms related to solutions and understand the concepts of colligative properties.
		CO 4	To learn the basic concepts of electrochemistry emphasizing on electrolyes, electrochemical cells and electrode potentials.
		CO 5	To understand the concepts of acids, bases and buffers and also to learn the defination, formulas and experiments involved in studying the properties of liquids.
Course Code	**BIT 1.1**	**Course Title**	**BIOTECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce classical genetics to comprehend various inheritance patterns.	**CO 1**	To familiarize with the structure and functions of different cell organelles of the cell.

2	The fundamentals of Cell Biology are highlighted to describe the origin and reproduction of cells.	**CO 2**	To develop an understanding of cell growth and reproduction.
3	To understand the various types of mutations and how it could be utilized in research.	**CO 3**	To explore the mechanism of aging and death in a cell.
		CO 4	To distinguish between mutation and evolution.
		CO 5	To critically analyse and interpret the cellular responses.
SEMESTER - II			
Course Code	**GEN 2.1**	**Course Title**	**PRINCIPLES OF GENETICS**
	Course Objectives		**Course Outcomes (COs)**
1	To obtain an in-depth knowledge of various patterns of inheritance and the experimental and practical basis of those concepts.	**CO 1**	The students gain an in-depth knowledge of various patterns of inheritance and the experimental and practical basis of those concepts.
2	To Analyze various non-mendelian inheritance patterns.	**CO 2**	The students develop an understanding of various mechanisms of sex determination.
3	To Comprehend the use of statistical and biometric methods of analysis like Chi square test, probability, measures of central tendency.	**CO 3**	The students gain a thorough understanding of various non-mendelian inheritance patterns including maternal inheritance, maternal effects and imprinting
		CO 4	The students are adept in the use of statistical and biometric methods of analysis like Chi square test, probability, measures of central tendency.
		CO 5	Students study the direct applications of biometric methods in solving problems related to statistics in biology.
Course Code	**BIC 2.1**	**Course Title**	**FUNDAMENTALS OF CHEMISTRY - II**
	Course Objectives		**Course Outcomes (COs)**
1	To learn about properties of solids, crystalline systems and their analysis, and properties of liquids and solutions	**CO 1**	To understand properties of solids, their crystalline systems and methods of analysis, and properties of liquids in mixtures and solutions, their separation and applications
2	To describe features of chemical reactions, equilibrium and related laws, laws of chemical transformations and basics of catalysis	**CO 2**	To discuss reversible and irreversible chemical reactions, systems at chemical equilibrium and related laws

3	To summarize organic compounds and their characteristics, structure, reactivity and mechanism	**CO 3**	To comprehend the rate laws of chemical transformations, significance of determining rates of reactions as well as be able to understand different types of adsorption processes and basics of catalysis
		CO 4	To describe organic compounds, their nomenclature and properties, structure, reactivity and mechanism of hydrocarbons
		CO 5	To learn about properties of carbonyl compounds, alcohols, halides and organic metallics and their applications
Course Code	**BIT 2.1**	**Course Title**	**GENERAL BIOTECHNOLOGY AND BIOSTATISTICS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the fundamental techniques of Microbiology.	**CO 1**	To students will gain basic knowledge about the fundamental techniques of microbiology like microscopy ans sterilization techniques
2	To educate the students about the diversity, salient features, and the importance of the various microorganisms.	**CO 2**	The student will obtain a basic understanding about the diversity of the microorganisms, their molecular stucture and their fundamental biochemical processes.
3	The familiarize the students regarding the fundamental concepts of biostatistics	**CO 3**	The students will be familiar with the pathogenesis and treatment modalities of various microbial and viral diseases of human.
		CO 4	The students will be familier with the various techniques of handling biological samples and generate data
		CO 5	The students will be able to apply statistical knowledge in data handling derive statistical significane of the data set obtained
SEMESTER - III			
Course Code	**GEN 3.1**	**Course Title**	**CYTOGENETICS**
	Course Objectives		**Course Outcomes (COs)**
1	To Build a stable foundation of sound knowledge in the field of Cytogenetics	**CO 1**	Students gain a solid foundational knowledge of Cytogenetics
2	To Attain a sound knowledge of chromosome organization, linkage, sex linkage, crossing over and chromosomal abnormalities and its linked pathologies.	**CO 2**	Students demonstrate working knowledge in Cytogenetics, Karyotying, Linkage maps and linkage analysis, tetrad analysis and chromosomal aberrations.

3	To identify the types of chromatin and the evolutionary significance of heterochromatin and the chromatin modification mechanisms in heterochromatin.	**CO 3**	The students Attain a sound knowledge of chromosome organization and structure, special types of chromosomes, linkage, sex linkage, extra-chromosomal inheritance, crossing over and its mechanism and numerical and structural chromosomal abnormalities and the description of the pathologies caused by them.
		CO 4	The students gain an in-depth knowledge of polytene chromosomes, lampbrush chromosomes and B chromosomes and understand their evolutionary significance and their role in development
		CO 5	Students are able to explain the features and evolutionary significance ofheterochromatin and the chromatin modification mechanisms in heterochromatin.
Course Code	**BIC 3.1**	**Course Title**	**BIOORGANIC CHEMISTRY**
	Course Objectives		**Course Outcomes (COs)**
1	To gain knowledge about bio-inorganic, environmental chemistry, and environmental toxicology,	**CO 1**	Understand the concept of metal ions in biological systems, biochemical toxicology, water pollution, pesticides hazards, bioremediation and phytoremediation.
2	In depth understanding on carboxylic acids, amines, alkaloids, terpenes, heterocyclic compounds, drugs, colloids, photochemistry and steriochemistry.	**CO 2**	Learn about the structure and properties of hydroxy acids, dicarboxyllic acids, keto acids. classification, isomerism and biologically important amines, nicotine, atropine and LSD.
3	Comprehensive theoretical and foundational concept about biochemistry and separation techniques.	**CO 3**	Understand the properties, structure and biological roles of plant hormones and steriods. structure, nomenclature, reaction of furan, pyrrole, imidazole. classification of drugs, antibiotics and its action.
		CO 4	Learn about collidal system, emulsions, emulsifier, chemilumiscence, bioluminiscence, photocatalysis, sterioisomerism, mutarotation and chirality.
		CO 5	Understand about the biochemical composition of living organism, properties of water, spectroscopic methods, centrifugation, electrophoretic techniques, and chromatography.
Course Code	**BIT 3.1**	**Course Title**	**GENERAL BIOCHEMISTRY AND BIOPHYSICS**

	Course Objectives		Course Outcomes (COs)
1	To familiarize the students with the principal biomolecules.	**CO 1**	The students will gain a fundamental knowledge about the structure and chemistry of the principal biomolecules like carbohydrate, proteins and lipids as well as the importance of these biomolecules in living organisms.
2	To familiarize the students with the basic knowledge about the functioning of specialized molecules like enzymes and hormones.	**CO 2**	Students will develop an understanding regarding the diversity of the biomolecules, and their roles in organisms.
3	To provide the students with the basic concept of biophysics and familiarize them with methodologies employed to detect and quantitate different biomolecules	**CO 3**	The students will develop a basic understanding about the diversity, structure, and importance of specialized molecules like enzymes and hormones in living organisms.
		CO 4	The students will develop fundamental concepts like—pH and chemical bonding— that are crucial for the functioning of the biomolecules.
		CO 5	The students will become familiar with basic detection and separation techniques like spectroscopy, chromatography, centrifugation etc.
SEMESTER - IV			
Course Code	**Genetics 4.1**	**Course Title**	**Molecular Genetics**
	Course Objectives		**Course Outcomes (COs)**
1	To provide comprehensive understanding of salient features and structure of nucleic acids.	**CO 1**	Outline the structure and function of biomolecules in living organisms.
2	To impart elaborate understanding of the key events of prokaryotic and eukaryotic replication, transcription, translation and mechanism of gene regulation.	**CO 2**	Describe the synthesis of DNA, RNA and protein through specific mechanisms.
3	To develop adequate understanding of mutations and DNA repair mechanisms and their role in various genetic disorders.	**CO 3**	Expound the structural organization of genes and the control of gene expression.
		CO 4	Distinguish the types and mechanisms of mutations involving responses to environmental or physiological changes responsible for alterations of cell function due to mutations.

		CO 5	Apply the knowledge and link rapid advances in molecular biology to comprehend the mechanisms involved in various genetic diseases.
Course Code	**BIC 4.1**	**Course Title**	**HUMAN PHYSIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	Gain knowledge about organisation of body tissues and body fluids.	**CO 1**	Understand a detailed concept about the tissues, bone remodeling, blood, body fluids, erythropoiesis, blood clotting mechanism.
2	In depth understanding on the physiological role of body organs such as lungs, stomach, kidney, heart, nerves and muscle.	**CO 2**	Learn about the mechanism of respiration, acid base regulation, digestion and absorption mechanisms, kidney structure, and structure of nephron, formation, composition & concentration of urine.
3	Comprehensive theoretical and foundational concept about significant role of nutrients required for normal well being.	**CO 3**	Understand a detailed concept about local hormones, types, synthesis, storage, circulation, functions, mechanism, regulation and its disorders. Cardiac activity, its regulation, structure of vein, arteries and capillary. nerve signaling, membrane potential, neurotransmitters, its receptors and mechanism of action potential, structure of different types of muscle tissues, its energetics, mechanism of muscle contraction and its regulation.
		CO 4	Learn about Nutrion and Learn the concept about proximate analysis of food, BMR, RQ, SDA and RDA.
		CO 5	Understand about the importance of macronutrients & micronutrients with their sources, functions, deficiency disorders and the concept of malnutrition.
Course code	**Bit 4.1 biotechnology iv**	**Course title**	**Molecular biology**
	Course Objectives		**Course Outcomes (COs)**
1	To have basic knowledge of transmission genetics, hereditary mechanism and mutations.	**CO 1**	To have a firm foundation in the fundamentals of Molecular Biology.
2	To know the complex organization of the genetic material of prokaryotes and eukaryotes and gene expression studies.	**CO 2**	To develop an understanding of the cells, Cell organelles and its various cellular mechanisms

3	To understand the significance of central dogma of Molecular Biology.	**CO 3**	To analyze the mechanisms associated with Gene Expression at the level of Transcription and Translation.
		CO 4	To explore the mechanisms associated with Regulation of Gene Expression in Prokaryotes and Eukaryotes.
		CO 5	To analyze the genotypic and phenotypic relationship of normal and mutant types.
SEMESTER - V			
Course Code	**Genetics 5.1**	**Course Title**	**Recombinant DNA Technology**
	Course Objectives		**Course Outcomes (COs)**
1	To provide adequate knowledge on salient features and applications of tools used in RDT.	**CO 1**	Elucidate the features of various tools used in genetic engineering.
2	To enable students to understand the methodology involved and the various techniques used in construction of recombinant DNA.	**CO 2**	Understand the steps involved in recombinant DNA technology.
3	To enable students to comprehend the various applications of RDT.	**CO 3**	Analyze and implement the PCR technique in molecular biology and recombinant DNA technology.
		CO 4	Understand the applications of recombinant DNA technology.
		CO 5	Execute laboratory experiments using the standard methods and techniques in molecular biology, with the appropriate analysis and interpretation of results obtained.
Course Code	**Genetics 6.1**	**Course Title**	**Basic human genetics**
	Course Objectives		**Course Outcomes (COs)**
1	To apply the knowledge of on the structure of chromosomes and karyotyping in the identification of the types and nature of chromosomal aberrations	**CO 1**	Integrate the basic knowledge of Human chromosome with Paris Nomenclature, Karyotyping, FACS.
2	Enable the students to understand genetic diseases and the development of effective treatment	**CO 2**	Expound understanding of the Genetic diseases and inheritance pattern.
3	Educate the students about inheritance of characteristics and genetic diseases by children from parents through pedigree analysis.	**CO 3**	Analyze and predetermine Genetic diseases with Pedigree studies and Genetic Counselling.
		CO 4	Acquire in-depth understanding of Cell of immune system and immune responses.

		CO 5	Identify and apply experimental procedure of MHC, Tissue transplantation, graft versus host disease, cornea grafting and inherited immunodeficiency diseases.
Course Code	**BIC 5.1**	**Course Title**	**Biomolecules**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic structure of all biomolecules in the organization of life	**CO 1**	To determine the structures of carbohydrates that exist in the biological system like the blood group antigens and bacterial cell components
2	To analyse the significance of structures and characteristics of major biomolecules	**CO 2**	To classify and illustrate the basic structure of amino acid and different levels of the protein structure
3	To familiarize students with the classification, functions and applications of biomolecules	**CO 3**	To evaluate the importance of lipids as storage molecules and as structural component of biomembranes and summarize different types of lipids
		CO 4	To comprehend composition and structure of bio membranes and discuss the principle of saponification value and iodine value of fats
		CO 5	To assess the importance of high energy compounds, thermodynamic and electron transport chain components in ATP generation
Course Code	**BIC 6.1**	**Course Title**	**Enzymology and molecular biology**
	Course Objectives		**Course Outcomes (COs)**
1	Enable the students to learn the concepts of enzymes in detail and its importance in biochemical reactions.	**CO 1**	To learn the fundamental knowledge on enzymes and their importance in biological reactions.
2	To emphasize on the structure, isolation and characterization of nucleic acids with an overview of experimental proofs related to DNA as genetic material..	**CO 2**	To learn the structures of nucleic acids and to understand methodologies for isolation and characterization.
3	To illustrate the phenomenon of central dogma.	**CO 3**	To get exposed to key contributions of scientists and related experiments to prove DNA as the genetic material and also to learn the concept of replication process.
		CO 4	To understand various types of mutagens. Understand the different types of mutations and their effects in metabolism.
		CO 5	To learn the mechanisms of transcription and translation at molecular level in both eukaryotes and prokaryote.
Course Code	**BIT 5.1**	**Course Title**	**Genetic Engineering & Environmental BT**

	Course Objectives		Course Outcomes (COs)
1	To demonstrate the innovative utilization of manipulating enzymes, various cloning and expression vectors and analysis of genomic sequences.	**CO 1**	The students will have knowledge of tools and strategies used in genetic engineering.
2	To interpret the applications of genetic engineering in biotechnological research.	**CO 2**	They will get acquainted with the applications of recombinant DNA technology and genetic engineering from both academic and industrial perspective.
3	To educate the students in strategizing research methodologies employing recombinant DNA techniques.	**CO 3**	They also can use and apply the knowledge of genetic engineering in problem solving and in practice.
		CO 4	Students will be able to explore the biological and technological principles which govern diagnosis and therapeutic applications
		CO 5	Students will be able to apply biotechnological principles and techniques in Environmental Bioremediation and conservation methods
Course Code	**BIT 6.1**	**Course Title**	**Immunology and Animal Biotechnology**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students with fundamental understanding of immunity, vaccines, animal cell culture, cells and organs with immune response.	**CO 1**	To understand brief history of animal cell culture; cell culture media and reagents; culture of mammalian cells, tissues and organs; primary culture, secondary culture, continuous cell lines, suspension cultures; and application of animal cell culture .
2	To impart the basic knowledge of antigen, antibody, haptens, epitopes, production of antibodies, immunogenicity, antigenicity, serological tests in vitro to screen the samples.	**CO 2**	To make familiar with the topics on virus isolation and in vitro testing of drugs, testing of toxicity of environmental pollutants in cell culture, application of cell culture technology in production of human and animal viral vaccines and pharmaceutical proteins.
3	To prepare students with application and understanding of terminologies, different medium, animal cell culture methods, cell lines, screening methodologies with suitable applications in medical field.	**CO 3**	To learn about basic details on antigen, antibody, epitope, adjuvant, hapten, antibody production, blood grouping, and In vitro serological tests.

		CO 4	To impart the knowledge on history and scope, understanding of immunity types, cells and organs of immune response and their functions.
		CO 5	To have the basic understanding on vaccines, and immunization, types of vaccines, and their applications in medical science.
SEMESTER - VI			
Course Code	**Genetics 7.1**	**Course Title**	**Developmental and Evolutionary Genetics**
	Course Objectives		**Course Outcomes (COs)**
1	To understand and appreciate significance of Nuclear transplantation in the development of Organisms	**CO 1**	Understand the significance of Nuclear transplantation in the development of Amphibians and Acetabularia.
2	To provide comprehensive understanding of Darwinism, Methods of formation of new species, isolating mechanisms.	**CO 2**	Apply and appropriate methods to find Gene pool, Gene frequency and the methods adopted to find their relationship in the inheritance of characters.
3	To be familiarize with quantitative and qualitative triats and their inheritance pattern and genetic significance. Also to understand the significance of polygenes.	**CO 3**	Describe the Darwinism, Methods of formation of new species, isolating mechanisms.
		CO 4	Distinguish between Quantitative and Qualitative traits and apply the concepts in the better breed of plant and animal species.
		CO 5	Expound understanding of Quantitative inheritance and assumptions of polygenes.
Course Code	**Genetics 8.1**	**Course Title**	
	Course Objectives		**Course Outcomes (COs)**
1	To provide comprehensive understanding of applications of genetics in biomedical research and industry.	CO 1	Illustrate the production of recombinant proteins and their application in medical field.
2	Identify appropriate biological data bases for specific analyses and apply appropriate methods to determine sequence similarities.	CO 2	Identify appropriate biological data bases for specific analyses and apply appropriate methods to determine sequence similarities.
3	To enable students to comprehend the methodology of maintaining genetic resources, plant tissue culture and their applications.	CO 3	Describe the utilization of cell cultures for *in vitro* studies and commercial applications.
		CO 4	Identify the problems associated with culturing and maintenance of various plant tissues or cell types.

		CO 5	Identify and apply experimental procedures in breeding strategies to solve biological problems.
Course Code	**Biochemistry BIC 7.1**	**Course Title**	**Intermediate metabolism**
	Course Objectives		**Course Outcomes (COs)**
1	To appreciate the integrated approach of interrelated pathways of catabolism and anabolism	**CO 1**	To demonstrate how energy is synthesized by glycolysis, TCA cycles and other related pathways
2	To emphasize on metabolic disorders at the molecular level	**CO 2**	To describe the oxidation of lipids to generate energy as well as lipid biosynthetic pathways
3	To interpret the regulatory aspects of metabolism for better understanding of physiology and therapy	**CO 3**	To determine anabolism and catabolism of aminoacids, peptide biosynthesis and some related genetic disorders
		CO 4	To evaluate nucleic acid metabolic pathways and their relationships with certain disorders like gout
		CO 5	To appreciate the mechanisms of photosynthesis and nitrogen fixation
Course Code	**Biochemistry BIC 8.1**	**Course Title**	**Microbiology, immunology and genetic engineering**
	Course Objectives		**Course Outcomes (COs)**
1	To understand and apply microbiological techniques in sterilization, preservation and fermentation for product development as well as analysis of biomolecules using molecular biology and immunological techniques	**CO 1**	To comprehend and appraise the basic microbiology techniques like sterilization, preservation and fermentation and the biological products obtained using fermentor equipment
2	To apprise the students about components associated with immune system and molecular mechanism of their working leading to development of vaccines	**CO 2**	To summarize the concepts of PCR techniques, blotting techniques, and assess the principles and applications of immunological techniques of precipitation, agglutination, diffusion, immunoelectrophoresis
3	To illustrate creative use of modern tools and techniques for manipulation and analysis of genomic sequences and to expose students to application of recombinant DNA technology in biotechnological research	**CO 3**	To analyze the significance of organs and cells in immune system, antibody structures, role of MHC, and the concepts behind vaccine production
		CO 4	To describe the tools used in recombinant technology like enzymes, plasmid vectors and cloning hosts in both prokaryotes and eukaryotes
		CO 5	To discuss gene cloning strategies, gene libraries and transformation
Course Code	**BIT 7.1**	**Course Title**	**Plant Biotechnology**

	Course Objectives		Course Outcomes (COs)
1	To prepare students with basic principles, concepts, use, and application of the same in different plant tissue and organ culture techniques .	**CO 1**	Students will be able to understand the biotechnological principles and applications of plant tissue and organ culture, transgenic plants production, and IPR related titles.
2	To enable the students to learn and understand the basic biotechnology techniques in production, isolation, screening, analysis, confirmation and forwarding the transgenic plants for different traits and need based target modifications.	**CO 2**	Students will be able to learn the basic biotechnological techniques to explore plant molecular biological processes of plants.
3	To impart the students with the basic working knowledge on Intellectual Property Rights, Patent laws, Plant breeders rights, pt genetic resources with different agreements across the timeline, biosafety ethics, rules and concerns regarding transgenic plants.	**CO 3**	The students will be imparted with the basic skills and working knowledge of various plant cell and organ culture techniques with pros and cons with related topics.
		CO 4	Vast knowledge on production of transgenic plants with different methods and application of transgenic plants in different problematic areas will be learnt by students.
		CO 5	Thorough learning on Intellectual Property Rights, Trade secrets, patent methodologies, safety rules, concerns, regulations at different hierarchy will be achieved.
Course Code	**BIT 8.1**	**Course Title**	**Industrial Biotechnology**
	Course Objectives		**Course Outcomes (COs)**
1	To teach students about the ability to apply biotechnology in industrial processes	**CO 1**	Students will be able to develop key practical skills in fermenting biotechnology and better understand operations and commercial opportunities in fermentation-based biotechnology.
2	They will be able to propose about creating new and exciting products	**CO 2**	Students will be able to increase their understanding that 'industrial biotechnology' is based on using machines to control the growth of microorganisms

3	To teach students the basic principles of processing of bioproducts from biological resources in the areas of Industrial Biotechnology and to expose students to relevant and recent advances in industrial biotechnology.	**CO 3**	Students will be able to develop knowledge of a variety of fermentation strategies.
		CO 4	Students will be able to analyse potential business opportunities in fermentation-based biotechnology
		CO 5	Students will be able to explore the biological and technological principles which govern actual and potential biobusiness

NAME OF THE PROGRAMME	**BACHELOR OF SCIENCE (Electronics, Maths, Computer Science)**
PROGRAMME CODE	**IABOS06**

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To impart working knowledge of fundamental concepts in basic areas of electronics, mathematics and computer science	**PO1**	Apply the knowledge of electronics, mathematics and computer science to the solution of complex scientific problems
PEO2	To provide an understanding of mathematical skill for electronics and computer science.	**PO2**	Identify, formulate and analyse complex scientific problems reaching substantiated conclusions using first principles of mathematics, basic sciences and applied sciences
PEO3	A broad sense of social, ethical and professional responsibility with a capacity to demonstrate an understanding and appreciation of the human dimension of technology and its impact on mankind. An ability to work effectively as members of teams, composed of individuals from different disciplines.	**PO3**	Apply ethical principles and commit to professional ethics and responsibilities and norms of scientific practice. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
PEO4	To strong oral and written communication skills with a capacity to produce effective technical documents and to use current communication techniques and tools	**PO4**	Create motivated, enthusiastic, thinking and creative graduates to fill the roles as teachers, statisticians, professors, scientists, software professionals and administrators.
PEO5	A culture of life-long learning with a capacity to engage in continuous self-improvement, personal enrichment and professional development	**PO5**	Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

SEMESTER - I			
Course Code	**ELE 1.1 & 1.2**	**Course Title**	**BASIC ELECTRONICS**
	Course Objectives		**Course Outcomes (COs)**

1	To solve electrical networks using network theorem	**CO1**	Understand the basic circuits theorems
2	To understand function and process of semiconductors, PN junction diode, rectifiers and transistors	**CO2**	Able to learn the significance of rectifiers and voltage regulators
3	To know about the applications of special purpose devices	**CO3**	Differentiate variable and fixed rectifiers of different voltage
		CO4	On learning this unit, students will be able to understand the transistors and its mode of operation
		CO5	Able to learn the different special purpose semiconductor devices like JFET, MOSFET, UJT, TRIAC, SCR, and DIAC.
Course Code	**MAT 1.1 & 1.2**	**Course Title**	**MATHEMATICS-I**
	Course Objectives		**Course Outcomes (COs)**
1	To equip students with knowledge and insight in matrices, nth derivatives and reduction formulae of standard functions.	**CO1**	Students will be able to solve problems related to row reduced echelon form, normal form, rank of the matrix, eigen values and eigen vectors of the matrix in Algebra.
2	To provide basic subject knowledge of Mathematical applications in three dimensional analytical geometry.	**CO2**	Students will be able to prove theorems and solve problems related to nth derivatives of some standard functions, Jacobian, Euler's formulae in differential Calculus.
3	To develop the ability to use computer software as an aid and as a tool to study and solve problems in Mathematics.	**CO3**	Students would have understood theorems and solve problems related to reduction formulae of standard functions and congruence.
		CO4	Students will be able to derive the derivations and solve problems related to sphere, cylinder and cone in three dimensional analytical geometry.
		CO5	Students will be familiar of FOSS tools such as Scilab and Maxima to solve the problems related to the topics in Mathematics-I.
Course Code	**CSC 1.1 & 1.2**	**Course Title**	
	Course Objectives		**Course Outcomes (COs)**
1	Acquire necessary skills to design algorithms and flowcharts for developing applications in order to solve real world problems	**CO1**	Gain ability to devise algorithms and draw flow charts in order to design solutions to problems
2	Acquire good knowledge of structured programming concepts using C apply the concepts wisely	**CO2**	Capability to wisely use the program constructs and develop efficient C programs
3	Ability to develop modular programs in C and subsequently develop small projects in C language	**CO3**	Acquire knowledge of efficiently storing data in memory and retrieving using proper data structure

		CO4	Gain ability to develop modular programs to solve real world problems
		CO5	Capability to develop C programs for real world applications by applying suitable constructs and modularity
SEMESTER - II			
Course Code	**ELE 2.1 & 2.2**	**Course Title**	**BASIC ELECTRONICS-II**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the working of small signal and power amplifiers	**CO1**	On learning this unit, students will be able to understand the small signal and multistage amplifiers
2	To know about different types of oscillators and differential amplifier	**CO2**	On learning this unit, students will be able to classify the power and tuned amplifiers
3	To learn the different number systems and their interconversions	**CO3**	Enables the students to differentiate different oscillators and their constructions.
		CO4	Enables the students to learn differential amplifiers and its parameters.
		CO5	Enables the students to learn different number systems and their interconversions using in digital system.
Course Code	**MAT 2.1 & 2.2**	**Course Title**	**MATHEMATICS-II**
	Course Objectives		**Course Outcomes (COs)**
1	To equip students with knowledge and insight in group theory, Differential calculus and Integral Calculus.	**CO1**	Students will be able to prove theorems and solve problems related to the concepts of groups and subgroups.
2	To provide basic subject knowledge of Mathematical applications in Geometry and Differential equations.	**CO2**	Students will be able to derive standard derivations and solve problems related to tangent, normal, sub tangent, subnormal to the curve, pedal equations, envelopes, evolutes, asymptotes and tracing of curves in differential calculus.
3	To develop the ability to use computer software as an aid and as a tool to study and solve problems in Mathematics.	**CO3**	Students will be able to derive standard derivations and solve problems related to arc length, surface area and volume in integral calculus.
		CO4	Students will be able to derive standard derivations and solve problems related to linear differential equations and non-linear first order with higher degree in differential equations.
		CO5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 2.1 & 2.2**	**Course Title**	
	Course Objectives		**Course Outcomes (COs)**
1	Acquire practical knowledge of structured programming concepts using C	**CO1**	Ability to design C programs to solve problems

2	Acquire the ability to implement the derived data types using C language	**CO2**	Capability to develop efficient C programs.
3	Gain ability to develop modular programs in C	**CO3**	Acquire practical knowledge on using proper data structure
		CO4	Capability to design modular programs to solve real world problems
		CO5	Capability to develop C programs for certain applications.
SEMESTER - III			
Course Code	**ELE 3.1 & 3.2**	**Course Title**	**LINEAR INTEGRATED CIRCUITS & INSTRUMENTATION**
	Course Objectives		**Course Outcomes (COs)**
1	Ability to know different parameters of differential amplifiers and the applications of differential amplifiers	**CO 1**	Able to explain the block diagram and equivalent circuit of differential amplifiers.
2	Develop the concepts of oscillators and timers among students.	**CO 2**	Able to discuss the applications of operational amplifiers.
3	Students acquire the knowledge about different transducers, electronics and medical instruments.	**CO 3**	Recall the working of oscillator and construct phase shift oscillator and wein bridge oscillator
		CO 4	Develop the concept of measurement systems and their characteristics.
		CO 5	Understand the concept of bio-electrical signals like ECG, EEG, EMG and their origin.
Course Code	**MAT 3.1 & 3.2**	**Course Title**	**MATHEMATICS-III**
	Course Objectives		**Course Outcomes (COs)**
1	To understand concepts of cosets, cyclic group, sequence and series.	**CO 1**	Students will be able to prove theorems and solve problems related to order of an element, cosets, cyclic groups, Lagrange's theorem in Algebra.
2	To provide basic knowledge of limits, continuity, differentiability, mean value theorems and to evaluate limits using L'Hospital's rule.	**CO 2**	Students will be able to prove theorems and analyze the given sequence and series for convergence, divergence and oscillatory. Also they can find the summation of infinite series of different types.
3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues	**CO 3**	Students will be able to prove theorems and solve problems related to continuity, differentiability, evaluate limits involving various indeterminate forms using L'Hospital rule.
		CO 4	Students will be able to verify Rolle's, Lagrange's and Cauchy's mean value theorems, to express the given function as an infinite series by using Taylor's and Maclauin's theorems.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 3.1 & 3.2**	**Course Title**	**DATABASE MANAGEMENT SYSTEM AND SOFTWARE ENGINEERING**

	Course Objectives		Course Outcomes (COs)
1	Emphasize on how to organize and maintain data in a database and understand the underlying mathematical principles and concepts implemented in DBMS	**CO 1**	Gain good knowledge of the fundamental elements of relational database management systems
2	Gain knowledge to store , manipulate and retrieve efficiently and effectively the data using DBMS	**CO 2**	Acquire knowledge of the concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL
3	To provide the idea of decomposing the given problem into Analysis, Design, Implementation, Testing and Maintenance phases also provide an idea of using various process models in the software industry.	**CO 3**	Capability to design ER-models to represent simple database application scenarios
		CO 4	Describe the SDLC process models, Requirement Engineering process, Requirement elicitation and analysis, Requirement specification and system models.
		CO 5	Describes the concept of software verification, testing process, testing strategies, types of testing, levels of testing. Mathematical based verification and cleanroom software development.

SEMESTER - IV			
Course Code	**ELE 4.1 & 4.2**	**Course Title**	**DIGITAL ELECTRONICS AND VERILOG**
	Course Objectives		**Course Outcomes (COs)**
1		**CO 1**	Understand the digital logical gates and their functions.
2	Provide the learning platform to know about various combinational and sequential circuits	**CO 2**	Able to analyze the combinational logic circuits
3	Students are capable of writing and simulating various digital circuits by using verilog programming.	**CO 3**	Able to understand the working of a sequential logic circuit.
		CO 4	Learn the basic elements of basic verilog program
		CO 5	Able to write the verilog program

Course Code	**MAT 4.1 & 4.2**	**Course Title**	**MATHEMATICS-IV**
	Course Objectives		**Course Outcomes (COs)**
1	To master the ideas and techniques in groups and Fourier series.	**CO 1**	Students will be able to prove theorems and solve problems on Normal subgroups, Quotient groups, homomorphism, isomorphism and related concepts of group theory in Algebra.
2	To learn and work with Taylor's series, maximum, minimum values of functions of two variables, Laplace transforms and its applications to differential equations	**CO 2**	Students will be able to prove theorems and solve problems related to Fourier series and half range Fourier series.

3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues.	**CO 3**	Students will be able to prove theorems and solve problems related to Taylor's series, maximum, minimum values of functions of two variables, Laplace transforms and its applications to differential equations.
		CO 4	Students will be able to prove theorems and solve problems related to various types of ordinary differential equations.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 4.1 & 4.2**	**Course Title**	**OPERATING SYSTEM AND UNIX**
	Course Objectives		**Course Outcomes (COs)**
1	To make aware of basic concepts and functions of operating systems.	**CO 1**	Analyse the structure of OS and basic architectural components involved in OS design
2	To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.	**CO 2**	Analyse the various device and resource management techniques for time sharing and distributed systems.
3	Understand Process concepts in Unix Operating System.and unix utilities and commands	**CO 3**	Understand the Mutual exclusion, Deadlock detection and agreement protocols of Distributed operating system
		CO 4	Acquired Concepts of UNIX Operating System, its kernel and different subsystems of kernel, types of shells, scripting in it and programming, also working with filters: grep, sed and awk
		CO 5	Understand Process Control subsystem, its state diagram, types of scheduling and memory management policies, Programming with standard I/O
SEMESTER - V			
Course Code	**ELE 5.1 & 5.2**	**Course Title**	**COMMUNICATION-I**
	Course Objectives		**Course Outcomes (COs)**
1	Students are capable of understanding the working of analog communication systems and its sub units.	**CO 1**	Understand the concept of transmission lines.
2	Able to understand the working of modulators, demodulators and antennas	**CO 2**	Analysis the different analog modulation technique
3	Provide the concept of optical communication systems and their applications compared to traditional methods.	**CO 3**	Understanding the function of radio receiver
		CO 4	Able to know the significance of antennas in communication system
		CO 5	Understand the fiber optical communication
Course Code	**ELE 6.1 & 6.2**	**Course Title**	**MICROCONTROLLERS**

	Course Objectives		Course Outcomes (COs)
1	Students are able to understand the structure of microcontroller along with their functions	**CO 1**	Understand the architecture of 8051 microcontroller
2	Develop idea to program in both assembly and C program to interface 8051 microcontroller among students.	**CO 2**	Learn the instruction set of 8051 microcontroller
3	Differentiate the features of 8051 microcontroller and PIC microcontroller	**CO 3**	Understand the function of timers and counters in 8051 microcontroller
		CO 4	Capable to interface any device with 8051 microcontroller
		CO 5	Gain the knowledge of PIC microcontroller series
Course Code	**MAT 5.1 & 5.2**	**COURSE TITLE**	**MATHEMATICS-V**
	Course Objectives		**Course Outcomes (COs)**
1	To acquire knowledge about rings, types, integral domains and fields and to develop the mathematical skills of the students in the areas of numerical methods in finite differences, interpolation and numerical integration.	**CO 1**	Students would have understood the concepts, types and theorems of Rings, integral domain and fields.
2	To motivate students to gain knowledge about gradient, curl, laplacian, directional derivatives and orthogonal curvilinear coordinates.	**CO 2**	Students would have understood Scalar field, Directional derivatives, Angle between surfaces, vector field, divergence and curl, Laplacian, Harmonic functions and related problems.
3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues.	**CO 3**	Students will be familiar with Fundamental vectors or base vectors, spherical, cylindrical and orthogonal curvilinear coordinate system.
		CO 4	Students will be able to apply various interpolation methods, finite difference concepts and numerical integration whenever routine methods are not applicable.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**MAT 6.1 & 6.2**	**Course Title**	**MATHEMATICS-VI**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concept of calculus of variations, geodesics, Brachistochrone problem, isoperimetric problems and problems on line and multiple integrals.	**CO 1**	Students will be able to obtain the derivations and solve problems on calculus of variation such as geodesics, Brachistochrone problem and isoperimetric problems.
2	To learn and understand integral theorems such as Green's theorem, Stokes' theorem and Gauss divergence theorem and to solve problems related	**CO 2**	Students will be able to solve problems on line and multiple integrals

3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues.	**CO 3**	Students will be able to solve application problems online and multiple integrals.
		CO 4	Students will be able to obtain the derivations and solve problems related to the three integral theorems: Green's, Gauss divergence and Stokes' theorems.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 5.1 & 5.2**	**Course Title**	**OBJECT ORIENTED PROGRAMMING USING JAVA**
	Course Objectives		**Course Outcomes (COs)**
1	Analyze the concepts of Inheritance, Exception and Packages in java	**CO 1**	Understand fundamentals of Java programming
2	Study how to handle events and multi-threaded programming in java.	**CO 2**	Gain good knowledge of object oriented concepts
3	Learn how GUI can be designed and developed in Java using Applets	**CO 3**	Ability to write programs which implement the features of Java
		CO 4	To design and implement both console based and GUI based Java applications
		CO 5	Ability to develop graphics applications and animations in Java
Course Code	**CSC 6.1 & 6.2**	**Course Title**	**DOT NET FRAMEWORK AND C#.NET**
	Course Objectives		**Course Outcomes (COs)**
1	To Understand the concept of enterprise computing systems	**CO 1**	Knowledge about enterprise business view.
2	To gain knowledge of object-oriented paradigm in the C # programming language,	**CO 2**	Ability develop software applications in C # and SQL server
3	Ability to understand .NET framework tools	**CO 3**	Design real time applications using the controls of .Net frameworks.
		CO 4	Able to retrieve and update the information in RDBMS using windows application using .Net
		CO 5	Ability to understand and design real time database applications.
SEMESTER - VI			
Course Code	**ELE 7.1 & 7.2**	**Course Title**	**COMMUNICATION - II**
	Course Objectives		**Course Outcomes (COs)**
1	Students know about different digital modulation techniques	**CO 1**	Understand the different modulation techniques
2	Able to understand the working and construction of different microwave devices	**CO 2**	Analysis the function of different micro wave devices
3	Students learn about digital communication system which is using in satellite, RADAR and cellular communication system.	**CO 3**	Understand the process of satellite communication

		CO 4	Cable to understand the function of radar system
		CO 5	Understand the cellular communication system
Course Code	**ELE 8.1 & 8.2**	**Course Title**	**AVR MICROCONTROLLER**
	Course Objectives		**Course Outcomes (COs)**
1	Understand the architecture of AVR microcontroller	**CO 1**	Able to explain the ATmega32 8 bit microcontroller.
2	Learn the instruction set of AVR microcontrollers.	**CO 2**	Learn the instruction set of AVR 8 bit microcontrollers.
3	Develop ability to interface AVR microcontrollers using C programming.	**CO 3**	Cable to write the I/O port program for AVR microcontroller
		CO 4	Cable to write the timer and interrupt program for AVR microcontroller
		CO 5	Learn the process of the interfacing devices with AVR microcontrollers.
Course Code	**MAT 7.1 & 7.2**	**Course Title**	**MATHEMATICS-VII**
	Course Objectives		**Course Outcomes (COs)**
1	To acquire the knowledge about basics of Linear Algebra such as Vector space, subspaces, basis, dimension and to verify Rank-Nullity theorem.	**CO 1**	Students will be able to prove the theorems and solve problems related to Basics of Linear Algebra such as Vector space, subspaces, basis, dimension and to verify Rank-Nullity theorem.
2	To develop the mathematical skills of the students in the field of partial differential equations and number theory.	**CO 2**	Students will be able to prove theorems and solve problems related to various types of partial differential equations.
3	To develop the ability to utilize the Mathematical problem solving methods Through FOSS tools in addressing practical issues.	**CO 3**	Students will be able to prove theorems and solve problems related to applications of partial differential equations to the real world.
		CO 4	Students will be able to prove theorems and solve problems related to basic number theory.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**MAT 8.1 & 8.2**	**Course Title**	**MATHEMATICS-VIII**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the fundamental ideas of function of complex variables and developing a clear understanding of the fundamental concepts of complex analysis such as analytic functions, complex integrals and bilinear transformation.	**CO 1**	Students will be able to understand the basic concept of complex analysis such as analytic functions, harmonic functions and the role of Cauchy-Riemann equations.
2	To develop the mathematical skills of the students in the field of numerical methods such as solving algebraic, transcendental equations, simultaneous equations and ordinary differential equations numerically.	**CO 2**	Students will be able to understand the basic concept of bi-linear transformation, basics of complex integration, Cauchy's theorem, Cauchy's integral formula and their consequences.

3	To develop the ability to utilize the Mathematical problem solving methods through FOSS tools in addressing practical issues.	**CO 3**	Students will be able to know the methods of solving the system of linear equations numerically.
		CO 4	Students will be able to know the methods of solving the system of ordinary differential equations numerically.
		CO 5	Students will be able to use FOSS tools such as Scilab and Maxima to solve the problems related to the above topics.
Course Code	**CSC 7.1 & 7.2**	**Course Title**	**WEB PROGRAMMING**
	Course Objectives		**Course Outcomes (COs)**
1	Explain how the client-server model of Internet programming works.	**CO 1**	Explain the internet and related concepts that are vital in understanding web development, HTML program structure and few formatting tags.
2	Design and develop interactive, client-side, executable web applications.	**CO 2**	Demonstrate the important HTML tags: forms and frames, for designing static pages and separate design from content using Cascading Style sheet.
3	To learn to write, test, and debug web pages using HTML and JavaScript & CSS	**CO 3**	Understand the basic concepts of JavaScript including structure, arrays, functions. Constructors and error handling.
		CO 4	Demonstrate DOM, various events & event handling and DOM tree traversal & modifications.
		CO 5	Create dynamic documents with JavaScript and demonstrate basic usage of XML.
Course Code	**CSC 8.1**	**Course Title**	**COMPUTER NETWORKS**
	Course Objectives		**Course Outcomes (COs)**
1	Build an understanding of the fundamental concepts of computer networking and transmission media.	**CO 1**	Understand the fundamental concepts of networking, transmission media and multiplexing techniques.
2	To understand the basic concepts of data communication, layered model, protocols and interworking between computer networks and switching components in telecommunication systems	**CO 2**	Understand the error detection, correction methods and concept of network topology.
3	Know about routing mechanisms and different routing protocols of LAN and WAN technologies.	**CO 3**	Understand digital technologies, LAN,WAN, TCP/IP model.
		CO 4	Understand internetworking principles Internet protocols and IP addressing.
		CO 5	Understand routing principles and algorithms. Concepts of transmission of packets in TCP and UDP.

Course Code	CSC 8.2	Course Title	PROJECT LAB
	Course Objectives		**Course Outcomes (COs)**
1	To understand and select the task based on their core skills.	**CO 1**	Perform Requirements Analysis and the need to develop the application
2	To get the knowledge about analytical skill for solving the selected task	**CO 2**	Design the application using design tools and techniques
3	To get confidence for implementing the task and solving the real time problems	**CO 3**	Develop code using latest and apt programming language
		CO 4	Perform validation and testing
		CO 5	Gain confidence to develop projects

PROGRAMME NAME	**B.A. (Journalism, Optional English, Psychology)**
PROGRAM CODE	**IABOA01**

PEOs	Programme Educational Objectives (PEOs):		Programme Outcomes(POs)
PEO1	To impart comprehensive knowledge on the theoretical and practical components in the field of Journalism, Literature and Psychology	**PO1**	To help the students with the needs of career building in the various fields of multimedia.
PEO2	To Prepare students with the knowledge and skills for a career in Journalism	**PO2**	To enrich and promote high academic standards, by creating an optimal and enriching learning environment in understanding of myriad perspectives and scopes of human behaviour.
PEO3	Enable to navigate through the developments of literary histories and literary critical concepts and theories for a better appreciation of Literatures.	**PO3**	Acquiring the requisite knowledge in organizational behaviour which is required to solve real –world problems that have an impact on everyday life.
PEO4	To impart knowledge on the mysteries of human behaviour and gain insights based on language and create awareness about social causes and issues	**PO4**	To instill critical thinking skills in a variety of genres-as a process of intellectual inquiry and creative expression.
PEO5	To Prepare students for multiple careers fields and help them to flourish intellectually	**PO5**	Students will become effective thinkers and communicators who are well-equipped for a variety of careers in the challenging and competitive society.

SEMESTER - I			
Course Code	**JRN 1.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the process of Communication	**CO1**	The students should be able to know different communication theories

2	To teach the models of Communication which is very fundamental	**CO2**	To familiarize the students with different facets of mass communication including its characteristics
3	To educate about the role of role of mass media in society for development	**CO3**	To recognize the changes in the practice of media in recent times
		CO4	The Paper provides historical contribution of theoreticians of mass communication through their models
		CO5	Enlighten the students with theories of mass communication which provide strong foundation for its study
Course Code	**OPE 1.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	Create written texts in a variety of literary genres that demonstrate an ability to apply aesthetic values of theoretical perspectives	**CO1**	literary work where they learn convention skills of academic writing
2	Understanding the key aspects of the subject, develop independent and creativity thinking and enhance communicative skills	**CO2**	instills a critical perspective with which students approach the disciplines
3	Cognitive strategy of learning, thinking, organize and behave which motors the contrast between piece of art to frame sense of identity for effective communication	**CO3**	they get through exposure with periods and trends of language
		CO4	resources will incorporate the effective and ethical learning in frame of works
		CO5	develop students character and emotional maturity
Course Code	**PSY 1.1**	**Course Title**	**PSYCHOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To develop a knowledge base of human behaviour across the broad areas of psychology	**CO1**	Broader understanding of myriad perspectives and scopes of human behaviour
2	To ingrain the concept of learning ,remembering ,behaving and to assess the cognitive abilities and motives	**CO2**	Evaluate and interpret the higher mental processes along with the uses of intelligence tests and theories
3	Demonstrate the effect of extraneous variables in determining learning and remembering	**CO3**	Clear outlook on learning theories and a better insight on how people absorb and retain new information
		CO4	Interpret how memories are formed and stored and identifying memory enhancing strategies
		CO5	Develop knowledge on the underlying aspects of motivation through motivational theories
SEMESTER - II			
Course Code	**JRN 2.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**

1	To know the role functions of Journalism	**CO1**	The students would learn about the history of Indian and Kannada Journalism
2	To know in and out of the profession of Journalism with respect to printing and publishing	**CO2**	Enriches the knowledge of typography and printing technology
3	To facilitate the students to learn practical aspects of print media	**CO3**	Advises the students to do Review of newspaper contents
		CO4	The Paper explains the significance of printing technology in the modern era
		CO5	To know the relationship of content and printing
Course Code	**OPE 2.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	Master basic terms of literary study	CO1	Describe literature in its historical contexts
2	Utilize close reading as a primary skill of literary analysis	CO2	Differentiate between at least two periods of literary history
3	Recognize the conventions of different genres and develop interpretive arguments both in writing and discussion	CO3	Identify how literature and culture are interrelated
		CO4	Continue to develop and refine skills as close readers of literary texts
		CO5	Continue to develop interpretive arguments about literary texts
Course Code	**PSY 2.1**	**Course Title**	**PSYCHOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	Awareness of the different fields of psychology and practical application of the principles of psychology in everyday life for better understanding of holistic human behaviour and personality	**CO1**	Identify and develop a deeper knowledge on the neurological and biological influences on behaviour
2	To evaluate the process of receiving modifying and interpreting the external stimuli	**CO2**	Able to evaluate the stimulus response reaction of the visual sense and its influence on the cognitive process.
3	To analyze the variations in components of thinking and theories of emotions	**CO3**	Evaluate the application and uses of critical and creative thinking skills.
		CO4	Compare and contrast theories of emotions, understand the ubiquitous nature of portraying and recognizing emotions
		CO5	To identify the nature of personality in an individual, differentiate between different

			personality theories and understand the purpose of common personality tests.
SEMESTER - III			
Course Code	**JRN 3.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop a knowledge base of history and evolution of Radio, Television and Film	**CO1**	Distinguish between audio-visual and audio media with respect to script writing
2	To become aware of essentials of techniques of Programme production for Radio and Television	**CO2**	The students should be able to write scripts for Radio news, drama and commercials
3	To know the importance of electronic media in present day	**CO3**	Students should be able to understand the elements and importance of writing script
		CO4	Able to understand the blend of technology and communication skills in media
		CO5	Delineates the importance of technology in running the media
Course Code	**OPE 3.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	Educate students in both the artistry and utility of the English language through the study of literature and other contemporary forms of culture.	**CO1**	Students should be familiar with representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts.
2	Provide students with the critical faculties necessary in an academic environment, on the job, and in an increasingly complex, interdependent world.	**CO2**	Students should be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
3	Assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning.	**CO3**	Students should be able to identify, analyze, interpret and describe the critical ideas, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past.
		CO4	Students should be able to write analytically in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources.
		CO5	Students should be able to ethically gather, understand, evaluate and synthesize

			information from a variety of written and electronic source
Course Code	**PSY 3.1**	**Course Title**	**PSYCHOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To study the human growth and development across the life span from conception to childhood	**CO1**	Understand well established concepts of developmental aspects of human development
2	To understand the influence of heredity ,environment and maturation on the growth and development of the children's	**CO2**	Ability to understand the level of influence in biological and cognitive development
3	To explore how human life begins.	**CO3**	To identify and describe the major components involved in the human development
		CO4	Discuss how research and theory in developmental psychology have been applied to real world problems
		CO5	Summarize the overall developmental changes from conception to childhood
SEMESTER - IV			
Course Code	**JRN 4.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To make aware of the concepts and the laws regarding the freedom of expression	**CO1**	Students should be able to discuss the Right to freedom of Speech and reasonable restrictions
2	To make aware of media laws in India	**CO2**	Demonstrates an understanding of role of laws in Journalism
3	To introduces laws related to media	**CO3**	Determines the ethical issues of media with case studies
		CO4	Introduce different laws and Acts related to media
		CO5	Emphasizes the significance of knowing legal boundaries of media profession
Course Code	**OPE 4.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	Educate students in both the artistry and utility of the English language through the study of literature and other	**CO1**	To know ,appreciate the location of literature within humanities and establish connections across frontiers of disciplines

	contemporary forms of culture. o		
2	Provide students with the critical faculties necessary in an academic environment, on the job, and in an increasingly complex, interdependent world.	**CO2**	To develop critical thinking and imagination through long and short fiction and to familiarize students with cultural diversity through different representative samples of fiction
3	Assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning	**CO3**	To critically engage with culture, gender and marginality
		CO4	To introduce the students to the basic elements of poetry- to enrich the students through various perspectives readings in poetry
		CO5	Become able to differentiate between judgment and appreciation
Course Code	**PSY 4.1**	**Course Title**	**PSYCHOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To study the physical cognitive and social changes across the lifespan from adolescence to end of life	**CO1**	Understand the transition period from childhood to adolescence for a better and healthier life
2	Understanding the social expectation expressed in terms of developmental task in the mastery of person and social adjustment	**CO2**	Able to understand the age appropriate behaviour cognition and adaptation
3	Inculcating the various research ideologies associated with the study of lifespan	**CO3**	Time to discover and learning a new culture
		CO4	Ability to understand the meaning and purpose in life and the changes associated
		CO5	Enhance the holistic perspectives to improve the quality of life
SEMESTER - V			
Course Code	**JRN 5.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**

1	To develop the knowledge of news, news gathering techniques and news writing	**CO1**	Teaches about the news content and its significance
2	To become aware of different fields of reporting	**CO2**	Helps in learning different types of structure and methods of writing news
3	To the structure and methods of writing news reports	**CO3**	To learn the differences between news and features
		CO4	Teaches the technical aspects of writing news, features, press releases and specialized reporting
		CO5	Enlightens on the role and significance of newspaper organizations in dissemination of news and views
Course Code	**OPE 5.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an overview of the various phases of the evolution of Indian writing in English.	**CO1**	Students develop familiarity of representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts.
2	To introduce students to the thematic concerns, genres and trends of Indian writing in English.	**CO2**	Develop critical thinking and imagination through long and short fiction and to familiarize with cultural diversity through different representative samples of study.
3	To create awareness of class, race and gender as social constructs through history, novels and drama	**CO3**	Students are familiar with the key concepts of linguistics and develop awareness of the latest trends in language study
		CO4	Students develop skills to analyse the social concerns pertaining to the given Indian text
		CO5	They are able to interpret the texts of ancient times to modern from the Indian perspective.
Course Code	**PSY 5.1**	**Course Title**	**PSYCHOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To examine the concept of normality and abnormality	**CO1**	To help students distinguish from abnormal and normal behaviour and acquire a better understanding of abnormal behavioural patterns
2	To know the various behavioural dysfunction and maladaptive in everyday life	**CO2**	Better insight of understanding the problems of psychological, psychiatric and other related disorders

3	To put a human face on the study of abnormal psychology and increase student sensitivity to the struggles of people suffering from different types of problem	**CO3**	To gain additional knowledge and information in the field of mental health
		CO4	Identify the clinical features and able to apply in clinical settings
		CO5	Able to understand and predict the problems associated with maladaptive behaviour
Course Code	**JRN 6.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop knowledge of structure of newsroom organization	**CO1**	Illustrates the functioning of the different departments in news organizations and their coordination
2	To aware of news editing, newspaper design and layout	**CO2**	Delineates the duties and responsibilities of different staff members in a news organization
3	To know different departments of newsroom and their functions	**CO3**	Explains the editing process and its significance in the media
		CO4	Students should be able to edit the stories and give good headlines
		CO5	Teaches different methods of newspaper layouts and latest designs
Course Code	**OPE 6.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce world literatures to the students	**CO1**	Students will be able to interpret world literatures from diverse cultural perspectives
2	To familiarize students to the varied cultures and the periods of literatures in the various countries	**CO2**	Literary comprehension and appreciation would be honed
3	To induce literary comprehension in students and enhance their analytical and critical skills.	**CO3**	Exposure to varied cultures would enable their analytical skills to interpret literatures from new perspectives
		CO4	Application of literary critical terms and concepts enhances their critical abilities.
		CO5	Familiarity with the texts ancient and modern, of varied countries open avenues of clarity in the development of these literatures and cultures.
			PSYCHOLOGY

Course Code	PSY 6.1	Course Title	
	Course Objectives		**Course Outcomes (COs)**
1	To understand the inception, growth and career opportunities of industrial and organizational psychology	**CO1**	Assimilate the nature and job prospectus of industrial and organizational psychology
2	An overview of methodologies of job analysis, selection and incentive system in the current organizational perspectives	**CO2**	Comprehend the intricacies and imperativeness of job requirements, placements and modes of rewards in Industry
3	To identify the role of attitudes perceived motivational patterns attributing employees behaviour	**CO3**	Determine the detrimental effects of attitude and significance of motivation in job performance
		CO4	To discover the significance of motivation in job performance and apply it in the industrial setting
		CO5	To develop the ability to understand self and others with the help of psychological instruments and tools
SEMESTER - VI			
Course Code	**JRN 7.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop the knowing of principles of media management	**CO1**	Teaches about different types of media ownership and management in India
2	To know about the starting and running of the media organizations as a business	**CO2**	Throws light on commercial aspects of running the media organizations
3	To know about the starting and running of the media organizations as a business	**CO3**	Helps in knowing the media policies and their role in their management
		CO4	The students should be able to know the principles of media business such as planning, staffing, organization and direction
		CO5	Helps in analyzing the contents of different media organizations in relation to their policies
Course Code	**OPE 7.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an overview of the various phases of the development of Indian	**CO1**	Develop the critical thinking ability of the student to respond to various modes of

	writing in English.		prose writings in relation to their socio-historic and cultural contexts.
2	To introduce students to the thematic concerns, genres and trends of Indian writing in English.	**CO2**	Appreciate the ways in which authors achieve their effects and to develop skills necessary for literary study
3	To generate discussions on the constraints and challenges encountered in articulating Indian sensibility in English. And to expose students to the pluralistic aspects of Indian culture and identity.	**CO3**	Literatures dealing with contemporary issues draw the attention of the students to literature as a mirror which can lead to solutions in the social context.
		CO4	Understand the political, religious, social and cultural trends during different periods of time and its impact on society
		CO5	To develop a critical understanding of drama and various kinds of theatre and a range of dramatic skills and techniques.
Course Code	**PSY 7.1**	**Course Title**	**PSYCHOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To develop a knowledge in understanding the different aspects of mental disorders.	**CO1**	To protect society from dangerous manifestations of mentally ill.
2	To enable the students to get an understanding of the different therapeutic approaches and psychological intervention	**CO2**	The students will get an insight of the complex working of human mind
3	To encourage the students to know the warning signs and the causal patterns of mental illness	**CO3**	Knowledge on brain disorders and cognitive impairments .
		CO4	To learn to apply different therapeutic techniques and assessments used in the clinical setting
		CO5	To enable students to know and evaluate the outcomes of psychotherapies to treat disorders
Course Code	**JRN 8.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop the knowledge of the essentials of advertising and public	**CO1**	Explains the similarities and differences between advertising and public relations as

	relations		means of communication
2	To aware of marketing strategies of advertising and public relations	**CO2**	Teaches the importance of advertising and public relations for the media, market and society
3	To know the role and importance of these means of communication	**CO3**	Explains the role of advertising agencies and PR agencies
		CO4	Enlighten the knowledge of tools of advertising and PR industries in reaching the target audience
		CO5	Helps in knowing differences between publicity, public opinion, propaganda, advertising and public relations in a nutshell
Course Code	**OPE 8.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students have a feel of excellent classics in translation in various genres-Poetry, Fiction, Short Story and Drama-by a judicious selection. It should instill in the students a spirit of enquiry and further exploration	**CO1**	Students are familiar with the cultural diversity of the world and to extend various perspective readings
2	To appreciate the ways in which authors achieve their effects and to develop skills necessary for literary study	**CO2**	Students develop a spirit of enquiry and further exploration with study of the world of literature.
3	To sensitize the student to his own readings, to develop a critical sensibility, to inculcate a love of literature, and to instill a serious approach to literature	**CO3**	Enhancement of analytical and critical abilities is discerned as they apply the critical theories and concepts learnt through the texts they study.
		CO4	Students are able to transcend cultural barriers in understanding, foregrounding and contesting the “transcultural "aspects.
		CO5	Enabled to compare and contrast their indigenous literature and culture with other literatures and cultures.
Course Code	**PSY 8.1**	**Course Title**	**PSYCHOLOGY**
	Course Objectives		**Course Outcomes (COs)**

1	To familiarize and learn concept of human behaviour in organization	**CO1**	Establish what is driving and influencing employee behaviour for getting better results in an organization.
2	Understand the employee relationship and organizational culture	**CO2**	Determine an employee's competency gaps and identify the areas of improvement through the performance appraisal methods.
3	Incorporating the mechanism of various communicational pattern, teamwork and leadership styles in an organizational context	**CO3**	Effective communications that bear on how individuals make themselves understood and enable them to achieve their purposes through interaction that takes place in an organization.
		CO4	Able to identify solutions to problems that improve the well-being of every individual in the organization
		CO5	Identify the strengths and weaknesses of employees to place right men on right job

PROGRAM NAME	**B.A. (Journalism, Optional English, Political Science)**
PROGRAM CODE	**IABOA02**
PROGRAMME EDUCATIONAL OBJECTIVES	

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To impart comprehensive knowledge on the theoretical and practical components in the field of Journalism , Literature and Political Science	**PO1**	To help the students with the needs of career building in the various fields of multimedia.
PEO2	To Prepare students with the knowledge and skills for a career in Journalism	**PO2**	The Programme aims at moulding and making the student an ideal citizen.
PEO3	Enable to navigate through the developments of literary histories and literary critical concepts and theories for a better appreciation of Literatures.	**PO3**	To enrich the various facets of the profession with a blend of theoretical politics with practical knowledge for students to build analytical skills.
PEO4	To develop comprehensive knowledge on the political process and institutions	**PO4**	To in still critical thinking skills in a variety of genres-as a process of intellectual inquiry and creative expression.
PEO5	To Prepare students for multiple careers fields and help them to flourish intellectually	**PO5**	Students will become effective thinkers and communicators who are well-equipped for a variety of careers in the challenging and competitive society.

SEMESTER - I			
Course Code	**JRN 1.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**

1	To introduce the process of Communication	**CO1**	The students should be able to know different communication theories
2	To teach the models of Communication which is very fundamental	**CO2**	To familiarize the students with different facets of mass communication including its characteristics
3	To educate about the role of role of mass media in society for development	**CO3**	To recognize the changes in the practice of media in recent times
		CO4	The Paper provides historical contribution of theoreticians of mass communication through their models
		CO5	Enlighten the students with theories of mass communication which provide strong foundation for its study
Course Code	**OPE 1.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	Create written texts in a variety of literary genres that demonstrate an ability to apply aesthetic values of theoretical perspectives	**CO1**	literary work where they learn convention skills of academic writing
2	Understanding the key aspects of the subject, develop independent and creativity thinking and enhance communicative skills	**CO2**	instills a critical perspective with which students approach the disciplines
3	Cognitive strategy of learning, thinking, organize and behave which motors the contrast between piece of art to frame sense of identity for effective communication	**CO3**	they get through exposure with periods and trends of language
		CO4	resources will incorporate the effective and ethical learning in frame of works
		CO5	develop students character and emotional maturity

Course Code	**POL 1.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**

1	To understand the basic and fundamental principles of political science	**CO1**	To understand the knowledge about the significance of Political Science
2	To understand the concepts of Political Science	**CO2**	To understand the elements and the social contract theory regarding the origin of state
3	To understand the rights of citizens	**CO3**	Understand the basic Concepts of Law and Justice.
		CO4	Understand the difference between the Liberty and Equality
		CO5	Understand the Concepts of Rights & Duties towards the state

SEMESTER - II			
Course Code	**JRN 2.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To know the role functions of Journalism	**CO1**	The students would learn about the history of Indian and Kannada Journalism
2	To know in and out of the profession of Journalism with respect to printing and publishing	**CO2**	Enriches the knowledge of typography and printing technology
3	To facilitate the students to learn practical aspects of print media	**CO3**	Advises the students to do Review of newspaper contents
		CO4	The Paper explains the significance of printing technology in the modern era
		CO5	To know the relationship of content and printing
Course Code	**OPE 2.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	Master basic terms of literary study	**CO1**	Describe literature in its historical contexts
2	Utilize close reading as a primary skill of literary analysis	**CO2**	Differentiate between at least two periods of literary history
3	Recognize the conventions of different genres and develop interpretive arguments both in writing and discussion	**CO3**	Identify how literature and culture are interrelated
		CO4	Continue to develop and refine skills as close readers of literary texts
		CO5	Continue to develop interpretive arguments about literary texts

Course Code	POL 2.1	Course Title	POLITICAL SCIENCE
	Course Objectives		**Course Outcomes (COs)**
1	To understand the important political ideologies and their relevance	**CO1**	Understand major theories and ideologies of political science.
2	To understand the major political theories and ideologies of political Science	**CO2**	Understand the relevance and differences between Power, Authority and Legitimacy.
3	To reconcile political theory and practice through reflections on the ideas and practices related to democracy.	**CO3**	Demonstrate theoretical knowledge and how regional, cultural development affects the society and politics
		CO4	Understand State and its changing sovereign power due to globalization
		CO5	Evaluate and analyze the democracy with theoretical background.
SEMESTER - III			
Course Code	**JRN 3.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop a knowledge base of history and evolution of Radio, Television and Film	**CO1**	Distinguish between audio-visual and audio media with respect to script writing
2	To become aware of essentials of techniques of Programme production for Radio and Television	**CO2**	The students should be able to write scripts for Radio news, drama and commercials
3	To know the importance of electronic media in present day	**CO3**	Students should be able to understand the elements and importance of writing script
		CO4	Able to understand the blend of technology and communication skills in media
		CO5	Delineates the importance of technology in running the media
Course Code	**OPE 3.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	Educate students in both the artistry and utility of the English language through the study of literature and other contemporary forms of culture.	**CO1**	Students should be familiar with representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts.
2	Provide students with the critical faculties necessary in an academic	**CO2**	Students should be able to apply critical and theoretical approaches to the reading and

	environment, on the job, and in an increasingly complex, interdependent world.		analysis of literary and cultural texts in multiple genres.
3	Assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning.	**CO3**	Students should be able to identify, analyze, interpret and describe the critical ideas, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past.
		CO4	Students should be able to write analytically in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources.
		CO5	Students should be able to ethically gather, understand, evaluate and synthesize information from a variety of written and electronic source
Course Code	**POL 3.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To Understand basic and fundamental features of Indian constitution	**CO1**	To comprehend contemporary politics as a relationship between political institutions and the political process.
2	To Understand the nature and structure of the Indian Constitution.	**CO2**	To evaluate the role of Indian Political System
3	To Understand the organs and functions of Indian Political System	**CO3**	Understand and analyse the disputes between Union and State governments.
		CO4	Develop critical analysis of judicial decisions/ orders/judgments
		CO5	Understand differences between Federal, Unitary and Quasi federal structures
SEMESTER - IV			
Course Code	**JRN 4.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To make aware of the concepts and the laws regarding the freedom of expression	**CO1**	Students should be able to discuss the Right to freedom of Speech and reasonable restrictions
2	To make aware of media laws in India	**CO2**	Demonstrates an understanding of role of laws in Journalism

3	To introduces laws related to media	**CO3**	Determines the ethical issues of media with case studies
		CO4	Introduce different laws and Acts related to media
		CO5	Emphasizes the significance of knowing legal boundaries of media profession
Course Code	**OPE 4.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	Educate students in both the artistry and utility of the English language through the study of literature and other contemporary forms of culture. o	**CO1**	To know ,appreciate the location of literature within humanities and establish connections across frontiers of disciplines
2	Provide students with the critical faculties necessary in an academic environment, on the job, and in an increasingly complex, interdependent world.	**CO2**	To develop critical thinking and imagination through long and short fiction and to familiarize students with cultural diversity through different representative samples of fiction
3	Assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning	**CO3**	To critically engage with culture, gender and marginality
		CO4	To introduce the students to the basic elements of poetry- to enrich the students through various perspectives readings in poetry
		CO5	Become able to differentiate between judgment and appreciation
Course Code	**POL 4.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic philosophies of thinkers	**CO1**	Understand the features of Ancient Greek political thought
2	To understand the concepts of Western and Eastern political thinkers.	**CO2**	Understand the contribution of Indian Political Thought
3	To study the influence of political thinkers in present world.	**CO3**	Compare the features of Medieval and Modern Political Thought.
		CO4	To compare with the social contractual thoughts of Hobbes, Lock, and Rousseau and their view regarding state, government and general will.

		CO5	To appreciate the various social and political ideas of Indian political thinker and inculcate the spirit of ahimsa, satyagraha, through Gandhi ideology
SEMESTER - V			
Course Code	**JRN 5.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop the knowledge of news, news gathering techniques and news writing	**CO1**	Teaches about the news content and its significance
2	To become aware of different fields of reporting	**CO2**	Helps in learning different types of structure and methods of writing news
3	To the structure and methods of writing news reports	**CO3**	To learn the differences between news and features
		CO4	Teaches the technical aspects of writing news, features, press releases and specialized reporting
		CO5	Enlightens on the role and significance of newspaper organizations in dissemination of news and views
Course Code	**OPE 5.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an overview of the various phases of the evolution of Indian writing in English.	**CO1**	Students develop familiarity of representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts.
2	To introduce students to the thematic concerns, genres and trends of Indian writing in English.	**CO2**	Develop critical thinking and imagination through long and short fiction and to familiarize with cultural diversity through different representative samples of study.
3	To create awareness of class, race and gender as social constructs through history, novels and drama	**CO3**	Students are familiar with the key concepts of linguistics and develop awareness of the latest trends in language study
		CO4	Students develop skills to analyse the social concerns pertaining to the given Indian text
		CO5	They are able to interpret the texts of ancient times to modern from the Indian perspective.
Course Code	**POL 5.1**	**Course Title**	**POLITICAL SCIENCE**

	Course Objectives		Course Outcomes (COs)
1	To understand the basic and fundamental principles of public administration	**CO1**	Understand the meaning, scope, nature and importance of public administration, public and private administration
2	To understand the nature and dynamics of public administration	**CO2**	Highlights bases of organization, line and staff
3	To understand the financial administration and its process	**CO3**	Understand the functions of Management and role of the Chief Executive
		CO4	Students have the knowledge of recruitment, methods of recruitment, promotion, principle of promotion, moral, training and Discipline
		CO5	Understand the principle and Process of budget
Course Code	**JRN 6.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop knowledge of structure of newsroom organization	**CO1**	Illustrates the functioning of the different departments in news organizations and their co-ordination
2	To aware of news editing, newspaper design and layout	**CO2**	Delineates the duties and responsibilities of different staff members in a news organization
3	To know different departments of newsroom and their functions	**CO3**	Explains the editing process and its significance in the media
		CO4	Students should be able to edit the stories and give good headlines
		CO5	Teaches different methods of newspaper layouts and latest designs
Course Code	**OPE6.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce world literatures to the students	**CO1**	Students will be able to interpret world literatures from diverse cultural perspectives
2	To familiarize students to the varied cultures and the periods of literatures in the various countries	**CO2**	Literary comprehension and appreciation would be honed
3	To induce literary comprehension in students and enhance their analytical and critical skills.	**CO3**	Exposure to varied cultures would enable their analytical skills to interpret literatures from new perspectives
		CO4	Application of literary critical terms and

			concepts enhances their critical abilities.
		CO5	Familiarity with the texts ancient and modern, of varied countries open avenues of clarity in the development of these literatures and cultures.
Course Code	**POL 6.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic and fundamental principles of international relation	**CO1**	Understand foreign policy and major issues of international relations
2	To understand the nature, scope and importance of international relations	**CO2**	Understand the global issues by applying major traditions/theories of international relations.
3	To understand the concept of national power, foreign policy, human rights and approaches to international peace.	**CO3**	Students able to present their views on international events with theoretical background
		CO4	Demonstrate negotiating skills and have knowledge on diplomatic activities
		CO5	Acquires ethical and moral quality in understanding human rights and law
SEMESTER - VI			
Course Code	**JRN 7.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop the knowing of principles of media management	**CO1**	Teaches about different types of media ownership and management in India
2	To know about the starting and running of the media organizations as a business	**CO2**	Throws light on commercial aspects of running the media organizations
3	To know about the starting and running of the media organizations as a business	**CO3**	Helps in knowing the media policies and their role in their management
		CO4	The students should be able to know the principles of media business such as planning, staffing, organization and direction
		CO5	Helps in analyzing the contents of different media organizations in relation to their policies.

Course Code	OPE 7.1	Course Title	OPTIONAL ENGLISH
	Course Objectives		**Course Outcomes (COs)**
1	To provide an overview of the various phases of the development of Indian writing in English.	**CO1**	Develop the critical thinking ability of the student to respond to various modes of prose writings in relation to their socio-historic and cultural contexts.
2	To introduce students to the thematic concerns, genres and trends of Indian writing in English.	**CO2**	Appreciate the ways in which authors achieve their effects and to develop skills necessary for literary study
3	To generate discussions on the constraints and challenges encountered in articulating Indian sensibility in English. And to expose students to the pluralistic aspects of Indian culture and identity.	**CO3**	Literatures dealing with contemporary issues draw the attention of the students to literature as a mirror which can lead to solutions in the social context.
		CO4	Understand the political, religious, social and cultural trends during different periods of time and its impact on society
		CO5	To develop a critical understanding of drama and various kinds of theatre and a range of dramatic skills and techniques.
Course Code	**POL 7.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the principles of major constitutions in the world	**CO1**	Understand the features of UK, USA, China and Switzerland
2	To study the fundamentals of major constitutions in the world	**CO2**	Compare the Legislative functions of UK, USA, China and Switzerland
3	To understand the strengths, weaknesses and potential of the major constitutional system	**CO3**	Understand the role and executive functions of UK, USA, China and Switzerland
		CO4	To know different dimensions of judiciary, its role and functions
		CO5	Accruing knowledge about different forms of government found in different political systems in the world.
Course Code	**JRN 8.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop the knowledge of the essentials of advertising and public	**CO1**	Explains the similarities and differences between advertising and public relations as

	relations		means of communication
2	To aware of marketing strategies of advertising and public relations	**CO2**	Teaches the importance of advertising and public relations for the media, market and society
3	To know the role and importance of these means of communication	**CO3**	Explains the role of advertising agencies and PR agencies
		CO4	Enlighten the knowledge of tools of advertising and PR industries in reaching the target audience
		CO5	Helps in knowing differences between publicity, public opinion, propaganda, advertising and public relations in a nutshell
Course Code	**OPE 8.1**	**Course Title**	**OPTIONAL ENGLISH**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students have a feel of excellent classics in translation in various genres-Poetry, Fiction, Short Story and Drama-by a judicious selection. It should instill in the students a spirit of enquiry and further exploration	**CO1**	Students are familiar with the cultural diversity of the world and to extend various perspective readings
2	To appreciate the ways in which authors achieve their effects and to develop skills necessary for literary study	**CO2**	Students develop a spirit of enquiry and further exploration with study of the world of literature.
3	To sensitize the student to his own readings, to develop a critical sensibility, to inculcate a love of literature, and to instill a serious approach to literature	**CO3**	Enhancement of analytical and critical abilities is discerned as they apply the critical theories and concepts learnt through the texts they study.
		CO4	Students are able to transcend cultural barriers in understanding, foregrounding and contesting the “transcultural "aspects.
		CO5	Enabled to compare and contrast their indigenous literature and culture with other literatures and cultures.
Course Code	**POL 8.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**

1	To understand the working of international institutions	**CO1**	Analyse, evaluate, compare and discuss different international institutions including regional organization and challenges they face.
2	To understand the foreign policy of select countries and foreign policy of India	**CO2**	Compare foreign policy behaviour of selected nation-states of Asia and USA
3	To understand the developments in third world countries in post-world war II	**CO3**	Can find careers in various international institutions
		CO4	Demonstrate analyzing skills, nation-states and their policies
		CO5	Can work as policy analyst in international politics for countries and in magazines

PROGRAMME NAME	**B.A. (Tourism, History, Journalism)**
PROGRAM CODE	**IABOA03**

PEOs	Programme Educational Objectives (PEOs):		Programme Outcomes(POs)
PEO1	To impart comprehensive knowledge on the theoretical and practical components in the field of Journalism , History and Tourism	**PO1**	To help the students with the needs of career building in the various fields of multimedia.
PEO2	To help the students with the needs of career building in the various fields of multimedia.	**PO2**	To trace the evolution of Indian culture with special reference to the society and polity of ancient period and to identify and define India's earliest civilizations.
PEO3	To understand the basic tools of historical analysis	**PO3**	To nourish and expose the spirit of historical research, analysis, criticism, innovation and invention in history.
PEO4	To generate skilled resources for various avenues in the Tourism sector , to play a significant role in generating an expert workforce for the tourism industry at local, national and international level.	**PO4**	To enable students to become responsible towards the society and cultivate policies that will help tourism to grow wisely in the country.
PEO5	To Prepare students for multiple careers fields and help them to flourish intellectually	**PO5**	Students will have an advantage to choose various disciplines and explore their interest in the field of tourism.

Course Code	TOR 1.1	Course Title	TOURISM
	Course Objectives		**Course Outcomes (COs)**
1	To understand the definition of tourist and tourism and its origin	**CO1**	To enable students to differentiate between tourists and visitors by exploring

			the emerging trends in tourism industry by evaluating the future potential
2	To comprehend motivation for people to travel as theories	**CO2**	To appreciate the importance of modern tourism in India
3	To explore various emerging trends in tourism industry and evaluate future potential	**CO3**	To enable students to understand the significance of tourism in India in terms of economic growth
		CO4	To analyses the importance of types of tourism and how it is influencing the youth to travel
		CO5	To evaluate the importance of tourism in framing the infrastructure and technology
Course Code	**HIS 1.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To Trace the evolution of Indian culture with special reference to the society and polity of ancient period	**CO1**	Familiarize yourself with the evolution of Indian culture, society, plurality and polity of the ancient period.
2	To identify and understand India's earliest civilisations including the Neolithic revolution.	**CO2**	Do Historical research and analysis in Ancient India History
3	It provides an overview of the ancient civilization of India and their role in laying a foundation to our culture	**CO3**	To familiarise the students with the art and architecture that flourished in ancient days
		CO4	It provides a massive exchange of ideas, culture, traditions, language through the passage of ancient history
		CO5	The students will be able to appreciate about the number of races and religions in Indian History
Course Code	**JRN 1.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the process of Communication	**CO1**	The students should be able to know different communication theories
2	To teach the models of Communication which is very fundamental	**CO2**	To familiarize the students with different facets of mass communication including its characteristics
3	To educate about the role of role of mass media in society for development	**CO3**	To recognize the changes in the practice of media in recent times

		CO4	The Paper provides historical contribution of theoreticians of mass communication through their models
		CO5	Enlighten the students with theories of mass communication which provide strong foundation for its study
SEMESTER - II			
Course Code	**TOR 2.1**	**Course Title**	**TOURISM**
	Course Objectives		**Course Outcomes (COs)**
1	To identify the tourism product and to find out how it differs from manufactured products	**CO1**	To assess the resources in India available that attracts visitors from different regions
2	To understand and appreciate the history of tourism	**CO2**	To make students aware of promotional fairs and festivals organised by the tourism organizational bodies
3	To aware the students about the promotional activities	**CO3**	To understand the importance of historic monuments and heritage style in India
		CO4	To have a board idea on handicrafts of India as small scale industry
		CO5	To understand the role of ministry of tourism , schemes and policies framed to control the functions of tourism
Course Code	**HIS 2.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To identify the significant historic events during Medieval India.	**CO1**	Construct the arguments in Medieval Indian History by selecting and sequencing the Relevant evidence.
2	Equip the students to have an idea on the social cultural and administrative features during the Medieval period.	**CO2**	Situate the Medieval Indian History intelligently in the historical perspective and Understand the changed political and social dynamics.
3	The student will acquaint themselves with the various developments such as political conditions, agrarian developments and urbanization trends in India's early history and their contribution in shaping our society	**CO3**	It provides a vibrant picture of a massive exchange of ideas, culture and language over a period of five hundred years
		CO4	This paper provides students a platform to study, analyze and critically evaluate the

			life and careers of prominent personalities
		CO5	It will also help the students to begin to explore with kindle of hope to find out more.
Course Code	**JRN 2.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To know the role functions of Journalism	**CO1**	The students would learn about the history of Indian and Kannada Journalism
2	To know in and out of the profession of Journalism with respect to printing and publishing	**CO2**	Enriches the knowledge of typography and printing technology
3	To facilitate the students to learn practical aspects of print media	**CO3**	Advises the students to do Review of newspaper contents
		CO4	The Paper explains the significance of printing technology in the modern era
		CO5	To know the relationship of content and printing
SEMESTER - III			
Course Code	**TOR 3.1**	**Course Title**	**TOURISM**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the role of facilitators namely , travel agencies and Tour operators, airline, and travel industry	**CO1**	To assess the function of travel agency and types of agency operating in India
2	To acknowledge the travel documentation	**CO2**	To acknowledge the travel trend in airways, roadways and waterways
3	To understand the emerging trends in mode of transportation and E-ticketing	**CO3**	To know the procedure of inbound and outbound travel documentation, foreign currency, travel insurance and immigration procedures.
		CO4	To assess the operation and functions of airline, customs and airport tax, fare, calculation.
		CO5	To measure the scope of tourism as an industry and the future of the tourism industry.
Course Code	**HIS 3.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the heritage of South India with a focus on	**CO1**	Understanding history of Karnataka and their organic linkage to Indian History

	Karnataka		
2	To facilitate the students understand south Indian history as a distinct narrative within the board framework of Indian history	**CO2**	The student will have an understanding of the process of the linguistic unification of south India post-independence which have shaped the modern states of south India
3	To identify and understand the multi-cultural history of Karnataka	**CO3**	It also helps the students begin to explore with kindle of hopes of finding out more
		CO4	The students will have a broad overview of the post independent issues of south India which played in shaping the political framework of south Indian states
		CO5	The students will be able to demonstrate an understanding of the political, social and economic development of south Indian history
Course Code	**JRN 3.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop a knowledge base of history and evolution of Radio, Television and Film	**CO1**	Distinguish between audio-visual and audio media with respect to script writing
2	To become aware of essentials of techniques of Programme production for Radio and Television	**CO2**	The students should be able to write scripts for Radio news, drama and commercials
3	To know the importance of electronic media in present day	**CO3**	Students should be able to understand the elements and importance of writing script
		CO4	Able to understand the blend of technology and communication skills in media
		CO5	Delineates the importance of technology in running the media
SEMESTER - IV			
Course Code	**TOR 4.1**	**Course Title**	**TOURISM**
	Course Objectives		**Course Outcomes (COs)**
1	To undrestand the tourism management	**CO1**	To ensure students are able to understand the demand and needs of marketing in tourism
2	Focusing on hospitality industry and its products	**CO2**	To acquire ethical and professionalism values needed in the industry to face customers queries

3	To understand the significance of customer relationship management in hospitality	**CO3**	To demonstrate the role of stakeholder in tourism and their contribution
		CO4	To provide first-hand experience to students by giving them an exposure to industry challenges
		CO5	Demonstrating the importance of market research and marketing strategies in tourism
Course Code	**HIS 4.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To make students understand the significance of imperialism and colonization process of India.	**CO1**	To critically evaluate the practice of the permanent land revenue systems introduced by the British in India.
2	To understand historical processes and circumstances in which the Constitution was drafted.	**CO2**	Evaluate the impact of the English education system introduced by the British and its impact on the social movements.
3	To familiarize with the diverse visions that guided the makers of the Indian Constitution.	**CO3**	To perceive the process of the Nationalistic movement and the participation of the Indian National Congress.
		CO4	To comprehend and define the various movements which enhanced the Gandhian Era struggle for independence.
		CO5	To trace and analyze the labor and peasant movements towards the freedom of India.
Course Code	**JRN 4.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To make aware of the concepts and the laws regarding the freedom of expression	**CO1**	Students should be able to discuss the Right to freedom of Speech and reasonable restrictions
2	To make aware of media laws in India	**CO2**	Demonstrates an understanding of role of laws in Journalism
3	To introduces laws related to media	**CO3**	Determines the ethical issues of media with case studies
		CO4	Introduce different laws and Acts related to media
		CO5	Emphasizes the significance of knowing legal boundaries of media profession

SEMESTER - V			
Course Code	**TOR 5.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To understand detailed study of tourism policies by the government and holiday survey by the ministry of tourism	**CO1**	To understand the tourism policies by the government and survey by the ministry of tourism.
2	To know the importance of implementation of tourism planning	**CO2**	Understanding the importance of planning and analyzing the zone area.
3	Awareness of the infrastructure facilities and conservation of tourist attraction	**CO3**	To compare, evaluate the role of urban and rural area conservation and management of tourist attractions.
		CO4	Students will be able to differentiate the positive and negative impacts of tourism.
		CO5	To understand the economic impacts of tourism in international and national economic activity and inflow of revenue to government through tourism
Course Code	**HIS 5.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students understand the multi-dimensional process of change that independent India initiated.	**CO1**	To perceive the multi-dimensional process of change initiated in independent India.
2	Intends to study the complexities of growth and associated factors of independent India.	**CO2**	To understand the hegemony of national political parties in independent India.
3	To understand the concepts of Liberalisation, Privatization and Globalization	**CO3**	Critically analyze the regional identity issues and emergence of regional political parties.
		CO4	To discuss, analyze and compare the aspects of globalization, liberalization and environmental movements.
		CO5	To analyze the complexities of growth and associated factors that contributed to it.

Course Code	**JRN 5.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**

1	To develop the knowledge of news, news gathering techniques and news writing	**CO1**	Teaches about the news content and its significance
2	To become aware of different fields of reporting	**CO2**	Helps in learning different types of structure and methods of writing news
3	To the structure and methods of writing news reports	**CO3**	To learn the differences between news and features
		CO4	Teaches the technical aspects of writing news, features, press releases and specialized reporting
		CO5	Enlightens on the role and significance of newspaper organizations in dissemination of news and views
Course Code	**TOR 6.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To preserve and product natural resources and environment to achieve	**CO1**	To appreciate India as a land for all seasons and resources.
2	Enrich and promote India cultural heritage	**CO2**	Understanding the importance of ancient period and civilization
3	To study on sustainable development and demerits of Indian tourism	**CO3**	To appreciate various committees and Indian constitution in tourism.
		CO4	Students have the knowledge of foreign currency and comparison of VOS rules for few countries.
		CO5	To understand the growth of Indian tourism and allotments of funds for tourism development.
Course Code	**HIS 6.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the meaning of modern Europe and the factors contributed to it.	**CO1**	To gain knowledge about the modern historical processes that have evolved into modern European culture
2	To facilitate the students to critically look at Modern Europe from Indian perspective.	**CO2**	To familiarize the political revolutions and reforms of Europe
3	To equip the students with the knowledge of the socio – Political and economic development in Modern Europe.	**CO3**	To critically analyze internal factors within Europe contributed to the outbreak of World wars.
		CO4	Compare and contrast the impact of

			dictatorship rule in Europe
		CO5	To understand the meaning of Europe and the factors contributed to it.
Course Code	**JRN 6.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop knowledge of structure of newsroom organization	**CO1**	Illustrates the functioning of the different departments in news organizations and their co-ordination
2	To aware of news editing, newspaper design and layout	**CO2**	Delineates the duties and responsibilities of different staff members in a news organization
3	To know different departments of newsroom and their functions	**CO3**	Explains the editing process and its significance in the media
		CO4	Students should be able to edit the stories and give good headlines
		CO5	Teaches different methods of newspaper layouts and latest designs
SEMESTER - VI			
Course Code	**TOR 7.1**	**Course Title**	**TOURISM**
	Course Objectives		**Course Outcomes (COs)**
1	To educate people on the merit and demerits of entrepreneurship	**CO1**	To understand the entrepreneurship development programs are aimed at eradicating understanding.
2	To promote entrepreneurship development programs aimed at eradicating unemployment	**CO2**	Understanding the public and private entrepreneurship development programs to promote industrialization
3	To spread entrepreneurship development programs to promote industrialisation	**CO3**	Compare the steps of business plan –social, human resources and financial aspects.
		CO4	Understanding the steps of business plan and technical, financial and marketing aspects.
		CO5	To address the financial and marketing aspects of business plan
Course Code	**HIS 7.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To bring out the post second World War developments and their impact on	**CO1**	To perceive the multi-dimensional process of change initiated across the world by the

	the World history.		United Nations organization.
2	To understand the challenges that the contemporary world confronting with.	**CO2**	To understand the impact of the cold war period upon the economic and international security scenario.
3	the contemporary world by examining the multifaceted phenomenon of globalization.	**CO3**	Critically analyze the emergence of the third world organizations and liberation movements.
		CO4	To discuss, analyze and compare the aspects of Disarmament and arms control and various other international organisations promoting new economic order.
		CO5	To analyze the complexities of the contemporary world problems regarding human rights issues and environmental degradation.
Course Code	**JRN 7.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop the knowing of principles of media management	**CO1**	Teaches about different types of media ownership and management in India
2	To know about the starting and running of the media organizations as a business	**CO2**	Throws light on commercial aspects of running the media organizations
3	To know about the starting and running of the media organizations as a business	**CO3**	Helps in knowing the media policies and their role in their management
		CO4	The students should be able to know the principles of media business such as planning, staffing, organization and direction
		CO5	Helps in analyzing the contents of different media organizations in relation to their policies.
Course Code	**TOR 8.1**	**Course Title**	**TOURISM**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concepts of tourism policy	**CO1**	Understanding the national action plan 1992 and policies of civil aviation.
2	To focus on new guidelines for sustainable, eco-tourism and wildlife	**CO2**	Comparing the sustainable and eco-tourism guidelines and assessing the environmental impact assessments.
3	To study India rich heritage sites and to	**CO3**	Understanding Wildlife tourism and

	help understand the nature of heritage properties and conservation		conservation and preservation of heritage sites in India.
		CO4	Assessing the objectives and strategies of heritage management and international organizations engaged in protection.
		CO5	Measure the policies of ITDC and new marketing methods of tourism.
Course Code	**HIS 8.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To make understanding of West Asia as a distinct political idea.	**CO1**	To gain knowledge about the awakening of modern west Asia leading towards the first world war and movements in the middle east.
2	To create knowledge on the various movements that made Modern West Asia.	**CO2**	To familiarize the rise of nationalism as a result of middle-east oil and territorial crises
3	To understand the Arab-Israeli Political idea	**CO3**	To critically analyze internal factors within the contemporary issues of the Arab nations.
		CO4	Compare and contrast the emergence of the Arab-Israeli conflict impacting international politics.
		CO5	To understand the various movements leading towards the second world war.
Course Code	**JRN 8.1**	**Course Title**	**JOURNALISM**
	Course Objectives		**Course Outcomes (COs)**
1	To develop the knowledge of the essentials of advertising and public relations	**CO1**	Explains the similarities and differences between advertising and public relations as means of communication
2	To aware of marketing strategies of advertising and public relations	**CO2**	Teaches the importance of advertising and public relations for the media, market and society
3	To know the role and importance of these means of communication	**CO3**	Explains the role of advertising agencies and PR agencies
		CO4	Enlighten the knowledge of tools of advertising and PR industries in reaching the target audience
		CO5	Helps in knowing differences between publicity, public opinion, propaganda, advertising and public relations in a nutshell

PROGRAMME NAME	**B.A. (History, Economics, Political Science)**
PROGRAM CODE	**IABOA04**
PROGRAMME EDUCATIONAL OBJECTIVES	

Programme Educational Objectives (PEOs)	

		Programme Outcomes (POs): It helps students,	
PEO1	To impart comprehensive knowledge on the theoratical and practical components in the field of Journalism , Literature and Political Science	**PO1**	To help the students to the needs of career building in the various fields of multimedia.
PEO2	To Prepare students with the knowledge and skills for a career in Journalism	**PO2**	The Programme aims at molding and making the student an ideal citizen.
PEO3	Enable to navigate through the developments of literary histories and literary critical concepts and theories for a better appreciation of Literatures.	**PO3**	To enrich the various facets of the profession with a blend of theoretical politics with practical knowledge for students to build analytical skills.
PEO4	To develop comprehensive knowledge on the political process and institutions	**PO4**	To instill the critical thinking skills in a variety of genres-as a process of intellectual inquiry and creative expression.
PEO5	To Prepare students for multiple careers fields and help them to flourish intellectually	**PO5**	Students will become effective thinkers and communicators who are well-equipped for a variety of careers in the challenging and competitive society.

SEMESTER - I			
Course Code	**HIS 1.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To Trace the evolution of Indian culture with special reference to the society and polity of ancient period	**CO1**	Familiarize with the evolution of Indian culture, society, plurality and polity of ancient period.
2	To identify and understand India's earliest civilisations including the Neolithic revolution.	**CO2**	Do Historical research and analysis in Ancient India History
3	It provides an overview of the ancient civilization of India and their role in laying a foundation to our culture	**CO3**	To familiarise the students with the art and architecture that flourished in ancient days
		CO4	It provides a massive exchange of ideas, culture, traditions, language through the passage of ancient history
		CO5	The students will be able to appreciate about the number of races and religions in Indian History
Course Code	**ECO 1.1**	**Course Title**	**ECONOMICS**

	Course Objectives		Course Outcomes (COs)
1	To make students analyze how individual decision makers behave in an economic environment.	**CO1**	To introduce the basic concepts and theories of micro economics
2	To provide the students with fundamental principles of microeconomics.	**CO2**	To analyze consumer behavior.
3	Familiarize students to use the concepts to which they are introduced to facilitate analysis of the functioning of the micro economy.	**CO3**	Students will be able to explore the demand and supply forces and equilibrium position.
		CO4	To evaluate the cost and revenue concepts in productivity.
		CO5	To learn the types of markets and price determination.
Course Code	**POL 1.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic and fundamental principles of political science	**CO1**	To understand the knowledge about the significance of Political Science
2	To understand the concepts of Political Science	**CO2**	To understand the elements and the social contract theory regarding the origin of state
3	To understand the rights of citizens	**CO3**	Understand the basic Concepts of Law and Justice.
		CO4	Understand the difference between the Liberty and Equality
		CO5	Understand the Concepts of Rights & Duties towards the state
SEMESTER - II			
Course Code	**HIS 2.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To identify the significant historic events during the Medieval India.	**CO1**	Construct the arguments in Medieval Indian History by selecting and sequencing the Relevant evidence.
2	Equip the students to have an idea on the social cultural and administrative features duringthe Medieval period.	**CO2**	Situate the Medieval Indian History intelligently in the historical perspective and Understand the changed political and social dynamics.
3	The student will acquaint themselves with the various developments such as political conditions, agrarian developments and urbanization trends in India's early history and their contribution in shaping our society	**CO3**	It provides a vibrant picture of a massive exchange of ideas, culture and language over a period of five hundred years

		CO4	This paper provides students a platform to study, analyze and critically evaluate the life and careers of prominent personalities
		CO5	It will also help the students to begin to explore with kindle of Hopes of finding out more!
Course Code	**ECO 2.1**	**Course Title**	**ECONOMICS**
	Course Objectives		**Course Outcomes (COs)**
1	To identify the significant historic events during Medieval India.	**CO1**	Construct the arguments in Medieval Indian History by selecting and sequencing the relevant evidence.
2	Equip the students to have an idea on the social cultural and administrative features during the Medieval period.	**CO2**	Situate the Medieval Indian History intelligently in the historical perspective and understand the changed political and social dynamics.
3	The student will acquaint themselves with the various developments such as political conditions, agrarian developments and urbanization trends in India's early history and their contribution in shaping our society	**CO3**	It provides a vibrant picture of a massive exchange of ideas, culture and language over a period of five hundred years
		CO4	This paper provides students a platform to study, analyze and critically evaluate the life and careers of prominent personalities
		CO5	It will also help the students to begin to explore with kindle of hope to find out more!
Course Code	**POL 2.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the important political ideologies and their relevance	**CO1**	Understand major theories and ideologies of political science.
2	To understand the major political theories and ideologies of political Science	**CO2**	Understand the relevance and differences between Power, Authority and Legitimacy.
3	To reconcile political theory and practice through reflections on the ideas and practices related to democracy.	**CO3**	Demonstrate theoretical knowledge and how regional, cultural development affects the society and politics
		CO4	Understand State and its changing sovereign power due to globalization
		CO5	Evaluate and analyse the democracy with theoretical background.
SEMESTER - III			
Course Code	**HIS 3.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**

1	To familiarize the students with the heritage of South India with a focus on karnataka	**CO1**	Understanding history of Karnataka and their organic linkage to Indian History
2	To facilitate the students understand south indian history as a distinct narrative within the board framework of Indian history	**CO2**	The student will have an understanding of the process of the linguistic unification of south India post-independence which have shaped the modern states of south India
3	To identify and understand the multi-cultural history of Karnataka	**CO3**	It also helps the students begin to explore with kindle of hopes of finding out more
		CO4	The students will have a broad overview of the post independent issues of south India which played in shaping the political framework of south Indian states
		CO5	The students will be able to demonstrate an understanding of the political, social and economic development of south Indian history
Course Code	**ECO 3.1**	**Course Title**	**ECONOMICS**
	Course Objectives		**Course Outcomes (COs)**
1	To make students develop mathematical models, theories and analyze the data to learn interpretation	**CO1**	To introduce students to the basic concepts of statistics and develop skills of data analysis and ability to interpret
2	Understand relevance & need of quantitative methods for making business decisions.	**CO2**	To help students to solve the basic statistics in Economics.
3	Demonstrate a sound knowledge of fundamentals of statistics and statistical techniques.	**CO3**	To enable students to learn to apply mathematics to understand economic theory
		CO4	Students will be able to work on Functions.
		CO5	To understand and work with derivatives as a rate of change in mathematical models.
Course Code	**POL 3.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To Understand basic and fundamental features of Indian constitution	**CO1**	To comprehend contemporary politics as a relationship between political institutions and political process.
2	To Understand the nature and structure of Indian Constitution.	**CO2**	To evaluate the role of Indian Political System
3	To Understand the organs and functions of Indian Political System	**CO3**	Understand and analyse the disputes between Union and State governments.
		CO4	Develop critical analysis of judicial decisions/ orders/judgments

		CO5	Understand differences between Federal, Unitary and Quasi federal structures
SEMESTER - IV			
Course Code	**HIS 4.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To make students understand the significance of imperialism and colonization process of India.	**CO1**	To critically evaluate the practice of the permanent land revenue systems introduced by the British in India.
2	To understand historical processes and circumstances in which the Constitution was drafted.	**CO2**	Evaluate the impact of English education system introduced by the British and its impact on the social movements.
3	To familiar with the diverse visions that guided the makers of the Indian Constitution.	**CO3**	To perceive the process of the Nationalistic movement and the participation of the Indian National Congress.
		CO4	To comprehend and define the various movements which enhanced the Gandhian Era struggle for independence.
		CO5	To trace and analyze the labor and peasant movements towards the freedom of India.
Course Code	**ECO 4.1**	**Course Title**	**ECONOMICS**
	Course Objectives		**Course Outcomes (COs)**
1	The objective of this paper is to introduce the basic concepts of economics to the students so as to enable and learn about India.	**CO1**	To enable students to have an overview of the working of the Indian economy
2	To enable students to understand how optimum real life decisions are taken by individuals under situations of scarcity.	**CO2**	To analyze the present agricultural policies, growth level and future prospectus.
3	To enable students to understand how optimum decisions are taken by firms in the economy.	**CO3**	To evaluate the role of Industrial Sector in economy
		CO4	To understand the Indian Fiscal System, planning process in India
		CO5	To help students examine the leading issues in India’s economic development.
Course Code	**POL 4.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**

1	To understand the basic philosophies of thinkers	**CO1**	Understand the features of Ancient Greek political thought
2	To understand the concepts of Western and Eastern political thinkers.	**CO2**	Understand the contribution of Indian Political Thought
3	To study the influence of political thinkers in present world.	**CO3**	Compare the features of Medieval and Modern Political Thought.
		CO4	To compare with the social contractual thoughts of Hobbes, Lock, and Rousseau and their view regarding state, government and general will.
		CO5	To appreciate the various social and political ideas of Indian political thinker and inculcate the spirit of ahimsa, satyagraha, through Gandhi ideology
SEMESTER - V			
Course Code	**HIS 5.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students understand the multi-dimensional process of change that independent India initiated.	**CO1**	To perceive the multi-dimensional process of change initiated in independent India.
2	Intends to study the complexities of growth and associated factors of independent India.	**CO2**	To understand the hegemony of national political parties in independent India.
3	To understand the concepts of Liberalisation, Privatization and Globalization	**CO3**	Critically analyze the regional identity issues and emergence of regional political parties.
		CO4	To discuss, analyze and compare the aspects of globalization, liberalization and environmental movements.
		CO5	To analyze the complexities of growth and associated factors of contributed to it.
Course Code	**ECO 5.1**	**Course Title**	**ECONOMICS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students with economic models, to critically think about the economic theories and evaluate their assumptions and implications.	**CO1**	To understand the core values, principles and theories of economic development.
2	To gain an understanding of core economic principles and how they apply to a wide range of real-world issues.	**CO2**	To study the Classical, Socialist and Marxian Schools of thoughts towards development.
3	To master the theoretical and applied tools necessary to critique and create economic research.	**CO3**	To evaluate the significance of Neo-classical School thoughts.

		CO4	Understand the principles and thoughts of Economics thinkers
		CO5	Make students gain knowledge about the dynamics of economic thoughts.
Course Code	**POL 5.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic and fundamental principles of public administration	**CO1**	Understand the meaning, scope, nature and importance of public administration, public and private administration
2	To understand the nature and dynamics of public administration	**CO2**	Highlights bases of organization, line and staff
3	To understand the financial administration and its process	**CO3**	Understand the functions of Management and role of the Chief Executive
		CO4	Students have the knowledge of recruitment, methods of recruitment, promotion, principle of promotion, moral, training and Discipline
		CO5	Understand the principle and Process of budget
Course Code	**HIS 6.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the meaning of modern Europe and the factors contributed to it.	**CO1**	To gain knowledge about the modern historical processes that have evolved into modern European culture
2	To facilitate the students to critically look at Modern Europe from an Indian perspective.	**CO2**	To familiarize the political revolutions and reforms of Europe
3	To equip the students with the knowledge of the socio – Political and economic development in Modern Europe.	**CO3**	To critically analyze internal factors within Europe contributed to the outbreak of World wars.
		CO4	Compare and contrast the impact of dictatorship rule in Europe
		CO5	To understand the meaning of Europe and the factors contributed to it.
Course Code	**ECO 6.1**	**Course Title**	**ECONOMICS**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to understand the HR Management and system at various	**CO1**	To teach the basics of human resource management

	levels in general and in specific industries.		
2	To help the students focus on and analyse the issues and strategies required to select and develop manpower resources.	**CO2**	Understand the importance of planning, recruitment & selection in HRM.
3	To develop relevant skills necessary for application in HR related issues	**CO3**	To familiarize with induction and training for human resources.
		CO4	Make students evaluate the concepts performance appraisal and compensation in human resource employment.
		CO5	To understand the importance of promotion and transfers
Course Code	**POL 6.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basic and fundamental principles of international relation	**CO1**	Understand foreign policy and major issues of international relations
2	To understand the nature, scope and importance of international relations	**CO2**	Understand the global issues by applying major traditions/theories of international relations.
3	To understand the concept of national power, foreign policy, human rights and approaches to international peace.	**CO3**	Students able to present their views on international events with theoretical background
		CO4	Demonstrate negotiating skills and have knowledge on diplomatic activities
		CO5	Acquires ethical and moral quality in understanding human rights and law
SEMESTER - VI			
Course Code	**HIS 7.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To bring out the post second World War developments and their impact on World history.	**CO1**	To perceive the multi-dimensional process of change initiated across the world by the United Nations organization.
2	To understand the challenges that the contemporary world is confronting.	**CO2**	To understand the impact of the cold war period upon the economic and international security scenario.
3	The contemporary world by examining the multifaceted phenomenon of globalization.	**CO3**	Critically analyze the emergence of the third world organizations and liberation movements.
		CO4	To discuss, analyze and compare the aspects of Disarmament and arms control and various other international organisations promoting new economic order.

		CO5	To analyze the complexities of the contemporary world problems regarding human rights issues and environmental degradation.
Course Code	**ECO 7.1**	**Course Title**	**ECONOMICS**
	Course Objectives		**Course Outcomes (COs)**
1	It helps students to develop a global perspective, get connected to international business, market, people and acquire knowledge on other countries.	**CO1**	To provide knowledge on the basic concepts, tools and theories of international trade.
2	To provide a basis for further studies in International Business and Finance	**CO2**	To study the concept of terms of trade. To learn the importance of protectionist policy and importance of tariff imposition in business.
3	To allow students to have a better understanding of the regional trade regimes	**CO3**	To understand the importance of WTO in International trade.
		CO4	To examine the issues in commercial policy and economic international integration.
		CO5	To understand the concept of Balance of trade
Course Code	**POL 7.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the principles of major constitutions in the world	**CO1**	Understand the features of UK, USA, China and Switzerland
2	To study the fundamentals of major constitutions in the world	**CO2**	Compare the Legislative functions of UK, USA, China and Switzerland
3	To understand the strengths, weaknesses and potential of the major constitutional system	**CO3**	Understand the role and executive functions of UK, USA, China and Switzerland
		CO4	To know different dimensions of judiciary, its role and functions
		CO5	Accruing knowledge about different forms of government found in different political systems in the world.
Course Code	**HIS 8.1**	**Course Title**	**HISTORY**
	Course Objectives		**Course Outcomes (COs)**
1	To make understanding of West Asia as a distinct political idea.	**CO1**	To gain knowledge about the awakening of modern west Asia leading towards the first

			world war and movements in the middle east.
2	To create knowledge on the various movements that made Modern West Asia.	**CO2**	To familiarize the rise of nationalism as a result of middle-east oil and territorial crises
3	To understand the Arab-Israeli Political idea	**CO3**	To critically analyze internal factors within the contemporary issues of the Arab nations.
		CO4	Compare and contrast the emergence of the Arab-Israeli conflict impacting international politics.
		CO5	To understand the various movements leading towards the second world war.
Course Code	**ECO 8.1**	**Course Title**	**ECONOMICS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students with regard to structure, organization and operations of the financial system in India.	**CO1**	To provide an overview of the structure and features of the financial system.
2	To study the fundamentals of the Indian financial system regulation.	**CO2**	To provide knowledge about the working of the financial system.
3	To name the functions and objectives of international monetary and financial institutions.	**CO3**	To understand the importance of Financial Institutions.
		CO4	To learn the role of Commercial Banks in India.
		CO5	To evaluate the role of RBI and its monetary policy in money stabilization.
Course Code	**POL 8.1**	**Course Title**	**POLITICAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the working of international institutions	**CO1**	Analyze, evaluate, compare and discuss different international institutions including regional organization and challenges they face.
2	To understand the foreign policy of select countries and foreign policy of India	**CO2**	Compare foreign policy behaviour of selected nation-states of Asia and USA
3	To understand the developments in third world countries in post-world war II	**CO3**	Can find careers in various international institutions
		CO4	Demonstrate analyzing skills, nation-states and their policies
		CO5	Can work as policy analyst in international politics for countries and in magazines

NAME OF THE PROGRAMME	MASTER OF SCIENCE (Microbiology)
PROGRAMME CODE	IAMOS01

Programme Educational Objectives (PEOs)	Programme Outcomes (POs)

PEO1	The objective of the Post graduate degree in Microbiology is to make students knowledgeable about the various basic concepts in a wide ranging context which involve the use of knowledge and skills of Microbiology.	**PO1**	Learn the fundamental attributes of microorganisms concordantly with applied concepts of Microbiology in Food, Agriculture, Pharmaceutical Sciences, Medical and Environmental domains
PEO2	To understand, knowledge and skills in Microbiology needs to be developed through a thorough teaching learning processes in the class, practical skills through the laboratory work and experiential learning through case studies.	**PO2**	Communicate the research findings through paper publication, research proposals, commentary articles and other scientific fora and club
PEO3	To develop their presentation and articulation skills, exposure to industry and interaction with industry experts, write short research-based projects where they are guided and mentored by the academic and other experts of the subject.	**PO3**	Develop the skill to analyze and find solutions for the societal problems associated with medical diagnosis, food, agriculture, pest control, biofuel and bioremediation
PEO4	By cultivating talents and promoting all round personality development through multi-dimensional education a spirit of self-confidence and self-reliance will be infused in the student.	**PO4**	Acquire core knowledge and found research gaps in microbiology to formulate research projects to meet placements in industries, hospitals and research institutions
PEO5	The student will be instilled with values of professional ethics and be made ready to contribute to society as responsible individuals.	**PO5**	Do research project to apply the concepts in microbiology and to meet the global demand in the production of biofertilizers and antimicrobial agents following bio-ethical regulations

SEMESTER - I			
Course Code	**MMB101**	**Course Title**	**BACTERIOLOGY AND VIROLOGY**

	Course Objectives		Course Outcomes (COs)
1	The primary objective of the course is to build a strong foundation in the area of bacterial cell structure, division, survival and propagation.	**CO 1**	Analyze the microbial taxonomy of Archaea and Eubacteria according to Bergey's manual of systematic bacteriology
2	To create the knowledge about nutritional requirements of both aerobic and anaerobic cultures of bacteria	**CO 2**	Evaluate the structure and properties of organelles in bacteria and cyanobacteria.
3	Knowledge on history, general characters of viruses and how viruses are classified on basis of architecture and genetic material.	**CO 3**	Create the knowledge about nutritional requirements of both aerobic and anaerobic cultures
		CO 4	Criticise the properties of virus, prions and viroids
		CO 5	Apply the techniques for the assay and cultivation of viruses
Course Code	**MMB 102**	**Course Title**	**EUKARYOTIC MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to outline the structure, cultivation and significance of algae and fungi	**CO 1**	Outline the structure, cultivation and significance of algae and protozoans
2	To analyze the characteristics and classification of Fungi.	**CO 2**	Analyze the characteristics and classification of algae
3	To understand the evolutionary tendencies in fungi, algae and protozoa	**CO 3**	Understand about the biological and economical importance of algae and fungi
		CO 4	Create the insights about classification of fungi in relate with properties
		CO 5	Identify the factors influencing the growth of microbes at different ecosystem
Course Code	**MMB 103**	**Course Title**	**MICROBIAL PHYSIOLOGY AND BIOCHEMISTRY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of this paper is to provide the core principles and specialized knowledge of Carbohydrates, Lipids, Proteins, Vitamins, Porphyrin, cellular transport, law of thermodynamics, Lipid and Nitrogen metabolism.	**CO 1**	Explain the microbial responses towards various stress
2	To understand the mechanism of enzyme kinetics	**CO 2**	Apply the knowledge of biomolecules in biochemistry
3	To develop clear understanding of various aspects of microbial physiology along with diverse metabolic pathways existing in bacteria in relation to its survival and propagation	**CO 3**	Analyses the mechanism of enzyme kinetics in microbial physiology
		CO 4	Discuss the mechanism of photosynthesis in bacteria
		CO 5	Evaluate the metabolic process of microbial system

Course Code	MMB104	Course Title	MICROBIAL AND BIOCHEMICAL TECHNIQUES
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of this paper is to introduce the basic concept of qualitative and quantitative analysis of a given sample.	**CO 1**	Apply the techniques for the cultivation of pure culture
2	To Study various spectroscopic techniques and its instrumentation.	**CO 2**	Analyze about the microscopical's principals and applications
3	To understand the concept of separation science and its applications.	**CO 3**	Evaluation of microbial growth with various tests
		CO 4	Analysis of biomolecules
		CO 5	Understand the techniques of chromatography electrophoresis and isotope
Course Code	**MMB105**	**Course Title**	**BIOSTATISTICS (Soft core)**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of this paper is to will be able to make informed decisions based on data and apply statistical tools and techniques in their research works.	**CO 1**	Define the basic concepts of biostatistics and organization of data
2	To understand various statistics terminologies, significance and quantitative analysis in microbiology.	**CO 2**	Apply the different data collection methods and diagrammatic presentation of data
3	To get familiar with various computation tools of biostatistics	**CO 3**	Analyse the different types of data using statistical tools
		CO 4	Evaluate the graphical presentation of data, measures of central tendency and chi- square testing hypothesis
		CO 5	Elaborate the measures of dispersion, correlation and regression methods
Course Code	**MMB106**	**Course Title**	**BACTERIOLOGY, VIROLOGY AND EUKARYOTIC MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To demonstrate the practical skills in the use of tools, technologies and methods common to Bacteriology, Virology and Mycology.	**CO 1**	Use pure culture and selective techniques to enrich for and isolate microorganisms, using proper aseptic technique.
2	To provide knowledge in isolation, identification of microorganisms employing microscopic observation, plating and biochemical test.	**CO 2**	Understand the morphology, cultural, biochemical and other biological properties and characteristics of medically important bacteria
3	To Apply the concepts, basic research findings through description interpretation and analysis.	**CO 3**	Acquire skills of visualizing bacteria by staining, using a microscope and culturing bacteria in microbiological media to describe the features of bacterial and fungal colonies
		CO 4	Evaluate a microbiological problem in the context of an unknown microorganism, using appropriate media-based methods for identification.

		CO 5	Acquire a fairly good understanding of the different types of bacteria, fungi and algae
Course Code	**MMB107**	**Course Title**	**MICROBIAL PHYSIOLOGY, BIOCHEMISTRY AND MICROBIAL TECHNIQUES**
	Course Objectives		**Course Outcomes (COs)**
1	To gain practical skill about classification and properties of various biomolecules.	**CO 1**	At the end of each biochemical estimation method students will be able to qualitatively and quantitatively determine the level of various test macromolecules in a given sample
2	To gain comprehensive knowledge about biochemical pathways involved in intermediary metabolism of carbohydrate, protein, lipid and nucleic acid.	**CO 2**	Able to calculate enzyme activity and other quantitative and qualitative parameters of enzyme kinetics; also knowledge about lipids and nucleic acids.
3	To focus on the theories of enzyme kinetics, the mechanisms of enzyme catalysis, and immobilization of enzyme	**CO 3**	Able to make buffers, study enzyme kinetics and calculate Vmax, Km, Kcat values.
		CO 4	To understand the multisubstrate enzyme kinetics and enzyme Immobilization
		CO 5	Understand the principles of a number of analytical instruments which the students have to use during the study and also later as microbiologists for performing various laboratory manipulations.
SEMESTER - II			
Course Code	**MMB201**	**Course Title**	**MICROBIAL GENETICS**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to to understand how microorganisms can be used as tools to understand various biological phenomena.	**CO 1**	Outline the structure of prokaryotic and eukaryotic genome
2	To acquaint types of mutation, gene regulation and transposable element	**CO 2**	Discuss the types mutation and DNA repair mechanism
3	To understand the concepts in prokaryotic, eukaryotic, and viral genetics.	**CO 3**	Analyze the genetic recombination and the overview of bacterial genetic map
		CO 4	Interpret the gene transfer mechanism in bacteria
		CO 5	Evaluation of various types of vectors in genetic analysis
Course Code	**MMB202**	**Course Title**	**MOLECULAR BIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to acquire in-depth study on structure and organization of chromosome, replication process, transcription process, translation process and mutagenesis.	**CO 1**	Understand the concepts of molecular biology
2	To expose the students on the basic understanding of various techniques used in molecular studies.	**CO 2**	Remember about DNA damage and repair

3	To introduce the student to the advanced concepts in molecular biology.	**CO 3**	Analyze the mechanism of DNA replication
		CO 4	Identify the molecular aspects of gene expression
		CO 5	Evaluate the regulation criteria during gene expression
Course Code	**MMB203**	**Course Title**	**ENVIRONMENTAL MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to impart knowledge about structure, composition and functioning of microbial communities of diverse environment.	**CO 1**	Outline the study of airborne microbes
2	To understand the use of microbial population in mineral recovery, management of various types of pollutants and conversion processes of various types of wastes into value added products	**CO 2**	Evaluate the water quality parameters in relate with microbes
3	To understand bioremediation, xenobiotics, and effluent treatment methods	**CO 3**	Utilize and analyse the role of microbes in sewage water treatment
		CO 4	Appraise the microbial action in environment
		CO 5	Apply the microbial load in biodegradation
Course Code	**MMB204**	**Course Title**	**FOOD MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to teach the strategies to develop fermented and non-fermented milk products, plant based products, fish products, meat products bioactive compounds and malt beverages, wines, distilled liquors and vinegar.	**CO 1**	Analyze the intrinsic and extrinsic factors affecting the growth of microbes
2	To understand food spoilage microorganisms; the microbiology of food preservation and food commodities; fermented and microbial foods; principles and methods for the microbiological examination of foods; micro biological quality control, and quality schemes.	**CO 2**	Discuss the role of microbes in food preparation and spoilage
3	To create awareness among the students about the food quality analysis and the role of government organizations involved in food quality control.	**CO 3**	Illustrate various food preservation techniques
		CO 4	Apply the techniques to assay the food borne infections and intoxication
		CO 5	Create the knowledge about the microbial food products and determine the role of various agencies in food sanitation and control
Course Code	**MMB205**	**Course Title**	**BIOINFORMATICS (Soft core)**

	Course Objectives		Course Outcomes (COs)
1	The major objective of the course is to provide an overview of various bioinformatics tools, databases available and sequence analysis.	**CO 1**	Understand the hardware and software in computer, networking and firewalls.
2	To Provide knowledge on database concept, management, retrieval along with utilization in gene and protein analysis	**CO 2**	Outline the concept of biological databases, datamining
3	To learn various computational technique and online tools of bioinformatics	**CO 3**	Apply various bioinformatics tools for the analysis of biological sequences
		CO 4	Compare biological databases, sequence alignment and Phylogenetic trees
		CO 5	Assess the sequence similarity and significance of sequence alignment
Course Code	**MMB206**	**Course Title**	**MICROBIAL GENETICS AND MOLECULAR BIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to give basic understanding of microbial genetic manipulations	**CO 1**	Develop capability to perform different gene transfer methods in microbes.
2	To Provide idea about DNA, protein purification from samples and quantification	**CO 2**	Acquainted with molecular modification approaches that encompass extraction, purification, quantification and augmentation
3	To understand the importance of gene transfer mechanisms	**CO 3**	Students will be able to determine and quantify presence/absence of antigens and antibodies in biological samples
		CO 4	Discuss the molecular mechanisms underlying mutations,detection of mutations and DNA damage and repair mechanisms
		CO 5	Handle and independently work on lab protocols involving molecular techniques
Course Code	**MMB 207**	**Course Title**	**ENVIRONMENTAL AND FOOD MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to give hand on experience on isolation and characterization of microbes from different food sources, different spoiled food sources, agricultural (root nodules) and environmental samples(air water and soil).	**CO 1**	Know the microbial analysis of drinking water and aeromicrobiology
2	To analyze the microbial assessment of water and potability test for water Microbiology	**CO 2**	Comprehend the various methods to determine the Sanitary quality of water and sewage treatment methods employed in waste water treatment
3	To extend students knowledge on traditional fermented products to industrial fermentation products in the applied area of food microbiology.	**CO 3**	Carry out experiments to evaluate microbial quality of food products and water
		CO 4	Understand the microbial principles relating to the production of fermented foods

		CO 5	Recognize and describe the characteristics of important pathogens and spoilage microorganisms in foods
SEMESTER - III			
Course Code	**MMB301**	**Course Title**	**MEDICAL MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to make the students understand various attributes which make the microbes pathogenic or disease-causing, the emergence of newer pathogens with relevance to India and the various tools for their local or global spread	**CO 1**	Understand the medically important bacteria, virus, fungi and protozoa
2	To learn the basic concepts of medical microbiology and microbial pathogenesis: study of microbes, antimicrobial agents, epidemiology, and virulence factors associated with the pathogen.	**CO 2**	Criticize about the transmission and infection
3	To describe the molecular diagnostic methods and automated equipment which may be used for diagnosis of diseases caused by microorganisms.	**CO 3**	Analyze the symptoms, pathogenesis and laboratory diagnosis of bacterial, fungal, viral and protozoa
		CO 4	Elaborate the antimicrobial agents to handle microorganism in risk groups
		CO 5	Apply the immuno and molecular techniques for the diagnosis of disease
Course Code	**MMB302**	**Course Title**	**IMMUNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to understand the various components of the host immune system, their structure and organization, and functions to serve as the defense system of the body.	**CO 1**	Understand the characteristics of antigen, antibodies, complement system
2	To develop understanding of innate and adaptive immunity along with major cells and molecules involved	**CO 2**	Apply the immunological techniques in the diagnosis of diseases
3	To integrate immunology with health and enrich the knowledge for autoimmune disorders, hypersensitivity reaction	**CO 3**	Analyze the mechanism of innate and acquired immunity against diseases
		CO 4	Criticize the cell mediated and humoral immunity
		CO 5	Elaborate the tumor immunology

Course Code	**MMB303**	**Course Title**	**RECOMBINANT DNA TECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**

1	The major objective of the course is to understand various applications of microbes for the development of various products of agriculture, industrial and clinical application.	**CO 1**	Match the various DNA and RNA modifying enzymes and their functions
2	To acquire knowledge about the methods used to clone genes, make and screen libraries, and the various applications of the polymerase chain reaction.	**CO 2**	Experiment with DNA cloning and expression
3	To understand how recombinant DNA technology has been exploited in the study of biology as well as in the production of pharmaceutical products	**CO 3**	Apply the markers and techniques in molecular analysis
		CO 4	Analyze the protocol of various methods of DNA sequencing
		CO 5	Application of rDNA technology in agriculture, medical, industrial and environmental sectors.
Course Code	**MMB304**	**Course Title**	**APPLIED MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to understand the different areas and application of Microbiology	**CO 1**	Understand the diversity in microbiology
2	To know the characteristics of different microorganisms	**CO 2**	Analyze microbial communities inhabiting a multitude of habitats and occupying a wide range of ecological habitats
3	To create in the manufacture of industrially important microorganisms	**CO 3**	Know the general characteristics of Bacteria, fungi, algae and viruses
		CO 4	Appreciate how microbiology is applied in manufacture of industrial products
		CO 5	Develop a thorough understanding of common bacterial, viral, fungal, parasitic diseases of human being including some very important diseases
Course Code	**MMB305**	**Course Title**	**MEDICAL MICROBIOLOGY AND IMMUNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to develop students understanding of medical microbiology with hand on experience in the isolation of the bacteria from different sources	**CO 1**	Acquainted with molecular modification approaches that encompass extraction, purification, quantification and augmentation
2	It gives the knowledge about the pathogenicity, understanding the biofilm formation in bacteria, role of biofilm in pathogenicity and there antibiotics resistance pattern of pathogenic bacteria, which is useful for public awareness.	**CO 2**	Students will be able to determine and quantify presence/absence of antigens and antibodies in biological samples
3	To provide hands-on experience to basic immunological techniques for determination of microorganisms in biological fluids and other samples	**CO 3**	To make them understand the salient features of antigen antibody reaction & its uses in diagnostics and various other studies

		CO 4	Learning methods for antimicrobial susceptibility testing
		CO 5	Demonstrate practical skills in fundamental microbiological techniques
Course Code	**MMB306**	**Course Title**	**RECOMBINANT DNA TECHNOLOGY AND BIOINFORMATICS**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to demonstrate culture dependent studies of microbiomes, DNA molecular size determination and gel extraction	**CO 1**	Capable of performing several techniques used during development of Recombinant DNA
2	To impart hand on experience in basic techniques used in genomics, proteomics and metagenomic studies	**CO 2**	Students can perform isolation of DNA, amplification of any gene by PCR and its analysis by gel electrophoresis
3	To develop students understanding of medical microbiology with hand on experience in the isolation of the bacteria from different sources	**CO 3**	Capable of performing basic techniques of genomics, proteomics and metagenomics
		CO 4	Develop competence to retrieve information from biological databases and integrate these biological information with computational softwares
		CO 5	Developed basic skills for data retrieval, representation, analysis and interpretation
SEMESTER - IV			
Course Code	**MMB401**	**Course Title**	**AGRICULTURAL MICROBIOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to provide the students a basic understanding of agricultural microbiology including agricultural welfare, ecosystem wellness and the fate of microbial pathogens in the agricultural fields.	**CO 1**	Summarize the classification of microorganisms in soil and biogeochemical cycles
2	To know the importance of biofertilizers and biopesticides and to know about various techniques involved in biofertilizers and biopesticides production	**CO 2**	Develop the eco friendly agricultural practices by using microorganisms
3	To give an overview on plant microbe interaction and impart in-depth information on soil and agriculture	**CO 3**	Make use of microorganisms in the production of bio fertilizer
		CO 4	Classify the microbial diseases in crops
		CO 5	Evaluate the plant disease control measure

Course Code	**MMB402**	**Course Title**	**INDUSTRIAL MICROBIOLOGY**

	Course Objectives		Course Outcomes (COs)
1	The major objective of the course is to provide the design of bioreactors, media formulations and factors affecting the industrial production of bio-chemicals along with approaches that can be used for enhanced production	**CO 1**	Understand the microbial biotechnology through handling the microorganisms
2	To analyze the role of micro-organism in production of organic acids, alcohols, wine, vinegar, enzymes, vitamins, antibiotics, amino-acids and steroids	**CO 2**	Application of microbes in recombinant DNA technology for commercial microbial product production
3	To understand the strategies for development of microbial strains, process optimization, large scale production and product recovery will be covered for industrially relevant microbial products and therapeutic proteins	**CO 3**	Exposure on various techniques involve in genetic engineering
		CO 4	Apply the techniques of nanotechnology in biomedical fields
		CO 5	Exposure on Bioethics and biosafety guidelines on government norms of various countries
Course Code	**MMB403**	**Course Title**	**MICROBIAL BIOTECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to understand the microbial biotechnology through handling the microorganisms	**CO 1**	Understand the microbial biotechnology through handling the microorganisms
2	To expose on various techniques involve in genetic engineering	**CO 2**	Application of microbes in recombinant DNA technology for commercial microbial product production
3	To provide knowledge and in-depth study on plant & animal tissue culture techniques, Fermentation techniques & Biosensors, Environment & Energy, Concepts & Scope in Genetic Engineering and Applications of Genetic engineering	**CO 3**	Exposure on various techniques involve in genetic engineering
		CO 4	Apply the techniques of nanotechnology in biomedical fields
		CO 5	Exposure on Bioethics and biosafety guidelines on government norms of various countries.
Course Code	**MMB404**	**Course Title**	**AGRICULTURAL MICROBIOLOGY, FERMENTATION TECHNOLOGY AND MICROBIAL BIOTECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	The major objective of the course is to provide practical knowledge in the isolation and characterization of microbes important in agriculture.	**CO 1**	Know the methods to identify plant pathogens and Isolation of cellulose, xylan and pectin degrading microbes.
2	To understand the plant-pathogen interaction and able to isolate organisms that have potential as biofertilizers	**CO 2**	To know the methods of isolation, identification and mass production of Biofertilizer

3	To set up different fermentation processes with special emphasis on the downstream processing of bio-molecules purification and characterization	**CO 3**	Develop a clear understanding of the multifarious roles of microorganisms in soil, in association with plants and thus in the field of agriculture
		CO 4	Solid-state fermentation utilizing different agro-residues and food waste as substrates for production of different biomolecules viz. citric acid.
		CO 5	Have acquired a detailed knowledge of number of products which are produced by industrial fermentation processes

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To mentor graduates for working globally in core Biotech frontier areas of healthcare, food and nutrition, agriculture, and environment.	**PO1**	Possess the modern molecular Biological and Technical knowledge needed to support Biotechnology research activities.
PEO2	To expertise students in the field of biotechnology and industry needs and providing solutions for product/processes/technology development.	**PO2**	Demonstrate their ability to work effectively in a team.
PEO3	To prepare biotechnology graduates for a successful technical and professional career as per the needs of the biotechnology industry.	**PO3**	Study the use of living organisms and Bioprocess in genetic engineering, Medicine, Agriculture and results in all kinds of Bio products from GMO food to carry out Gene therapy to Autoimmune Disease.
PEO4	To inculcate technical and managerial skills crucial for real time scenarios through the enhancement of problem solving skills and advanced technical documentation ability.	**PO4**	They also explore Bioinformatics in the field of Molecular Biology. Bioinformatics methods are widely used for Gene Mapping, DNA analysis and Protein Samples. Biotechnology and Bioinformatics do a great favour to evolutionary biology and offer new vistas for Drug design and discovery.
PEO5	To equip the students to pursue higher education and research in reputed institutes at national and international level.	**PO5**	Students become an excellent researcher or Scientist or Teacher in Biotechnology field to discover unique products for societal needs with proper Ethical statute.

SEMESTER - I			
Course Code	**MBT 101**	**Course Title**	**Cell Biology**
	Course Objectives		**Course Outcomes (COs)**
1	To review the mechanisms and significance of cell to cell communications.	**CO 1**	To learn the concepts of Cell and Molecular biology and to apply in various research areas confirm or reject the hypothesis.
2	To describe the nature of the endomembrane system and the packaging and transportation of metabolites to desired cell organelles.	**CO 2**	To develop an understanding of various cell signaling pathways and its effect on cells.
3	To understand the causes of aging and cell death in a detailed manner.	**CO 3**	To explore the nature of specialized cells such as muscles and neurons.
		CO 4	To distinguish between mitosis and meiosis and understand its significance in cell development.
		CO 5	To compile an appreciation for all levels of biological organization, including the molecular, cellular, organismal, and systems levels.
Course Code	**MBT 102**	**Course Title**	**Molecular Genetics**

	Course Objectives		Course Outcomes (COs)
1	To Acquaint the basics of Heredity, fundamental concepts of the organization of genome in Eukaryotes.	**CO 1**	Understand the Mendelian Genetics, Gene, Chromosome, its Structure and Organization of Genome
2	To Understand the Molecular Mechanism of Genetic Recombination and Transposable Elements	**CO 2**	Summarize the fundamental mechanism on the Process of Genetic Recombination and Comprehend the role of cis/trans elements in gene regulation of Prokaryotes and Eukaryotes
3	To impart Knowledge on Mutagenesis, Sex Determination and Population Genetics	**CO 3**	Recognize Common Mutations, their Natural Repair Systems, Gene Suppression and Studies to detect Disorders in Human
		CO 4	Applying the knowledge gained through the understanding of Molecular Screening for Sex determination
		CO 5	Understand the Modulation of Gene, Population Genetics and Molecular basis of Evolution in Homosapiens
Course Code	**MBT 103**	**Course Title**	**General Microbiology**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarise the students with microbial identification, classification, nomenclature, and taxonomy.	**CO 1**	Defining the evolution, physiological and growth aspects of microbes. Inculcate the practical knowledge to the students in the field of microbiology
2	TO acquaint with the growth of microbes, structural morphology, classification of different bacterias and staining techniques	**CO 2**	Identifying the knowledge on the various medically important bacteria
3	To study about the microbial identification, general eukaryotic organisms, viruses etc,	**CO 3**	Formulating the central dogma of viral infection and its types.
		CO 4	Categorizing the knowledge in fungal infections.
		CO 5	Interpreting the importance of various microbes from different ecological niches.
Course Code	**MBT 104**	**Course Title**	**Biochemistry**
	Course Objectives		**Course Outcomes (COs)**
1	Educate the students to relate the key principles of Biochemistry at an advanced level	**CO 1**	Relate the key principles of biochemistry at an advanced level
2	Educate the students regarding the importance of biological macromolecules and their role in the living system	**CO 2**	Translate the importance of carbohydrates and their role in living systems as the energy source.
3	Educate the students regarding the biochemical pathways that regulate the metabolic processes and the bioenergetics within the cellular environment.	**CO 3**	Summarize an advanced level of understanding about the structure and function relationship of Proteins. Interpret the correct folding of proteins for their right function
		CO 4	Compare the role of lipids in biological systems and movement of molecules across membranes

		CO 5	Impart an understanding in the students about the metabolic processes and the bioenergetics.
Course Code	**MBT105**	**Course Title**	**Biostatistics**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to have basic statistical knowledge for interpretation of results.	**CO 1**	Construct tables and graphs for data presentation
2	To impart hands-on experiential, overall statistical analysis for analysing the scientific data with suitable analysis package for interpretation.	**CO 2**	Explain measures of central tendency and dispersion along with predicting probability features of experiments
3	To prepare students in portraying the analysing skills with research skills in planning, executing, observing, analysing and interpretation of scientific and comprehensive models.	**CO 3**	Discuss the correlation between different types of data along with related variables.
		CO 4	Test hypothesis and carry out related statistical tests including that of significance.
		CO 5	Analyse and interpret practically, the data acquired in biological experiments, by using statistical methods
SEMESTER - II			
Course Code	**MBT 201**	**Course Title**	**Biochemical Techniques and Enzymology**
	Course Objectives		**Course Outcomes (COs)**
1	To educate the students regarding the various tecniques that are used in modern biology to unserstand the structure and function of biomolecules	**CO 1**	Students will gain knowledge regarding the various techniqoes that are employed to study biomolecules in a qualitative and quantitative manner
2	To enlighten the studenst about the various techniques employed to seperate and purify biomolecules.	**CO 2**	Students will understand and will be able to apply the techniques employed to gain insight about the structural organization of biomolecules
3	To educate the students regrding the principles of enzyme activity, enzyme kinetics, as well as the mechanistic aspects of enzyme action.	**CO 3**	The students will develop tproficiency regarding important biochemical techniques like chromatography and electrophoresis as well as their applications.
		CO 4	The students will gain understanding regarding the basic principle of Enzymatic action and teh factors govorning them.
		CO 5	The students will develop proficiency regrding the mechanistic approaches of enzyme action. They will also develop expertise in different aspects of enzyme kinetics and enzyme inhibition.
Course Code	**MBT 202**	**Course Title**	**Molecular biology**
	Course Objectives		**Course Outcomes (COs)**

1	To describe the mechanisms by which protein complexes repair different forms of DNA damage.	**CO 1**	To develop a deep understanding of various kinds of interactions stabilizing the DNA and its kinetics.
2	To comprehend the complex organization of transcriptional machinery in higher eukaryotes.	**CO 2**	To predict the effect of histone modifications in the gene expression of eukaryotes.
3	To review the gene silencing methods and its application in research.	**CO 3**	To know the current techniques and analysis methods in Molecular Biology.
		CO 4	To analyze how endogenous biological processes such as transposition, site-specific recombination and the CRISPR-Cas9 system are being used to alter eukaryotic genome.
		CO 5	To understand the operation of gene expression by small RNAs.
Course Code	**MBT 203**	**Course Title**	**Immunology & Immuno-technology**
	Course Objectives		**Course Outcomes (COs)**
1	The students will be able to identify the cellular and molecular basis of immune responsiveness.	**CO 1**	Relate and discuss the role of the immune cells in health and disease.
2	The students will be able to describe immunological response and how it is triggered and regulated.	**CO 2**	Outline the basic mechanisms that regulate immune responses and maintain tolerance. Summarize how the innate and adaptive immune system collaborate to fight infections
3	The students will be able to transfer knowledge of immunology into clinical decision-making through case studies presented in class.	**CO 3**	Translate the understanding of basic mechanisms into identification of biological, clinical and therapeutic implications
		CO 4	Construct the knowledge of immunology into clinical decisionmaking through case studies.
		CO 5	Justify the experiments and techniques employed in relevant fields of immunological research
Course Code	**MBT 204**	**Course Title**	**Environmental Biotechnology**
	Course Objectives		**Course Outcomes (COs)**
1	To impart the awareness on environmental monitoring with the fundamental information on sources of energy, pollution, sources of pollution, important terminilogies and concepts used in environmental science.	**CO 1**	The student will be able to evaluate the potential of biodegradation of organic pollutants, taking microbial and physical/chemical environments, as well as the hemicalstructure of the compound itself, into consideration
2	To educate on the management of water, waste water treatment practices, biomining, biodiesel sources and generation, bioremediation, and biowaster treatment.	**CO 2**	Students will understand the phenomenon of phytoremediation for the decontamination of soil and water, wetlands as treatment processes, biofilms/biofilters for vapor-phase wastes, and composting.
3	To enable on the analysing samples from different pollutant sources, strategical planning for overcoming pollution, results interpretations, designing novel biowaste treatment methods, and	**CO 3**	Students will learn about the environmental quality evaluation, monitoring, and remediation of contaminated environments.

	attending the global environmental problems with problem solving method.		
		CO 4	Students will learn about the use of biosensors in environmental analysis, environmental engineering.
		CO 5	Students will understand the problems and serious repurcussions on environment and learn to overcome by using the knowedge gained by the course work.
Course Code	**MBT 205**	**Course Title**	**Bioinformatics**
	Course Objectives		**Course Outcomes (COs)**
1	To prepare the students with basic knowledge of bioinformatics tools and techniques related areas for delineating from the pathway.	**CO 1**	Infer the solutions to basic bioinformatics problems discuss the use of bioinformatics in addressing a range of biological questions.
2	To enable with the understanding of genetic sequence, arrangement, analysis, local search, algorthmic tools usage, designing primers, parameters to be analysed, and programmes to be used.	**CO 2**	Distinguish how bioinformatics methods can be used to relate sequence, structure and function.
3	To familiriase with the tools usage on structure, pattern, asssociation, homology, analogy, BLAST search, Multiple sequence alignment, primer designing, preparation of evolutionary diagram, and phylogenetic tree.	**CO 3**	Categorize central bioinformatics data and information resources.
		CO 4	Model the principles and algorithms of pairwise and multiple alignments, and sequence database searching.
		CO 5	Relate pattern matching in bio molecular sequences. Justify how evolutionary relationships can be inferred from sequences (phylogenetics).
SEMESTER - III			
Course Code	**MBT 301**	**Course Title**	**Plant and Agricultural Biotechnology**
	Course Objectives		**Course Outcomes (COs)**
1	To impart the technical knowledge of in vitro culturing plant cells and Recombinant DNA techniques	**CO 1**	Learn the principles and technical advances behind the in vitro culture of plant cells and rDNA techniques
2	To educate on the crop improvement strategies and techniques of Plant transformation methods for yield improvement and stress tolerance traits.	**CO 2**	Learn the applications of plant transformation for improving the productivity and performance of plants under biotic and abiotic stresses
3	To get acquaint with the latest technologies, methodologies, requirements in handling instruments, diagnostic tools in line with the day to day happenings.	**CO 3**	Understand the use of antisense technologies for improvement of crop Plants.
		CO 4	acquaint with principles, technical requirement, scientific and commercial

			applications in Plant Biotechnology,
		CO 5	Support methodologies in plant tissue/cell culture to plant improvement, as well as DNA handling with PCR-based detection diagnostic tools.
Course Code	**MBT 302**	**Course Title**	**Animal Biotechnology**
	Course Objectives		**Course Outcomes (COs)**
1	To Educate students to the Principles, Practices and Applications of Animal Biotechnology, Genetic Transformation and Transgenesis of Animals and its Products.	**CO 1**	Acquire knowledge in Primary Cell Culture Techniques, Maintenance of Cell Line, Scaling up of Cell Culture and the Production.
2	To inculcate the Applications of Stem Cells, Tissue Engineering in Medical Field and Assisted Reproductive Technology in Livestock and Humans	**CO 2**	Understand about the Stem Cells, Tissue Engineering, Transplantation and to Culture Cells in 3D Methods.
3	To impart Knowledge on Bioethics, Biosafety, Animal Models, GM Crops and its implications.	**CO 3**	Understand about Transgenesis, Cloning Techniques, In vitro fertilization and Improvement of Livestock
		CO 4	Understand the Screening, Characterization and Scale-up of Pharmaceutical Products from Mammalian and Animal Cells
		CO 5	Understand the various Biosafety Regulations in Biotechnology, Comprehend on Ethical issues of Human Genome Project and Ethical Races, Get familiarized with GM Crops, GMP, GLP, IPR and Patent Procedures implications.
Course Code	**MBT303**	**Course Title**	**Genetic Engineering**
	Course Objectives		**Course Outcomes (COs)**
1	To demonstrate the innovative utilization of manipulating enzymes, various cloning and expression vectors and analysis of genomic sequences.	**CO 1**	Become familiar with the tools and techniques of genetic engineering DNA manipulation enzymes, genome and transcriptome analysis and manipulation tools, gene expression regulation, production and characterization of recombinant proteins.
2	To interpret the applications and techniques of genetic engineering in biotechnological research.	**CO 2**	Exposure of students to the applications of genetic engineering in biological research.
3	To educate the students in strategizing research methodologies employing recombinant DNA techniques.	**CO 3**	Perform basic genetic engineering experiments at the end of course.
		CO 4	Acquire knowledge of advances in biotechnology- healthcare, agriculture and environment cleanup via recombinant DNA technology.
		CO 5	Encourages self entrepreneurship skills by learning skills in various tools and techniques

			of biotechnology with enhanced application areas of research.
SEMESTER - IV			
Course Code	**MBT401**	**Course Title**	**Bioprocess Technology**
	Course Objectives		**Course Outcomes (COs)**
1	To bring about the basic understanding on the bioprocess technology usage by introducing the required terminologies, concepts, principles in understanding formulation of medium, fermentation process, bioreactors,and different different processing reactions.	**CO 1**	To know about principle of growth, importance of maintaining the cultures, techniques used for enhancing the yield and role of various factors on the growth of biological strains
2	To enable for acquantation with methods of immobilization and biotransformation, production of industrially important products and topics related to Intellectual Property Rights and Entrepreneurship.	**CO 2**	To learn the processes of primary and secondary metabolite production with certain examples
3	To imbibe the primary and applied skills and knowledge required for usage of different mediums, fermentation protocols, downstream processing requirements, novel products usage at industries, and laws with opportunities associated with new ventures.	**CO 3**	Collect the proficient knowledge of design of fermenter and operation of fermentation process, methods of translation of laboratory data to pilot scale process
		CO 4	To imbibe understanding on Bioreactors, Industrial downstream processing, immobilization and biotransformation techniques.
		CO 5	To educate on the industrially important products and gain knowledge of Intellectual property rights and entrepreneurship skills to become a successful beginner commercial venture.
Course Code	**MBT402**	**Course Title**	**Medical and Pharmaceutical Biotechnology**
	Course Objectives		**Course Outcomes (COs)**
1	To get a broad understanding of the value of biomedical research for biotechnological applications.	**CO 1**	The students will gain both theoretical and practical knowledge onthe aspects of various pathogens and genes on overall health of human body.
2	To get acquainted with concepts of cancer biology and nanotechnology	**CO 2**	They will learn the basic and detailed knowledge of what drugs are and how to manifest the symptoms within the body.
3	To understand the concepts of drug and its receptors along with their applications in the manufacturing of biopharmaceuticals.	**CO 3**	They will also get an enhanced knowledge and functions of various regulatory agencies like FDA, IRBS and ICH.
		CO 4	Explain the components of, and challenges in development of biologicals and drugs in the pharmaceutical and biotechnology industry.

		CO 5	Describe organization & processes in biotechnology and pharmaceutical industry for their operations and research and development.
Course Code	**MBT403**	**Course Title**	**Genomics & Proteomics**
	Course Objectives		**Course Outcomes (COs)**
1	To educate with the identification justification of the results of various methodologies used in the latest perspectives of biochemistry, molecular biology and biomedicine.	**CO 1**	Communicate and justify conclusions clearly and unambiguously to both specialist and non-specialist audiences. Develop critical reasoning within the subject area and in relation to the scientific or business context.
2	To impart the necessary knowledge required in identification and description of emerging omics and molecular required	**CO 2**	Identify and describe the different components in prokaryotic and eukaryotic genomes and proteomes. Identify molecular mechanisms responsible for diseases.
3	To equip with skills required for communication, analysing, executing, and justifying the experiments with suitable reasoning and problem solving capacity for entrepreneurship opportunities.	**CO 3**	Use the different methodologies, techniques and tools commonly used in genome sequencing, assembly and annotation.
		CO 4	Use the different methodologies, techniques and tools commonly used in proteomics and RNAmics and metabolomics.
		CO 5	Integrate contents in biochemistry, molecular biology, biotechnology and biomedicine from a molecular perspective.

NAME OF THE PROGRAMME	**MASTER OF SCIENCE (Applied Genetics)**
PROGRAMME CODE	**IAMOS03**

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To promote a profound and integrated comprehension of branches of Genetics and their implication towards the advancement of health and biological sciences.	**PO1**	Able to identify and solve problems associated with the different types of human, animal and plant diseases.
PEO2	To understand how genetic concepts affect broad societal issues including health and disease, food and natural resources, environmental sustainability, etc.	**PO2**	Develop an in-depth understanding of the principles of genetics, cytogenetics, developmental genetics, molecular mechanisms of cellular physiology, plant and microbial genetics, bioinformatics, human genetics etc., to obtain a sound knowledge of various fields of genetic study
PEO3	To develop insight into the mathematical, statistical, and computational basis of genetic analyses that use genome-scale data sets in systems biology settings	**PO3**	Enable to think analytically and creatively to solve problems, judge arguments and make decisions in scientific and other contexts.
PEO4	To enable comprehensive and detailed understanding of genetic methodology and how quantification of heritable traits in families and populations provides insight into cellular and molecular mechanisms.	**PO4**	Develop a commitment to life-long learning and career pursuits within the life sciences disciplines.
PEO5		**PO5**	Develop ability to integrate the basic knowledge in genetics with other related disciplines

SEMESTER - I			
Course Code	**MGE 101**	**Course Title**	**Cell Biology**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to comprehend the structure and functions of various organelles and that extracellular matrix.	**CO 1**	Comprehend and relate the structure and functional aspects of various cell organelles.
2	To acquire knowledge on the cytoskeletal elements and the mechanism of various signaling pathways.	**CO 2**	Cognize and contrast the interaction of a cell with extracellular proteins and other cells.
3	To acquaint yourself with various techniques used in cell and molecular biology and their applications in resolving scientific biological problems.	**CO 3**	Describe and demonstrate the familiarity with the components of cytoskeletal elements.
		CO 4	Understand the basic principles of signal transduction mechanisms and infer the role of different extracellular signals and receptors in cellular communication.
		CO 5	Elucidate the principles of various techniques in cell and molecular biology.
Course Code	**MGE 102**	**Course Title**	**Basic Genetics**

	Course Objectives		Course Outcomes (COs)
1	To obtain an in-depth knowledge of various patterns of inheritance and the experimental and practical basis of those concepts	**CO 1**	Students gained knowledge of various patterns of inheritance in unicellular and multicellular organisms.
2	To understand cell-cell hybridization techniques,linkage, crossing over and principle of construction of linkage maps	**CO 2**	Acquire knowledge on hybridization techniques, crossing over, linkage and linkage and chromosome mapping.
3	To apply statistical and biometrical methods of analysis in genetics research by using Chi-Square test, Students' t test, probability, Anova etc..,	**CO 3**	Analyse and apply various non-mendelian inheritance patterns in the form of gene interactions, extranuclear inheritance of traits of various organisms.
		CO 4	Apply statistical and biometrical methods of analysis like Chi square test in genetics research
		CO 5	Derive an understanding of various mechanisms of sex determination
Course Code	**MGE 103**	**Course Title**	**Essentials of Cytogenetics**
	Course Objectives		**Course Outcomes (COs)**
1	To gain an in-depth knowledge of concepts and essentials of cytogenetics	**CO 1**	Students are able to build an elaborate knowledge of various concepts in Cytogenetics
2	: To obtain an in-depth knowledge of polytene chromosomes, lampbrush chromosomes and B chromosomes and understand their evolutionary significance and their role in development	**CO 2**	Students gain an in-depth knowledge of various special types of chromosomes and understand their evolutionary significance and function.
3	To carry out a detailed analysis of Evolution of sex chromosomes and evolution of new karyotypes	**CO 3**	Students are able to perform a detailed analysis of Evolution of X and Y chromosomes and the chromosomal mechanics in the evolution of new karyotypesStudents are able to perform a detailed analysis of Evolution of X and Y chromosomes and the chromosomal mechanics in the evolution of new karyotypes
		CO 4	Students obtain a sound knowledge of chromosome organization and structure, Explain and identify the differences between types of chromatin and the evolutionary significance of heterochromatin and the chromatin modification mechanisms in heterochromatin
		CO 5	Students are able to provide experimental evidence for the chromosome theory of inheritance and Chromosomal mechanics in speciation processes
Course Code	**MGE 104**	**Course Title**	**Biological Chemistry**
	Course Objectives		**Course Outcomes (COs)**

1	To enable to understand and apply the biochemical aspects in biological systems like physiological and metabolic events.	**CO 1**	Students developed ability to apply basic principles of chemistry to biological systems and molecular biology.
2	To enhance knowledge in the quantitative and qualitative estimation of biomolecules.	**CO 2**	Able to relate and experiment various interrelated physiological and metabolic events.
3	To instill knowledge in various bichemical concepts and their applications in biological research perspectives.	**CO 3**	Understand and experiment the fundamental concepts of biology, chemistry and biochemisty
		CO 4	Acquire knowledge in the quantitative and qualitative estimation of biomolecules and critically analyze the inheritance pattern in the offsprings.
		CO 5	Students obtained knowledge about the influence and role of structure in reactivity of biomolecules and research the application of the same.
Course Code	**MGE 105**	**Course Title**	**Cellular Physiology**
	Course Objectives		**Course Outcomes (COs)**
1	To Give a detailed description of the cell environment, buffering systems, water, gases and blood pressure regulation. A thorough knowledge of Radiations in the cell environment and their effects on cells.	**CO 1**	Students gain insight into the cell microenvironment, buffering systems, and the homeostasis of water, gases and blood pressure and knowledge of Radiation effects on cells.
2	To obtain insight into ion channels and carriers and movement of solvent and solutes across cell membrane	**CO 2**	Students can illustrate the structure of Plasma membrane and permeability to water and solutes, partition coefficient and permeability
3	to obtain an in-depth knowledge of Excitability and contractility of cells, synaptic transmission of action potentials, salutatory conduction and an analysis of effects of various factors on action potential of nerve cells	**CO 3**	Students perform a detailed study of Measuring membrane potential, resting membrane potential and action potential, voltage clamping use of Nernst equilibrium potential and Goldman Constant Field equations
		CO 4	Students demonstrate an an in-depth knowledge of ion channels and carriers and movement of solvent and solutes across cell membrane
		CO 5	Students demonstrate an an in-depth knowledge of ion channels and carriers and movement of solvent and solutes across cell membrane

SEMESTER – II			
Course Code	**MGE 201**	**Course Title**	**Molecular Biology**
	Course Objectives		**Course Outcomes (COs)**

1	To provide comprehensive understanding of salient features and structure of nucleic acids.	**CO 1**	Compare the genome structure and function of eukaryotic cells with that of simpler prokaryotic cells.
2	To impart elaborate understanding of the key events of prokaryotic and eukaryotic replication, transcription and translation.	**CO 2**	Illustrate the structural organization of genes and the control of gene expression.
3	To gain in-depth knowledge on the mechanism of gene regulation and expression.	**CO 3**	Distinguish between positive and negative control of gene expression.
		CO 4	Apply the knowledge of various operons in formulating and executing experiments involving gene expression studies to address biological problems.
		CO 5	Apply the knowledge and link rapid advances in molecular biology to comprehend the mechanisms involved in various genetic diseases
Course Code	**MGE 202**	**Course Title**	**Genetics of Development**
	Course Objectives		**Course Outcomes (COs)**
1	To perform a detailed analysis of molecular events of Oogenesis and spermatogenesis.	**CO 1**	Students perform a detailed analysis of molecular events of Oogenesis and spermatogenesis and Hormonal regulations
2	To analyze Cell fate and pattern formation, molecular analysis of basic body plan and understand the genetics of axis specification in Drosophila.	**CO 2**	Students are able to provide an in-depth account of Molecular events of fertilization and genetics of multicellularity cleavage in early development
3	To give an account on Stem cells, Embryonic stem cells and therapeutic cloning, transgenic stem cells and Regeneration Therapy and to describe Cellular aging and death.	**CO 3**	Students can account of Early vertebrate development and Morphogenetic and cell movement.
		CO 4	Students give an account on Stem cells, Embryonic stem cells and therapeutic cloning, transgenic stem cells and Regeneration Therapy. A description of Cellular aging and death, Caspases, Cellular death receptors, Apoptosis and mechanism of Apoptosis.
		CO 5	: Students perform a detailed analysis of Cell fate and pattern formation, molecular analysis of basic body plan, Genetics of axis specification in Drosophila, C. elegans, Amphibians and mammals

Course Code	**MGE 203**	**Course Title**	**Mutation and Cancer Biology**
	Course Objectives		**Course Outcomes (COs)**

1	To give a description of Basic concepts of mutation, mutagenesis and mutagenic agents and their effects.	**CO 1**	Students gain knowledge of Basic concepts of mutation, mutagenesis and mutagenic agents and their effects, effects of physical and chemical mutagens
2	To give a detailed analysis of DNA damage and repair mechanisms and DNA repair diseases.	**CO 2**	Students perform a detailed analysis of DNA damage and repair mechanisms and an account of DNA repair defects in Human diseases
3	To gain an in-depth view of Cancer cytogenetics and cancer genetics.	**CO 3**	Students perform an in-depth analysis of Cancer cytogenetics and cancer genes-oncogenes, tumour suppressors, role of P53 in cancer induction
		CO 4	Students gain an understanding of tumor immunology, Mechanism of immune response to cancer, cancer diagnostics & therapy, Biochemical, histological and radiological methods for cancer diagnosis. An analysis of Chemotherapy and radiotherapy strategies for cancer treatment, Immunotherapy of cancer
		CO 5	Students are introduced to Cancer biology, mechanism of Carcinogenesis, types of cancers, characteristics of cancer cells
Course Code	**MGE 204**	**Course Title**	**Evolutionary Genetics**
	Course Objectives		**Course Outcomes (COs)**
1	To make the Students to understand Biochemical and Genetic basis of formation of new species and inheritance of characteristics.	**CO 1**	Describe the adaptive features of both primary and secondary aquatic vertebrates, desert reptile and mammals and also experiment the evolutionary aspects.
2	To enable the studens to gain absolute knowledge on Darwinism, origin of speices, modern synthetic theory and various theories of evolution.	**CO 2**	Elucidate the Chemical basis of origin of life and experiments for supporting that idea.
3	To gain in depth knowledege on adaptive variation in the process of evolution.	**CO 3**	Describe and solve the mystery of the origin of new species by understanding the concepts of theory of Evolution considering Darwinism and Modern Synthetic theory.
		CO 4	Expound understanding of adaptive significance of coloration and mimicry with respect to environmental influence and the formation of variations in the expression of the characters in the process of evolution.
		CO 5	Describe the Isolating mechanisms, modes of speciation, Biological & Evolutionary Species

Course Code	**MGE 205**	**Course Title**	**Bioinformatics and Biostatistics**
	Course Objectives		**Course Outcomes (COs)**

1	To enable the students to understand the concepts and principles of biology, computer science, mathematics and Bioinformatics.	**CO 1**	Able to understand and apply the concepts of Bioinformatics.
2	To facilitate the students to enumerate biological macromolecular structures	**CO 2**	Understand the basic principles of biology, computer science and mathematics to address complex biological problems
3	To make the students understand different methods to characterise and manage the different types of Biological data.	**CO 3**	Students are able to enumerate biological macromolecular structures and structure prediction methods
		CO 4	Capable of analysing and understanding different types of protein and other organism specific databases
		CO 5	Able to explain about the methods to characterise and manage the different types of Biological data.
SEMESTER - III			
Course Code	**MGE 301**	**Course Title**	**Genetic Engineering**
	Course Objectives		**Course Outcomes (COs)**
1	To provide adequate knowledge on salient features and applications of tools used in RDT.	**CO 1**	Elucidate the features of various enzymes used in genetic engineering.
2	To enable students to understand the methodology used in construction of recombinant DNA.	**CO 2**	Contrast the cloning and expression vectors with respect to their characteristic features.
3	To facilitate students to obtain deeper insight into the various techniques used in genetic engineering.	**CO 3**	Explain the construction of genomic and c-DNA library and their applications.
		CO 4	Comprehend and illustrate the steps and strategies involved in genetic manipulation.
		CO 5	Analyze and implement the hybridization techniques in construction of recombinant DNA.
Course Code	**MGE 302**	**Course Title**	**Microbial and Plant genetics**
	Course Objectives		**Course Outcomes (COs)**
1	To gain insight into Microbial Genetics, the generalized life cycles of microbes, Bioremediation and phytoremediation, Biosensors.	**CO 1**	Students take an in-depth look into Microbial Genetics, an Over view of generalized life cycles of microbes, Non- sexual variation, Tetrad analysis and linkage detection, Bioremediation and phytoremediation, Biosensors.
2	To study the significance of plants as genetic model systems and gene regulation in plants.	**CO 2**	Students perform an Over view of plants as genetic model systems, gene regulation in plants, ABC model of regulation of flower development, Development of dorsal and ventral asymmetry in leaves. Role of KNOX genes in evolution of compound leaf, Mechanism of self-incompatibility in plants

3	To perform an in-depth analysis of Molecular and genetic basis of Crown Gall disease development and the Genetic basis of disease resistance and susceptibility in plants.	**CO 3**	Students analyze the Molecular and genetic basis of Crown Gall disease development, Genetic basis of disease resistance and susceptibility in plants. Molecular basis of host pathogen interaction, Mechanism of T-DNA transfer and their utility in production of transgenic plants.
		CO 4	Students are able to provide a description of Protoplast technology- Isolation, maintenance and viability tests for protoplast, methods of protoplast fusion and its application
		CO 5	Students give an account on Biofertilizers, Production and beneficial roles of Rhizobium, Azatobacter blue green algae, mycorizal fungi and Azolla
Course Code	**MGE 303**	**Course Title**	**Human Genetics**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students to grasp the fundamentals of gene therapy, problem solving in the fields of Science, Medicine and Society.	**CO 1**	Students can synthesize and incorporate the fundamentals of gene technology in order to understand how such technology impacts human.
2	To gain knowledge and apply the techniques of principles of inheritance of human traits, diseases related to genes and chromosomes.	**CO 2**	Employ the scientific method for the acquisition of new knowledge to solve problems regarding human genome, diseases and inheritance pattern.
3	To familiarize with immune system and the importance of antibody and cell mediated immune responses in defence mechanism to defend human from various pathogenic infections and diseases.	**CO 3**	Apply to real life situations and one's life the principles of human heredity.
		CO 4	Students can access and apply historical and current knowledge regarding human heredity, and understand how such knowledge has influenced law, medicine and society.
		CO 5	Understand the pattern of immune response against various pathogenic agents and research and apply the concepts in the field of Clinical genetics.
Course Code	**MGE 304**	**Course Title**	**Psychology and Life**
	Course Objectives		**Course Outcomes (COs)**
1	To develop a knowledge base of human behaviour across the life span	**CO 1**	Apply psychological principles to everyday life in understanding and enhancing self efficacy.
2	Awareness of the different fields of psychology and the application of the principles of psychology in everyday life for better understanding of holistic human behaviour and personality	**CO 2**	Evaluate misconceptions or erroneous behavioural claims based on evidence from psychological science

3	To explore how the physical, mental and emotional factors influence individual development and behaviour	**CO 3**	To familiarize and learn concept of human behaviour in the social world
		CO 4	Interpret how memories are formed and stored and know the clear outlook on learning theories and a better insight on how people absorb and retain new information
		CO 5	To encourage students to know the warning signs and the causal patterns of mental health issues and able to identify the strengths and weaknesses of employees to place right men on right job
SEMESTER - IV			
Course Code	**MGE 401**	**Course Title**	**Genomics and Proteomics**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the terms-genomics, proteomics and other omics and their significance	**CO 1**	Students analyze the various subfields of genomics, proteomics and other omics including transcriptomics, metabolomics and their significance
2	To perform an analysis of Gene prediction- experimental methods and computer based methods.	**CO 2**	Students perform an Analysis of Gene prediction- experimental methods and computer based methods, gene prediction rules and various softwares used for prediction.
3	To describe mapping techniques, sequencing methods and functional analysis techniques.	**CO 3**	Students are able to provide a description of the experimental methods used in various fields of genomics including mapping techniques, sequencing methods and functional analysis techniques.
		CO 4	Students take an indepth look into the various genome databases, the annotation of genomes and taxonomy and significance of genomes of various model organisms.
		CO 5	Students can account on the Concepts of evolution of genomes and the hypotheses available to explain the evolution of genomes in lifeforms.
Course Code	**MGE 402**	**Course Title**	**Immunology and Haematology**
	Course Objectives		**Course Outcomes (COs)**
1	To empower the students to understand the different cells and tissues involved in defence mechanism of defending humanbeings from diseases caused by various microorganisms.	**CO 1**	Acquire a broad and coherent theoretical and technical knowledge of cells and tissues of immune system.
2	To enable the students to understand the normal and inappropriate immune responses and their consequences and also the importance of vaccination in the process of protecting human from infectious diseases.	**CO 2**	Elucidate pathologies associated with an inappropriate immune response which leads to autoimmune disorders. Also to understand and analyse the importance of vaccination in defending human beings from various infectious diseases.

3	To facilitate the students to understand the apply the knowledge of hemolytic disorders and also to enable them to acquire knowledge in setting up of blood bank and blood safety.	**CO 3**	Comprehend a broad and coherent theoretical and technical knowledge of haematology and hemolytic disorders. Also to critically analyse functions of blood cells and platelets in defence mechanism.
		CO 4	Acquisition of indepth knowledge on different types of blood groups and able to apply compatibility testing and antihuman globulin test.
		CO 5	Understand and apply the acquired knowledge on blood transfusion, administration of blood bank and blood safety.
Course Code	**MGE 403**	**Course Title**	**Biomedical Genetics**
	Course Objectives		**Course Outcomes (COs)**
1	To acquaint students with various genetically inherited diseases, diseases caused by viruses, bacteria, fungi and protozoa.	**CO 1**	Comprehend and illustrate the role of genetic and genomic assessment in clinical practice, including applications in disease screening, diagnosis, and treatment.
2	To enable students to comprehend how basic pharmacokinetic processes are defined, expressed and affected; how pharmacokinetics together with pharmacodynamics determine the effect intensity and effect duration of a drug.	**CO 2**	Understand and correlate the relationship between pharmacokinetics and pharmacodynamics to prevent adverse medication implications in patients and to relate the concepts with the best and advanced clinical practice to augment drug delivery care.
3	To enable students to demonstrate mastery of cutting edge research approaches in developing various molecular therapeutics and understand the process of drug development.	**CO 3**	Outline the process of drug development and account for critical factors and decision points in drug development process.
		CO 4	Acquaint with how nanotechnology is implemented in treatment of various diseases.
		CO 5	Integrate novel biomedical knowledge and emerging technologies in professional practice for enhanced health care.
Course Code	**MGE 404**	**Course Title**	**Plant and Animal Biotechnology**
	Course Objectives		**Course Outcomes (COs)**
1	To provide students new knowledge and widening of the knowledge of handling of classical and modern plant biotechnology processes, including breeding of healthy plants, plants with improved characteristics and plants for biomolecule production.	**CO 1**	Apply knowledge acquired in plant breeding which is of disease resistant, healthy and improved characteristics.
2	To facilitate the students to obtain skills on biotechnological processes such as cell and tissue culture, gene transfer in plants and also applicative value in pharmaceutical and food industry, in agriculture and in ecology.	**CO 2**	Construct the techniques involved in cell and tissue culture and gene transfer in plants and also its applications in pharmaceutical, agriculture and food industries.

3	To illustrate the techniques, procedure and growth patterns of animal tissue and organ culture, cell lines and commercial applications of animal tissue culture.	**CO 3**	Illustrate and experiment the techniques, procedure and growth patterns of animal cell culture.
		CO 4	Outline the history and structure of animal cell and describe the in vitro applications of animal cell culture.
		CO 5	Construct the techniques in production of cloned animal and its applications. Also to make the students to understand the uses of animal cells in vaccine production.

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	Apply chemical principles and theories and acquire skills in synthesis, instrumentation and characterization.	**PO1**	Understand and appreciate the importance of Chemistry as a central science by the knowledge of its diverse applications.
PEO2	Apply laboratory skills and critical thinking to develop applications for solving Industry oriented problems.	**PO2**	Have sound knowledge of the fundamental and advanced concepts of applications of chemical and scientific theories.
PEO3	Function as a team member and develop projects in a multi-disciplinary environment by emulating leadership skills.	**PO3**	Acquire experimental skills required for employment in chemical and pharmaceutical industry.
PEO4	Work productively as chemistry professional by adopting to environment with lifelong learning and adhering to ethical standards and apply the knowledge acquired for the improvement of the society.	**PO4**	Develop analytical and problem-solving skills
PEO5	Organic Chemistry graduates nurtured with multidisciplinary knowledge will be a successful leader with quality to handle all kind of diverse circumstances.	**PO5**	Acquire the ability to synthesize, separate and characterize compounds using laboratory and instrumentation techniques.

SEMESTER - I			
Course Code	**MCH-101**	**Course Title**	**Inorganic Chemistry-1**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basics of atomic structure and bonding in inorganic compounds	**CO 1**	Appreciate the different theories of chemical bonding and be able to apply these theories to solve structures
2	The chemistry of non-metal containing compounds such as boranes, borazines, sulphur nitrogen	**CO 2**	Correctly write the structures of heteropoly, isopoly anions and metal carbonyl clusters and relate the structure to chemical reactivity
3	The structure and applications of isopoly and heteropoly anions of vanadium, molybdenum and tungsten and metal carbonyl clusters	**CO 3**	Understand the three dimensional structure of silicates and catalytically important molecules such as aluminosilicates (zeolites) and apply their knowledge towards selectivity
		CO 4	Choose an appropriate solvent for carrying out any chemical reaction based on the Choose an appropriate solvent for carrying out any chemical reaction based on the principles of acids and bases.
		CO 5	understand the nuclear models.
Course Code	**MCH-102**	**Course Title**	**Organic Chemistry**
	Course Objectives		**Course Outcomes (COs)**
1	Basic concepts of bonding, structures, resonance, aromaticity, hyperconjugation and tautomerism in organic molecules	**CO 1**	Apply the concepts of bonding, resonance, aromaticity, hyperconjugation and tautomerism to higher organic compounds
2	Generation, structure, stability and reactivity of reactive intermediates	**CO 2**	Predict the products, identify reaction intermediates and propose suitable mechanism for organic reactions
3	Synthetic molecular receptors, their significance and functions	**CO 3**	Identify stereogenic centres, recognize enantiomers, diastereomers, meso compounds, draw stereochemical structures, and provide R/S designations of stereocenters
		CO 4	Draw stable conformations for substituted cyclic compounds, fused and bridged rings
		CO 5	Understand the host-guest interactions in molecular receptors
Course Code	**MCH-103**	**Course Title**	**Physical Chemistry-1**
	Course Objectives		**Course Outcomes (COs)**
1	Mathematical framework for thermodynamics of open system	**CO 1**	Account for the physical interpretation of distribution functions
2	Concepts in classical laws of thermodynamics and their application, postulates of statistical mechanics, statistical interpretation of thermodynamics, ensembles	**CO 2**	Use kinetic data to check the viability of a mechanism

3	Statistical mechanics are used to develop the statistics for Bose-Einstein, Fermi-Dirac and photon gases	**CO 3**	Understand the concept of activation energy and its calculation from kinetic data
		CO 4	Account for the physical interpretation of partition functions and be able to calculate Bose-Einstein statistics.
		CO 5	Define and explain surface and interfacial phenomenon
Course Code	**MCH-104**	**Course Title**	**Analytical Chemistry**
	Course Objectives		**Course Outcomes (COs)**
1	Principles, terminologies, types and applications of chromatography	**CO 1**	Organize, analyze and interpret data using the tools learned in an ethically responsible
2	Optical and thermal methods of chemical analysis; principle, instrumentation and applications.	**CO 2**	Describe and adopt suitable separation techniques
3	Various concepts of volumetric analysis - equivalence point, theory of indicators, use of chemical equations and equilibrium constants.	**CO 3**	Interpret data obtained from optical and thermal methods of chemical analysis
		CO 4	Write balanced chemical equations, plot titration curves.
		CO 5	calculate concentrations of analyte from neutralization, redox, complexometric, precipitation and gravimetric titrations.
Course Code	**MCH-105**	**Course Title**	**Mathematics for Chemists (Soft Core)**
	Course Objectives		**Course Outcomes (COs)**
1	This course will introduce the students to various basic mathematical methods for chemists. The methods involve probability and statistics, linear algebra, vectors and matrices. first and second order differential equations and their solution.	**CO 1**	Students learn Differential Equations.
2	The concepts of mathematics can improves the critical thinking and problem solving capacity	**CO 2**	Applications of advanced integration in chemistry
3	Develop and maintain problem solving skills and understanding basic proofs	**CO 3**	Students learn how to apply probability and statistics chemistry.
		CO 4	Matrices and Determinants applications in solving problems in chemistry
		CO 5	Students learn Algebra
SEMESTER - II			
Course Code	**MCH-201**	**Course Title**	**Inorganic Chemsitry**
	Course Objectives		**Course Outcomes (COs)**
1	Kinetic and thermodynamic parameters as a measure of stability of coordination compounds	**CO 1**	Understand and apply the principles of stability of complexes in synthesis of new molecules

2	Advanced theories of bonding in complexes along with their stereochemistry.	**CO 2**	Relate the structure of complexes to their properties.
3	Electronic spectroscopy and magnetic properties of coordination compounds.	**CO 3**	Use electronic spectroscopy as an analytical tool in the structural elucidation of complexes
		CO 4	Interpret the magnetic properties of transition metal complexes based on magnetic measurements
		CO 5	Able to study photochemical and photophysical phenomena
Course Code	**MCH 202**	**Course Title**	**Organic chemistry-II**
	Course Objectives		**Course Outcomes (COs)**
1	Mechanisms and evidences for aromatic electrophilic and nucleophilic substitutions,addition reactions, elimination reactions and rearrangements	**CO 1**	Explain the mechanistic pathway for aromatic substitutions, addition reactions, elimination,reactions and rearrangements.
2	Effect of substrate structure, leaving group and attacking species in the above reactions.	**CO 2**	Predict the stereochemistry of the products formed.
3	The orientation and stereochemistry of the product formed.	**CO 3**	Design reactions with the help of name reactions and rearrangements and use of suitable reagents
		CO 4	Demonstrate concepts of Carbanions, Enamines and Ynamines and explain their stability, reactivity, selectivity and predict the products.
		CO 5	Specify neighbouring group participation (NGP) and predict the products in reactions involving NGP. Explain different mechanisms of ester and amide hydrolysis.
Course Code	**MCH-203**	**Course Title**	**Physical chemistry**
	Course Objectives		**Course Outcomes (COs)**
1	The kinetics and thermodynamics of electrochemical reactions	**CO 1**	Define and explain surface and interfacial phenomenon.
2	Concepts in classical laws of thermodynamics and their application, postulates of statistical mechanics, statistical interpretation of thermodynamics, ensembles.	**CO 2**	to study the quantum aspects of charge transfer at electrode solution interface
3	To study the ionic atmosphere by using Debye-Huckel Theory.	**CO 3**	Account for the physical interpretation of distribution functions and discuss and show how these can be used in calculations of basic thermodynamic properties.
		CO 4	Account for the physical interpretation of partition functions and be able to calculate thermodynamic properties of model systems using Boltzmann -, Fermi-Dirac and thermodynamic properties of model systems using Boltzmann -, Fermi-Dirac and Bose-Einstein statistics.
		CO 5	To study the objectives of statistical thermodynamics

Course Code	MCH-204	Course Title	Spectroscopy-1
	Course Objectives		**Course Outcomes (COs)**
1	Basic concepts of group theory and its applications.	**CO 1**	Recognize symmetry elements, identify point groups of molecules, construct and explain character table for simple molecules.
2	Principles and instrumentation of different molecular spectroscopic methods.	**CO 2**	Categorize molecules based on their symmetry properties and predict their molecular properties.
3	Qualitatively predict which signals are to be observed in the rotational, vibrational orelectronic spectrum of various materials ranging from single atoms (atomic spectroscopy)	**CO 3**	Combine, evaluate and interpret information from the various spectroscopic techniques in determination of molecular structures.
		CO 4	Learn Electronic spectra of diatomic molecules Born-oppenheimer approximation
		CO 5	Recognize spectroscopy in microwave, Rotational spectra of rigid diatomic molecules, selection rules, interaction of spectral lines
Course Code	**MCH-205**	**Course Title**	**Green Synthesis (Soft Core)**
	Course Objectives		**Course Outcomes (COs)**
1	The primary goal of this subjest is to make students aware of how chemical processes can be designed, developed and run in a sustainable way.	**CO 1**	Learn environment friendly reaction techniques
2	It designs and produce cost competative chemical products and processes that attain the highest level of the pollution prevention hierarchy by reducing pollution.	**CO 2**	Learn and apply Industrial synthetic method using atom economization
3	It also develops new synthetic pathways using tools such as green solvents, green catalysis in organic synthesis, dry media synthesis and catalyst free reactions	**CO 3**	Application of green synthetic methods for industrial production.
		CO 4	Learn solvent free reactions
		CO 5	Learn the applications of multi component name reactions using green methods.
SEMESTER - III			
Course Code	**MCH 301**	**Course Title**	**Organic Reaction Mechanisms**
	Course Objectives		**Course Outcomes (COs)**
1	Evidences for the mechanisms of substitution reactions	**CO 1**	Explain the mechanistic pathway for aliphatic substitutions and free radical reactions with stereochemistry
2	Formation, structure, stability, reactivity and reactions of free radicals	**CO 2**	Principles and terminologies in photochemistry and photochemical reactions

3	Pericyclic reactions, rules governing them and their applications	**CO 3**	Describe and explain photochemical and photophysical processes with mechanisms, and apply established experimental methods for the investigation of these processes
		CO 4	Predict and rationalise the outcomes of pericyclic reactions with stereochemistry
		CO 5	Molecular orbital diagram and conservation of orbital symmetry
Course Code	**MCH 302**	**Course Title**	**Chemistry of Natural Products**
	Course Objectives		**Course Outcomes (COs)**
1	Classification, nomenclature, structure, biosynthesis, occurrence, analysis and pharmaceutical perspectives of natural products	**CO 1**	Understand extraction and purification methods of natural compounds from available sources
2	Structural elucidation of these natural products by elemental analysis and characterization by different spectroscopic techniques	**CO 2**	Design efficient total synthesis of complex molecules by recognizing substructures amenable to known transformations
3	Classification, synthesis and use of insect pheromones used in pest control	**CO 3**	Familiarize with various types of natural products from different sources and their applications
		CO 4	Industrial synthesis of these natural products
		CO 5	stereochemistry and separation techniques.
Course Code	**MCH-303**	**Course Title**	**Organic Spectroscopy**
	Course Objectives		**Course Outcomes (COs)**
1	Spectroscopic techniques including the basic principles for recording of NMR, IR, UV, and MS spectra	**CO 1**	Combine information from experimental NMR, IR, UV, and MS spectra and elucidate the structure of unknown organic compounds
2	Applications of UV-Vis spectroscopy	**CO 2**	To determine molecular structure from analysis of the spectral data.
3	Principles of nuclear magnetic resonance spectroscopy of 1H, 13C (1D and 2D) and other nuclei (15N, 19F, 29Si and 31P).	**CO 3**	Predict the NMR, IR, UV-Vis and MS spectra from a given molecular structure
		CO 4	Identification and characteristics of functional groups using IR spectroscopy
		CO 5	Fragmentation pattern, effect of isotopes in Mass spectroscopy.
SEMESTER - IV			
Course Code	**MCH- 401**	**Course Title**	**Organometallic and Heterocyclic Chemistry**
	Course Objectives		**Course Outcomes (COs)**
1	σ-bonded and π-bonded ligands, metal-carbon bonding, 18- and 16-electron rules, Green rules for nucleophilic addition, complexation and decomplexation of organometallic compounds.	**CO 1**	Understand the scope, diversity and applications of organometallic compounds.

2	Application of various organometallic compounds in organic synthesis	**CO 2**	Predict the stability, reactivity of metal complexes and stereochemistry of products formed
3	Synthesis, properties and reactions of 3-, 4-, 5-, 6-, 7- and 8-membered heterocyclic compounds.	**CO 3**	Design the synthesis of industrially important compounds
		CO 4	Rationalize the synthesis, structure and applications of organometallic compounds for organic transformations
		CO 5	Classification, synthesis and applications of mesoionic compounds.
Course Code	**MCH-402**	**Course Title**	**Stereochemistry and retrosynthetic analysis**
	Course Objectives		**Course Outcomes (COs)**
1	Stereochemistry of organic compounds exhibiting atropisomerism and chirality due to the presence of heteroatoms	**CO 1**	Identify stereogenic centres and provide R/S designations for atropisomers and compounds with heteroatoms
2	Disconnection approach to organic synthesis	**CO 2**	Determine absolute configuration of organic by various rules and techniques
3	Strategies needed to devise routes for the synthesis of simple to complex target compounds	**CO 3**	Analyse target compounds by retrosynthetic strategy and devise suitable anionic, cationic and radical synthons
		CO 4	Apply the knowledge and understanding of essential facts, concepts, principles and theories relating to retrosynthetic analysis
		CO 5	Protecting and deprotecting functional groups in organic synthesis.
Course Code	**MCH-403**	**Course Title**	**Organic Synthesis**
	Course Objectives		**Course Outcomes (COs)**
1	Principles and terminologies in asymmetric synthesis and the importance of chirality in organic synthesis	**CO 1**	Understand the importance of asymmetric synthesis and propose syntheses of molecules with control of the stereochemistry with control of the stereochemistry
2	Stereoselective, diastereoselective and enantioselective strategies and the use of chiral auxiliary components for asymmetric synthesis	**CO 2**	Design chemical processes and products that eliminate the use or generation of hazardous substances
3	Ultrasound, microwave, ionic liquids, phase transfer catalysts, polymer supports in organic synthesis	**CO 3**	Use ultrasound, microwave, ionic liquids, phase transfer catalysts and polymer supports
		CO 4	Multi-component reactions for various organic transformations multi-component reactions for various organic transformations.
		CO 5	Study the rearrangement reaction and mechanism.
Course Code	**MCH-404**	**Course Title**	**Medicinal Organic Chemistry**
	Course Objectives		**Course Outcomes (COs)**
1	Basic biological and pharmacological interactions of drugs with their targets.	**CO 1**	Use of the knowledge gained for the development of biologically and clinically active drugs

2	Process of drug discovery.	**CO 2**	Discussion of the recent developments in chemotherapy
3	The relation of structure and physical properties of drugs to their pharmacological activity.	**CO 3**	Describe the current challenges and opportunities in medicinal chemistry in light of contemporary developments in the field of drug discovery
		CO 4	Synthesis and mode of action of the different classes of drugs
		CO 5	Development of novel medicine

NAME OF THE PROGRAMME	MASTER OF SCIENCE (Biochemistry)
PROGRAMME CODE	IAMOS05

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To provide students a comprehensive knowledege base in Biochemistry and related fields through analytical and application based courses	**PO1**	Get a comprehensive understanding of theoretical and practical concepts in the varied disciplines of Biochemistry.
PEO2	To equip students with appropriate theoretical and practical skillsets to tackle issues in the field of Biochemistry	**PO2**	Be equipped with practical skills in biochemical analysis and develop insight on the modern tools of research necessary to solve real life problems.
PEO3	To inculcate in students the critical analysis, questioning and reasoning skills needed for a future career in higher studies, research and industry.	**PO3**	Develop analytical and critical thinking abilities to engage in independant research in the advanced multidisciplinary areas of Biochemistry.
PEO4	To encourage students to build their potential for ethical, moral and social inter-disciplinary research and be able to handle scientific and social responsibilities	**PO4**	Develop the requisite skillsets in order to express their persuasive scientific ideas at bigger scientific platforms and pursue careers in Biochemical research and industry.
PEO5	To produce students with leadership skills and professional integrity and enabling them to work in diverse professional platforms for empowering and promoting scientific advancement of our country.	**PO5**	Demonstrate expertise and ethical perspective on areas related to lifesciences by developing ethical, interpersonal and team management abilities.

SEMESTER -I			
Course Code	**MBC 101**	**Course Title**	**Biophysical and Bio-organic chemistry**
	Course Objectives		**Course Outcomes (COs)**
1	Enable students to learn basic biophysical concepts such as pH and thermodynamics	**CO 1**	Understand the physiochemical properties of water, pH, p Ka and biological buffers and their importance.
2	Educate students about the chemical basis of biological systems and the reaction kinetic phenomenon	**CO 2**	Get familiarised with basic concepts of thermodynamics laws, red-ox reactions in biological systems and know the concepts of Stereochemistry
3	Enable students to understand the role and relevance of different organic compounds in life sciences	**CO 3**	Learn the mechanism of Bio-organic reactions, rearrangement reactions and Free radicals, their sources, chain reactions, effects on biological molecules and membranes.

		CO 4	Know the structure and properties of Heterocyclic compounds, their occurrence in biological systems.
		CO 5	Define Ligand field theory of complexes, kinetics and mechanism of reactions of organometallic moieties of biological molecules like chlorophyll and hemoglobin.
Course Code	**MBC 102**	**Course Title**	**Biomolecules**
	Course Objectives		**Course Outcomes (COs)**
1	To train students to appreciate the salient features, basic structure of all biomolecules in the organization of life	**CO 1**	To appreciate the structures of carbohydrates that exist in the biological system, their importance in blood groupings, bacterial cell wall and cell surfaces
2	To aquaint stduents with the significance of biomolecules and methodology involved in characterizing major biomolecules	**CO 2**	To comprehend the classification and structure of amino acids and their properties and mechanisms of peptide synthesis
3	To familiarize students with the classification, functions and application aspects of biomolecules	**CO 3**	To summarize the concepts of levels of protein organization, denaturation and renaturation of proteins and protein folding pathways
		CO 4	To relate to the structure and importance of lipids as storage molecules and as structural component of biomembranes
		CO 5	To describe the structures of nitrogenous bases, properties of nucleic acids, their isolation, characterization and sequencing
Course Code	**MBC 103**	**Course Title**	**Analytical Biochemistry - I**
	Course Objectives		**Course Outcomes (COs)**
1	To comprehend the strategies and principles of biochemical investigations employing whole animal studies, isolated organs, tissues, and cell cultures and model organisms	**CO 1**	To understand the strategies in biochemical investigations employing whole animal studies, isolated organs, tissues, and cell cultures and model organisms
2	To acquaint students with basic instrumentation, principle and procedure of various sophisticated instruments like phase contrast, fluorescence, electron microscopy, Geiger-Muller counter, Liquid scintillation counter, autoradiography and learn about centrifugation & biocalorimetry	**CO 2**	To discuss the theory and applications of different types of microscopic techniques such as optical, phase contrast, confocal, fluorescence and electron microscopy and preparation of specimens for these microscopic techniques
3	To understand about biological data collection and the application of various biostatistical methods and tools in research	**CO 3**	To articulate the principle and applications of different separation techniques utilizing different types of centrifugation as well as biocalorimetry in the studies of thermodynamics and kinetics of biochemical reactions

		CO 4	To apply the principles of radiochemistry to analytical determination of biomolecules and life processes
		CO 5	To relate the principles of collection of data to biological experiments and the proper statistical analysis of biological data and its presentation
Course Code	**MBC 104**	**Course Title**	**General Physiology**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the students with general concepts related to tissues and cytoskeleton filaments and proteins.	**CO 1**	Understand the general formation of the tissues, its types, junctions and components involved in it and gain knowledge about cytoskeleton filaments and proteins, its organization, dynamics and role in maintaining the integrity of the cell.
2	To educate in depth about the physiology of nervous and muscular systems.	**CO 2**	Get familiarised with the detailed knowledge about the nerve signaling, membrane potential, neurotransmitters, its receptors and mechanism of action potential. And also patch clamp technique and understand the structure of different types of muscle tissues, its energetic, mechanism of muscle contraction and its regulation.
3	To educate about the complete physiology related to respiratory,digestive,excretory,circulatory systems along with basics of endocrinology.	**CO 3**	Learn different types of digestive juices, enzymes present and its action. In detail the mechanism of absorption of different nutrients. They also studied detoxification mechanisms and liver function tests and understand different types of circulation, cardiac activity, its regulation, blood composition, clotting, CSF, Lymph and its analysis in diagnosis was learnt by the students.
		CO 4	Learn mechanism of respiration and acid base regulation by respiration and understand about the structure of nephron, formation of urine, tubular function test, acid base balance and hormonal regulation.
		CO 5	Learnt hormones types, synthesis, storage, circulation, functions, mechanism, regulation and its disorders were learnt by the students. Measurement of hormones and receptors and degradation were also studied by the students.

Course Code	MBC 105	Course Title	Microbiology
	Course Objectives		**Course Outcomes (COs)**
1	To gain knowledge about bacteriology, eukaryotic microorganisms, food and dairy microorganisms	**CO 1**	Learn about the conventional and molecular methods of classification, identification, cultivation and morphology of eukaryotic microorganisms
2	In depth understanding on microbial staining and pure culture techniques	**CO 2**	Know the basic structure, visualization techniques and function of different components of the bacterial cell.
3	Comprehensive theoretical and foundational concept about bacterial and viral pathogenesis and their interventions	**CO 3**	Understand the principles of microbial nutrition and know the various Physical and Chemical growth requirements of bacteria and their growth measurement.
		CO 4	Learn the mechanisms of Bacterial Pathogenesis and know various intervention strategies such as antibiotics.
		CO 5	Know about viruses classification and discern the replication strategies of few representative viruses.
SEMESTER - II			
Course Code	**MBC 201**	**Course Title**	**Enzymology**
	Course Objectives		**Course Outcomes (COs)**
1	To provide students with the concepts and principles of biochemical catalysts.	**CO 1**	To discuss the basic characteristics, classification and purification of enzymes
2	To survey the methodologies involved in assessing the enzyme activity and mechanism of enzyme action.	**CO 2**	To evaluate the 3D structure of an enzyme active site and the techniques used to investigate the active site structure
3	To illustrate the enzyme catalysis, kinetics and regulatory aspects	**CO 3**	To become familiarized with types of enzyme catalysis and the mechanism of important enzymes
		CO 4	To describe the various theories behind enzyme action, factors affecting enzyme action and enzyme kinetics
		CO 5	To aquaint with the kinetics of enzymatic reactions and sigmoidal kinetics of allosteric enzymes, along with their various regulation
Course Code	**MBC 202**	**Course Title**	**Analytical Biochemistry - II**
	Course Objectives		**Course Outcomes (COs)**
1	To learn the fundamental principles behind chromatography and electrophoresis and choose and apply suitable separation techniques to different biomolecules	**CO 1**	To appraise the handling of various chromatographic techniques and apply them in isolating and characterizing different biological molecules
2	To discuss the principle and applications of spectroscopic techniques and to implement the use of instruments like UV-VIS	**CO 2**	To discuss the theory of purification of biomolecules by advanced techniques like affinity chromatography, HPLC, FPLC and Gas

	spectroscopy, NMR, CD, ORD, MS, X-Ray diffraction in biological research		chromatography
3	To describe large-scale analysis of proteins or proteomes in a biological sample and to define their concentrations, molecular states, structures, functions and connections	**CO 3**	To comprehend the principles of different types of Electrophoresis and their applications in biological investigations and experiments
		CO 4	To apply the fundamental laws of different types of spectroscopy and applications of UV-visible, Fluorescence, NMR, IR, mass spectrophotometry, X-ray diffraction in analytical determination and characterization of biomolecules
		CO 5	To understand about common workflows for the large-scale analysis of proteins, understanding how to analyze proteins using 2D gel electrophoresis, LC-ESI and MALDI mass spectrometry
Course Code	**MBC 203**	**Course Title**	**Metabolism - I**
	Course Objectives		**Course Outcomes (COs)**
1	Enable students to learn and understand the concepts of carbohydrate metabolism and related disorders.	**CO 1**	Learn about glucose oxidative metabolic pathways in living things.
2	Enable students to learn and understand the concepts of lipid metabolism and related disorders.	**CO 2**	Understand the detailed metabolism of glycogen molecule.
3	Educate students about the biochemistry related to Photosynthesis.	**CO 3**	Understand the important metabolic disorders in detail.
		CO 4	Understand in detail about the metabolism of lipids.
		CO 5	Learn the photosynthetic reaction mechanism, phases,adaptations of C4 & CAM plants and also bacterial photosynthesis.
Course Code	**MBC 204**	**Course Title**	**Membrane Biochemistry**
	Course Objectives		**Course Outcomes (COs)**
1	Enable students to understand the concept of biomembrane pysiology and biochemistry	**CO 1**	Understand structures of membrane lipids their dynamics and techniques involved in membrane structure determination.
2	Educate students about the role of biomolecules in membrane associated physiological processess	**CO 2**	Understand concept of membrane topology, role of membrane proteins, and their structures.
3	Make students understand the concepts of protein targeting and membrane transport	**CO 3**	Understand protein targeting, signal sequence, its functions and mechanism of targeting.

	mechanisms		
		CO 4	Know the detailed mechanisms of membrane transportation and bacterial transport systems.
		CO 5	Know about nuclear transport mechanism and protein targeting in various subcellular organelles.
Course Code	**MBC 205**	**Course Title**	**Bioinformatics and Toxicology**
	Course Objectives		**Course Outcomes (COs)**
1	To gain knowledge about Computers and computer programming languages.	**CO 1**	Know about the fundamental operation of computer, C programming, PERL, Bioperl, Database management system and biological databases.
2	In depth understanding on Databases; Biological databases; and tools to analyse sequences.	**CO 2**	Understand the algorithms to analyse DNA and protein sequences by alignment and phylogenetic analysis.
3	Comprehensive theoretical and practical foundation concept about protein structure prediction, Molecular interaction and Toxicology studies.	**CO 3**	Learn about various computational methods and tools used for protein secondary and tertiary structure prediction
		CO 4	Gain knowledge about molecular docking concepts employed in drug discovery and its applications.
		CO 5	Understand in detail about the core concepts of toxicology, and its effect at multiple levels of biological organization.

SEMESTER – III			
Course Code	**MBC 301**	**Course Title**	**Molecular Biology - I**
	Course Objectives		**Course Outcomes (COs)**
1	To learn and understand the fundamentals of molecular biology like nature of genetic material, features of genomes, damage and repair	**CO 1**	To describe the characteristics of DNA as genetic material and acquire basic concepts of genome, its composition and organization
2	To categorize possible modes of replication and its regulation, and roles of enzymes in replication of both prokaryotes and eukaryotes	**CO 2**	To comprehend the basic steps involved in DNA replication in prokaryotes and eukaryotes, emphasizing the enzymes involved in different types of replication, including plasmids and viruses
3	To sketch the intricate levels of molecular mechanisms underlying the process of transcription and its regulation and post translational modifications	**CO 3**	To assess the molecular mechanisms behind DNA damage and repair in both prokaryotes and eukaryotes

		CO 4	To analyze the basic steps involved in transcription in prokaryotes and eukaryotes, emphasizing the enzymes involved in transcription and the techniques used to understand transcription
		CO 5	Understand the post transcriptional modifications of the eukaryotic mRNA and their significance and functions
Course Code	**MBC 302**	**Course Title**	**Molecular Physiology**
	Course Objectives		**Course Outcomes (COs)**
1	To gain knowledge about Nerve signalling and Endocrine signalling mechanisms.	**CO 1**	Learn in detail about different types of neurotransmitters, its receptor structure and subclasses, mechanism of action and its termination. Important understanding of agonists and antagonists functions.
2	In depth understanding on Cell cycle regulations; apoptosis mechanisms and stem cells	**CO 2**	Complete understand about different classes of hormone molecules, its signal transduction pathways, its proteins, nuclear signaling and its biochemistry of vision.
3	Comprehensive theoretical and foundational concept about Cancer, important signalling pathways in humans and plants.	**CO 3**	Learn in detail about cell cycle checkpoints, stem cells and its properties. Also in this unit, apoptosis and its pathways has been understood.
		CO 4	Know abour cancer signs, symptoms, pathophysiology, diagnosis and treatment and its signalling cascades.
		CO 5	Understand the general mechanism of action of plant hormones and pheromones signalling mechanism in plants.
Course Code	**MBC 303**	**Course Title**	**Metabolism - II**
	Course Objectives		**Course Outcomes (COs)**
1	Educate the students about the concepts of metabolic energy capture and tranfer mechanisms.	**CO 1**	To understand the basic concepts of metabolic energy capture and transfer, biological oxidation, oxidative phosphorylation, ATP synthesis in mitochondria, plants and bacteria.
2	Enable the students to understand the different stages of nitrogen cycle and its importance in life.	**CO 2**	To understand nitrogen cycle with detailed mechanism of nitrogen fixation and its importance in the assimilation of atmospheric nitrogen
3	Educate the students about the metabolism of various nitrogen molecules and discuss about its significance.	**CO 3**	To learn the synthesis and degradation of purines and pyrimidines by salvage and denovo pathways, disorders related to the nucleotide metabolism.
		CO 4	To understand the mechanism of degradation of essential and non essential amino acids in plants ,microbes and animals.

		CO 5	To learn how amino acids are synthesized in living things along with inborn errors of amino acid metabolism and synthesis, degradation and regulation of heme along with related disorders of heme.
SEMESTER - IV			
Course Code	**MBC 401**	**Course Title**	**Molecular Biology - II**
	Course Objectives		**Course Outcomes (COs)**
1	To illustrate the concepts of gene regulation in prokaryotes, eukaryotes and viruses and discuss the role of chromatin organization in gene regulation	**CO 1**	To summarize the basic steps in gene regulation that includes positive and negative regulation in prokaryotes and viruses
2	To analyze the principles of regulation of gene expression by transcriptional modulators and RNA regulators	**CO 2**	To describe the role of chromatin organization, modification and chromatin remodeling in gene expression regulation in eukaryotes
3	To categorize the process of translation in prokaryotes and eukaryotes along with comprehension of the genetic code	**CO 3**	To analyze the structure and mechanism of gene expression regulation eukaryotic transcription activators, repressors and coactivators, regulation of gene expression by mRNA stability, siRNA and miRNA
		CO 4	To comprehend the mechanism of protein translation in both prokaryotes and eukaryotes and understand the basic structure and function of the ribosome and enzymes involved in translation
		CO 5	To interpret how the genetic code was deciphered, wobble hypothesis and properties of the genetic code and its deviation
Course Code	**MBC 402**	**Course Title**	**Biochemical Genetics**
	Course Objectives		**Course Outcomes (COs)**
1	To gain knowledge about Nature of genetic material, chromosomes, genes and mutations.	**CO 1**	Know about the gene, organization in chromosomes, mutation and its types and the beneficial and harmful effects of mutations.
2	In depth understanding on Classical genetics; Quantitative genetics; and Human genetics	**CO 2**	Learn about the history of genetics through the study of various experimental organisms and understand quantitative genetics mechanisms and population genetics including methods such as Hardy Weinberg equilibrium.

3	Comprehensive theoretical and foundational concept about Bacterial genetics and Viral genetics.	**CO 3**	Understand about the biochemical events occurring in mitosis and meiosis, higher orders of organization of chromosomes in humans, transposition in humans and chromosomal abnormalities that cause diseases.
		CO 4	Know about construction of a genome map of the microorganisms through the methods of gene transfer.
		CO 5	Learn about the life cycle of bacteriophages, fine structure of T-phage and how Benzer used bacteriophages to learn about concept of cistrons and the process of transduction.
Course Code	**MBC 403**	**Course Title**	**Biotechnology**
	Course Objectives		**Course Outcomes (COs)**
1	Educate the basic concepts related to the field of Biotechnology	**CO 1**	To learn and understand the basic concepts related to the field of Biotechnology such as cloning strategies, characteristics of enzymes and vectors involved in genetic engineering.
2	Enable the methodologies involved in Biotechnology.	**CO 2**	To outline of methodology for genomicand cDNA libraries construction
3	Educate the overview of transgenic strategies.	**CO 3**	To describe the principle,types and applications of PCR and Learn various advanced gene sequencing methods for the identification of gene products.
		CO 4	To illustrate the over view of transfection strategies involved in gene transfer to animals cells.
		CO 5	To illustrate the over view of gene transfer strategies involved in plant cells.
Course Code	**MBC 404**	**Course Title**	**Immunology**
	Course Objectives		**Course Outcomes (COs)**
1	To provide knowledge and understanding of immunology and the way it is applied in diagnosis and therapy	**CO 1**	To explain the nature of various infective agents and the mechanism of defense
2	To familiarize students with the essential molecules, cells, tissues, and organs involved in body defense mechanism concepts at molecular and genetic level	**CO 2**	To interpret the roles of various cells and organs involved in immune response
3	To facilitate the learning of techniques involved in understanding the immunological aspects of physiological and biological samples	**CO 3**	To comprehend the defensive mechanism against antigens and study of antigens by various immunochemical techniques

		CO 4	To assess natural and acquired immunity and self recognition of the immune system
		CO 5	To describe types of antibodies, antibody production and purification and immunotherapy, TCR gene organization and combination

NAME OF THE PROGRAMME	M.Sc. Computer Science
PROGRAMME CODE	IAMOS07

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	· Provide strong core training both theoretically and practically to create adept IT professionals	**PO1**	Acquire core competencies to cater to the demands of the industry through strong theoretical foundation and extensive practical exposure
PEO2	· Gain substantial knowledge in Computer Science discipline and apply programming and computational skills for industrial solutions	**PO2**	Gain substantial knowledge to apply technical and computational skills to problems across a broad range of application domains
PEO3	· Acquire ability to identify, design and implement sustainable solutions to ever changing interdisciplinary global problems through Research & Innovation capabilities	**PO3**	Transform complex business strategies and modern issues into problems, investigate, understand and propose integrated solutions using emerging technologies
PEO4	· Exposure to real-world problems through project development, in order to adapt easily to the industry demands	**PO4**	Possess skills to pursue quality research in Computer Science and develop solutions to societal needs
PEO5	Acquire skills to apply research methods including design of experiments, data analysis, interpretation of data, synthesis of information, developing GUI applications to provide innovative solutions to the real world problems	**PO5**	Gain ability to adapt to technological advances and achieve personal and professional excellence through active participation in life-long learning

SEMESTER - I			
Course Code	**MCS101**	**Course Title**	**FILE STRUCTURES**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students aware of fundamental storage management systems and file operations	**CO1**	Learn file organization and file operations in Unix file system
2	To learn about maintaining high-level file structure inclusive of indexing, co-sequential processing, B-Trees and B+ trees	**CO2**	Gain knowledge in object oriented file management, record structures, record operations using a class library
3	To learn the significance of hashing methods to organize and maintain file structures	**CO3**	Acquire knowledge and skills in effective storage management
		CO4	Gain knowledge, skills and need for frequent indexing in file maintenance
		CO5	Explore various hashing methods for an effective storage and retrieval

Course Code	MCS102	Course Title	THEORY OF COMPUTATION
1	Mathematical foundation of computation in learning automata theory, theory of formal languages and grammars	CO1	Learn about automation for recognizing patterns using abstract mathematical model
2	To prepare students to construct automata for any given pattern and transformation to regular expression for pattern recognition	CO2	To design mathematical model for design of a compiler, design of PCB circuit and checking, and other engineering applications
3	To understand Decidable, Undecidable problems , NP class problems and how efficiently it can be solved to a higher degree	CO3	Gain exposure to regular expression and grammars for pattern recognition
		CO4	Explore Turing machine concepts and its applications in machine learning, software testing, high performance computing etc.,
		CO5	Acquire skills to solve non-programmable problems
Course Code	MCS103	Course Title	ADVANCED DATABASES
	Course Objectives		Course Outcomes (COs)
1	To provide a strong foundation in database concepts with a changing industry scenario	CO1	Learn about data modeling in a real-life situation
2	To learn and acquire skills in advanced data modeling concepts inclusive of OOD and ORD	CO2	Able to write cost effective queries in a database environment
3	To be familiar with query processing in distributed databases	CO3	Gain knowledge in interacting with Object Oriented databases using union, intersection and minus operations
		CO4	Acquire knowledge in Object Oriented Data Modeling for a new project
		CO5	Develop skills to update themselves to the changing industry needs
Course Code	MCS104	Course Title	ADVANCED COMPUTER ARCHITECTURE
	Course Objectives		Course Outcomes (COs)
1	To learn about high performance computers and significance of modern architecture	CO1	Understand memory organization and mapping techniques
2	To make students to understand instruction parallelism, multi-processors, pipelining , storage and interconnection	CO2	Demonstrate concepts of parallelism in hardware/software
3	To make students to be aware of traditional architecture limitations and future directions to overcome	CO3	Understand architectural features of advanced processors
		CO4	Ability to handle multi-processors, pipelining through instruction

		CO5	Implement modern machines and to fine tune system performance
Course Code	**MCS105 (Soft Core):**	**Course Title**	**QUANTITATIVE, TEACHING AND RESEARCH APTITUDE**
	Course Objectives		**Course Outcomes (COs)**
1	To prepare students to know about basic concepts of Quantitative Ability	**CO1**	Ability to score well in quantitative aptitude tests
2	To make students to understand basic concepts of Logical Reasoning Skills	**CO2**	Acquire skills to solve logical reasoning problems quickly
3	Help students to solve campus placement aptitude papers covering Quantitative Ability, Logical Reasoning and Verbal Ability	**CO3**	Encouraging students to take up competitive exams to improve their competency
		CO4	Learn about research articles, thesis writing and effective presentation
		CO5	Learn about e-governance and policy matters of our higher education system
Course Code	**MCS106**	**Course Title**	**FILE STRUCTURES LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To gain working knowledge in maintaining huge databases using file structures	**CO1**	Learn to read and write objects in a fixed length and variable length record
2	To acquire skill in implementing multilevel indexing concept using B trees, B+ trees on files	**CO2**	Ability to handle huge databases using file structures with list of experiments
3	Apply hashing techniques to resolve record collision	**CO3**	Gain exposure in performing multilevel indexing for quick accessing
		CO4	Implement B-Tree and B+ Tree to perform tree operations
		CO5	Gain practical experiments to visualize record collision and ways to solve through algorithms
Course Code	**MCS107**	**Course Title**	**ADVANCED DATA BASE MANAGEMENT SYSTEMS LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To make them understand in designing, creating and analyzing for table design	**CO1**	To emphasize the significance of normalization in databases
2	To make students to understand advanced query execution such as joins and embedded SQL	**CO2**	Analyze and implement the concept of object relational database in development
3	To gain practical knowledge in handling terabytes of data to perform analytics	**CO3**	Gain exposure in writing optimized queries using joins and embedded SQL
		CO4	Design a commercial object relational schema and implement using Oracle and MySQL
		CO5	Apply and Analyze transaction management in centralized and distributed databases

SEMESTER – II			
Course Code	**MCS201:**	**Course Title**	**OBJECT ORIENTED ANALYSIS AND DESIGN USING UML**
	Course Objectives		**Course Outcomes (COs)**
1	To make students to understand fundamental concepts of Object Orientation with different notations	**1**	Learn fundamental concepts of object orientation with notations
2	To help students to learn about association, generalization, aggregation And its notations	**2**	Able to comprehend thoroughly about the proposed software through various diagrams in UML
3	To make students to understand cohesion and coupling in OOAD	**3**	Emphasize collaboration among the team to better understand the business situation
		4	Gain exposure in fixing proportionate cohesion and coupling during design of a system
		5	Able to reuse existing libraries for their ongoing projects
Course Code	**MCS202**	**Course Title**	**ADVANCED JAVA PROGRAMMING**
	Course Objectives		**Course Outcomes (COs)**
1	To make students to learn about Object Orientation concepts	**CO1**	Facilitate students in writing multi-threaded programming and exceptions
2	To prepare students to understand socket programming in java	**CO2**	Familiarize with using stream classes I/O handling
3	To make them familiar with user interface packages like Swing and Hibernate	**CO3**	Ability to make use of TCP/IP sockets for data transmission and reception
		CO4	Learn how to write Java servlet programs for session tracking at server side
		CO5	Apply Swing package to design attractive user interfaces with swing libraries
Course Code	**MCS203:**	**Course Title**	**ARTIFICIAL INTELLIGENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To learn fundamental concept of AI	**CO1**	Able to understand heuristic search techniques
2	To make students to understand the significance of knowledge representation	**CO2**	Importance of knowledge base in expert system development
3	To learn about expert systems in real-life situation	**CO3**	Ability to comprehend robot architecture to recognize texture, image and scenes
		CO4	Learn neural network architecture and its convergence in identifying an object
		CO5	Analyze and Discuss case studies of expert systems in medical and engineering applications

Course Code	MCS204:	Course Title	OPTIMIZATION TECHNIQUES
	Course Objectives		**Course Outcomes (COs)**
1	To make students to understand objective function, constraints in OR	**CO1**	Able to understand objective function, set of constraints in OR
2	To facilitate students to understand dynamic programming and game theory	**CO2**	Learn how to bring optimal solution in transportation problem, Linear Programming Problem
3	To make students to understand and to solve queuing theory problems	**CO3**	Ability to understand PERT chart for a proposed task undertaken, estimating optimal time to complete the work using CPM
		CO4	Facilitate students to understand issues in dynamic programming
		CO5	Apply methodology to determine optimal solution for a given set of problems in LPP, Transportation, Traveling salesman problem, game puzzle, queuing applications
Course Code	**MCS206:**	**Course Title**	**OBJECT ORIENTED DESIGN USING UML LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To make students to understand data modeling using UML tool for library application in different views	**CO1**	Able to design data modeling for library application using a software tool enabling us to understand what we intend to do as a project
2	To help students to learn forward and reverse engineering using UML and generation of document	**CO2**	Able to generate Use case view to understand the business system easily
3	To make students to understand to appropriate cohesion and coupling while designing modules in a project	**CO3**	Able to generate logical view to interconnect subsystems
		CO4	Facilitate students to use specific notations for association, aggregation, and generalization
		CO5	Gain exposure to perform forward and reverse engineering for checking before actual implementation takes place
Course Code	**MCS207**	**Course Title**	**Advanced Java Programming Lab**
	Course Objectives		**Course Outcomes (COs)**
1	To make students to learn about Object Orientation concepts	**CO1**	Implement java program to devise a calculator with arithmetic operations in a Grid layout
2	To prepare students to understand socket programming in java	**CO2**	Implement java threads to display three different text in fixed time interval
3	To make them familiar with user interface packages like Swing and Hibernate	**CO3**	Able to write java program to fetch data from the database using JDBC connectivity
		CO4	Implement Producer and Consumer problems using multi-threaded programming
		CO5	Implement java servlet server side programming to display message at a client machine

Course Code	MCS205:	Course Title	SOFT SKILLS AND PERSONALITY DEVELOPMENT
	Course Objectives		**Course Outcomes (COs)**
1	To make students to understand the importance of positive attitude and self-development	**CO1**	Inculcate the importance of positive attitude in career planning
2	To make students to learn verbal communication and soft skills	**CO2**	Able to maintain etiquettes and manner in a group, telephonic conversation etc.,
3	To make the students to be creative, acquire qualities of a leader, negotiate and managing conflict	**CO3**	Able to take part in presentation, group discussion, usage of body language etc.,
		CO4	Able to perform well in letter writing, project proposals, documentation in their own style
		CO5	Able to learn through successful personalities worldwide
SEMESTER - III			
Course Code	**MCS301:**	**Course Title**	**ADVANCED WEB PROGRAMMING**
1	To provide a strong foundation in advanced web application development in a three tier architecture using Perl, PHP, Ruby and Rails	**CO1**	Learn the basic concepts of client and server side scripting languages
2	To Prepare the students to excel in server side scripting, development of cookies and session tracking	**CO2**	Understand Perl and PHP Programming languages for text processing
3	To make students to understand pattern matching using Perl/PHP	**CO3**	Learn and implement Ruby programming on Rails framework
		CO4	To implement AJAX Server side script to improve the performance of the server
		CO5	To take up real-time projects in pattern matching using Perl/PHP
Course Code	**MCS302**	**Course Title**	**ADVANCED ALGORITHMS**
1	Analyze variety of algorithms with practical applications emphasizing optimal Solution of each algorithm	**CO1**	Gain knowledge of designing a Greedy method approach in formulating algorithm
2	Identify most suitable algorithm for a given task in order to save time and cost Resources	**CO2**	Understand algorithm efficiency consideration and write effective algorithms
3	To be aware of complex problems such as NP Hard and NP-complete problems	**CO3**	Explore various string matching/pattern matching algorithm widely used in machine learning automation
		CO4	Gain exposure to parallel algorithms, parallel time and processors time complexity
		CO5	Identify probabilistic and randomized algorithm through graphs
Course Code	**MCS303**	**Course Title**	**CRYPTOGRAPHY AND NETWORK SECURITY**

	Course Objectives		Course Outcomes (COs)
1	To understand mathematical concepts behind cryptography and different kind of Attack possibly happen in a networked environment	**CO1**	Understand the characteristic of information, security models, SSDLC
2	To learn about how to maintain confidentiality, Integrity and availability of data	**CO2**	Understand the concept of firewalls, VPNs and Intrusion detection system
3	To make them learn about DES. AES, algorithm and digital signature	**CO3**	Understand different types of attacks, different Modes of operations, HMAC
		CO4	Understand Kerberos in detail, X.509 certificate, PGP working , IP security Architecture
		CO5	Able to devise new algorithm on DES, AES encryption algorithms to provide security in a shared environment
Course Code	**MCS304**	**Course Title**	**WEB PROGRAMMING LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To create web pages using HTML, DHTML, XML, JavaScript and CSS to store data in a table using web pages	**CO1**	Implement interactive web pages using HTML, JavaScript and CSS.
2	To develop a new website of its kind with enhanced features like online loan Application and Product Recommender System	**CO2**	Design responsive web pages to connect MySQL database using PHP and Perl
3	Apply latest tools to design, develop and encourage project based learning	**CO3**	Create and execute Perl and PHP programs to access server information.
		CO4	Demonstrate server side applications using servlet and JSP
		CO5	Able to take projects in web application and real-time web hosting
Course Code	**MCS305:**	**Course Title**	**ADVANCED ALGORITHMS LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To research a specific algorithm with different set of values and to plot graph to understand its behavioral patterns with respect to input size n	**CO1**	Gain knowledge of different design techniques and their implementation.
2	To handle string matching problems using naïve Bayes classification and KMP problems in order to compare performance	**CO2**	Understand algorithm efficiency computation and write effective algorithms
3	To make the students to find out optimized solution in algorithms using research statistics	**CO3**	Implement Boyer-Moore approach to string matching algorithm
		CO4	Apply machine learning algorithms in their curriculum project
		CO5	Able to perform statistical analysis on algorithms

SEMESTER - IV			
Course Code	**MCS401:**	**Course Title**	**Research Methodology**
	Course Objectives		**Course Outcomes (COs)**
1	To help understand and motivate students to do research in computer science by writing articles with originality in content	**CO1**	Understand the research process and write research papers effectively
2	To prepare students to extract outcome of research through inferences	**CO2**	Learn to perform statistical analysis and gain skills in interpreting results
3	To earn credibility in handling consultancy/funded research projects	**CO3**	Gain knowledge of statistics to analyze data
		CO4	Gain Knowledge of Evolutionary Algorithms
		CO5	Gain familiarity on SPSS tool and GRETL tool
Course Code	**MCS404**	**Course Title**	**: Scilab Lab**
1	To understand the need for implementation and verification of mathematical functions in a numerical computing environment using Scilab	**CO1**	Understand the importance of simulation/implementation to verify mathematical functions
2	To learn how to Interpret and visualize simple mathematical functions and operations thereon using plots	**CO2**	Design and implement programs to solve algebraic and transcendental functions.
3	Analyze the program for correctness and determine or predict the output and verify it under simulated software Scilab	**CO3**	Implement mathematical equations in numerical computing environment.
		CO4	Acquire knowledge of inference through plots and charts
		CO5	Check for correctness of program using Scilab and predict the output
Course Code	**MCS402/MCS403 ELECTIVES 4E1**	**Course Title**	**SOFTWARE TESTING**
	Course Objectives		**Course Outcomes (COs)**
1	To make students to understand the purpose of software testing	**CO1**	Learn fundamental concept of testing a software
2	To make them learn about various levels of testing	**CO2**	Learn to prepare test cases for a given problem using triangle problem, nextdate function, and Commission problem as samples
3	To get to know about object oriented integration testing	**CO3**	Able to learn through system testing
		CO4	Able to conduct object oriented integration testing
		CO5	Learn and do mapping the testing practices for any new diverse project
Course Code	**MCS402/MCS403 ELECTIVES 4E2:**	**Course Title**	**E-GOVERNANCE**
	Course Objectives		**Course Outcomes (COs)**

1	To create awareness about e-governance and administration	**CO1**	Able to comprehend on e-governance for our nation
2	To learn Government of India guidelines for websites and w3c guidelines	**CO2**	Conversant with UN survey and W3C guidelines of e-governance
3	To make the students understand UN survey of e-governance	**CO3**	Able to contribute for digital india programme
		CO4	Gain exposure to e-governance to election commission, aadhar UID,income tax
		CO5	Gain exposure to centralized admission, online examination, scholarship management

Course Code	**MCS402/MCS403 ELECTIVES 4E4**	**Course Title**	**CLOUD COMPUTING**
	Course Objectives		**Course Outcomes (COs)**
1	To make students to be aware of various cloud computing models, strength and weakness of cloud	**CO1**	Analyze various cloud programming models and apply them to solve problems on the cloud
2	Enabling students to understand security, privacy and interoperability	**CO2**	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing
3	To help and motivate students to undertake projects in cloud environment	**CO3**	Explain the core issues of cloud computing such as security, privacy, and interoperability
		CO4	Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model
		CO5	Ability to comprehend Service Oriented Architecture[SOA] and its services in Business and IT in cloud environment
Course Code	**MCS402/MCS403 ELECTIVES 4E5:**	**Course Title**	**DATA MINING**
	Course Objectives		**Course Outcomes (COs)**
1	To help students to understand basic data warehousing architecture and schema	**CO1**	Understand the basic concepts, schema and architecture of data warehouse
2	To make students to understand variety of data mining algorithms to perform classification, clustering and outlier analysis	**CO2**	Design data warehouse with dimensional modeling and OLAP Operations
3	To apply data mining and machine learning techniques in their curriculum projects	**CO3**	Categorize and differentiate data for applying, frequent pattern mining, association and correlation
		CO4	Apply data mining algorithms to implement classification, clustering and outlier analysis
		CO5	Acquire confidence in taking up machine learning projects
Course Code	**MCS402/MCS403 ELECTIVES 4E6:**	**Course Title**	**DIGITAL IMAGE PROCESSING**

	Course Objectives		Course Outcomes (COs)
1	To give an insight into fundamental concepts of image processing	**CO1**	Learn basic steps in image acquisition, sensing and storage
2	To help understand concept of image enhancement	**CO2**	Able to perform image enhancement using histogram processing and filtering
3	To make them understand various algorithms in segmentation and compression	**CO3**	Able to learn algorithms for region based segmentation and to magnify the segment
		CO4	Able to write compression algorithms using Huffman coding and Run length encoding
		CO5	Acquire confidence in taking projects in image processing and Geographic information system

Course Code	**MCS402/MCS403 ELECTIVES 4E7 :**	**Course Title**	**CYBER SPACE**
	Course Objectives		**Course Outcomes (COs)**
1	To make students to understand pros and cons of social media networking	**CO1**	Understand basics of domain name service, social media networking sites
2	To help understand growth rate of e-commerce trading worldwide	**CO2**	Understand growing trend of online business like Amazon, Netflix etc.,
3	To create an awareness about offenses and penalties of IT Act 2000 as per court of Law	**CO3**	Able to learn about how e-governance is being handled by Aadhar UID, Income Tax etc.,
		CO4	Understand the intricacies of cyber crime through electronic gadgets
		CO5	Able to avoid illegal activities using internet and social media
Course Code	**MCS402/MCS403 ELECTIVES 4E8**	**Course Title**	**MACHINELEARNING**
	Course Objectives		**Course Outcomes (COs)**
1	To make students to understand machine learning as a subfield of AI	**CO1**	Understand the basic concepts of machine learning
2	To help students to understand neural networks and support vector machines	**CO2**	Design neural network to identify an object
3	To make students to different clustering and classification algorithms	**CO3**	Able to use SVM and Linear Regression for inducing machine learning
		CO4	Apply and Analyze classifier accuracy among different algorithms
		CO5	Acquire confidence in taking up projects in AI and machine learning
Course Code	**MCS402/MCS403 ELECTIVES 4E9**	**Course Title**	**DATA SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To help students to understand the history of data science	**CO1**	Understand the history of DSS, OLAP, BigData and Data Science
2	To help understand the need for data cleaning before applying algorithms on data	**CO2**	Able to apply cleaning algorithm and imputation algorithm on dataset

3	To make students to understand statistical inference through three dimensional visualizations	**CO3**	Able to use statistical functions in appropriate for analyzing data
		CO4	Able to Apply K-means clustering, decision tree algorithms on dataset
		CO5	Apply clustering and classification methods to extract potential information from huge dataset
Course Code	**MCS402/MCS403 ELECTIVES 4E10**	**Course Title**	**BLOCK CHAIN TECHNOLOGY**
	Course Objectives		**Course Outcomes (COs)**
1	To help students to understand the concept of Block Chain Technology	**CO1**	Able to understand the concept of block chain and history of crypto digital currency
2	To help students to understand the growing trend of crypto currency world wide	**CO2**	Able to comprehend type of block chain
3	To create an awareness about Ethereum, Bitcoin and other digital currencies in use	**CO3**	Know how to establish a smart contract for buying and selling crypto currencies
		CO4	Know the intricacies involved in block chain investment
		CO5	Able to learn the success and failure of block chain technology
Course Code	**MCS402/MCS403 ELECTIVES 4E11:**	**Course Title**	**INTERNET OF THINGS**
	Course Objectives		**Course Outcomes (COs)**
1	To create an awareness on communication models of IoT	**CO1**	Able to understand communication models of IoT
2	To make students to understand issues in wireless medium access	**CO2**	Able to identify design and security issues in IoT
3	To make students to understand design and security challenges in IoT	**CO3**	Implement IoT concepts through Python coding
		CO4	Able to make use of IoT tools like Arduino, Eclipse, M2M Lab and Canopy
		CO5	Analyze and Apply knowledge driven from case studies of industrial automation, Smart Grid and Data Analytics using IoT
Course Code	**MCS405**	**Course Title**	**MAIN PROJECT LAB**
	Course Objectives		**Course Outcomes (COs)**
1	To design and develop an innovative real-time project in scientific, engineering, business application	**CO1**	Perform Requirements Analysis and the need to develop the application
2	To be familiar with system development methods and practices to save development time and cost	**CO2**	Design the application using design tools and techniques
3	To make the students to understand the need for proper documentation, preparation of test cases for verification	**CO3**	Develop code using latest and apt programming language
		CO4	Perform validation and testing

		CO5	Able to collaborate with team members to Design and Develop projects

NAME OF THE PROGRAMME	M.SC. PHYSICS
PROGRAMME CODE	IAMOS08

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To impart quality education both in theoretical as well as experimental physics with special emphasis on 'learning by doing' to produce quality manpower for teaching as well as research.	**PO1**	Understand the terminology used in Classical Mechanics, Quantum mechanics, Statistical mechanics, Electrodynamics, Physics of Solids, Nanotechnology.
PEO2	To enable the students to acquire deep knowledge in fundamental aspects of all branches of Physics.	**PO2**	Gain the knowledge on important concepts in Mathematical Physics, Quantum mechanics, Laser and Optics, Numerical analysis, Atomic, molecular and particle physics and design realistic circuits to perform specified operations.
PEO3	To inculcate scientific bent of mind and attitude relevant to science such as concern for efficiency, accuracy and precision, objectivity, integrity, enquiry, effective communication, ethical responsibilities, Initiative and Inventiveness	**PO3**	Understand the important connections between theory and experiment.
PEO4	To develop abilities and skills that encourages research and development activities and is useful in everyday life.	**PO4**	Learn laboratory skills, enabling them to take measurements in a physics laboratory and estimate sources of error in a measurement. Develop written and oral communication skills in communicating physics and research oriented topics.
PEO5	To develop abilities and skills that encourages research and development activities and is useful in everyday life.	**PO5**	Understand ethical aspects of their role as a professional in the field of physics and its applications.

SEMESTER - I			
Course Code	**MPH 101:**	**Course Title**	**Classical Mechanics**
	Course Objectives		**Course Outcomes (COs)**
1	To analyse the Lagrangian and Hamiltonian approach to solve the classical systems	**CO1**	Gain the knowledge on basic formalism of classical mechanics which includes Lagrangian, Hamiltonian, scattering and many body systems.
2	To explain the different types of small oscillations and dynamics of rigid bodies	**CO2**	Able to describe the physical principle behind the derivation of Lagrange and Hamilton's equations, and the advantages of these formulation
3	To describe the motion of a particle in a non-inertial frame of reference, central forces and scattering in central force field.	**CO3**	Able to relate symmetries to conservation laws in physical systems, and apply these concepts to practical situations
		CO4	Able to demonstrate and practice different problem-solving strategies within mechanical physics and assess which of these strategies is most useful for a given problem
		CO5	Connect concepts and mathematical rigor in order to enhance understanding
Course Code	**MPH102:**	**Course Title**	**Electronic Circuits and Devices**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the understanding of the physics of electronic devices like junction diodes, special diodes and photo electronic devices	**CO1**	Able to explain the construction and working of various diodes, op-amps, digital electronic circuits, convertors and their applications.
2	To discuss the characteristics, limitations, linear and non-linear applications of operational amplifiers.	**CO2**	Able to describe the working of operational amplifiers and related integrated circuits and design realistic circuits to perform specified operations for linear and non-linear applications.
3	To provide the knowlede of Boolean Algebra, basic digital electroncs, design and working of flip flops, registers, counters, timers, DAcs, ADCs and memory devices.	**CO3**	Able to design suitable and efficient circuits for intended operations
		CO4	Realize the importance of various analog and digital electronic circuits in electronic devices
		CO5	Know the physics of semiconductor devices and other optoelectronic devices and their applications

Course Code	MPH103:	Course Title	Quantum Mechanics - I
	Course Objectives		**Course Outcomes (COs)**
1	To discuss the failure of classical physics and a strong foundation of Quantum mechanics.	**CO1**	Understand the necessity and basic formalism of quantum mechanics, and its applications.
2	To analyse the quantum mechanical systems with different potentials	**CO2**	Able to construct the Schrodinger picture or Heisenberg picture or interaction picture which is depending on the particle and operator state.
3	To deduce the general formalism of quantum theory.	**CO3**	Able to build connections between mathematical development and conceptual understanding.
		CO4	Abel to analysis the problems of free particle, particle in a box and harmonic oscillator and find the transmission and reflection coefficient for tunnelling particle.
		CO5	Able to solve quantum mechanics problems. This will include complex functions and Hilbert spaces, and the theory of operator algebra.
Course Code	**MPH104:**	**Course Title**	**Mathematical Methods of Physics - I**
	Course Objectives		**Course Outcomes (COs)**
1	To explain the vector space, subspaces , orthogonality and linear operators.	**CO1**	Equip the students with basic mathematical procedures required in physics
2	To understand calculus of variation and solve non linear problems.	**CO2**	Able to solve physically relevant partial differential equations using standard methods like separation of variables, series expansion (Fourier-type series), and integral transforms.
3	To describe gradient, divergence, curl operations and elementary tensors analysis and their physical significance in analysing the physics systems.	**CO3**	Students will have a good grasp of the basic elements of complex analysis, including the important integral theorems. They will be able to determine the residues of a complex function and use the residue theorem to compute certain types of integrals.
		CO4	Gain knowledge on elementary tensor analysis and their applications.
		CO5	Solve linear ordinary differential equations and use of Frobenius method to get the series solution of differential equations.
Course Code	**MPH105:**	**Course Title**	**Experimental Techniques in Physics**
	Course Objectives		**Course Outcomes (COs)**
1	To learn the importance of safety of the apparatus and person doing the experiment, identify occupational health hazards like chemical substances, radiations and practice the general electrical testing standards and norms in the labs.	**CO1**	Recognize the importance of safety of the apparatus and person doing the experiment, identify occupational health hazards like chemical substances, radiations and practice the general electrical testing standards and norms in the labs.

2	To perform measurements, identify the sources of error and classify them as systematic errors, random errors, recognize the need for precision and accuracy, and evolve methods to reduce errors and perform elementary data fitting	**CO2**	Perform measurements, identify the sources of error and classify them as systematic errors, random errors, recognize the need for precision and accuracy, and evolve methods to reduce errors and perform elementary data fitting
3	To describe the methods to generate vacuum by rotary, oil diffusion, turbo molecular pumps, Ion pumps.	**CO3**	Students will be able to know the various techniques to generate vacuum and also about thin film techniques.
		CO4	Describe the methods to generate vacuum by rotary, oil diffusion, turbo molecular pumps, Ion pumps.
		CO5	Understand the certain landmark experiments of historical importance in Physics by going through the original papers
SEMESTER - II			
Course Code	**MPH201:**	**Course Title**	**Statistical Mechanics**
	Course Objectives		**Course Outcomes (COs)**
1	To formulate the Maxwell thermodynamic relations and able to evalute the entropy changes in different thermodynamic process	**CO1**	Provide the knowledge of statistical mechanics in studying and analyzing the behaviour of many particles complex systems.
2	To formulate the Statistical interpretation of the basic thermodynamic variables and	**CO2**	Able to describe macroscopic systems, thermodynamic potentials and ensembles
3	To analyse and study the behaviour of many particles complex systems using statistical mechanics.	**CO3**	Understand the importance and consequences of quantum mechanics for macroscopic particle systems
4	To explain some physical phenomena using quantum statistics	**CO4**	Able to identify thermodynamic fluctuations and develop Onsager reciprocal relations.
		CO5	Ability to solve problems relevant to statistical mechanics
Course Code	**MPH202:**	**Course Title**	**Electrodynamics**
	Course Objectives		**Course Outcomes (COs)**
1	To evaluate electrostatic potential using different techniques	**CO1**	Able to solve the boundary value problems using method of images and able to demonstrate the electric field polarization in dielectrics
2	To describe the magnetostatic field in matter	**CO2**	Able to understand that laws of reflection, refraction are outcomes of electromagnetic boundary conditions.
3	To explain the propogation of electromagnetic waves in different media	**CO3**	Grasped the idea of electromagnetic wave propagation through wave guides and transmission
4	To construct the covariant formalism of relativistic electrodynamics	**CO4**	Able to formulate scalar and vector potentials, identify the gauge transformations.

		CO5	Gain knowledge on special theory of relativity by including the relativistic electrodynamics.
Course Code	**MPH203**	**Course Title**	**QUANTUM MECHANICS - II**
	Course Objectives		**Course Outcomes (COs)**
1	To find the eigen fucntion and eigen value for degenerate and non-degenerate system	**CO1**	Able to apply time independent perturbation theory to find the energy correction and wave function correction for the quantum system.
2	To solve the scatering problem	**CO2**	Able to connect the the solutions of two regions in quantum barrier potential problem by the use of WKB approximation
3	To understand symmetric and anti-symmentric wave fuctions and also understand the quantum relastivitic particle	**CO3**	Able to solve strong scattering particle problem by partial wave's analysis method.
		CO4	Gain the knowledge on representing symmetric and anti-symmetric wave function.
		CO5	Able to study the dynamics of quantum relastivitic particle
Course Code	**MPH204:**	**Course Title**	**MATHEMATICAL METHODS OF PHYSICS - II**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the students with the necessary mathematical tools at an advanced level for them to apply to physical systems	**CO1**	Students will be able to apply the concepts of Fourier Series and Integral transforms to analyse physical systems
2	To enable the students to use the tools of Fourier analysis, integral transforms, Green's function and their applications	**CO2**	Students will be able to know the properties of Green's functions, Construct Green's function in special cases and find the solutions of inhomogeneous differential equations
3	To provide the knowledge of complex analysis and group theory which is helpful to understand and analyse advanced level physics	**CO3**	Apply the knowledge gained in complex analysis to solve problems
		CO4	Gain the knowledge in Group Theory, types of groups, and elementary ideas in continuous groups
		CO5	Understand the basic mathematical tools required to develop the theory of physical systems and analyse them.
Course Code	**MPH205:**	**Course Title**	**ELEMENTARY BIOPHYSICS**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the saparation of molecules from mixture by chromatography and electrophoresis techniques.	**CO1**	Understand to separate the macromolecules from the mixture by using chromatography and electrophoresis techniques.

2	To determine the size of the molecules and also get knowldege on instrumental techniques	**CO2**	Able to determine the size of molecules using light scattering by macromolecules and study the optical activity
3	To provide a basic knowledge of radiation physics and its uses in medical field.	**CO3**	Gain knowledge onvarious instrumental techniques such as Absorption spectroscopy, Raman spectroscopy provides the information of molecular rotations and vibrations.
		CO4	Gain the knowledge about the radiation sources, dosimetry- measurement of ionizing radiation in a given place or on a person.
		CO5	Understand the effect of radiation on the living system and protection measures from radiation and explain the radiation therapies used in the medical field
SEMESTER - III			
Course Code	**MPH 301:**	**Course Title**	**NUCLEAR AND PARTICLE PHYSICS**
	Course Objectives		**Course Outcomes (COs)**
1	To gain knowledge on nuclear forces, nuclear reactions and nuclear detectors	**CO1**	Gain knowledge about the interaction of charged particles with matter, conservation laws in nuclear reactions, characteristics of nuclear forces and the deuteron problem.
2	To analyze various nuclear models	**CO2**	Gain the knowledge of construction and principle of working nuclear detectors and nuclear electronics.
3	To describe the modern experimental tools of Nuclear and Particle Physics job prospects	**CO3**	Analyse the structure and stability of the nuclei using liquid drop model and shell model
		CO4	Discuss the selection rules for beta decay and gamma decay.
		CO5	Describe the modern experimental tools of Nuclear and Particle Physics
Course Code	**MPH302**	**Course Title**	**CONDENSED MATTER PHYSICS**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the crystal system and their properties	**CO1**	Gain the knowledge of basics of crystallography, seven crystal systems and evaluate the miller indices of crystal planes.
2	To apply techniques to typical problems encountered in the field	**CO2**	Investigates different classes of materials-metals, ceramics, and electronic materials.
3	To identify the Identify research opportunities in the domain which are offered as scientists and technologists, etc. in national and international institutions.	**CO3**	Gain knowledge on Piezoelectricity and ferroelectricity
		CO4	Apply key analysis techniques to typical problems encountered in the field
		CO5	Identify research opportunities in the domain which are offered as scientists and technologists, etc. in national and international institutions.

Course Code	MPH303 E1:	Course Title	LASERS AND OPTICS
	Course Objectives		**Course Outcomes (COs)**
1	To understand the process of producing laser light and its propoerties	**CO1**	Gain the knowledgeon LASER, fibre optics and its applications.
2	To study the light effects through light phenomenon's	**CO2**	Describe the different types of lasers, its principle, properties of laser beam
3	To acquire the knowledge on nonlinear optics	**CO3**	Establish dispersion relation for dilute gases and dense gases, also gain the knowledge of the polarization of light through retarded plates
		CO4	Gain the knowledge on interference and diffraction and their applications
		CO5	Understand the basic concepts about the nonlinear optics and interaction of radiation with a dielectric medium.
Course Code	**MPH 304 E3**	**Course Title**	**MATERIAL SCIENCE**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the structure and property interrelationship of engineering materials and the mechanical behaviour of engineering materials based upon interatomic structure (bond type).	**CO1**	Able to understand the structure and property interrelationship of engineering materials and the mechanical behaviour of engineering materials based upon interatomic structure (bond type).
2	To get the knowledge on crystal imperfections	**CO2**	Gain the knowledge on crystal imperfections anddescribe how and why defects in materials greatly affect the properties and limit their use in service.
3	To learn the importance of polymer materials, composites and their applications	**CO3**	Understand the mechanical properties of materials.
		CO4	Learn the importance of polymer materials, composites and their applications
		CO5	Able to Identify the research opportunities in the field of material science
SEMESTER - IV			
Course Code	**MPH401:**	**Course Title**	**ATOMIC AND MOLECULAR PHYSICS**
	Course Objectives		**Course Outcomes (COs)**
1	To learn and understand the atomic models and absorption and emission of spectra	**CO1**	Understand the early atomic models
2	To acquire knowledge on IR and Rama spectra	**CO2**	Understand the Zeeman effect , Paschen-Back and Stark effect
3	To find the symmetry of molecules with the use of IR and Raman spectroscopy.	**CO3**	Gain the knowledge on rotational and vibrational spectra of molecules and instrumentation of IR and Raman spectrometer.
		CO4	Able to find the symmetry of molecules with the use of IR and Raman spectroscopy.

		CO5	Able to apply the theoretical techniques presented in course to practical problems
Course Code	**MPH402:**	**Course Title**	**NUMERICAL ANALYSIS AND COMPUTATIONAL PHYSICS**
	Course Objectives		**Course Outcomes (COs)**
1	To solve physical problems using numerical techniques	**CO1**	Able to solve the problems using Newton's Raphson method and bisection method
2	To gain knowledge on random variable and fundamental probability laws.	**CO2**	Gain the knowledge on random variable and fundamental probability laws.
3	To learn C language and use it as a tool to write programs for the numerical techniques	**CO3**	Able to analyze errors in measurement and fit the experimental data
		CO4	Ability to solve both ordinary and partial differential equations using special functions and/or computational techniques.
		CO5	Understand the theoretical and practical aspects of the use of numerical methods
Course Code	**MPH403 E5**	**Course Title**	**: PHYSICS OF SOLIDS AND LIQUID CRYSTALS**
	Course Objectives		**Course Outcomes (COs)**
1	To describe the elastic vibration in continuous media and thermal properties of solids	**CO1**	Gain knowledge on physical properties of different categories of solid materials, with an emphasis on the crystalline state.
2	To calculate binding energy of a molecule and able to discuss the different types of interatomic force and diffusion in solids	**CO2**	Understand the properties of solid materials.
3	To determine the elastic constants of cubic crystals and discuss classification, symmetry, textures and optical properties of different types of liquid crystals.	**CO3**	Gain knowledge on interatomic forces, bonding in ionic crystals and diffusion in solids.
		CO4	Able to Identify and explain the various optical processes such as absorption, photoconductivity, photoelectric effect, photovoltaic effect and photoluminescence
		CO5	Able to explain the construction and working of LCD
Course Code	**MPH404E7:**	**Course Title**	**PHYSICS OF NANOMATERIALS**
	Course Objectives		**Course Outcomes (COs)**
1	To discuss the significance, classification and applications of nanomaterials.	**CO1**	Qualitatively describe how the nanoparticle size can affect the morphology, crystal structure, reactivity, and electrical properties.
2	To explain the physics of nanomaterial.	**CO2**	Describe several synthesis methods for fabrication of inorganic nanoparticles, one-dimensional nanostructures (nanotubes, nanorods, nanowires), thin films, nanoporous materials, and nanostructured bulk materials, and also could describe how different lithography methods can be used for making nanostructures.

3	To prepare the nanomaterials' using different fabrication techniques	**CO3**	Gain knowledge on nanomagnets, gas sensors, quantum confinement etc.
4	To analyse the properties of nanomaterial using different characterization techniques	**CO4**	Able to learn to determine the surface morphology and various mechanical properties characterization by scanning probe techniques like SEM, AFM, STM.
		CO5	Acquired knowledge in synthesizing and fabricating nanostructured materials of various inorganic compounds (metals, semiconductors, oxides, fullerenes) and constructions of these

NAME OF THE PROGRAMME	M.Com.
PROGRAMME CODE	IAMOC01

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To impart latest knowledge and career oriented skills along with building character in a conducive environment, so that the students excel in education and prepare a career in corporate sector, teaching and commerce related activities.	**PO1**	Learn up to date concepts and applied skills with positive mind set to contribute gainfully, these attributes make them to stand out in their career in world of Commerce and business, academics and allied areas.
PEO2	To prepare students for career in professional accountancy, corporate sector and allied areas like teaching and research.	**PO2**	Develop competencies to comprehend and aim at opting competitive and professional careers in Accountancy and Finance.
PEO3	The program aims at preparing students to a broad spectrum of commercial activities. Commerce is the applied discipline encompassing varied commercial activities like economic analysis, insurance process, financial operations etc.	**PO3**	Develop renewed focus to carry out wide variety of pursuits which together, one way or the other are related to the wider arena of commerce and its applications.
PEO4	The program aims at making students to be able to analyze both internal and external environment and prepare to react to the situations. Commerce is highly dynamic in nature. It has to adopt to the changing business environment	**PO4**	Ability to scan, analyses and adapt to the highly dynamic external environment challenging the business operations on perpetual basis.
PEO5	The program intends to develop logical thinking so that they are comprehend principles of accounts, financial analysis and other commercial theory and practices, so that they can carry forward and able to independently carry out further research leading to findings and their publications.	**PO5**	Develop the skill to connect the theoretical knowledge to carry out solution oriented research by applying logical thinking and rational reasoning analysis leading to the findings being published in Leading Journals for wider effectiveness.

SEMESTER - I			
Course Code	**MCM 101**	**Course Title**	**BUSINESS MARKETING**
	Course Objectives		**Course Outcomes (COs)**
1	To facilitate indepth understanding of similarities and differences between Business Marketing and Consumer Marketing.	**CO1**	Able to distinguish and comprehend various business marketing practices with respect to consumer marketing practices
2	To equip students, with application tools towards formulating and implementing Business Marketing Strategies.	**CO2**	Able to understand the formulation of Business Marketing Strategies
3	To make the student to understand new product development involving high technology marketing	**CO3**	Comprehend the process of implementation of Business Marketing Strategies
		CO4	Capable of new product development involving high technology marketing like online marketing process
		CO5	Able to understand online marketing, tele marketing and complete struture of digital marketing
Course Code	**MCM 102**	**Course Title**	**INTERNATIONAL BUSINESS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the concepts, functions and practices of international business.	**CO1**	Able to comprehend the rudiments and broader aspects of international business practices
2	To enable them get global perspective on issues related to business and foreign trade, balance of trade, balance of payments in relations to import and export trade.	**CO2**	Create competency to analyse important Business issues at global level
3	To enable the student to understand international human resources management and the imortance of employee relations.	**CO3**	Recognise and apply the Human Resource Management and employee relations
		CO4	Interpret foreign trade,balance of payment positions and its process
		CO5	Can articulated the Global trade integration and its implications
Course Code	**MCM 103**	**Course Title**	**INFORMATION SYSTEMS AND COMPUTERS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize student with aspect of business information systems and relevant information technology.	**CO1**	Able to understood the hardware , software and periperal aspects of Information Systems
2	To develop skills to design and implement simple computer based business and audit information systems and database management tools	**CO2**	Capable of understanding the importance of information system in business operations

3		**CO3**	Can comprehend the skill set required to apply digital tools
4	To make them understand the software types and functions by using different statistical tools by applying various financial related anaysis.	**CO4**	Capable of application of various softwares related financial analysis
		CO5	Get to use DBMS
Course Code	**MCM 104**	**Course Title**	**MICRO & MACRO ECONOMICS FOR BUSINESS DECISIONS**
	Course Objectives		**Course Outcomes (COs)**
1	To understand micro and macroeconomic concepts in area of commerce and management	**CO1**	Able to apply economic concept to solve problems in commerce and management
2	To expose the economic analysis as a tool for business decision making and its interpretation	**CO2**	Use the tools of economic analysis on business decision making process
3	To expose to international financial sector and major institutions to the latest and emerging areas in economics	**CO3**	Able to analyse Macro Economic policies and its effect on business
4	To understand micro and macroeconomic concepts in area of commerce and management	**CO4**	Can link the contribution of major international economic institutions and business decisions
		CO5	Capable of following the latest developments in the field of economics and itsapplications
Course Code	**MCM 105**	**Course Title**	**ADVANCED FINANCIAL MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To impart the knowledge in financial management and decision making process and capital structure theories	**CO1**	Comprehend the decision making process and pros and cons of various capital structure theories
2	To impart advanced knowledge of Capital Budgeting and Risk Analysis Techniques	**CO2**	Apply cash flows and evaluate projects using different techniques.
3	To expose the students to Corporate Restructuring and Derivatives	**CO3**	Apply statistical tools to evaluate complex projects
		CO4	Comprehend the process of Mergers and Acquisitions and its financing
		CO5	Use derivatives and hedging risk
Course Code	**MCM 106**	**Course Title**	**HUMAN RESOURCE MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	1. To expose the students to the principles and practices of Human Resources Management.	**CO1**	Aware of basic principles and practices of HRM
2	To make students internalize good HR practices	**CO2**	Express familiarity with good HR practices

3	To appraise the impotance of HR operations, HR Ethics and practices in India.	**CO3**	Can analyse various HR operations and practices to be adopted across various sectors
		CO4	Adopt, nurture and comply to safe and healthy work environment
		CO5	Internalize HR Audit requirements with HR ethical compliance requirement
Course Code	**MCM 107**	**Course Title**	**GST AND BUSINESS REPORTING**
	Course Objectives		**Course Outcomes (COs)**
1	To make the student to understand the concept of GST & Business Reporting	**CO1**	Provide the updation of knowledge to understand the subject with more clarity
2	To bring out the importance & application of GST and Accounting Standards in the current economic scenario	**CO2**	Enable the students to learn the charges on GST and apply the same appropriately with different types of Goods and Services
3	To enable the students to understand relationship between GST and other laws like income tax, companies act etc.	**CO3**	Able to analyse the relationship between GST Laws with other Corporate laws
		CO4	Able the students to understand the application of GST Law with its infrastructure like GST portal
		CO5	Provide all required knowledge to analyse the Input Tax Credit with Electronic Ledgers and Returns
SEMESTER - II			
Course Code	**MCM 201**	**Course Title**	**LOGISTICS & SUPPLY CHAIN MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an insight into the principles and practices in Logistics and SCM	**CO1**	Can comprehend the basic concepts and its applications in Logistics and SCM
2	To expose to the various practices of outsourcing and logistics service providers	**CO2**	Can analyse various scenarios on to which outsourcing is favourable and enlist appropriate logistic service providers
3	To introduce planning of Global SCM and creating effective network design through Information Technology	**CO3**	Can figure out as how global SCM works based on which can create network design
		CO4	Can understand and apply various inventory management practices in global SCM
		CO5	Able to interpret the IT applications and understand various performance metrics
Course Code	**MCM 202**	**Course Title**	**RISK MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To provide basic knowledge of risk, type of risks and tools of risk management	**CO1**	Able to understand and comprehend various types of risks

2	To expose to the application aspects in various business situations.	**CO2**	Can apply various risk management tools in different business scenarios
3	To enable to apply innovative risk hedging techniques/tools.	**CO3**	Able to use latest risk management techniques like hedging
4	To familiarize the student the important theories of risk and risk pricing models.	**CO4**	Can comprehend the theoretical underpinnings to solve risk issues using various risk pricing models
5	To enable the students to undestand the insurance which will be helpful during high risk.	**CO5**	Can understand the use of insurance as high risk mitigation mechanism
Course Code	**MCM 203**	**Course Title**	**ADVANCED E-COMMERCE**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the concept of e-Commerce and its basic elements	**CO1**	Understand the meaning and fundamentals of e-Commerce and its applications
2	To enable to have an overview of electronic payment systems and its importance in ecommerce.	**CO2**	Can understand and apply electronic payment system which is vital for e commerce operations
3	To introduce the infrastructure of m-Commerce and its technological applications	**CO3**	Able to understand the rudimentary aspect of technological framework and the required infrastructure to enable m-Commerce
4	To expose the student application and service of m commerce	**CO4**	Can understand and apply the services of M-Commerce
5	To make student understand the commercial aspects of M-Commerce in various sectors	**CO5**	Able to read the M-Commerce application in diverse business sectors
Course Code	**MCM 204**	**Course Title**	**BUSINESS RESEARCH METHODS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students with concepts, tools and techniques of the methodology of business research.	**CO1**	Able to understand the fundamental aspects of Business Research Methods
2	To impart the knowledge on collection and processing of data.	**CO2**	Capable of doing research project with data collected from corporate and allied sector.
3	To enable the students data interpretation and report writing required for business activities.	**CO3**	Can collect data from appropriate sources based on which effective and reliable research findings is possible
		CO4	Able to apply data processing techniques to get the required findings.
		CO5	Capable of summarizing the research activity and able to present in the form of research report
Course Code	**MCM 205**	**Course Title**	**OPERATIONS RESEARCH AND QUANTITATIVE TECHNIQUES**
	Course Objectives		**Course Outcomes (COs)**
1	To impart knowledge in concepts and tools of OR and QT	**CO1**	Able to understand the fundamental concepts and tools of OR and QT

2	To make students apply these in managerial decision making	**CO2**	Capable of applying various tools in decision making process in real time business scenario
3	To expose the student to study the different statistical theories anddecision making by analyzing the Scenarios	**CO3**	Able to understand the theortical backgrounds and apply to get the required results
		CO4	Able to apply different software packages to arrive at the solutions effectively.
		CO5	Can comprehend to have timelines followed by using evaluation softwares
Course Code	**MCM 206:**	**Course Title**	**MONETARY SYSTEM AND BANKING REGULATIONS**
	Course Objectives		**Course Outcomes (COs)**
1	To expose students to domestic and international monetary systems	**CO1**	Can figure out both domestic and international monetary system and its operations
2	To familiarize with issues relating to Banking regulations.	**CO2**	Get to understand the background and regulations of banking sector at different levels
3	To make the student understand the concept of foreign exchange regime.	**CO3**	Able to grasp the foreign exchange system and its operation
		CO4	Can analyse the background operations of banking using various monitoring tools and techniques
		CO5	Can understand international banking regulations and prudential norms
Course Code	**MCM 207**	**Course Title**	**MICRO FINANCE AND VENTURE CREATION**
	Course Objectives		**Course Outcomes (COs)**
1	To make the student understand the concept of Financial Benefits and RBI guidelines to Micro Finance	**CO1**	Can comprehend basic concepts and guidelines to micro finance
2	To have on overview of different players, institutions and regulatory agencies influencing the Micro Finance activity.	**CO2**	Can identify the important players and agencies in the micro finance sector
3	To examine & compare the changing scenario of the rural people with the use of Microfinance.	**CO3**	Can analyse the benefits of micro finance institutions in poverty alleviation of rural sector
4	To introduce to the concept of entrepreunership and new venture creation	**CO4**	Can understand entrepreunership oppurtunities and its successful applications
5	To make the students about the startups and its success.	**CO5**	Able to identify various oppurtunities and challenges in startups with the knowledge of EDP

SEMESTER - III			
Course Code	**MCM 301**	**Course Title**	**Business Ethics and Corporate Governance**
	Course Objectives		**Course Outcomes (COs)**
1	To make the student conscious about ethical values in real life and in business	**CO1**	Able to comprehend ethical ans moral framework in professional and business arena
2	To introduce to ethical theories and principles with reference to ethical practices indifferent functions of the business	**CO2**	Able to recollect the principles to adopt CSR related activities
3	To update on Corporate Governance through exposure to various Committees	**CO3**	Cabability of applying ethics in Marketing and Finance
		CO4	Cabability of applying ethics in HRM and IT
		CO5	Can able to know the functioning of Corporate Governance with exposure to its current practice
Course Code	**MCMA 302**	**Course Title**	**CORPORATE FINANCIAL REPORTING**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce to the principles of Corporate Reporting based on Accounting Standards viz Ind AS,IFRS & US GAAP	**CO1**	Able to understand theoretical background of Accounting Standards and convergence with IFRS
2	To expose students to present the accounts as per the revised formats and new developments in financial reporting	**CO2**	Able to understand the operation of Financial Reporting at global level
3	To enable the students to analyse the different financial instruments and its Reporting	**CO3**	Able to prepare Financial Statements as per revised latest accounting standards
		CO4	Able to understand and prepare supplementary Financial Reports
		CO5	Capable of expressing accounting and reporting of financial instruments
Course Code	**MCMA 303**	**Course Title**	**ACCOUNTING FOR MANAGERIAL DECISIONS**
	Course Objectives		**Course Outcomes (COs)**
c	To expose the students to managerial decision making process.	**CO1**	Able to explain steps involved in managerial decision making process
2	To make the students understand the importance of the key factors in managerial decision making	**CO2**	enable students to apply cost concepts in management decision making process.
3	To impart knowledge on Budgetary Control and Variance Analysis Uniform costing in improving Cost control and Cost reductions	**CO3**	Fix Responsibility Centres in an organisation and evaluate divisional performance using costing techniques

		CO4	Prepare different Functional Budgets and make variance analysis and take necessary actions to control the variances
		CO5	Prepare costing reports under set uniform costing system and make interfirm comparison
Course Code	**MCMA**	**Course Title**	**304 STRATEGIC COST MANAGEMENT – I**
	Course Objectives		**Course Outcomes (COs)**
1	To expose the students to the internal environment of business and to enable them to formulate strategies relating to cost.	**CO1**	Link the costing system to the Strategic Management process
2	To eloborate on emerging cost concepts in acheiving the organisational	**CO2**	Evaluate the realtime operations in achieving the organisational goals
3	To expose to the modern and latest issues in Cost Management Techniques Like ABC system ,Life Cycle Costing.	**CO3**	Able to identify the cost drivers, cost pool and arrive at the real cost of the products and services
		CO4	Identify the products in their different stages of lifecycle and able to react and maximise the revenues
		CO5	Able to link the current practices with modern costing methods for better cost management practices
Course Code	**MCMA 305**	**Course Title**	**:Goods and Services Tax & Customs**
	Course Objectives		**Course Outcomes (COs)**
1	To make students familiarize with the new Indirect tax of GST	**CO1**	Provide the updation of knowledge to understand the subject with more clarity
2	To understand the various provisions and tax calculations under GST	**CO2**	Enable the students the charges on GST and apply the same appropriately with different types of Goods and Services
3	To make the students gain through knowledge on customs act and update the amendments	**CO3**	Able to analyse the relationship between GST with Income Tax laws
		CO4	Able the students to understand the application of GST Law with available infrastructure at GST and portal
		CO5	Strenghthening the knowledge of the students in the area of Customs Law and its applications to Business and ITC
SEMESTER - IV			
Course Code	**MCM 401**	**Course Title**	**COMMODITY MARKETS**
	Course Objectives		**Course Outcomes (COs)**
1	To expose students to the world of commodity markets	**CO1**	Able to understand the concept of Commodity Markets in its varied dimensions

2	To explain the concept and importance of quality assurance systems	**CO2**	Can comprehend quality of the commodities traded in commodity markets and able to link with proper pricing
3	To make the students understand the different types of derivatives instruments and their importance in commodity markets	**CO3**	Apply the concept of derivative instruments in commodity trading
		CO4	Able to understand the various important concepts relating to Commodity Markets
		CO5	Able to work and manage commodity market operations complying with the regulatory framework
Course Code	**MCMA 402:**	**Course Title**	**CORPORATE REPORTING PRACTICES AND IND AS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize with recent developments in the area of financial reporting	**CO1**	Apply the principles and practices of GAAP as enumerated under IFRS
2	To gain advanced knowledge on the accounting for Business Combination, Consolidation and Group Financial Statements	**CO2**	Apply the accounting principles in business combination as per Ind AS 103
3	To expose the students to the IND AS presentation of accounts inventory valuation and other reporting	**CO3**	Apply the principles and practices of Ind AS 110 and prepare Consolidated Financial Statements
		CO4	Prepare accounting statements for investments in associates and Joint Venture statements
		CO5	Apply the Ind AS principles in varied business scenarios
Course Code	**MCMA 403**	**Course Title**	**STRATEGIC COST MANAGEMENT – II**
	Course Objectives		**Course Outcomes (COs)**
1	To expose the students to the external environment of business and to enable them to formulate strategies relating to cost and pricing.	**CO1**	Able to scan and understand the external environment of Business for evolving Pricing strategies
2	To make the students understand the importance of transfer pricing under international trading	**CO2**	Capable of computing various Transfer Prices and its Pros and Cons.
3	To enable the students to appreciate quality concepts in cost accounting	**CO3**	Apply the concept of learning Curve and Compute the cost
		CO4	Can Interpret the importance of quality and prepare Quality related reports.
		CO5	Capable of analysing the organisation in its Broader sense
Course Code	**MCMA 404**	**Course Title**	**DIRECT TAXES PLANNING**
	Course Objectives		**Course Outcomes (COs)**

1	To appraise the students of the tax concepts, its theory and laws.	**CO1**	Provide an elaborate knowledge on Tax Planning Methods
2	To give an integrated view of direct tax and apply the laws to business decisions.	**CO2**	Enhance the Knowledge on Direct laws to apply the suitable Tax planning decision on Corporates.
3	To expose the students to understand the different tax benefits available under the IT Act towards Tax Planning.	**CO3**	Able to analyse the corporates the appropriate methods towards tax planning.
		CO4	Able the students can understand the different tax benefits available under the IT ACT towards reduction of tax liabilities
		CO5	Can apply suitable tax planning benefits to the corporates .

NAME OF THE PROGRAMME	M.Com. (FA)
PROGRAMME CODE	IAMOC02

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	The M.Com(FA) Program is to acquaint students intermediate and advanced level concepts in broad spectrum of knowledge in Business and its operations involving Accounting, Finance and allied activities	**PO1**	Interpret the conceptual aspects into applied solutions in the challenging and dynamic business situations.
PEO2	To make students involve in solving business situations by applying theoretical knowledge to arrive at business solutions	**PO2**	Formulate strategies, set targets and work towards achievable goals and take corrective actions.
PEO3	To make students comprehend the business situations and apply the tools and techniques to achieve the desired objectives	**PO3**	Able to scan the causes and effects of various operations through analytical research and be able to solve the business problems.
PEO4	To apply analytical skills and able to develop appropriate strategies in wide variety of operations.	**PO4**	Willing to take up challenging and dynamic position in the areas of business and be a contributing member involving group activities, still being distinct while aiming at the best possible results.
PEO5	To inculcate values, professionalism team and competitive spirit, articulation and assertive skills, willingness to update and applications to be a contributing member.	**PO5**	Able to comprehend Macro Economic factor both at National and Global Level and work at Micro Level to find appropriate solutions.

SEMESTER - I			
Course Code	**MFA 101**	**Course Title**	**ACCOUNTING CONVENTIONS AND STANDARDS**
	Course Objectives		**Course Outcomes (COs)**
	Course Objectives	**CO1**	Will understand the importance and need for accounting standards and various bodies involved in the process
1	· To expose the students to the role of accounting standards and the process of standard setting.	**CO2**	Will have an understanding of accounting standards at global level and important bodies involved
2	To introduce the student to the international arena of accounting standards	**CO3**	Will be able to grasp Ind AS converged with IFRS
		CO4	able to apply all relevent Accounting suitable standards on corpoate accounting
		CO5	capable to apply Ind AS in accounting for corporates specially in Business Combinations and preparing Consolidated Financial Statements
Course Code	**MFA 102**	**Course Title**	**MANAGING PEOPLE IN ORGANISATIONS**
	Course Objectives		**Course Outcomes (COs)**
1	To enable students gain knowledge about concepts, principles and practices relating to managing people in organizations.	**CO1**	Understand problems in alignment with organizational goals and objectives
2	To enable the students use the knowledge in managing human resource better.	**CO2**	Understand and value the impact of workforce diversity and globalization on health care organizations
3	To enable the students to gain the knowledge of different kinds of training and development on Human Resources	**CO3**	Use critical judgment to construct effective human resources policies for the effective management of people in health care organizations
Course Code	**MFA 103:**	**Course Title**	**MICRO & MACRO ECONOMICS FOR BUSINESS DECISIONS**
	Course Objectives		**Course Outcomes (COs)**
1	To understand micro and macroeconomic concepts in area of commerce and management	**CO1**	Able to apply economic concept to solve problems in commerce and management
2	To expose the economic analysis as a tool for business decision making and its interpretation	**CO2**	Use the tools of economic analysis on business decision making process
3	To expose to international financial sector and major institutions to the latest and emerging areas in economics	**CO3**	Able to analyse Macro Economic policies and its effect on business
		CO4	Can link the contribution of major international economic institutions and business decisions

		CO5	Capable of following the latest developments in the field of economics and itsapplications
Course Code	**MFA 104:**	**Course Title**	**MANAGERIAL FINANCE**
	Course Objectives		**Course Outcomes (COs)**
1	To impart knowledge in advanced techniques of financial management	**CO1**	define and measure the risk and rates of return through the capital asset pricing model
2	To expose students various tools of investment decisions	**CO2**	understand the difference between net cash flow and net income and the relevance of cash flow in financial planning
3	To make the students to understand the importance of budgeting and controlling in corporates	**CO3**	engage in certain capital budgeting procedures including payback, discounted payback, net present value, and internal rate of return
		CO4	identify and calculate component costs of capital, budgeting and controlling in corporate.
		CO5	Understand the techniques methods of investment appraisal
Course Code	**MFA 105**	**Course Title**	**OPERATIONS RESEARCH AND QUANTITATIVE TECHNIQUES**
	Course Objectives		**Course Outcomes (COs)**
1	To impart knowledge in concepts and tools of OR and QT	**CO1**	Able to understand the fundamental concepts and tools of OR and QT
2	To make students apply these in managerial decision making	**CO2**	Capable of applying various tools in decision making process in real time business scenario
3	To expose the student to study the different statistical theories and then application with software packages	**CO3**	Able to understand the theortical backgrounds and apply to get the required results
		CO4	Able to apply different software packages to arrive at the solutions effectively.
		CO5	Can comprehend to have timelines followed by using evaluation softwares
Course Code	**MFA 106:**	**Course Title**	**FINANCIAL MARKETS AND SERVICES**
	Course Objectives		**Course Outcomes (COs)**
1	To make the student familiarize with the financial services and markets in the Indian financial system.	**CO1**	Defines the functions of financial markets and intermediary institutions.
2	To provide an understanding of working of financial markets.	**CO2**	Explains effects of asymmetric information on financial markets
3	To familiarize the students to know the importance of banking and financial sector participating in the financial sector reform	**CO3**	Understand the various calculations of Sensex and Nifty
		CO4	Compares for an exchange regimes and learn theories in Marketing

		CO5	Understand the importance of Banking and Financial Sector reforms in Indian Economy
Course Code	**MFA 107:**	**Course Title**	**BUSINESS LEGAL SYSTEMS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the legal environment which influences business functioning.	**CO1**	Recognize legal and ethical issues when making business decisions.
2	To enable the students acquire proper perspective about legal environment for better decision making.	**CO2**	Understand MRTP Act, Consumer Protection Act, Features, Issues, and Court decision.
3	To make the students to understand the importance of SEBI ,IPR Act and its implications	**CO3**	Identify contracts that must be in writing, effects of non-compliance, and the construction and interpretation of contracts
		CO4	Familiarise with GATT/WTO, TRIMS, TRIPS, U R Round
		CO5	Able to understand environment Laws, Water Act, Air Act, Environment Protection Act 1986
SEMESTER - II			
Course Code	**MFA 201:**	**Course Title**	**CONTEMPORARY ISSUES IN ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To expose the students to emerging accounting issues at national and global level.	**CO1**	explain the role of positive accounting theory in explaining and predicting accounting policy choice and the behaviour of the capital markets;
2	To impart knowledge on latest accounting practices in the areas of CSR, HR, Inflation Accounting	**CO2**	Capable of analysing and evaluating the financial reporting of companies.
3	To make the students understand the Accounting for Leases, Brands and Balanced Score Cards	**CO3**	research and analyse complex contemporary financial accounting issues, and formulate well-reasoned and coherent arguments and reach well considered conclusions in relation to those issues;
		CO4	Measure the Human Resources using various approaches and methods
		CO5	Use analytical thinking to identify, and evaluate the emerging issues and in accounting and business.

Course Code	MFA 202	Course Title	INFORMATION TECHNOLOGY FOR ACCOUNTING AND FINANCE
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize student with aspect of business information systems and relevant information technology.	**CO1**	Able to understand the hardware , software and periperal aspects of Information Systems
2	To develop skills to design and implement simple computer based business and audit information systems.	**CO2**	Capable of understanding the importance of information system in business operations
3	To make understand the software types and functions by using different statistical tools and DBMS in application of various financial related anaysis.	**CO3**	Can comprehend the skill set required to apply digital tools
		CO4	Capable of application of various softwares related to financial analysis
		CO5	Get to use DBMS
Course Code	**MFA 203**	**Course Title**	**DIRECT TAXES PLANNING**
	Course Objectives		**Course Outcomes (COs)**
1	To appraise the students of the tax concepts, its theory and laws.	**CO1**	Provide basic and fundemental knowledge on Tax Planning Methods.
2	To give an integrated view of direct tax and apply the laws to business decisions.	**CO2**	Enhance the Knowledge on Direct laws to apply the suitable Tax planning decision on Corporates.
3	To expose the students to understand the different tax benefits available under the IT Act towards tax planning	**CO3**	Able to analyse the corporates the appropriate methods towards tax planning.
		CO4	Able the students can understand the different tax benefits available under the IT ACT towards reduction of tax liabilities
		CO5	Can apply suitable tax planning benefits to the corporates .
Course Code	**MFA 204 :**	**Course Title**	**SECURITIES ANALYSIS AND PORTFOLIO MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To enable the student to develop skills in analyzing various types of securities.	**CO1**	Recognize and apply appropriate theories, principles, and concepts relevant to securities analysis and portfolio management
2	To impart the knowledge of various theories and techniques with its application in securities analysis	**CO2**	apply the concept of portfolio management for the better investment.
3	To make the students understand the role of SEBI in Portfolio Investment	**CO3**	equipped with the knowledge of security analysis.
		CO4	Able to take investment decision at lower risk and more return .
		CO5	Formulate and exercise appropriate judgment in selecting and presenting information using

			various methods relevant to securities analysis and portfolio management.
Course Code	**Subject 5 MFA 205 :**	**Course Title**	**STRATEGIC COST AND MANAGEMENT ACCOUNTING**
	Course Objectives		**Course Outcomes (COs)**
1	To expose the students to the external environment of business and to enable them to formulate strategies related to cost and pricing.	CO1	Explain the role of cost data in pricing decisions
2	To introduce the students to activity based cost techniques and its application	CO2	Analyse the linkage between cost data and systems and the organisation of activities and resource flows in a range of manufacturing and service activities;
3	To acquaint the students in the emerging concept of TQM, Life Cyle Costin and JIT	CO3	Analyse the processes involved in identifying, measuring, analysing, interpreting and communicating information to managers in pursuit of the organisation's goals
		CO4	Develop strategies for managing costs and Explain the role of cost data in pricing decisions.
		C05	familiarize with TQM, Life Cycle Costing, JIT
Course Code	**MFA 206:**	**Course Title**	**ASSET LIABILITY MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	This course aims at developing necessary skills for applying the principles of financial analysis to management of funds by commercial banks and the insurance sector.	**CO1**	Understanding of managing interest rate & liquidity risk and exploring best practice in risk reporting, contingency planning and regulatory compliance.
2	To enable the students to understand the asset liability management	**CO2**	explore the issues and challenges of Asset and Liability Management for bank risk managers, auditors, and regulators
3	To enable the students to understand the asset,liability and Risk management.	**CO3**	Understand practical advantages and disadvantages of risk measurement and management tools and techniques, using samples of best practice risk reports.
		CO4	Explore various skills to monitor and measure Risk
		CO5	Familiarise the techniques of Transfer pricing.
Course Code	**MFA 207:**	**Course Title**	**BUSINESS RESEARCH METHODS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students with concepts, tools and techniques of the methodology of business research.	**CO1**	Able to understand the fundamental aspects of Business Research Methods

2	To impart the knowledge on collection and processing of data.	**CO2**	Capable of doing research project with data collected from corporate and allied sector.
3	To enable the students data interpretation and report writing required for business activities.	**CO3**	Can collect data from appropriate sources based on which effective and reliable research findings is possible
4		**CO4**	Able to apply data processing techniques to get the required findings.
5		**CO5**	Capable of summarizing the research activity and able to present in the form of research report
SEMESTER - III			
Course Code	**MFA 301:**		**BUSINESS ETHICS AND CORPORATE GOVERNANCE**
	Course Objectives		**Course Outcomes (COs)**
1	To make the student conscious about ethical values in real life and in business	**CO1**	Able to comprehend ethical and moral framework in professional and business arena
2	To introduce to ethical theories and principles with reference to ethical practices indifferent functions of the business	**CO2**	Recollect the principles to adopt CSR related activities
3	To update on Corporate Governance through exposure to various Committees	**CO3**	Apply ethics in Marketing and Finance
4		**CO4**	Apply ethics in HRM and IT
5		**CO5**	Appreciate the functioning of Corporate Governance with exposure to its current practice
Course Code	**MFA 302**	**Course Title**	**GOODS AND SERVICES TAX**
	Course Objectives		**Course Outcomes (COs)**
1	To make students familiarize with the new Indirect tax of GST	**CO1**	Provide the updation of knowledge to understand the subject with more clarity
2	To understand the various provisions and tax calculations under GST	**CO2**	Enable the students the charges on GST and apply the same appropriately with different types of Goods and Services
3	To make the students understand about the submission of various returns of GST	**CO3**	Able to analyse the relationship between GST with Income Tax laws
4		**CO4**	Able the students to understand the application of GST Law with available infrastructure at GST and portal
5		**CO5**	Strenghthening the knowledge of the students in the area of Customs Law and its applications to Business and ITC

Course Code	MFA 303	Course Title	FOREX AND DERIVATIVES
	Course Objectives		**Course Outcomes (COs)**
1	To enable students to acquire skills in forex management	**CO1**	Will understand the structure and operations of Forex Market
2	To introduce the mechanism of currency and options ,Interest Rates and the risk mitigating strategies	**CO2**	Will be able to apply the concept and solve problems on Currency Futures and Options
3	To expose the Derivative Instruments and its functioning	**CO3**	Will be able to understand and apply various hedging strategies in foreign exchange risk exposure
4		**CO4**	Will grasp the concept of Interest Rate exposure and its management
5		**CO5**	Will understand derivatives and its operations
Course Code	**MFA 304**	**Course Title**	**INSURANCE AND RISK MANAGEMENT**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students with the principles and practices of insurance business.	**CO1**	Understand the concept of risk and risk management;Identify and categorize the various types of risks;
2	To enale student to acquire skills and knowledge on different insurance product,pricing and its regulations	**CO2**	Understand the Various Insurance Regulation in India
3	To expose the students towards making insurance claim settlements under different conditions.	**CO3**	Familiarize with fundamental legal principles of insurance for Management of Risk
4		**CO4**	Choose appropriate insurance policies related to life and health insurance;
5		**CO5**	Apply the insurance mechanism in risk management.
Course Code	**MFA 305**	**Course Title**	**ADVANCED E-BUSINESS**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the concept of e-Commerce and its basic elements	**CO1**	Understand the meaning and fundamentals of e-Commerce and its applications
2	To enable to have an overview of electronic payment systems and its importance in ecommerce.	**CO2**	Can understand and apply electronic payment system which is vital for e commerce operations
3	To introduce the infrastructure of m-Commerce and its applications	**CO3**	Able to understand the rudimentary aspect of technological framework and the required infrastructure to enable m-Commerce
4		**CO4**	Can understand and apply the services of M-Commerce
5		**CO5**	Able to read the M-Commerce application in diverse business sectors

SEMESTER - IV			
Course Code	MFA 401	**Course Title**	STRATEGIC MANAGEMENT
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the concepts and practices of the Strategic Management.	**CO1**	Understand the basic concepts and principles of strategic management analyse the internal and external environment of business
2	To familiarize the students on the implementation and evaluation of making under different circumstances.	**CO2**	Develop and prepare organizational strategies that will be effective for the current business environment
3	To make the students understand the challenges to create effective strategic management at corporates .	**CO3**	Able to understand the Strategy Selection , Expansion,Mergers, Acquisition
4		**CO4**	Familiarize with Strategic Choice in Different Markets.
5		**CO5**	Devise strategic approaches to managing a business successfully in a global context
Course Code	MFA 402	**Course Title**	International Accounting
	Course Objectives		**Course Outcomes (COs)**
1	To provide an understanding to the students with regard to diverse International Accounting and Reporting Practices.	**CO1**	familiarize and understand the International Financial Reporting Standards (IAS or IFRS) and their application to the companies who use them.
2	To understand the techniques of accounting and consolidation by MNC's	**CO2**	Analysis and interpretation of all the International Accounting Standards
3	To develop skills in the students to analysis International Statements.	**CO3**	Understand accounting principles and conceptual similarities and differences between international GAAPs
4		**CO4**	Read and understand financial statements under different GAAPs
		CO5	understand the Global Accounting Standards like IFRS Framework and US GAAP.
Course Code	MFA 403:	**Course Title**	International Financial Management
	Course Objectives		**Course Outcomes (COs)**
	Course Objectives		**Course Outcomes (COs)**
1	To provide students with a conceptual framework of how financial decisions are undertaken in a multinational company.	**CO1**	Able to understand the theoretical underpinnings for financial decision making in MNC's
2	To familiarize students with unique economic factors that challenges a financial manager in the international context.	**CO2**	Apply economic and external factors in the function as financial manager in global context

3	To expose to the long term borrowings and working capital management in the international market	**CO3**	Able to state diverse financial mangement concepts applied in MNC
4		**CO4**	Can interpret short term financial function like cash,inventory and receivables management
Course Code	**MFA 404**	**Course Title**	**SFM**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the dynamics of Strategic Financial Management and Project Management from financial perspective	**CO1**	Can understand the strategic framework of the organisation and formulate and implement the required financial strategy
2	To understand techniques of Corporate Valuation, Mergers , Acquisitions and Corporate Restructuring	**CO2**	Can comprehend the application of various techniques of corporate valuation
3	To introduce Corporate Governance and Risk Management	**CO3**	Can assess the conditions required for Mergers and Acquisitions and its post merger analysis
4		**CO4**	Able to identify conditions for corporate restructuring and apply appropriate revival strategies
5		**CO5**	Can observe the functioning of Corporate Governing structure and its mechanism

NAME OF THE PROGRAMME	MASTER OF TOURISM AND TRAVEL (5 years Integrated)
PROGRAMME CODE	IAMOT01

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To empower students with current knowledge and skills in Tourism and Hospitality Management.	**PO1**	The program is designed to produce senior management level tourism and travel professionals who with their expertise can serve both private and public institutions
PEO2	To provide experiential learning avenues through practical exposure by conducting study tours, Internship and Project and On Job Training facilities in Tourism and Hospitality Management.	**PO2**	Students gain a practical view of the concepts and skills applied to crisis management, conduct market research as well as building sustainable tourism management through imparting real-life work scenarios
PEO3	To inculcate professional ethics, human values, social responsibility and sustainable growth of the Tourism and Hospitality Industry .	**PO3**	Designing the curriculum into theoretical and practical aspects, students are given an in – depth knowledge of the operations carried out in the Tourism & Hospitality Industry.
PEO4	To provide the life long learning career oriented development and to prepare entrepreneurs in the Tourism and Hospitality Industry.	**PO4**	The activities undertaken during the course study helps in instilling good communication and interpersonal skills in the candidates, so as to help them meet the expectations of the vast needs of the industry
PEO5	To empower the professionals in the field of Tourism and Hospitality Management.	**PO5**	The program aims to refine and polish the skills of the students making them proficient to take up future businesses in the sector of Travel and Tourism.

SEMESTER - I			
Course Code	**MTM 101**	**Course Title**	**ENGLISH - I**
	Course Objectives		**Course Outcomes (COs)**
1	To make the students gain knowledge and help them focus on global issues.	**CO 1**	To tactfully handle universal issues in order to bring success.
2	To make the students analyse the concept of globalization and its impacts in life.	**CO 2**	To get them realise the positivity of racism free society or society of equals.
3	To educate students on the importance of human values, social skills and shape them to be socially responsible citizens.	**CO 3**	To throw light on producing an ideal society by giving equal status to women.
		CO 4	To have better examination on pros and cons of globalisation.
		CO 5	To feed students on benefits of adopting human values.
Course Code	**MTM 102**	**Course Title**	**ADDITIONAL ENGLISH - I**
	Course Objectives		**Course Outcomes (COs)**
1	Develop the learners' critical thinking capabilities focused through the course as an important need.	**CO 1**	The learners will be able to critically think beyond the text.
2	Equip the learners with the practical, emotional, intellectual and creative aspects of language by integrating knowledge and skills.	**CO 2**	Develop a deeper appreciation of cultural diversity with the help of poetry and prose from a variety of cultures throughout the world
3	To read the prescribed text with understanding and insight	**CO 3**	Integrate the knowledge on the aspects of emotion, intelligence and creativity
		CO 4	Gain ample practice in writing skills
		CO 5	Write essays and reports and differentiate between objective and subjective writing
Course Code	**MTM – 103**	**Course Title**	**Fundamentals of Tourism Industry**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept and nature of Tourism and its significance.	**CO 1**	Learn Definition, concepts, nature of tourism & its importance with various tourism systems that are related to Tourism Industry
2	To examine tourism industry features and functions of Travel Agency and Tour Operations	**CO 2**	To understand the significance of tourism in terms of Socio-economic, environmental and Economic development.
3	To equip with various tourism systems that are related to Tourism Industry.	**CO 3**	To understand the role and contribution of Travel and Tour operations, types and advantages of transportation modes.
		CO 4	To know about the features, segmentation, and problems and issues of tourism industry in India.

		CO 5	To understand the Functioning of tourism system and Models and theories of Tourism system

Course Code	**MTM – 104**	**Course Title**	**Tourism Products & Resources**
	Course Objectives		**Course Outcomes (COs)**
1	To highlight the Major concepts of Tourism related to the activities concerned.	**CO 1**	To highlight about Historical Development of Tourism in India
2	To understand about the historical development and transportation system in India	**CO 2**	To know about the historical developments of Transportation System in India
3	To equip with special concepts and emerging trends of the Tourism Products.	**CO 3**	To identify important Nature based Tourism products in India and the role in promotion of tourism
		CO 4	To know and understand the major concepts of tourism
		CO 5	To highlight and identify the Special Interest Tourism Products in India.
Course Code	**MTM – 105**	**Course Title**	**Geography of Tourism in India**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept and types of geography related to tourism in India.	**CO 1**	To understand the branches of geography, themes of geography and map reading skills
2	To know about the geography and tourism development in India	**CO 2**	Knowledge of Latitude & Longitude, International Dateline, weather climate
3	To equip with skills related to geography of tourism in India	**CO 3**	Learn the Greenwich mean time, Calculation of Time.
		CO 4	To understand the details about the Geography of Tourism in India
		CO 5	Learn the scope, trends & opportunity for tourism development in India.
Course Code	**MTM – 106**	**Course Title**	**Hospitality Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the meaning and concept of Hospitality and its Industry.	**CO 1**	To understand the definition of hotels & Hospitality and the link between Hospitality & Travel – Tourism Industry.
2	To equip with the major sections/units of the Hospitality Industry / Hotel Industry.	**CO 2**	To highlight on the important categories and classification of Hotels
3	To Provide the concept and roles in Job description and Job specifications	**CO 3**	Knowledge of Major & Minor departments of a hotel
		CO 4	To highlight on the Hotel facilities and services
		CO 5	To know about the Job Specification and Job Description of department managers
Course Code	**MTM 108**	**Course Title**	**Constitution of India and Human Rights**
	Course Objectives		**Course Outcomes (COs)**

1	To provide meaning and concept of Indian Constitution	**CO 1**	To understand the Political System in India.
2	To provide the students with the knowledge of Indian constitution	**CO 2**	To highlight on Fundamental Rights
3	To gain the knowledge about the various principles and writs in Indian Constitution.	**CO 3**	Too highlight on Directive Principles of the state
		CO 4	To know about the various Constitutional Writs
		CO 5	To understand the constitutional values
SEMESTER - II			
Course Code	**MTM 201**	**Course Title**	**ENGLISH - II**
	Course Objectives		**Course Outcomes (COs)**
1	To shed lights on means of social and cultural empowerment and expose the learners to number of themes on contemporary significance for cultural and intellectual development.	**CO 1**	To make the students aware of having an aim and purpose in life.
2	To hone the students on advanced communicative skills.	**CO 2**	To recognise unconditional love , sacrifice and appreciate the value of Ahimsa
3	To inculcate communicative and study skills in English and prepare students in meeting challenges in our times	**CO 3**	To have a practical knowledge and experiences of life
		CO 4	To learn being empathetic towards one another
		CO 5	To overcome Generation gap
Course Code	**MTM 202**	**Course Title**	**ADDITIONAL ENGLISH - II**
	Course Objectives		**Course Outcomes (COs)**
1	To show the importance of human values, ethics & moral values	**CO 1**	To learn the skill of being simple & content and value the relationship of family and friends and not misuse them
2	To realise the value of relationships through the text and grammar	**CO 2**	Sensitive outlook towards various issues and how to handle them in a different perspective
3	To draw the attention on writing skills and learn to communicate better	**CO 3**	To receive various aspects of language and use them
		CO 4	To focus on association between form and functions of language
		CO 5	The learners will be able to find and understand the coherence of language and Literature
Course Code	**MTM-203**	**Course Title**	**Principles of Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept and nature of Management & its role in the Tourism Organisation	**CO 1**	To understand the concept, functions and theories of Management and its evolutions.
2	To understand about the management functions in the Organisations	**CO 2**	To understand the concepts of Planning, decision making and span of control.

3	To equip with latest and modern management techniques implemented in the Tourism industry.	**CO 3**	To know about the concepts and importance of Authority and Responsibility.
		CO 4	To know about the importance of Organization and coordination
		CO 5	To understand the concept of Managerial Control and techniques
Course Code	**MTM-204**	**Course Title**	**Geography of World Tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept and types of Geography related to tourism across the globe.	**CO 1**	To understand the Geography of Asia
2	To know about the physical divisions and tourism across the globe	**CO 2**	To understand the important features of North and South America
3	To equip them with skills related to Geography of Tourism in the World.	**CO 3**	To understand the Geography of Europe
		CO 4	To know about the geographical features of Africa
		CO 5	To know about the Geographical aspects of Australia and Newzealand.
Course Code	**MTM-205**	**Course Title**	**Fundamentals of Food & Beverage Operations**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Food Service and Catering Industries.	**CO 1**	To provide the concept of Food Service Industry in India
2	To identify the Alcoholic and Non-Alcoholic beverages	**CO 2**	To learn the organizational charts of Food and Beverage Department
3	To equip with fundamental operations of Food and Beverage activity	**CO 3**	To identify the Alcoholic and Non-alcoholic beverages and types of Bars
		CO 4	To provide the basic knowledge about the procedure involved in Purchase of Food Commodities.
		CO 5	To know about the scope and future of Food Service Industry
Course Code	**MTM-206**	**Course Title**	**Study tour report and Viva Voce**
	Course Objectives		**Course Outcomes (COs)**
1	Develop knowledge and understanding of different stakeholders of travel and tourism industry	**CO 1**	To learn the preparation of Tour itineraries.
2	Analyze and appraise a particular form of tourism and tourism business at a specific destination.	**CO 2**	To know about the transportation systems and accommodation systems in the study area.
3	Develop the over all ability and expertise from where to conduct a review / situational / observational analysis of the tourism industry at the Regional / National Level	**CO 3**	To gain more practical exposure on the Tourism Industry
		CO 4	To understand the concept of tour costing

		CO 5	Identify the components of tourism

Course Code	**MTM 207 FC**	**Course Title**	**Environment & Public Health**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concept and importance of Environment and Public Health.	**CO 1**	To know about the basic concepts of environment
2	To create awareness about the environment.	**CO 2**	To understand the environmental problems
3	To understand the causes and problems of environment.	**CO 3**	To know about the basic concepts about the Public health
		CO 4	
		CO 5	
SEMESTER - III			
Course Code	**MTM 301**	**Course Title**	**Communication Skills – I**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the use of the English language for communication purpose.	**CO 1**	Understand the use of English language for communication.
2	To acquire skills that enable the student to undertake a job.	**CO 2**	Acquire skills that enable students to undertake a job.
3	To apply the knowledge of the language to seek new avenues.	**CO 3**	The knowledge of the language to seek new avenues.
		CO 4	
		CO 5	
Course Code	**MTM-302**	**Course Title**	**Foreign Language – French I**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of International language –French at Elementary level -1.	**CO 1**	Learn the concept of French Language
2	To equip with basic grammar, writing and spoken French at Elementary level - 1.	**CO 2**	Identify the basic verbs, vowels, pronunciation of French Langauge
3	Understand the basic coversations in Tourism and Hospitality Industry	**CO 3**	Identify the Weeks of the day, Months and numbers in the French Language
		CO 4	Able to identify the Timings in the French
		CO 5	Describe conversations in Restaraunt, reservation sections in Tourism and Hospitality Industry
Course Code	**MTM-303**	**Course Title**	**Tour operations Management**
	Course Objectives		**Course Outcomes (COs)**

1	To provide the concept of tour and types of tour	**CO 1**	Learn the concepts of tour and tour components
2	To provide the concept of Tour Packaging and Tour Operations.	**CO 2**	Analyse the concept of Tour packaging Management
3	To equip with Itinerary development and knowledge about various International and National Tourism Organisation	**CO 3**	Provide the concept of different types of Itinerary preparations
		CO 4	Understand the significance of Travel Documents and formalities in International Travel
		CO 5	Describe the significance of Domestic Tourism Organisations in Tourism Promotions
Course Code	**MTM -304**	**Course Title**	**Tourism Product - I**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Indian History from the ancient period and role of the same in promoting Tourism.	**CO 1**	Learn Indian History from ancient period and role of the same in promoting tourism.
2	To provide the concept of the cultural contributions in the Indian History	**CO 2**	Learn the various cultural existences in India.
3	To equip with historical happenings at the past .	**CO 3**	The knowledge of history associated with the destination will enhance the skills
		CO 4	Examine the role of Mahajanapadas in Indian History
		CO 5	Describe the administration system in British Period
Course Code	**MTM 305**	**Course Title**	**Tourism Development and Policies**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of principles and policies of Tourism in India.	**CO 1**	To understand the significance and evolution of tourism demand and Travel motivators.
2	To equip with operational dimensions of Tourism Administration in India.	**CO 2**	Analyse the role of committees in Tourism Administration in India
3	To understand the roles of NTO and WTO	**CO 3**	Examine the Role of tourism organizations in Tourism development
		CO 4	Explain about the Tourism Development in India
		CO 5	Examine the concepts and significance of Tourism Planning and policy in India
Course Code	**MTM-306**	**Course Title**	**Tourism Marketing**
	Course Objectives		**Course Outcomes (COs)**
1	To help the students to understand the concept of Marketing and its applications.	**CO 1**	Understand the concept of marketing and its application.
2	To make the students aware of modern methods and techniques of marketing with special reference to tourism industry.	**CO 2**	Identify the tourist segmentation to develop new products.

3	To provide the concept of the service marketing to the students	**CO 3**	Learn the importance of Branding and packaging decision to gain customer faith & reliability as the product in intangible in nature
		CO 4	Learn the concept of service as a product & its marketing.
		CO 5	Examine the pricing strategies & approaches to attract customer for better growth of the business
Course Code	**MTM-307**	**Course Title**	**Front office Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept and practices of Front Office in a 5 Star Hotel.	**CO 1**	Develop the concept & practices of Front office in a 5 star
2	To equip with the fundamental operations of Front Office department of a Hotel.	**CO 2**	Learn the organization of Front office & Reception.
3	To understand the role, forms and formats used in the Front Office Department	**CO 3**	Learn the Role & responsibility of Reservation team
		CO 4	Learn about the registration process as per the law.
		CO 5	Learn about the Lobby & Bell Desk Operation
Course Code	**MTM 308**	**Course Title**	**Study Tour Report and Viva Voce – III**
	Course Objectives		**Course Outcomes (COs)**
1	Develop knowledge and understanding of different stakeholders of travel and tourism industry.	**CO 1**	To learn the preparation of Tour itineraries.
2	Analyze and appraise a particular form of tourism and tourism business at a specific destination.	**CO 2**	To know about the transportation systems and accommodation systems in the study area.
3	Develop the over all ability and expertise from where to conduct a review / situational / observational analysis of the tourism industry at the Regional / National Level.	**CO 3**	To understand the concept of tour costing
		CO 4	To gain more practical exposure on the Tourism Industry
		CO 5	Identify the components of tourism
SEMESTER - IV			
Course Code	**MTM 401**	**Course Title**	**Communication Skills – II**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the use of the English language for non-literary purposes.	**CO 1**	Understand the use of English language for communication
2	To acquire skills that enable the student to undertake a job.	**CO 2**	Acquire skills that enable students to undertake a job.
3	To apply the knowledge of the language to seek new avenues.	**CO 3**	The knowledge of the language to seek new avenues.

Course Code	MTM 402	Course Title	FOREIGN LANGUAGE : FRENCH – II (Theory)
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of International language –French at Elementary level -2.	**CO 1**	Able to conjugate different verbs in French
2	To equip with basic grammar, written and spoken French at Elementary level - 2.	**CO 2**	Learn about the Present, Past and Future tenses and its usage in sentence formation
3	To practice basic dailogues in the Tourism and Hospitality Industry	**CO 3**	Describe the Numbers and Professions in French
		CO 4	Able to read the timings in French Language
		CO 5	Describe basic coversations in Tourism and Hotel Industry
Course Code	**MTM-403**	**Course Title**	**Travel Agency Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of a travel agency and its management.	**CO 1**	Examine the important skills and concepts about Managing the Travel Agency.
2	To equip with fundamental operations of a travel agency and International tourism Organisations.	**CO 2**	Understand the significance of Approval Procedures for Travel agency and tour operations business in India
3	To understand the arroval procedure for Travel Agency Business in India	**CO 3**	Highlight on the managing of tour escort services in the Tourism.
		CO 4	To know the importance of Managing the Tourist Guide services at the destination.
		CO 5	To identify the role and contribution played by the International Tourism organizations in Tourism Promotion
Course Code	**MTM-404**	**Course Title**	**Tourism Product – II (Indian Architecture & Culture)**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Indian Architecture and Culture from the ancient period and role of the same in promoting tourism	**CO 1**	Learn the concept of Indian Architecture and Culture from the ancient period.
2	To equip with architecture and cultural events of the past.	**CO 2**	Describe the role & importance of Indian Art & Architecture in promoting tourism.
3	To equip with Socio-Cultural contributions in ancient period for Indian Architecture and Culture	**CO 3**	Examine about the pre-historic art during the great civilization of Harappa, Jaina – Buddha Art
		CO 4	Distinguish among various temple architecture & art in India.

		CO 5	Understand the impact of the advent on Religion, Art & Architecture.
Course Code	**MTM-405**	**Course Title**	**Event Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide insight into Event and Advertising Industries.	**CO 1**	Learn the basic concepts of Event
2	To equip with fundamental operations of Event Management companies/ Events.	**CO 2**	Highlight on the elements of Events & Event Management
3	To equip with the role of MICE Events in Tourism and Hospitality Management	**CO 3**	Describe the Event Marketing & Pricing tools used by the organizations.
		CO 4	Understand the the fundamental of MICE
		CO 5	Learn the procedure for organizing & hosting international events.
Course Code	**MTM – 406**	**Course Title**	**Housekeeping Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept and practice of House-keeping department in a 5 Star Hotel.	**CO 1**	Understand the basics of House Keeping Operations
2	To equip with fundamental operations of House-keeping department of a Hotel	**CO 2**	Examine the role of Control Desk
3	To understand the roles and responsibalities of different sections under House Keeping Department	**CO 3**	Identify the Cleaning agents in HK
		CO 4	Explain the types of linens used in the HK
		CO 5	Understand the role of Accounts Department in HK Operations
Course Code	**MTM 407**	**Course Title**	**Foriegn Language : FRENCH - II (VIVA VOCE)**
	Course Objectives		**Course Outcomes (COs)**
1	To Conjugate the Verbs	**CO 1**	Learn conjugation of the verbs in the French
2	To understand the pronunciation of Verbs	**CO 2**	Improve the speaking skills in French
3	To speak fluently the basic french	**CO 3**	Usage of the verbs in Present, Past and Future tense based on the situation
		CO 4	Usage of the basics of Grammer in the french communication
		CO 5	Describe about the home, family, restaraunt and friends in french
Course Code	**MTM-408**	**Course Title**	**Travel Agency Management (PRACTICAL)**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the procedure involved in the setting up of Travel Agency Business in India	**CO 1**	Analyse the procedure for setting up of Travel Agency
2	To understand the procedure involved in filling information in Travel Documents	**CO 2**	Identify the information in Travel Documents

3	To know about the procedure involved in booking online portals for reservation	**CO 3**	Understand the usage of the Online Booking Tools in Reservation
		CO 4	Understand the importance of Office Automation in Travel Agency Business
		CO 5	Learn the calculation of FOREX

Course Code	**MTM 409**	**Course Title**	**Study Tour Report & Viva Voce – IV**
	Course Objectives		**Course Outcomes (COs)**
1	Develop knowledge and understanding of different stakeholders of travel and tourism industry	**CO 1**	Learn different aspects of field trips to natural environments
2	Analyze and appraise a particular form of tourism and tourism business at a specific destination	**CO 2**	Examined how preparation for the field trip, connections to school curriculum, and pedagogy related to students' knowledge acquisition, environmental attitudes, and commitment to environmental behavior
3	Develop the over all ability and expertise from where to conduct a review / situational / observational analysis of the tourism industry at the Regional / National Level.	**CO 3**	Developed a framework for designing and assessing field trips
		CO 4	Examine the components of Tourism Industry
		CO 5	Describe procedure involved in Package Tour Designing
Course Code	**MTM – 410**	**Course Title**	**Personality Development**
	Course Objectives		**Course Outcomes (COs)**
1	To develop personality based on extensive experience.	**CO 1**	Understand about self-awareness
2	To create self-awareness	**CO 2**	Understanding the importance of human values
3	To learn how to manage time wisely.	**CO 3**	Techniques required to improve skills
		CO 4	Develop and understand time management
		CO 5	Importance of leadership values
SEMESTER - V			
Course Code	**MTM – 501**	**Course Title**	**Tourism Product- III (Karnataka History)**
	Course Objectives		**Course Outcomes (COs)**

1	To provide information on the history of Karnataka from the ancient period and role of the same in promoting tourism	**CO 1**	Describe the geography of Karnataka and sources of Karnataka History
2	To equip with historical happenings of the past with special reference to Karnataka .	**CO 2**	Identify famous dynasties Gangas, Chalukyas, Rashtrakutas and Hoysalas and their contributions
3	To provide information on famous rulers and cultural contributions towards Karnataka Tourism	**CO 3**	Analyse the history of Kalachuris, Vijayanagara, Bahamani, Adilshahi and Keladi Nayakas and contributions
		CO 4	To understand the history of Mysore Wodeyar
		CO 5	Examine the role of Freedom Movement in Karnataka
Course Code	**MTM – 502**	**Course Title**	**Food & Beverage Management - I**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Food and beverage section of a hotel industry	**CO 1**	To understand the significance of Food and Beverage Production Department in the Hotel
2	To equip with fundamental operations of Food and Beverage production department of a 5- star hotel.	**CO 2**	To learn the concept of Kitchen and Production Management in a hotel.
3	To understand the role of Food and Beverage Staffs	**CO 3**	Identify the different methods used in the cooking
		CO 4	Importance of Cuisines and characteristics of International Cuisines in Tourism
		CO 5	identify and understand the important products prepared by the Bakery and Confectionary Department
Course Code	**MTM 503**	**Course Title**	**Accounting & Finance in Tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Accounting and Finance	**CO 1**	To understand the basic concepts of Accounting.
2	To equip with fundamental operations of Accounting at Tourism organisation.	**CO 2**	Learning about how to prepare trial balance and preparation of Final Accounts of Sole Trading Concerns.
3	To understand the scope of Finacial Management and Money Market	**CO 3**	Knowing about Financial Management, Scope of Finance, Goals of Finance
		CO 4	Studying about Money Market and its Components. Indian Money Market and its features, Capital Market. Indian Stock Market and a few sources of finance to start and run a business.
		CO 5	Studying about the objectives of Capital Structure and Capital Budgeting.
Course Code	**MTM – 504**	**Course Title**	**Tourism Research Methodology**
	Course Objectives		**Course Outcomes (COs)**

1	To provide the concept of research in the field of Tourism	**CO 1**	Understand and describe types of Research
2	To equip with basic research tools and ideas related to Tourism Research.	**CO 2**	Describe methods of the Data Collcetion Techniques
3	To introduce the Statistical Tools of Data Analysis	**CO 3**	Understand Statistical Analysis
		CO 4	Understand Statiscal Application in Tourism Research
		CO 5	Prepare sample of Tourism report

Course Code	**MTM 505**	**Course Title**	**Health & Wellness Tourism (Theory)**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Health and Wellness Tourism and role of the same in promoting Tourism	**CO 1**	Examine the significance of Health and wellness Tourism in India.
2	To equip with basic yoga and ayurveda concepts in health tourism industry	**CO 2**	To know about the definitions and concepts of Yoga
3	To understand the applications of Yoga.	**CO 3**	Identify different types of Asanas and Applications
		CO 4	Understand the basic concepts of Ayurveda
		CO 5	Identify the preventive aspects in the Ayurveda
Course Code	**MTM – 505**	**Course Title**	**Health & Wellness Practical**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Health and Wellness Tourism and role of the same in promoting Tourism	**CO 1**	To know the importance and procedure on First Aid system, BMI, and BP
2	To equip with basic yoga and ayurveda concepts in health tourism industry	**CO 2**	To learn how to perform Surya Namaskara and its benefits
3	To understand the applications of Yoga.	**CO 3**	To learn different types of Asanas and its benefits.
		CO 4	To learn the concept of preparations in Ayurveda
		CO 5	To learn the Home Remedies and its applications in the human health
Course Code	**MTM – 506**	**Course Title**	**Internship Training report & Viva Voce**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the working environment in Tourism and Hospitality Industry	**CO 1**	First-hand exposure of working in the real world.

2	To get the hands on experience on operational aspects of the Tourism Business	**CO 2**	Allows students to harness the skill, knowledge, and theoretical practice they learnt while pursuing the course.
3	To understand the work flow in the organisation	**CO 3**	Learning curve for students with little experience of the professional world
		CO 4	Teaches young professionals about the specific industries and companies they are interested in.
		CO 5	Exposes to new people in a more controlled and stable environment

Course Code	**MTM – 508**	**Course Title**	**Value Education (SDC)**
	Course Objectives		**Course Outcomes (COs)**
1	To know the need and purpose of value education	**CO 1**	Learning about the values, need and purpose of value educa-tion, importance of value education in present context, role of family, society and institutions in inculcating the values. Concept of human val-ues, improve personality, character formation towards positive personality
2	To improve personality and sensitization of students towards the society.	**CO 2**	Understanding and learning value education for national and global development, national and constitutional values.
3	To create a positive approach towards the ecological balance.	**CO 3**	Understanding and studying about En-vironmental and Ecolog-ical balance, significance and need. Acquiring knowledge about Biodi-versity, prevention and preservation of natural resources
		CO 4	
		CO 5	

SEMESTER - VI

Course Code	**MTM 601**	**Course Title**	**Tourism Product –IV (Karnataka Architecture & Culture)**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Karnataka Architecture and Culture from the ancient period and role of the same in promoting Tourism.	**CO 1**	Learn various art & architecture from different dynasties.
2	To equip with historical happenings at the past with special reference to art and architecture of Karnataka	**CO 2**	Describe the importance of the art & architecture in promoting tourism
3	To equip with the Cultural art forms in Karnataka	**CO 3**	Understand the culture of Karnataka
		CO 4	Examine the authentic cuisine of Karnataka to attract tourists.
		CO 5	Knowledge of the fairs & Festival of Karnataka in promoting tourism

Course Code	MTM 602	Course Title	Food and Beverage Management-II
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Food and beverage section of a hotel industry.	**CO 1**	To understand the Menu and importance of the same in the Food service industry
2	To equip with fundamental operations of Food and Beverage Service department of a star hotel.	**CO 2**	Describe on different types of Restaurant services
3	To understand the Food service joints in Hotel Industry	**CO 3**	Analyse the nature and significance of Food Service Joints.
		CO 4	Explain the procedure in serving different beverages
		CO 5	Identify new trends and developments in food service industry
Course Code	**MTM – 603**	**Course Title**	**Airfares & Ticketing Management (Theory)**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Airfares and Ticketing and role of the same in promoting Tourism	**CO 1**	Understand the basic concepts of Airline Ticketing
2	To equip with Softwares related to Ticketing Management	**CO 2**	Examine the steps involved in Airfare calculation
3	To understand the Standard Traffic Documents	**CO 3**	To know about the Ticketing documents and its importance.
		CO 4	Understand the basic concepts and significance of BSP operations.
		CO 5	Significance of the PTA and Procedure involved in the PTA.
Course Code	**MTM – 604**	**Course Title**	**Global Distribution System (Amadeus)**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Airfares and Ticketing with emphasis on any one software (Amadeus/Galileo/ Sabre/Abacus).	**CO 1**	Know about the role of GDS and creation of the PNR
2	To equip with the necessary knowledge of software related to Ticketing Management.	**CO 2**	Learn the aspects of sending special service information.
3	To understand the basics of PNR Reservation System	**CO 3**	Learn and understand the Fare display and pricing the itinerary for the passengers.
		CO 4	Know the procedure involved in the Hotel reservation
		CO 5	Understand the procedure involved in the Car reservations.
Course Code	**MTM – 605**	**Course Title**	**Tourism Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Economics and its role in the tourism industry.	**CO 1**	Learn the concept of economics & its role in the tourism industry.

2	To equip with economical concepts of Tourism development	**CO 2**	Examine the concept of Tourism Demand
3	To understand the contribution of Tourism to GDP	**CO 3**	Describe the role of Tourism and Contribution to GDP
		CO 4	Identify the concept and components of Tourism Supply
		CO 5	Learn various market structure with reference to tourism economics
Course Code	**MTM 606**	**Course Title**	**Airfares and Ticketing Management (Practical)**
	Course Objectives		**Course Outcomes (COs)**
1	To know about the important Airlines, city codes, country codes domestic and International	**CO 1**	Identify the major Airlines at National and International level
2	Understand the concept of Air Routes	**CO 2**	Identify the 3 letter city codes of India and World
3	To know about the OAG Time Table	**CO 3**	Identify the 2 letter codes of Airlines and Country codes National and International
		CO 4	To understand how to read City-to-City Schedules in OAG
		CO 5	Marking Air Routes in India
Course Code	**MTM 607**	**Course Title**	**Study Tour Report & Viva Voce - V**
	Course Objectives		**Course Outcomes (COs)**
1	Develop knowledge and understanding of different stakeholders of travel and tourism industry	**CO 1**	Emphasizes experiential learning and offer both group and self directed activities that enable learners to explore tourism & hospitality industries cultures, practices and people
2	Analyze and appraise a particular form of tourism and tourism business at a specific destination.	**CO 2**	Provides first-hand knowledge about the organizational structures and modes of operation in different industries.
3	Develop the over all ability and expertise from where to conduct a review / situational / observational analysis of the tourism industry at the Regional / National Level.	**CO 3**	To develop a framework for designing and assessing field trips
		CO 4	To understand the concept of Tourism Components at National Level
		CO 5	Examine the costing of the Tour Packaging concept
Course Code	**MTM 608**	**Course Title**	**Skill Development Course Foreign Language : German**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the basics of German Language	**CO 1**	Learn the basic concepts at Elelemntary Level - 1
2	To know about the Numbers in German Langauge	**CO 2**	Conjugate numbers in German
3	To understand the basic grammar in German	**CO 3**	Learn the basic Grammar in German
		CO 4	Understand the usage of Basic Verbs

		CO 5	Usage of Verbs in Sentence formation
SEMESTER - VII			
Course Code	**MTM – 701**	**Course Title**	**Organisational Behavior in Tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Behaviour and its effectiveness in tourism organization.	**CO 1**	Understand the foundation of OB as an interdisciplinary subject and it approaches to study OB.
2	To equip with organizational skills and behavior to face the challenges of the Tourism Industry	**CO 2**	Examine the foundations of individual behaviour, Personality, Theories, determinants and personality traits. Understanding the concept of Perception and Learning.
3	To provide the concept of Motivation Theories	**CO 3**	To acquire the knowledge of the concept Motivation, Theories, Process. Understanding the concept of Rewards in Organizations and the concept of Leadership.
		CO 4	Learning the concept of Attitude, its components. Concept of Values and Stress causes and outcomes
		CO 5	To learn the concept of Group dynamics, importance of joining groups, Group cohesiveness, Team dynamics and team issues
Course Code	**MTM – 702**	**Course Title**	**Principles of Heritage Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Heritage and Heritage Management in promoting Tourism	**CO 1**	To understand the important features, evolution and sources of Indian Culture
2	To equip with skills and techniques pertaining to Heritage Management .	**CO 2**	Understand the concepts of Heritage and to identify important heritage sites in India and Abroad
3	To equip with the role of different international organisations on Heritage Management	**CO 3**	Examine the significance of Heritage management in tourism promotions
		CO 4	Describe the role of National and International organizations engaged in the Heritage Management
		CO 5	Identify and know about the important heritage sites in India, Karnataka and Heritage hotels in promotion of tourism in India
Course Code	**MTM 703**	**Course Title**	**Tourism Laws**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of various Laws related to Tourism & Historical Monuments.	**CO 1**	To understand the basic concepts of laws.
2	To equip with both national and international level laws related to Hospitality and	**CO 2**	Examine on the different types of Rules and regulations,

	Tourism Industry .		Acts applicable in Indian tourism and applicable to Foreigners who wish to stay in India as a Tourist, Tariffs.
3	To understand the roles played by different laws in India	**CO 3**	Analyse the importance of different types of Acts in Law which are applicable and used in Tourism industry
		CO 4	Describe the role of Archaeological Survey of India, Ancient Monuments Preservation Act, Cases on Heritage Conservation.
		CO 5	Examine various acts relating to the Wild birds and Animals Protection Act, Forest Act, The Environment Act
Course Code	**MTM – 704**	**Course Title**	**Eco Tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the significance of ecotourism;	**CO 1**	Learning the Fundamentals of Ecology, Function and Management of Ecosystem, Relationship between Tourism and Ecology
2	To comprehend the theories and practices of ecotourism;	**CO 2**	Examine the Ecotourism Evolution, Typology of Eco-tourists, Ecotourism Activities and Impacts, Western views of Ecotourism
3	To be familiar with the model ecotourism projects; and to use the theoretical knowledge to mange ecotourism resources.	**CO 3**	Analyse about Ecotourism Development, Ecotourism Policies, Planning and Implementation, Ecotourism Programming.
		CO 4	Explain the Protected Area Management through Ecotourism, Case studies on Periyar National Park, Kaziranga National Park, Gulf of Manar, South Africa.
		CO 5	Describe various Ecotourism Development Agencies, Department of Forest and Environment and Government of India
Course Code	**MTM – 705**	**Course Title**	**Cost and Management accounting in tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of advanced Accounting in tourism activity	**CO 1**	To learn the concept of Cost Accounting, it nature and scope and the differences between Cost Accounting and Financial Accounting.
2	To equip with Cost & management techniques related to Tourism industry.	**CO 2**	Examine the elements of cost, cost classification and how to prepare cost sheet and its estimation with package tours and the various costing methods
3	Understand the analysis of Financial statements	**CO 3**	The preparation of operating costing, transportation costing, hotel costing and canteen costing using Hubbart formula.
		CO 4	Explain basic concepts, objectives, scope, advantages & disadvantages of Management Accounting with differences between Cost Accounting and Management Accounting

		CO 5	The analysis and interpretation of Financial Statements and Budgeting and Ratio Analysis.
Course Code	**MTM – 706**	**Course Title**	**Foreign Language : Spanish-I**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of International language –Spanish at Elementary level -1.	**CO 1**	Identify the Alphabet, Articles, Numbers, Genders, Adjectives and Opposites
2	To equip with basic grammar, written and spoken Spanish at Elementary level – 1	**CO 2**	Learning Regular Verbs.
3	To know the usage of Regular verbs	**CO 3**	Examine the Ordinal and Cardinal Numbers, Time, Weather, Days of the week, Months of the Year.
		CO 4	Application of the Verbs like Ser and Estar, Reflexive Verbs and Gustar Se.
		CO 5	Identify Interrogative Pronouns, Negation, Adjective Possessive, Preposition and Tourism and Hospitality related terms in Spanish.
Course Code	**Soft Core MTM – 707**	**Course Title**	**Emerging trends in Travel & Tourism Industry**
	Course Objectives		**Course Outcomes (COs)**
1	To know about emerging trends in Travel and Tourism Industry	**CO 1**	To describe the emerging trends in Tourism
2	To understand the concept of Tourism Ethics	**CO 2**	Analyse the role of Global Code of Ethics in Tourism
3	Toequip with the concepts of the Sustainable and Responsible tourism	**CO 3**	Explain tourism development through sustainable and responsible tourism practices
		CO 4	Examine the role of various International organisations in environment protaction in tourism destinations
		CO 5	Identify the eco-friendly practices in the Tourism industry
Course Code	**MTM 708**	**Course Title**	**Foreign Language – Spanish – I (Viva Voce)**
	Course Objectives		**Course Outcomes (COs)**
1	To enhance basic spanish speaking skills among the students	**CO 1**	Enhance readiong skills in the Spanish
2	To make students understand about the usage of grammar.	**CO 2**	Enhance the reading skills of the students
3	To understand the basic coversations in Spanish	**CO 3**	Improving on writing skills in the Spanish
		CO 4	To make use of simple grammar and enhance the speaking skills among the students
		CO 5	Describe themselves in small paragraphs in Spanish

SEMESTER - VIII			
Course Code	**MTM 801**	**Course Title**	**International Business Environment**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of International Business Environment and its implication on Tourism.	**CO 1**	Understand the features and factors affecting Internatiolisation
2	To equip with cultural practices related to MNCs and role of them in Tourism.	**CO 2**	Learning the PESTLE Analysis of International Business.
3	To understand the concept of International Finance	**CO 3**	Acquiring knowledge about MNCs, its role in India and regulations of MNCs.
		CO 4	Identify types of FOREX markets and determining the exchange rates
		CO 5	Analyse the concept of International Marketing, role of International Marketing and Structure and functions of International financial organizations
Course Code	**MTM – 802**	**Course Title**	**Principles of Museology & Conservation**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Museology and Conservation related to Tourism.	**CO 1**	Learning about the Policies, Laws, Acts and History of Museums, Theories of Museology
2	To equip with laws, acts, policies related to Museology and Conservation.	**CO 2**	Understanding the types and functions of Museum, Nature, Museum Associations, Professional ethics, concepts of new and modern museums and Museum Development
3	To understand the importance of Preservation and Conservation	**CO 3**	Describe the Documentation and Collection process in Museums
		CO 4	Examine the elements of Display and types of Exhibitions
		CO 5	Describe the types of preservation and Conservation in Museums
Course Code	**MTM 803**	**Course Title**	**Global Tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Global Tourism and globalization in tourism.	**CO 1**	Examine the process and factors affecting Global Tourism.
2	To equip with global tourism trends and Tourism Marketing .	**CO 2**	Analyse the imapct of Globalisation and Tourism
3	To understand the Contemporrary trends in Global Tourism	**CO 3**	Examine the concept of Global Tourism Market
		CO 4	Explain the Global Tourism Trends
		CO 5	Describe the contemporary issues in Global Tourism
Course Code	**MTM 804**	**Course Title**	**Supply Chain Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of supply chain management in relation to Tourism Industry.	**CO 1**	Understand the meaning, importance and objectives of SCM

2	To equip with Supply chain techniques and tools and role of IT in Supply Chain Management.	**CO 2**	Examine Supply Chain Network Design
3	To understand the concept of Sourcing in Supply Chain Management	**CO 3**	Describe the role of Transportation in SCM
		CO 4	Analyse the role of Revenue management and pricing in SCM
		CO 5	Explain the role of IT in SCM

Course Code	**MTM 805**	**Course Title**	**E-commerce in Tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of E-Commerce and its application to Tourism Industry.	**CO 1**	Understand about the E-commerce models
2	To equip with techniques related to E-commerce and E-Business Categories.	**CO 2**	Examine the role of Online Research and challenges
3	To understand the Online research in E-commerce	**CO 3**	Analyse the role of Electronic Payment System
		CO 4	Describe the role of e-advertising, e-CRM and EDI in e-commerce
		CO 5	Explain the role of Persoinalisation in Organisation

Course Code	**MTM 806**	**Course Title**	**Foreign Language – Spanish – II**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of International language –Spanish at Elementary level -2.	**CO 1**	Describe about the Home, City and Family
2	To equip with basic grammar, writing and spoken Spanish at Elementary level - 2.	**CO 2**	Apply the usage of the Verbs
3	To understand the basic conversations in Restaraunts	**CO 3**	Examine various Gerunds
		CO 4	Practice of basic converasations in Restaraunts
		CO 5	Explain the basic letter writing skills

Course Code	**MTM 807**	**Course Title**	**Soft Core : Emerging Trends In Hospitality Industry**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the Growth of Hospitality Industry	**CO 1**	Describe the classification of Accommodation and latest trends
2	To identify trends in Accommodation	**CO 2**	Identify the eco-friendly practices in the accommodation sector
3	To understand the trends in the Food and Beverage sector	**CO 3**	Examine the role of Food Quality and Quality meals
		CO 4	Explain the role of HR in Hospitality Industry
		CO 5	Elucidate issues and challenges faced by HR in Hospitality Industry

Course Code	MTM 808	Course Title	Foreign Language – Spanish – II (Viva Voce)
	Course Objectives		**Course Outcomes (COs)**
1	To understand the listening skills	**CO 1**	To enhance reading skills
2	To understand the Writing skills and grammar	**CO 2**	To enhance listening skills
3	To understand the importance of Speaking skills in Spanish	**CO 3**	To enhance speaking skills
		CO 4	To make use of grammar in Spanish basic conversations
		CO 5	Identify the verbs and usage in Spanish
SEMESTER - IX			
Course Code	**MTM 901**	**Course Title**	**International Airlines Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of International Airlines and their management aspects in relevance to effective development of Touris	**CO 1**	Identify the SSR Codes and usage of same in sending information to airlines
2	To equip with the formalities and regulations pertaining to International Airlines Management.	**CO 2**	Describe Baggage, types and rules peratining to International Travel
3	To know about the usage of PAT Supplement in Air Fare Calculation	**CO 3**	Explain the formalities for International Travel
		CO 4	Examine the role of International conventions on Air Transport
		CO 5	Analyse Air Fare Calculations using the PAT
Course Code	**MTM – 902**	**Course Title**	**Corporate Governance and Ethics in Tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Business Ethics and Corporate Governance in tourism Industry	**CO 1**	Understand the basic concepts of Ethics
2	To equip with Business, Ethical aspects in application to service industry.	**CO 2**	Identify the issues in ethics and concepts of Moral Philosophy perspectives.
3	To understand the issues in Ethics	**CO 3**	Application of Code of ethics in Tourism Industry
		CO 4	Examine ethical aspects in HRM
		CO 5	Explain the concept of Corporate Goveranance and principles in India
Course Code	**MTM – 903**	**Course Title**	**Advanced Tourism & Hospitality Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Yield Management, Travel Agency Management in related to Tourism and Hospitality Industry.	**CO 1**	Application of Yield Management in Tourism and Hospitality Industry

2	To equip with tools related to Yield Management and Basic travel desk operations.	**CO 2**	Examine the role of Computers in different sections of the Hotel Sector and Tourism
3	To undestand the future trends in Hospitality Industry	**CO 3**	Describe the role of HR in Hospitality
		CO 4	Identify the role played by Travel Desk in Hospitality Industry
		CO 5	Examine strategies and future challenges in Hospitality Industry
Course Code	**MTM – 904**	**Course Title**	**Cargo Management**
	Course Objectives		**Course Outcomes (COs)**
1	**Cargo Management**	**CO 1**	Examine various terminolgies used in Cargo
2	To equip with practices and procedures adopted by reputed organization in Cargo Management.	**CO 2**	Describe the nature and types of Cargo
3	Understand the process of Cargo Operations	**CO 3**	Analyse different rates and tariffs in Cargo
		CO 4	Elucidate the role of IATA Cargo Agent
		CO 5	Explain various complaints and Claims at Cargo Section
Course Code	**MTM – 905**	**Course Title**	**Customer Relationship Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of CRM and Customer Retention in Tourism Industry	**CO 1**	Application of CRM in Tourism and Hospitality Industry
2	To equip with emerging trends in CRM and E-CRM	**CO 2**	Describe the types of E-CRM
3	To understand the role of Customer service in Hospitality Industry	**CO 3**	Examine the role of Listening and Questioning techniques
		CO 4	Explain the methods of responding to the customers
		CO 5	Analyse how to deal with the Upset Customers
Course Code	**MTM 907**	**Course Title**	**Open Elective – International Business Relations for Tourism**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the scope of International Relations in Tourism	**CO 1**	Examine the role of International Relations in Tourism
2	To equip the knowledge on Foriegn Policy	**CO 2**	Elucidate the Foriegn Policies and regulations in India
3	To understand the issues in International Relations	**CO 3**	Examine the various issues in International Relations
		CO 4	Analyse factors affecting International Relations
		CO 5	Describe various regulations and permits to enter various countries

SEMESTER - X			
Course Code	**MTM – 1001**	**Course Title**	**Travel Media & Journalism**
	Course Objectives		**Course Outcomes (COs)**
1	To provide basic understanding about travel journalism and its role in tourism promotion	**CO 1**	Examine various concepts in Tourism Journalism
2	To equip the students with the practical know-how on travel writing and the dynamics of making travelogues.	**CO 2**	Analyse the role of documentation of the destinations
3	To understand the developing ideas for writing articles	**CO 3**	Identify different sources of Information for tourism research
		CO 4	Describe steps for writing tourism articles
		CO 5	Examine the usage of various verbs and adverbs in portraying research experiences
Course Code	**MTM – 1002**	**Course Title**	**Transport Management**
	Course Objectives		**Course Outcomes (COs)**
1	To provide the concept of Transport Management in promoting Tourism	**CO 1**	Describe the role of Transport system in India
2	To equip with models and practice of Transport Management.	**CO 2**	Anayse the modes of Surface Transportation and its role
3	To understand the Airport areas and facilities	**CO 3**	Examine various areas at Airport and formalities for domestic and International
		CO 4	Explain types of Rail tours and its significance in India
		CO 5	Discuss role of Water Transport System in India
Course Code	**MTM – 1003**	**Course Title**	**Public Relation**
	Course Objectives		**Course Outcomes (COs)**
1	To equip the students with the basic knowledge of public relations and its significance in tourism promotion	**CO 1**	Describe the importance and function of PR in Tourism
2	To make the students familiar with different types of media.	**CO 2**	Describe the importance and function of PR in Tourism
3	o make the students familiar with different types of writing and interfacing technologies in public relations.	**CO 3**	Examine the role of Ad Agency and PR Campaigns
		CO 4	To examine new technologies in Public Media and PR
		CO 5	Critic the need for PR in Tourism

NAME OF THE PROGRAMME	MASTER OF ARTS (Economics)
PROGRAMME CODE	IAMOA01

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To provide students a well -founded educational base and well learning environment in economics	**PO1**	To develop Intellectual skills by building the ability to explain core economic terms, Statistics and Econometric concepts, and theories.
PEO2	To provide the students pursue the course that emphasises qualitative and theoretical aspects of economics	**PO2**	Demonstrate the ability to use the qualitative and quantitative research methods.
PEO3	To develop socio economics research skills in analysing, testing and focus on policy making	**PO3**	Apply Economic theories and concepts to contemporary Economic and social issues, as well as formulation and analysis of policy.
PEO4	To provide experiential learning in understanding the theories, principles in economics.	**PO4**	Analyse the Consumer behaviour, production theories and market behaviour,
PEO5	To engage in scientific enquiry, critical thinking and be professional decision makerin economics field.	**PO5**	Students will be able to be decision maker as economic consultant and deal with issue of scarcity.

SEMESTER - I			
Course Code	**MEC 101**	**Course Title**	**Advanced Micro Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce principals and methods in Economic Analysis, Managerial Economics.	**CO 1**	Acquire Knowledge on Demand and Consumer Behaviour.
2	To provide the students with fundamental principles of microeconomics.	**CO 2**	Analysis of Production and Cost concepts.
3	Familiarize students to use the concepts to which they are introduced to facilitate analysis of the functioning of the micro economy.	**CO 3**	Evaluate the price and output determination in Imperfect Markets.
		CO 4	Develop the understanding towards Neo-Classical theories of firm.
		CO 5	Enable the students to understand the advanced micro theories.
Course Code	**MEC 102**	**Course Title**	**Advanced Macro Economics**
	Course Objectives		**Course Outcomes (COs)**

1	The students will be taught to demonstrate their knowledge of the fundamental and technical concepts of economics.	**CO 1**	Demonstrate awareness on measurement and working of National Income.
2	To learn and apply the basic theories of economics in critical thinking and problem solving.	**CO 2**	Illustrate the Classical theories of Income and Output determination.
3	To make students able to make decisions wisely using cost-benefit analysis.	**CO 3**	Evaluate the Neo –classical theories of consumption and Investment.
		CO 4	To be aware of Business Cycle occurrence and its impact on economy.
		CO 5	Understand the functioning of macro environmental factors in Economy.
Course Code	**MEC 103**	**Course Title**	**Financial Institutions and Markets**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students to the financial services and markets.	**CO 1**	Evaluate the importance of Financial Institutions in present scenario.
2	To enrich student's understanding of the fundamental concepts and working of financial service institutions	**CO 2**	Understand the instruments of money markets.
3	To equip students with the knowledge and skills necessary to become employable in the financial service industry.	**CO 3**	To gain knowledge and understand the working of Capital Markets.
		CO 4	To be aware of working of Central Bank in India.
		CO 5	To make students understand the monetary policy and its implication and process.
Course Code	**MEC 104**	**Course Title**	**Mathematical Methods for Economists**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the concepts of Linear Algebra and Real Analysis.	**CO 1**	To make students study the applications of elementary mathematics.
2	To analyze the role of mathematical assumptions in economic modelling.	**CO 2**	The subjects provide knowledge on application of derivatives in consumer theory.
3	To provide foundations of major techniques to solve optimization problems in economics.	**CO 3**	To learn the application of derivatives in production and Markets.
		CO 4	To learn the simple operations of Matrices.
		CO 5	Understand the concept of Simultaneous Equations through Cramer's rule.
Course Code	**MEC 105**	**Course Title**	**Economics of Growth and Development**
	Course Objectives		**Course Outcomes (COs)**
1	The Students will get knowledge of the fundamental and technical concepts of economics.	**CO 1**	To gain knowledge about the growth and development concepts.
2	Students will apply the basic theories of economics in critical thinking and problem solving.	**CO 2**	To be aware of classical theories of development.

3	To learn the economic models and development theories.	**CO 3**	To evaluate the role of classical and modern theories of development and its implications on economy.
		CO 4	To evaluate the role of classical and modern theories of growth and its implications on economy.
		CO 5	Understand the application of classical neoclassical and modern theories in achieving economic development.
Course Code	**MEC 106**	**Course Title**	**Monetary Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To present the main current macroeconomic problems.	**CO 1**	To make students learn the money demand and supply concept.
2	To describe the role of central banks in the economy.	**CO 2**	The subjects provide knowledge on money and interest rate theories.
3	To introduce the students to the standard analytical methodology that figures out the optimal monetary policy measures.	**CO 3**	To understand the neo classical theories of Inflation concept.
		CO 4	To analyse the Monetary policy implication on economy.
		CO 5	Understand the concept of employment and theories relate to it.
Course Code	**MEC 107-1**	**Course Title**	**Agricultural Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To study the significance of agriculture in economic development.	**CO 1**	To understand the role of agricultural sector importance in achieving economic development of country.
2	To provide information to students about various modern technology and ideas adopted in the agriculture sector.	**CO 2**	he subjects provide knowledge on theories of Agricultural development.
3	To bring awareness on Agricultural policies.	**CO 3**	To gain knowledge about the relationship between production functions and its application in agricultural sector.
		CO 4	To understand the practical problem faced by Agricultural sector in marketing process
		CO 5	Understand the factors supply and demand factors for agricultural production Operations
Course Code	**MEC 107-2**	**Course Title**	**Health Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To Master the key economic concepts and analytical tools needed to analyze health care sector .	**CO 1**	To make students understand the role of Health economics in present scenario.
2	To Understand and apply micro economic principles to analyze the major issues of the health care sector.	**CO 2**	To evaluate the demand and supply forces in relation to health care sector.
3	To Understand the key institutional and market factors that affect the incentives of the stakeholders in the key health care markets.	**CO 3**	To gain knowledge about health care financing.

		CO 4	To gain statistical data on health care sector and study its impact on economy.
		CO 5	Understand the role of health care institutions in providing their contributions.
SEMESTER - II			
Course Code	**MEC 201**	**Course Title**	**Indian Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To help a student to understand Indian economic problems	**CO 1**	To give overview on current status of Indian economy.
2	Enable the students to appreciate the evolution of Indian economy, its institutional framework, planning policy	**CO 2**	Understand the planning process and its objectives to be achieved.
3	Understand the relevance of policies and planning in economy	**CO 3**	To gain broad knowledge on population of country.
		CO 4	Make students familiar with the problem of poverty and Unemployment.
		CO 5	Learn the economic reforms in country.
Course Code	**MEC 202**	**Course Title**	**International Trade -Theory and Policy**
	Course Objectives		**Course Outcomes (COs)**
1	To to provide an understanding of the broad principles of international trade.	**CO 1**	To learn the theories of International trade.
2	To help understand the theories to facilitate the free flow of trade in goods, services and capital.	**CO 2**	To evaluate and analyse the impact of Tariffs on economy.
3	To examine the impact of the trade policies followed at the national and international levels as also their welfare implications for the economies.	**CO 3**	Discuss the concept of terms of trade in international trade.
		CO 4	To understand the role of WTO and it's functioning.
		CO 5	To understand the concept of Economic Integration.
Course Code	**MEC 203**	**Course Title**	**Statistical Methods and Computer Applications for Economist**
	Course Objectives		**Course Outcomes (COs)**
1	To help a student to know the calculus, including calculation of derivatives, partial derivatives of both explicit and implicit functions and solving optimization problems.	**CO 1**	CO1-To introduce students to the basic concepts of statistics and develop skills of data analysis and ability to interpret.
2	Use statistical methods for research analysis and interpretation.	**CO 2**	CO1-To help students to solve the basic statistics in economics like correlation and regression.
3	Identify, critically evaluate and synthesise the substantive theories for creating models for understanding economic behavior.	**CO 3**	CO1-To enhance student's practical knowledge on time series and Index Numbers.

		CO 4	CO1-To enable students in learning theory of distribution.
		CO 5	CO1-To learn Statistics Inferences and do Hypothesis testing.
Course Code	**MEC 204**	**Course Title**	**Welfare Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To make students understand the General Equilibrium Concept and achieve it.	**CO 1**	To learn the general equilibrium theory.
2	To bring awareness of welfare attainment in economy.	**CO 2**	To understand the pricing strategies and learn the present pricing regime
3	The students should have knowledge of optimal	**CO 3**	To get knowledge on Paretian welfare economics.
		CO 4	To learn the Public choice theory and its implication in welfare of society.
		CO 5	To analyse and evaluate the need of optimality and welfare in country.
Course Code	**MEC 205**	**Course Title**	**Public Economic theory and Policy**
	Course Objectives		**Course Outcomes (COs)**
1	To create knowledge about the vast areas of fiscal institutions, tax systems, expenditure programs.	**CO 1**	To understand the role of Government in Mixed economy.
2	Help to understand budgetary procedures, stabilization instruments, debt issues, levels of government.	**CO 2**	Understand the concept of Public Choice.
3	To understand Indian tax policy from practical and theoretical economic perspectives.	**CO 3**	To analyse the rationale for public choice.
		CO 4	Describe the role of public expenditure by the government in economic development.
		CO 5	To analyse the role of budget, Taxation and its implications on economy.
Course Code	**MEC 206**	**Course Title**	**Economics of Insurance**
	Course Objectives		**Course Outcomes (COs)**
1	To make students understand the importance of Insurance in economy.	**CO 1**	To understand the role of Insurance in economic development.
2	To analyse the concept of Risk Management.	**CO 2**	Understand the concept of Risk Management.
3	To bring awareness on health and life insurance.	**CO 3**	To analyse the role of Insurance in economic development.
		CO 4	To understand the essentials of life and health insurance.
		CO 5	Understand and analyse the importance of Insurance Management

SEMESTER – III			
Course Code	**MEC 301**	**Course Title**	**Research Methodology**
	Course Objectives		**Course Outcomes (COs)**
1	To understand some basic concepts of research and its methodologies	**CO 1**	To gain theoretical knowledge on Research.
2	To select and define research problem and conduct research.	**CO 2**	To familiarise with various types of Research.
3	To prepare project report write a research report and thesis.	**CO 3**	Understand the methodology of research.
		CO 4	Understand the steps of Research and implementation.
		CO 5	To acquire knowledge of Sampling and report writing by the student.
Course Code	**MEC 302**	**Course Title**	**Financial Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To learn the advanced level of finance, banking, accounting and other areas of commerce.	**CO 1**	Understand the fundamentals accounting.
2	To be aware of concepts like financial transactions, financial instruments and financial markets.	**CO 2**	To learn the basic computation of final accounts.
3	To acquire the students with the basic knowledge of financial economics.	**CO 3**	Empower the students to solve the basic capital budgeting, cash flow and risk analysis problems.
		CO 4	To introduce students the concept of financial economics to use in decision making as economist.
		CO 5	Learn the capital structure and ratio analysis problems.
Course Code	**MEC 303**	**Course Title**	**Fundamentals of Econometrics**
	Course Objectives		**Course Outcomes (COs)**
1	The course has been designed with the objective to understand econometrics for quantitative analysis in economics.	**CO 1**	To understand the basics of econometrics.
2	To make students convergent with data analysis in MS Excel.	**CO 2**	To learn the measurement of Error.
3	To use econometric modeling for analysis and decision making.	**CO 3**	To develop the regressions with qualitative independent variables.
		CO 4	To learn dynamic Econometric models.
		CO 5	To understand the basic time series econometrics.

Course Code	MEC 304	Course Title	Advanced Computer Application in Economics
	Course Objectives		**Course Outcomes (COs)**
1	The ability to work effectively and understand the present as well as future economic scenario of the country and international level.	**CO 1**	Students will get practical exposure towards the statistical analysis.
2	The ability to use the power of computers in applications in economics.	**CO 2**	Students will create quantitative models to solve real world problems.
3	Students are given exposure towards the statistical weapons for analysis.	**CO 3**	Students will understand the Multivariate models.
		CO 4	To learn the analysis of Multivariate Statistical Models.
		CO 5	Students will learn the IT application to Commerce and Finance.
Course Code	**MEC 305**	**Course Title**	**International Finance and Business**
	Course Objectives		**Course Outcomes (COs)**
1	To study the fundamentals of the global financial system regulation.	**CO 1**	To understand the International capital flows.
2	To name the functions and objectives of international monetary and financial institutions.	**CO 2**	Students will learn the functioning of foreign exchange market.
3	To review the key stages and principles of development of the world currency system.	**CO 3**	To understand the monetary adjustments in economy.
		CO 4	Students will learn the Balance of payments adjustments by analysing the disequilibrium.
		CO 5	To evaluate the role of Multilateral financial Markets in International trade development.
SEMESTER - IV			
Course Code	**MEC 401**	**Course Title**	**Operational Research**
	Course Objectives		**Course Outcomes (COs)**
1	To impart knowledge in concepts and tools of Operations Research	**CO 1**	Students will be introduced to the operational research learning importance.
2	To understand mathematical models used in Operations Research	**CO 2**	To understand the Linear programming method.
3	To apply these techniques constructively to make effective business decisions	**CO 3**	To get the practical working on Transportation and Assignment problems.
		CO 4	To understand the Game theory method and Input Output methods.
		CO 5	A comprehensive understanding of Network Analysis

Course Code	MEC 402	Course Title	Environmental Economics
	Course Objectives		**Course Outcomes (COs)**
1	Students will learn how markets allocate goods and why they sometimes fail allocate environmental goods optimally.	**CO 1**	Understand the importance of Environmental economics dynamism.
2	Students will learn how to regulate pollutants that travel across country boundaries and how environmental regulations affect trade flows.	**CO 2**	How to value the natural resources availability and learn the optimum management of it.
3	Students learn quantitative skills by working with the mathematical models that show how to allocate environmental goods optimally.	**CO 3**	To learn the economic valuation of Environment.
		CO 4	To evaluate the environmental policy instruments.
		CO 5	To learn about the environmental institutions.
Course Code	**MEC 403**	**Course Title**	**Labour Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To understand the supply and demand to illustrate how wages are determined.	**CO 1**	To understand the Indian Labour Market.
2	To learn how productivity influences wages.	**CO 2**	To learn the Employment and age policy in India.
3	Predict how various policies or regulations will impact labor markets.	**CO 3**	Understand the functioning of labour.
		CO 4	Analyse the labour management in preseNT competitive world.
		CO 5	Understand the National wage policy.
Course Code	**MEC 404**	**Course Title**	**Economics Planning**
	Course Objectives		**Course Outcomes (COs)**
1	To gain an understanding of core economic principles and how they apply to a wide range of real-world issues.	**CO 1**	To familiarize students with Economic Planning.
2	To master the theoretical and applied tools necessary to critique and create economic research.	**CO 2**	To learn the various planning process and five years plan.
3	To learn how to articulate pragmatic, principles-based policies to enhance economic well-being and promote social justice.	**CO 3**	Learn the functioning of Planning Commission in five year plan.
		CO 4	To be able to analyse the mobilisation and allocation of resources for the plans.
		CO 5	To understand the need of sectoral planning

Course Code	**MEC 405**	**Course Title**	**Urban Economics**
	Course Objectives		**Course Outcomes (COs)**
1	To learn new conceptual and theoretical models in Urban Studies	**CO 1**	To learn the impact of urbanisation in present era.
2	To examine complex causes and systems that frame urban challenges	**CO 2**	To understand and analyse the problems of urbanisation.
3	To understand research methods and tools to interrogate urban problems	**CO 3**	Understand the urbanisation growth process.
		CO 4	Enable students to analyse the urban policies in India.
		CO 5	Familiarize students to know the measures to be taken for urban growth.
Course Code	**MEC 406**	**Course Title**	**PROJECT WORK**
	Course Objectives		**Course Outcomes (COs)**
1	To encourage students to do research work.	**CO 1**	Give a practical exposure to the students.
2	To learn statistical techniques and use it in analysis	**CO 2**	Make use of Research methodology in making project.
3	To learn the research skills.	**CO 3**	Use of statistical techniques to find the solution.
		CO 4	To understand the cause and effect of problem and give solutions to problems.
		CO 5	Enhance the Research skills.

NAME OF THE PROGRAMME	M.A. English
PROGRAMME CODE	IAMOA02

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To provide students with a sound foundation in literary concepts necessary to formulate, analyse and articulate narrative expressions.	PO1	Helps the students learn the evolution of language and the politics
PEO2	To equip students to use the literary and critical skills learnt during the course for creative productions.	PO2	Enhances critical thinking of students and cultivate language skills of students by introducing them to structures of language through a wide variety of literary works
PEO3	To create interest in independent literary pursuits for further career in academics, research and industry	PO3	Hones the writing skills of students and they learn the conventions of academic writing
PEO4	To make the students aware of the importance of historical contexts and ideological drifts.	PO4	Introduces different literary periods and trends of each of these periods and instils a critical perspective with which students approach the disciplines
PEO5	To motivate students towards life-long learning that uses the intellectual advantage gained from the course to understand the world better	PO5	Introduces works written by different sections of people (gender, racial and ethnic minorities) and makes the students give critical responses from different perspectives.

SEMESTER - I			
Course Code	MEG 101	Course Title	BRITISH LITERARY HISTORY - PART - I
	Course Objectives		Course Outcomes (COs)
1	To view English literary history in its socio-cultural and political contexts	CO1	Students explore the canonical literary works of the various periods of English literature and the Irish literary tradition
2	To create an awareness of the problems of canon-formation and literary representation.	CO2	Enhanced with the writings and outlet of such writers' view implementing their ideas and understanding the concept and cultural thoughts behind the pieces of art
3	To make the students know different works and the period.	CO3	They also gain wide perception in connecting varied writings of the authors and the fictional characters
		CO4	They are aware of the socio-cultural and political context to the period of representation.

		CO5	Learners are able to find connections in relevance to the contemporary world and the works of the period
Course Code	**MEG 102**	**Course Title**	**LITERARY CRITICISM, CRITICAL THEORIES ANDCRITICAL READING PART - I**
	Course Objectives		**Course Outcomes (COs)**
1	To span the history of Western Literary Criticism, and introduce students to vital moments in its history.	**CO1**	Enhances the critical thinking of students by introducing to them a bunch of literary and political theories.
2	To equip students with terms and concepts towards the critical reading of textual material.	**CO2**	Students are able to navigate through the various literary critical theories and concepts for a better understanding and appreciation of the intricate and various branches of literature.
3	To introduce the world of media studies through concepts related to media and communication, and help students analyze a pervasive media-text, i.e., the advertisement.	**CO3**	Literary criticism enables the students with guidelines to analyse, deconstruct, interpret and evaluate works of literature.
		CO4	Able to know all phases of literary understanding where emphasis is on the evaluation of literary works and the authors' place of standing in literary history.
		CO5	Familiarised with the world of media studies which empowers the with skills to analyse persuasive media text.
Course Code	**MEG 103**	**Course Title**	**Gender Studies & Concepts Part – I**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students to the multi-accented inter-disciplinary frames of gender.	**CO1**	Students are familiarised with the key concepts of gender studies.
2	To show how gender operates in the lives of individuals and as a social practice via institutional and cultural technologies.	**CO2**	The study encompasses a broader understanding besides the central discussions of Women Studies and feminist discourses.
3	To equip them with analytical, critical and creative skills to interrogate the biases in the construction of gender and patriarchal norms.	**CO3**	Students are able to examine issues related to the normative male-female binary progressing to interrogating gender studies in more complexed and nuanced manner.
		CO4	They are also introduced to gender debates in India too, thus providing a locale setting on the subject.
		CO5	This course enables the students to delve deeper into the polemics of Gender Studies with a strong base.

Course Code	MEG 104	Course Title	INDIAN WRITINGS IN ENGLISH PART - I
	Course Objectives		**Course Outcomes (COs)**
1	To provide an overview of the various phases of the evolution of Indian writing in English.	**CO1**	Students are introduced to the evolution and development of Indian Writing in English from its inception to recent times.
2	To understand both Indian writing in English and Regional Literatures in India translated into English as part of Indian Literature.	**CO2**	Students are aware of the thematic concerns, genres and trends of Indian writing in English.
3	To show students a cultural world they are familiar with and the prevalence of several cultural worlds within any apparently uniform culture.	**CO3**	They are enlightened with the socio-cultural and political realm of India as they grasp the varied themes and major trends in Indian English Writings.
		CO4	To expose students to the pluralistic aspects of Indian culture and identity
		CO5	Indian Writing in English and Modern Indian Literatures translated into English enables students to examine literatures produced in India from the pre-modern to the present times.
Course Code	**MEG 105**	**Course Title**	**COMMUNICATIVE ENGLISH & LANGUAGE SKILLS PART-I**
	Course Objectives		**Course Outcomes (COs)**
1	To teach students all the languages skills-listening, speaking, reading and writing.	**CO1**	Students find themselves excelling in communicative skills.
2	To teach students Phonetics and Modern English Grammar.	**CO2**	Foundation of Phonetics and Grammar is known
3	To train students in languages functions.	**CO3**	Preparedness to communicate and meet the requirement.
		CO4	Would be familiar with the functions of Language
		CO5	Familiar with the skills required for speaking and listening.
Course Code	**MEG 106**	**Course Title**	**RE-MAPPING EUROPEAN CLASSICS PART - I**
	Course Objectives		**Course Outcomes (COs)**
1	To help students read texts in the wider contexts of European history	**CO1**	Students are equipped with a profound view of European Literature throughout the various ages
2	To introduce students to the Europe's best fictions.	**CO2**	Students are able to read and analyse the texts not only in the provided context but also relating it to present day issues
3	To encourage students to develop new and original methods of interpretation even while surveying 'traditional' texts.	**CO3**	Aware of new interpretations of the canonical literatures
		CO4	Students develop analytical, critical, exploratory skills
		CO5	A broad vision of life by making the students to come to grips with universal problems and

			varied life situations through the works they come across.
Course Code	**MEG 107**	**Course Title**	**AMERICAN LITERARY HISTORY-PART I**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the major literary movements of American Literature from 1750 to the present and some of the key authors and text of the period.	**CO1**	Students gain familiarity of established American Literature and the literary periods.
2	To Develop the analytical skills necessary for critical engagement with texts and the skill needed for augmentative writing	**CO2**	The socio-cultural knowledge developed through reading of American literature enable the students to understand the various cultures, thus enhancing their views towards a global culture.
3	Attending to the ways in which politics, society and the arts illuminate and interrogate the literature.	**CO3**	Their critical and analytical skills are developed as through their close reading of the texts, discussions.
		CO4	They hone their argumentative, analytical and interpretive skills, as they explore the American literary tradition.
		CO5	Aware of American thought and political writings to American literary expressions.
SEMESTER - II			
Course Code	**MEG 108**	**Course Title**	**WORLD LITERATURES IN ENGLISH PART – 1**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students to the varieties of writings in English those have emerged from different regions and continents.	**CO1**	Students gain understanding of various writings in English from places all around the world.
2	To show how writers from other cultures have used language as a cultural tool.	**CO2**	They are introduced to various cultural domains through these texts.
3	To be familiar with world literature.	**CO3**	Students learn about different genres.
		CO4	Students will be exposed to different cultures in the world through the texts of their study
		CO5	To generate a broad vision of life by making the students to come to grips with universal problems and varied life situations.

SEMESTER - II			
Course Code	**MEG 201**	**Course Title**	**BRITISH LITERARY HISTORY PART - II**
	Course Objectives		**Course Outcomes (COs)**
1	To view English literary history in its socio-cultural and political contexts	**CO1**	Students explore the canonical literary works of the various periods of English literature and the Irish literary tradition
2	To create an awareness of the problems of	**CO2**	Enhanced with the writings and outlet of such

	canon-formation and literary representation.		writers' view implementing their ideas and understanding the concept and cultural thoughts behind the pieces of art
3	To make the students know different works and the period .	**CO3**	They also gain wide perception in connecting varied writings of the authors and the fictional characters
		CO4	They are aware of the socio-cultural and political context to the period of representation.
		CO5	Learners are able to find connections in relevance to the contemporary world and the works of the period
Course Code	**MEG 202**	**Course Title**	**LITERARY CRITICISM, CRITICAL THEORIES ANDCRITICAL READING - PART - II**
	Course Objectives		**Course Outcomes (COs)**
1	To span the history of Western Literary Criticism, and introduce students to vital moments in its history.	**CO1**	Enhances the critical thinking of students by introducing to them a bunch of literary and political theories.
2	To equip students with terms and concepts towards the critical reading of textual material	**CO2**	Students are able to navigate through the various literary critical theories and concepts for a better understanding and appreciation of the intricate and various branches of literature.
3	To introduce the world of media studies through concepts related to media and communication, and help students analyze a pervasive media-text, i.e., the advertisement.	**CO3**	Literary criticism enables the students with guidelines to analyse, deconstruct, interpret and evaluate works of literature.
		CO4	Able to know all phases of literary understanding where emphasis is on the evaluation of literary works and the authors' place of standing in literary history.
		CO5	Familiarised with the world of media studies which empowers the with skills to analyse persuasive media text.
Course Code	**MEG 203**	**Course Title**	**GENDER STUDIES & CONCEPTS PART – II**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students to the multi-accented inter-disciplinary frames of gender.	**CO1**	Students are familiarised with the key concepts of gender studies
2	To show how gender operates in the lives of individuals and as a social practice via institutional and cultural technologies	**CO2**	The study encompasses a broader understanding besides the central discussions of Women Studies and feminist discourses.
3	To equip them with analytical, critical and creative skills to interrogate the biases in the construction of gender and patriarchal norms.	**CO3**	Students are able to examine issues related to the normative male-female binary progressing to interrogating gender studies in more complexed and nuanced manner.

		CO4	They are also introduced to gender debates in India too, thus providing a locale setting on the subject.
		CO5	This course enables the students to delve deeper into the polemics of Gender Studies with a strong base
Course Code	**MEG 204**	**Course Title**	**INDIAN WRITINGS IN ENGLISH PART - II**
	Course Objectives		**Course Outcomes (COs)**
1	To provide an overview of the various phases of the evolution of Indian writing in English	**CO1**	Students are introduced to the evolution and development of Indian Writing in English from its inception to recent times
2	To understand both Indian writing in English and Regional Literatures in India translated into English as part of Indian Literature	**CO2**	Students are aware of the thematic concerns, genres and trends of Indian writing in English.
3	To show students a cultural world they are familiar with and the prevalence of several cultural worlds within any apparently uniform culture	**CO3**	They are enlightened with the socio-cultural and political realm of India as they grasp the varied themes and major trends in Indian English Writings.
		CO4	To expose students to the pluralistic aspects of Indian culture and identity
		CO5	Indian Writing in English and Modern Indian Literatures translated into English enables students to examine literatures produced in India from the pre-modern to the present times
Course Code	**MEG 205**	**Course Title**	**COMMUNICATIVE ENGLISH & LANGUAGESKILLS PART-II**
	Course Objectives		**Course Outcomes (COs)**
1	To teach students all the languages skills-listening, speaking, reading and writing.	**CO1**	Students find themselves excelling in communicative skills.
2	To teach students Phonetics and Modern English Grammar.	**CO2**	Foundation of Phonetics and Grammar is known
3	To train students in languages functions.	**CO3**	Preparedness to communicate and meet the requirement.
		CO4	Would be familiar with the functions of Language
		CO5	Familiar with the skills required for speaking and listening.
Course Code	**MEG 206**	**Course Title**	**RE-MAPPING EUROPEAN CLASSICS PART - II**
	Course Objectives		**Course Outcomes (COs)**
1	To help students read texts in the wider contexts of European history	**CO1**	Students are equipped with a profound view of European Literature throughout the various ages
2	To introduce students to the Europe's best fictions.	**CO2**	Students are able to read and analyse the texts not only in the provided context but also relating it to present day issues

3	To encourage students to develop new and original methods of interpretation even while surveying 'traditional' texts.	**CO3**	Aware of new interpretations of the canonical literatures
		CO4	Students develop analytical, critical, exploratory skills
		CO5	A broad vision of life by making the students to come to grips with universal problems and varied life situations through the works they come across.
Course Code	**MEG 207**	**Course Title**	**AMERICAN LITERARY HISTORY-PART II**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize the students with the major literary movements of American Literature from 1750 to the present and some of the key authors and text of the period.	**CO1**	Students gain familiarity of established American Literature and the literary periods.
2	To Develop the analytical skills necessary for critical engagement with texts and the skill needed for augmentative writing	**CO2**	The socio-cultural knowledge developed through reading of American literature enable the students to understand the various cultures, thus enhancing their views towards a global culture
3	Attending to the ways in which politics, society and the arts illuminate and interrogate the literature.	**CO3**	Their critical and analytical skills are developed as through their close reading of the texts, discussions
		CO4	They hone their argumentative, analytical and interpretive skills, as they explore the American literary tradition
		CO5	Aware of American thought and political writings to American literary expressions
Course Code	**MEG 208**	**Course Title**	**WORLD LITERATURES IN ENGLISH PART – 1**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students to the varieties of writings in English those have emerged from different regions and continents.	**CO1**	Students gain understanding of various writings in English from places all around the world.
2	To show how writers from other cultures have used language as a cultural tool.	**CO2**	They are introduced to various cultural domains through these texts
3	To be familiar with world literature	**CO3**	Students learn about different genres
		CO4	Students will be exposed to different cultures in the world through the texts of their study
		CO5	To generate a broad vision of life by making the students to come to grips with universal problems and varied life situations.

SEMESTER - III			
Course Code	**MEG 301**		**LITERARY CRITICAL THEORY-PART-I**
	Course Objectives		**Course Outcomes (COs)**
1	To make a distinction between literary criticism and literary theory, and to update students on the major theoretical turns in the 20th century.	**CO1**	Students are familiarised with major movements in critical theory
2	To instil in students thinking practices which would help them align theory with textual and social practices.	**CO2**	Enabled them to distinguish between Literary Criticism and Literary Theory while progressing through the theoretical landmarks of the 20th century
3	To enhance the critical thinking of students by introducing to them a bunch of literary and political theories	**CO3**	Gaining appropriate directions, students are enabled to such thought processes that aligns theories with textual and social practices
		CO4	Students will be able to evaluate passages from critical essays and locate them within specific theories
		CO5	Able to distinguish between literary criticism and literary theory
Course Code	**MEG 302**	**Course Title**	**POSTCOLONIAL STUDIES & CONCEPTS - PART- I**
	Course Objectives		**Course Outcomes (COs)**
1	To acquaint students with the basic terminologies of post colonial studies as a major current discipline.	**CO1**	Students are introduced to the key concepts of Postcolonial Studies.
2	To familiarize them with the history of the development of post colonial theory and its present relevance.	**CO2**	They will be able to trace the development of postcolonial theories from its inception to the present day
3	To enable them to critique literary texts within the theoretical frames of post colonial studies.	**CO3**	Students are enabled to know the critical, analytical and evaluative means within the frames of postcolonial studies.
		CO4	Students are sensitized with how language has borne the politics of the colonizer.
		CO5	To enable the students interpret literature based on the theory.
Course Code	**MEG 303**	**Course Title**	**LITERARY & CULTURAL STUDIES-THEORIES ANDCONCEPTS - PART I**
	Course Objectives		**Course Outcomes (COs)**
1	Introducing students to the idea of Popular Literature and Popular Culture.	**CO1**	Students are introduced to Cultural Studies and to genres in literature and films
2	Training students to see non – canonical texts too as part of a complex web of historical conditions and cultural patterns.	**CO2**	CO2: Their curiosity is prompted to understand subsets of popular culture and sub-culture in relation to literary and film texts.
3	To help students study sub culture and fringe identities	**CO3**	They are also made aware of the various cultures of the world through the non-canonical works woven through a complexity of historical conditions and cultural patterns
		CO4	Theoretical frames of cultural theories enable the students to read popular literary and film

			texts within those frames to configure means of studying and analysing cultural ethos.
		CO5	To sensitize the students with how far is language cultural.
Course Code	**MEG 304**	**Course Title**	**LANGUAGE & LINGUISTICS –PART-I**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the study of language and linguistics, language variation and the contribution of Ferdinand De Saussure.	**CO1**	Students are introduced to the study of language and linguistics
2	To teach phonology, morphology, syntax, semantics and pragmatics.	**CO2**	They are aware of language variation
3	To teach Chomsky's Transformational Generative Grammar and Halliday's Scale Category Grammar.	**CO3**	learn the basic concepts and terminology to acquire the nuances of language and implement the same with expertise.
		CO4	They learn the linguistic approach
		CO5	Acquire knowledge on descriptive and perspective approach of language study
Course Code	**MEG 305**	**Course Title**	**TEACHING ENGLISH LANGUAGE AND LITERATURE - PART - I**
	Course Objectives		**Course Outcomes (COs)**
1	To describe the status of English and English situation in India with an understanding of the factors that determine the status.	**CO1**	Students are equipped with a varied spectrum of Teacher-learning and Teaching – Learning in a pedagogic set up.
2	To equip students with both Literary and Linguistic Competence.	**CO2**	They will be able to trace the development of English Language and Literature in India
3	To analyse the students practices in relation to the prevalent teaching atmosphere	**CO3**	Along with related Language acquisition, Status, Perspectives and Specific purposes to meet Global challenges
		CO4	Resource materials and psychological theories of Learning enable the students to groom themselves as instructors in the future
		CO5	Develop an in-depth knowledge of various approaches and methods- Direct method, Reading method, Structural Method and Audio-Lingual Method
Course Code	**MEG 306**	**Course Title**	**WRITE IT RIGHT**
	Course Objectives		**Course Outcomes (COs)**
1	To help students get the basics right.	**CO1**	Students will improve their speaking ability in English both in terms of fluency and comprehensibility

2	To grasp the nature of the writing exercise one has embarked upon	**CO2**	Students will enlarge their vocabulary by keeping a vocabulary journal
3	To promote effective writing across a whole range of tasks all of us face on a daily basis.	**CO3**	Students succeed in enhancing their writing skills
		CO4	The basics are refreshed for an improved and effective writing that would enable the students to effectively express their creative impulses and also communicate across a range of tasks faced in everyday situations.
		CO5	Students will strengthen their ability to write academic papers, essays and summaries using the process approach.
Course Code	**IV SEMESTER M.A. ENGLISH- Subject-1 Paper-IV(i)**	**Course Title**	**LITERARY & CRITICAL THEORY - PART-II**
	Course Objectives		**Course Outcomes (COs)**
1	To make a distinction between literary criticism and literary theory,	**CO1**	Students gain further perspectives on major movements of critical theories,
2	To update students on the major theoretical turns in the 20th century.	**CO2**	Learn different theories such as Reader-response, feminism, New historicism and Post-colonialism.
3	To instil in students thinking practices which would help them align theory with textual and social practices.	**CO3**	Enabled with the need to theorize and relevance to historicism
		CO4	Empowering them with qualities requisite to critically evaluate literary pieces
		CO5	locate them within specific theoretical setting
SEMESTER - IV			
Course Code	**MEG 401**		**LITERARY CRITICAL THEORY- PART-II**
	Course Objectives		**Course Outcomes (COs)**
1	To make a distinction between literary criticism and literary theory, and to update students on the major theoretical turns in the 20th century.	**CO1**	Students are familiarised with major movements in critical theory
2	To instil in students thinking practices which would help them align theory with textual and social practices.	**CO2**	Enabled them to distinguish between Literary Criticism and Literary Theory while progressing through the theoretical landmarks of the 20th century
3	To enhance the critical thinking of students by introducing to them a bunch of literary and political theories	**CO3**	Gaining appropriate directions, students are enabled to such thought processes that aligns theories with textual and social practices
		CO4	Students will be able to evaluate passages from critical essays and locate them within specific theories
		CO5	Able to distinguish between literary criticism and literary theory

Course Code	MEG 402	Course Title	POSTCOLONIAL STUDIES & CONCEPTS - PART-II
	Course Objectives		**Course Outcomes (COs)**
1	To acquaint students with the basic terminologies of post-colonial studies as a major current discipline.	**CO1**	Students are introduced to the key concepts of Postcolonial Studies.
2	To familiarize them with the history of the development of post-colonial theory and its present relevance.	**CO2**	They will be able to trace the development of postcolonial theories from its inception to the present day
3	To enable them to critique literary texts within the theoretical frames of post-colonial studies.	**CO3**	Students are enabled to know the critical, analytical and evaluative means within the frames of postcolonial studies.
		CO4	Students are sensitized with how language has borne the politics of the colonizer.
		CO5	To enable the students interpret literature based on the theory.
Course Code	**MEG 403**	**Course Title**	**LITERARY & CULTURAL STUDIES - THEORIES ANDCONCEPTS - PART II**
	Course Objectives		**Course Outcomes (COs)**
1	Introducing students to the idea of Popular Literature and Popular Culture.	**CO1**	Students are introduced to Cultural Studies and to genres in literature and films
2	Training students to see non – canonical texts too as part of a complex web of historical conditions and cultural patterns.	**CO2**	Their curiosity is prompted to understand subsets of popular culture and sub-culture in relation to literary and film texts.
3	To help students study sub culture and fringe identities	**CO3**	They are also made aware of the various cultures of the world through the non-canonical works woven through a complexity of historical conditions and cultural patterns
		CO4	Theoretical frames of cultural theories enable the students to read popular literary and film texts within those frames to configure means of studying and analysing cultural ethos.
		CO5	To sensitize the students with how far is language cultural.
Course Code	**MEG 404**	**Course Title**	**LANGUAGE & LINGUISTICS – PART-II**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the study of language and linguistics, language variation and the contribution of Ferdinand De Saussure.	**CO1**	Students are introduced to the study of language and linguistics
2	To teach phonology, morphology, syntax, semantics and pragmatics.	**CO2**	They are aware of language variation
3	To teach Chomsky's Transformational Generative Grammar and Halliday's Scale Category Grammar.	**CO3**	Learn the basic concepts and terminology to acquire the nuances of language and implement the same with expertise.
		CO4	They learn the linguistic approach
		CO5	Acquire knowledge on descriptive and perspective approach of language study

Course Code	MEG 405	Course Title	TEACHING ENGLISH LANGUAGE AND LITERATURE - PART - II
	Course Objectives		**Course Outcomes (COs)**
1	To describe the status of English and English situation in India with an understanding of the factors that determine the status.	**CO1**	Students are equipped with a varied spectrum of Teacher-learning and Teaching – Learning in a pedagogic set up.
2	To equip students with both Literary and Linguistic Competence.	**CO2**	They will be able to trace the development of English Language and Literature in India
3	To analyse the students practices in relation to the prevalent teaching atmosphere	**CO3**	Along with related Language acquisition, Status, Perspectives and Specific purposes to meet Global challenges
		CO4	Resource materials and psychological theories of Learning enable the students to groom themselves as instructors in the future
		CO5	Develop an in-depth knowledge of various approaches and methods- Direct method, Reading method, Structural Method and Audio-Lingual Method

NAME OF THE PROGRAMME	M.Sc. Mathematics
PROGRAMME CODE	IAMOA06

Programme Educational Objectives (PEOs)		Programme Outcomes (POs)	
PEO1	To impart working knowledge of fundamental concepts of pure and applied mathematics.	**PO1**	Apply the knowledge of pure and applied mathematics to the solution of complex scientific problems
PEO2	To provide qualitative education through effective teaching learning processes by introducing projects, participative learning and latest software tools.	**PO2**	Identify, formulate and analyze complex scientific problems reaching substantiated conclusions using first principles of mathematics, basic sciences and applied sciences
PEO3	A broad sense of social, ethical and professional responsibility with a capacity to demonstrate an understanding and appreciation of the human dimension of technology and its impact on mankind. An ability to work effectively as members of teams, composed of individuals from different	**PO3**	Apply ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice. Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
PEO4	To strong oral and written communication skills with a capacity to produce effective technical documents and to use current communication techniques and tools	**PO4**	Create motivated, enthusiastic, thinking and creative graduates to fill the roles as teachers, statisticians, professors, scientists, software professionals and administrators.
PEO5	A culture of life-long learning with a capacity to engage in continuous self-improvement, personal enrichment and professional development	**PO5**	Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

SEMESTER - I			
Course Code	**MMA 101**	**Course Title**	**ALGEBRA-I**
	Course Objectives		**Course Outcomes (COs)**
1	This course is aimed to provide an introduction of normal subgroups, permutation groups, concept and to develop working knowledge of Ideals, Principle Ideal Domain, Euclidean Domain, Unique Factorization Domain and Modules.	**CO1**	Gain knowledge of normal subgroups, permutation group, normal series, solvable group and nilpotent group.

2	The course also fulfils the objective to make students aware of the applicability of abstract mathematics in real world problems.	**CO2**	Create, select and apply appropriate algebraic structures such as finitely generated abelian groups, Ideals, Fields to explore the existing results.
3	Students will explore: foundations of Algebraic structures, Groups, Rings, Ideals, Fields, Homomorphisms etc.	**CO3**	Introduce the concepts of conjugacy classes, normalizers and centralizers.
		CO4	Utilize the class equation and Sylow theorems to solve different related problems
		CO5	Design, analyze and implement the concepts of homomorphism and isomorphism between groups and rings for solving different types of problems, for example, Isomorphism theorems, quotient groups.
Course Code	**MMA 102**	**Course Title**	**REAL ANALYSIS**
	Course Objectives		**Course Outcomes (COs)**
1	This course is aimed to provide a deeper and rigorous understanding the fundamental concept of Riemann-Stieltjes integral.	**CO1**	Use theory of Riemann-Stieltjes integral in solving definite integrals arising in different fields of science and engineering.
2	Students will explore the concept of sequence and series of functions.	**CO2**	Apply the knowledge of concepts of real analysis in order to study theoretical development of different mathematical techniques and their applications.
3	Focus of this course will be the theoretical foundation of functions of several variables.	**CO3**	Identify challenging problems in real variable theory and find their appropriate solutions.
		CO4	Acquire the knowledge of sequence, series and uniformly convergence of series by different Test.
		CO5	Extend their knowledge of real variable theory for further exploration of the subject for going into research
Course Code	**MMA 103**	**Course Title**	**TOPOLOGY- I**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the fundamental ideas of Topological Spaces	**CO1**	Understand the basic concepts of finite and infinite sets, cantors theorem, continum hypothesis and zorns lemma
2	To develop a clear understanding of the fundamental concepts of	**CO2**	Acquire the knowledge of metric spaces.Apply the knowledge of concepts

	Topology such as countable and uncountable, metric spaces, cantor's intersection theorem.		of real analysis in order to study theoretical development of different mathematical techniques and their applications.
3	To enable students familiar with these concepts and their fruitful applications.	**CO3**	Apply the knowledge of concepts of real analysis in order to study topological concepts.
		CO4	Define and illustrate the concept of topological spaces and continuous functions.
		CO5	Extend their knowledge of real variable theory for further exploration of the subject for going into research.
Course Code	**MMA 104**	**Course Title**	**ORDINARY DIFFERENTIAL EQUATIONS**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce ordinary differential equations and fundamental theorems for existence and uniqueness.	**CO1**	Demonstrate the methods of solving linear differential equations of nth order.
2	The course also fulfills the objective to make students aware of the applicability of ordinary differential equations in real world problems.	**CO2**	Understand ordinary differential equations of various types, their solutions, and fundamental concepts about their existence, eigen value problem and sturm liouville problems.
3	Students will explore: fundamental sets of solutions, dependent solutions, ordinary and singular points of differential equations and linear system of homogeneous and non-homogeneous equations.	**CO3**	Apply various power series methods to obtain series solutions of differential equations.
		CO4	Discuss various methods of linear system of homogeneous and non-homogeneous equations.
		CO5	Solve ordinary differential equation problem based on real life problem.
Course Code	**MMA 105**	**Course Title**	**DISCRETE MATHEMATICS**
	Course Objectives		**Course Outcomes (COs)**
1	The objective of this course is to provide the fundamentals and the concepts of discrete mathematical structures with applications.	**CO1**	Demonstrate the methods of solving linear differential equations of nth order. Demonstrate knowledge of how Tautologies, Quantifiers, Predicates and Validity are defined.
2	The course also fulfils the objective to make students aware of the applicability of important theorems with constructive proofs, real life problems	**CO2**	Apply various counting techniques such as product, sum rule, inclusion exclusion principle.

3	Students will explore: Mathematical Logic, Counting techniques, Lattice Theory, Boolean, Algebra, Graphs, Trees and Algebraic Structure in the field of Computer sciences and its applications and non-homogeneous equations.	CO3	Apply various types of relations in real world problems.
		CO4	Describe Lattices and Posets and their use.
		CO5	Describe the graph and tree concept problem based on real life problem.
Course Code	**MMA 106**	**Course Title**	**BRIEF BIOGRAPHY OF EMINENT MATHEMATICIANS AND HISTORY OF MATHEMATICS**
	Course Objectives		**Course Outcomes (COs)**
1	The objective of this course is to inspire students by well-known mathematicians lifestyle and their contribution to the world of Mathematics.	CO1	Students would have inspired by the brief biographies of well-known Mathematicians
2	To make them know the history of development of Algebra, Calculus, Analysis, Geometry and the number system.	CO2	Students would have understood the brief history of Algebra and its evolution.
3	Explore students to the methods of proof and related theorems.	CO3	Students would have exposed themselves to the evolution of number system, especially complex number system.
		CO4	Students would have learnt how the Analysis developed over the years.
		CO5	Students will be able to apply methods of proofs in related problems.
SEMESTER - II			
Course Code	**MMA 201**	**Course Title**	**ALGEBRA - II**
	Course Objectives		**Course Outcomes (COs)**
1	This course is aimed to provide an introduction of Modules and modules homomorphisms, submodules and quotient modules	CO1	Gain knowledge of modules, module homomorphism, exact sequences of modules.
2	The course also fulfils the objective to make students aware of the applicability of abstract mathematics in real world problems.	CO2	Create, select and apply appropriate algebraic structures such as finitely generated abelian groups, Ideals, Fields to explore the existing results.
3	Students will explore: Roots of polynomial, Elements of Galois Theory.	CO3	Introduce the concepts of modules with chain conditions-Artinian and noetherian modules.
		CO4	Utilize the roots of polynomial and apply

			the roots in simple and separable extension.
		CO5	Analyze and implement the concepts of Galois theory.
Course Code	**MMA 202**	**Course Title**	**COMPLEX ANALYSIS**
	Course Objectives		**Course Outcomes (COs)**
1	The objective of this course is to introduce the fundamental ideas of the functions of complex variables.	**CO1**	Becoming familiar with the concepts Complex numbers and their properties and operations with Complex number.
2	To develop a clear understanding of the fundamental concepts of Complex Analysis such as analytic functions, complex integrals and a range of skills which will allow students to work effectively with the concepts	**CO2**	Evaluating limits and checking the continuity of complex function.
3	Students will explore algebraic, geometric and topological structures of the complex number field.	**CO3**	Checking differentiability and Analyticity of functions.
		CO4	Evaluate Complex integrals and applying Cauchy integral.
		CO5	To understand certain theorems like Casorti-wierstrass theorems, Hadamards three circle theorem, Hurwitz theorem
Course Code	**MMA 203**	**Course Title**	**TOPOLOGY_- II**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the fundamental ideas of compactness, countability, separation axioms.	**CO1**	Understand the basic concepts of compact spaces, axioms of countability.
2	To develop a clear understanding of the fundamental concepts of Topology such as compact space, product topology.	**CO2**	Define and illustrate the concept of the separation axioms, regularity
3	To enable students familiar with these concepts and their fruitful applications.	**CO3**	Define and illustrate the concept of product topology and quotient topology.
		CO4	Understand theorems like the Urysohn's Lemma, Urysohn's Metrization Theorems.
		CO5	Demonstrate knowledge and understanding of concepts such as point wise convergence and uniform convergence of Topology.

Course Code	MMA 204	Course Title	PARTIAL DIFFERENTIAL EQUATIONS
	Course Objectives		**Course Outcomes (COs)**
1	This course will focus on the formulation of first and second order partial differential equations (PDEs) for three basic types of hyperbolic, parabolic and elliptic equations	**CO1**	Classify partial differential equations into Linear equation, Semi linear, Quasi-linear and nonlinear equations.
2	Problem solving of PDEs which include heat, wave and Laplace' s equation that arise in various physical systems.	**CO2**	Find solutions of partial differential equations and determine the existence, uniqueness of solution of partial differential equation.
3	Students will explore: solving First order partial differential equations and second order partial differential equations.	**CO3**	Find out the complete integral by Charpit's method and also find the particular integral, singular integral.
		CO4	Solve simple eigenvalue problems of Sturm-Liouville type.
		CO5	Solve ordinary differential equation problem based on real life problem
Course Code	**MMA 205**	**Course Title**	**FUNCTIONAL ANALYSIS**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students to the ideas and some of the fundamental theorems of functional analysis.	**CO1**	Demonstrate knowledge and understanding on normed linear spaces.
2	To provide a working knowledge of the basic properties of Banach spaces., Hilbert spaces and inner product space.	**CO2**	Understand the concepts of Hahn-Banach theorem and its consequences.
3	To demonstrate significant applications of the theory of functional analysis.	**CO3**	Appreciate the role of Inner product space.
		CO4	Understand and apply ideas from the theory of Hilbert spaces to other areas.
		CO5	Define and illustrate the projection operators.
Course Code	**MMA 206**	**Course Title**	**MATHEMATICAL MODELLING AND NUMERICAL ANALYSIS - I**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce Mathematical Models to apply in real world problems.	**CO1**	To understand and apply Mathematical Models in other science field.
2	To learn algebraic and transcendental equations where analytical methods fail.	**CO2**	To learn Models leading to linear and nonlinear partial differential equations
3	To solve Nonlinear Equations in One Variable	**CO3**	To understand an apply Nonlinear Equations in One Variable.

		CO4	To Solve Linear and Nonlinear system of Equations using iterative methods and decomposition methods
		CO5	To understand and apply Interpolation and Numerical Integration
SEMESTER - III			
Course Code	**MMA 301**	**Course Title**	**DIFFERENTIAL GEOMETRY**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the fundamentals of differential geometry primarily by focusing on the theory of curves and surfaces in three space.	**CO1**	The student will be able to compute quantities of geometric interest such as curvature, as well as develop a facility to compute in various specialized systems, such as semi geodesic coordinates or ones representing asymptotic lines or principal curvatures.
2	To be able to understand the fundamental theorem for plane curves.	**CO2**	The student will also be introduced to the method of the moving frame and over determined systems of differential equations as they arise in surface theory.
3	The theory of surfaces introduces the fundamental quadratic forms of a surface, intrinsic and extrinsic geometry of surfaces	**CO3**	Students will start being able to develop arguments in the geometric description of curves
		CO4	The student will be able to develop arguments in the surfaces in order to establish basic properties of geodesics
		CO5	The student will be able to use shape operators.
Course Code	**MMA 302**	**Course Title**	**MATHEMATICAL METHODS**
	Course Objectives		**Course Outcomes (COs)**
1	To familiarize students with a range of mathematical methods that are essential for solving advanced problems.	**CO1**	The student will be able to do reduction of IVPs, BVPs and eigen value problems.
2	To perform mathematical techniques in Integral Equations and Asymptotic expansions.	**CO2**	The student will be able to do asymptotic expansion of functions and integrals.
3	To perform mathematical techniques in Numerical solution of Partial differential equations.	**CO3**	Understand and apply Runge Kutta methods of first, second and fourth order

		CO4	Understand and apply the concept of BVP
		CO5	Understand and find the numerical solution of PDE
Course Code	**MMA 303**	**Course Title**	**FLUID MECHANICS**
	Course Objectives		**Course Outcomes (COs)**
1	To expose students to Cartesian tensors, tensor calculus ad integral theorems.	CO1	To expose students to Cartesian tensors, tensor calculus ad integral theorems.
2	To make them understand the physical properties of fluids and to formulate the equations.	CO2	To make them understand the physical properties of fluids and to formulate the equations.
3	To understand the motion of inviscid fluids and viscous fluids.	CO3	To understand the motion of inviscid fluids and viscous fluids.
		CO4	Students would have understood the formation of equations related inviscid fluids and related theorems.
		CO5	Students would have learnt the motion of viscous fluids and derivation of various equations related.
Course Code	**MMA 304**	**Course Title**	**COMPUTATIONAL LINEAR ALGEBRA**
	Course Objectives		**Course Outcomes (COs)**
1	To discuss various decompositions of vector spaces and linear transformations on vector spaces.	CO1	Find characteristic values, characteristic vectors and the minimal polynomial of a linear transformation and to determine a linear transformation is diagonalizable.
2	To study diagonalizable operator on a vector space and characterizations of it using the minimal and characteristic polynomials.	CO2	Decompose a vector space into a sum of invariant subspaces and a linear transformation into a direct sum of induced operators.
3	To introduce different classes of linear operators on inner product spaces and to study their structures.	CO3	Compute the cyclic subspace generated by a vector and to construct the rational and Jordan forms of linear transformations and matrices.
		CO4	Determine a linear operator is normal, unitary and orthogonal projection and to construct the spectral decomposition of normal and self-adjoint operators.
		CO5	Construct the matrix of a bilinear form and to find index, rank and signature of a bilinear form.

SEMESTER - IV			
Course Code	**MMA 401**	**Course Title**	**MEASURE AND INTEGRATION**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce the basic concept of measure and integration theory.	**CO1**	Acquire the knowledge and understanding of basic concepts of measure and integration theory.
2	To introduce the measurable sets, measurable functions.	**CO2**	Explain measure and outer measure, extension of measure.
3	To create the ability to solve problem and logical thinking of the students.	**CO3**	Apply the Lebesgue integral and Riemann integral of a bounded function defined ona closed interval.
		CO4	Reflection of understanding of the functions of bounded variation.
		CO5	Understand the LP uniqueness of extension and derived proof of some theorems.
Course Code	**MMA 402(A)**	**Course Title**	**RIEMANNIAN GEOMENTRY**
	Course Objectives		**Course Outcomes (COs)**
1	To analyze manifolds and Tensor fields	**CO1**	By the end of the course, students will have a thorough understanding of Manifolds, Tangent and cotangent spaces to a manifold
2	To analyze curves and geodesics in Riemannian manifold	**CO2**	Students will have a thorough understanding of Tensor fields and their components.
3	To be able to understand Hypersurfaces of Riemannian manifolds.	**CO3**	To learn Riemannian connections and their components
		CO4	To understand and find curves and geodesics in Riemannian manifold.
		CO5	To identify Hyper surfaces of Riemannian manifolds
Course Code	**MMA 402(B)**	**Course Title**	**SPECIAL FUNCTIONS**
	Course Objectives		**Course Outcomes (COs)**
1	To understand students with special functions –hypergeometric series, q series and partitions.	**CO1**	Discuss various kinds of special functions in detail, their properties and relations.

2	To explain the analytic techniques in computing the solutions of various special functions.	**CO2**	Identify the hypergeometric series, q-series.
3	To equip the students with the mathematical background for the development of such techniques.	**CO3**	Understand the Ramanujans summation formula and its applications.
		CO4	Understand the q-series and theta function.
		CO5	Demonstrate the concept of partition and related theorems.
Course Code	**MMA 402(C)**	**Course Title**	**THEORY OF NUMBERS**
	Course Objectives		**Course Outcomes (COs)**
1	To understand students with concept of multiplicative and completely multiplicative functions.	**CO1**	Be literate in the language and notation of number theory
2	To explain the Residue classes and complete residue classes and introduce the concept of partitions.	**CO2**	Work with congruence's, solve congruence equations and systems of equations with one and more variables.
3	To equip the students with the mathematical background for the development of such techniques.	**CO3**	Understand and apply residue classes and complete residue classes.
		CO4	Understand the two theorems of Euler, Rogers-Ramanujan identities.
		CO5	Demonstrate the concept of partition and related theorems.
Course Code	**MMA 402(D)**	**Course Title**	**ENTIRE AND MEROMORPHIC FUNCTIONS**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students with Meromorphic functions.	**CO1**	Student would have understood all the fundamentals of Entire functions and meromorphic functions.
2	To expose students to the theorems related to entire functions.	**CO2**	Students would have understood asymptotic values and curves.
3	To make students understand different types of meromorphic functions and related theorems.	**CO3**	Students would have understood the relation between order and the derivative of entire function and relation between various exponential values.
		CO4	Students would have understood the different types of models.
		CO5	Student will be able use these functions for the related applications.
Course Code	**MMA 403(A)**	**Course Title**	**MAGNETOHYDRODYNAMICS**
	Course Objectives		**Course Outcomes (COs)**
1	To give an introduction to the subject of Magnetohydrodynamics –the study of the flow of an electrically	**CO1**	State Maxwell's equations, make the magnetohydrodynamic approximation

	conducting fluid in the presence of a magnetic field.		and derive the magnetic induction equation.
2	To present the basic theory and apply it to a variety of physical problem.	**CO2**	To derive the basic equations of MHD.
3	Learn the classical MHD.	**CO3**	To derive Chandrasekhar's theorem.
		CO4	Linearise the governing equations and obtain the dispersion relations for Alfven waves.
		CO5	To solve flow problems, Hartmann flow.
Course Code	**MMA 403(B)**	**Course Title**	**FLUID DYNAMICS OF OCEAN AND ATMOSPHERE**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students with fundamental concepts dynamics related to ocean and atmosphere.	**CO1**	The student would have understood all the fundamental concepts necessary to learn the motion of a ocean.
2	To expose students to various equations related fluid dynamics of ocean.	**CO2**	The student would have learnt all the theories and theorems related to motion of fluid in ocean.
3	To make students understand atmospheric dimensions and the physical constraints that affect the atmosphere.	**CO3**	Students would have Understood different physical constrains acting on earth-atmosphere system.
		CO4	Students would have Understood Homogeneous Models of the wind-driven Oceanic circulation.
		CO5	Students will be able to solve live problems related to this course.
Course Code	**MMA 403(C)**	**Course Title**	**COMPUTATIONAL FLUID DYNAMICS (CFD)**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students with fundamental concepts computational fluid dynamics.	**CO1**	The student would have understood all the fundamental concepts necessary to computational fluid dynamics.
2	To expose students to various numerical methods to solve fluid dynamics problems.	**CO2**	The student would have learnt all the finite difference methods, finite volume methods and finite element methods.
3	To make students understand and apply these numerical methods to solve problems.	**CO3**	Students would have learnt some examples related to all the above methods.
		CO4	Students would have Understood different models and equations related.
		CO5	Students will be able to solve live problems using these methods to the desired approximation.

Course Code	MMA 404(A)	Course Title	FINITE ELEMENT METHOD WITH APPLICATIONS
	Course Objectives		**Course Outcomes (COs)**
1	To provide a theoretical introduction and application of advanced numerical methods for solving different types of problems viz. linear systems, ordinary and partial differential equation arising in various field of applications .	**CO1**	Apply the knowledge of advanced numerical methods in order to solve different types of problems viz. linear systems, ordinary and partial differential equation arising in various field of applications for example in science, engineering and economics etc.
2	To explain the concept of weighted residual approximations, finite elements nad solution of one dimensional ordinary differential equations.	**CO2**	Understand advantages of advanced numerical methods.
3	The major focus will be on development, analysis and implementation of numerical methods	**CO3**	Select and implement an appropriate numerical method for solving a given problem keeping in mind nature of the problem.
		CO4	Understand the finite element procedures, solution of one dimensional ordinary differential equations.
		CO5	Extend their knowledge to do research work on these methods and similar type of other methods.
Course Code	**MMA 404(B)**	**Course Title**	**GRAPH THEORY**
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students with fundamentals of graph theory	**CO1**	Students will have the idea of connectivity of graphs and related properties.
2	To expose students to the modern application of graph theory	**CO2**	Students would have understood the concept of planarity of graphs and its characters.
3	To make students understand how to model the live problems graphically and solve.	**CO3**	Students would have acquired the knowledge on colourability of graphs and its consequences.
		CO4	Students will be able to apply the properties of matchings and factorization for the real world problems.
		CO5	Students will be able to apply the concept of directed graphs and related properties to the problems.

Course Code	MMA 404(C)	Course Title	
	Course Objectives		**Course Outcomes (COs)**
1	To introduce students with preliminary concepts design and analysis of algorithms.	**CO1**	Students would have understood all the preliminary concepts of algorithms
2	To expose students to various graph algorithms and dynamic programming.	**CO2**	Students would have learnt all the graph algorithms.
3	To make students apply these algorithms to solve problems..	**CO3**	Students would have learnt all the dynamic programming concepts.
		CO4	Students would have Understood different operations.
		CO5	Students will be able to solve live problems using these algorithms.

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PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		*B.Com*	
PROGRAM CODE		*IABOC01*	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To develop student competencies in the development, measurement, analysis, validation, and communication of accounting, financial, banking, and other related information.	PO1	Demonstrate a sound understanding and knowledge of the accounting concepts, and principles, to measure, analyze, validate, and communicate various accounting and financial information to appropriate authorities.
PEO2	To provide an understanding of various systems, policy frameworks, and strategies needed to administer the rapid changes in global, legal, regulatory, and ethical issues relating to Commerce, Business, and Accounting.	PO2	Apply the various techniques in the decision-making process with updated knowledge in implementing business practices of Finance, Taxation, Business Laws, and other areas of business and the context in which it operates.
PEO3	To equip students with an understanding of financial modeling, financial engineering, business analytics, its constituents, the principles on which it operates, inter-linkages, and regulatory concerns apart from exposure to different functional domains of management.	PO3	Apply appropriate tools and techniques to plan, organise, coordinate, direct, and control business enterprises, private, government, and non–governmental organizations to meet the current and future expectations of the business and industry.
PEO4	To equip students with professional skills, values, leadership, and entrepreneurial skills required for setting up incubation centers and small-scale enterprises, in the present-day context.	PO4	Demonstrate an ability to inculcate a sense of professional ethics, integrity, and social responsibility in various domains and adapt to changing technology with applied skills toward sustainable development.
PEO5	Increased student autonomy in the learning & research process, and ability to self-reflect and engage in lifelong learning.	PO5	Demonstrate the ability to self-reflect on research skills, and other functional areas of management, commerce, and accounting and engage in lifelong learning.

SEMESTER I

Course Code	C21 DC 1.1	Course Title	Financial Accounting
	Course Objectives		Course Outcomes
1	To acquaint students with the accounting concepts, tools and techniques influencing Business Organizations.	CO1	Be able to develop the skill of recording financial transactions and preparation of reports in accordance with Ind AS.
2	Prepare organisation's financial accounts (statements) for a specific period of time.	CO2	Be able to understand and prepare the financial statements required for today 's business .
3	To improve clarity, consistency and comparability of the communication of financial information.	CO3	Be able to understand the concepts and theoretical knowledge of Financial accounting.
		CO4	Be able to understand the accounting treatment required for converting a Partnership firm into a Limited company.
		CO5	Be able to apply the concept of accounting to find out the profitability at different activity/departmental levels and analyse the same for decision making in business.

SEMESTER I

Course Code	C21 DC 1.2	Course Title	Corporate administration
	Course Objectives		Course Outcomes
1	To enable students to get familiarized with the existing Company Law and Secretarial Procedure.	CO1	Be able to understand the framework of Companies Act of 2013 and different types of companies.
2	Understand the various roles played by top executives.	CO2	Be able to identify the stages and documents involved in the formation of companies in India.
3	To familiarize students about the different types of meetings conducted by the company.	CO3	Be able discuss the role, responsibilities and functions of key Management Personnel in Corporate Administration.
		CO4	Be able to recognize the procedure involved in the corporate meetings and the role of company secretary in the meeting.
		CO5	Be able to draw the role of liquidator in the process of winding up of the company.

SEMESTER–I

Course Code	C21 DC 1.3	Course Title	Principles Of Management
	Course Objectives		Course Outcomes
1	To familiarize the students to the concepts and principles of organization management.	CO1	Be able to understand the managerial concepts related to business.
2	To Create awareness of the principles to be followed in an organisation	CO2	Be able to demonstrate the roles, skills and functions of management.
3	To study the system and process of effective controlling in the organization	CO3	Be able to understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.
		CO4	Be able to understand the importance of planning and forecasting in the decision making process of a given organization.
		CO5	Be able to understand the management principles and management Theories.

SEMESTER–I

Course Code	**SBC 1.1**	**Course Title**	**Basic Excel Technique**
	Course Objectives		Course Outcomes
1	To impart excel formulas to students and application of the same.	CO1	Examine spreadsheet concepts and explore the Microsoft office Excel environment.
2	To equip students with the knowledge on how to debug and audit the advanced formulas	CO2	Understand and apply basic principles of laying out excel models for decision making.
3	To make the students meet the industry requirements	CO3	Use excel functions to summarize quantitative data graphically using pivot tables and charts.
		CO4	Apply formulas to lay data in readiness for analysis.
		CO5	Evaluate the financial impact of investments.

Course Code	C21 OE 1.1	Course Title	Financial Literacy
	Course Objectives		Course Outcomes
1	To provide an understanding of the knowledge of financial literacy and to create awareness of the same.	CO1	Understand the importance of financial literacy and its implementation of day-to day life.
2	To familiarize with the basic concepts of banking, accounting and insurance sectors.	CO2	Learn the basic accounting, banking and insurance concepts and their usage in daily life transactions.
3	To provide an awareness on managing personal finance in day-to- day life.	CO3	Demonstrate an understanding of the different types of banking operations available for customers.
		CO4	Recognize and understand the procedure involved in managing personal finance.
		CO5	Explain the role of insurance and its importance including benefits.

SEMESTER II

Course Code	**C21 DC 2.1**	**Course Title**	**Advanced Financial Accounting**
	Course Objectives		Course Outcomes
1	To provide students conceptual knowledge of accounting.	CO1	To acquire conceptual knowledge of basics of fire insurance claims.
2	To review and understand the accounting tools and techniques influencing business organizations.	CO2	To develop the skill of recording the Consignment transactions in the books of Consignor and Consignee and ascertain Profit.
3	To effectively analyze, interpret and use financial statements.	CO3	To identify and analyse the concepts of Joint venture and prepare different set of accounts on Joint Venture
		CO4	To familiarize the concept of Branch account and its system.
		CO5	To equip with the knowledge of accounting process and preparation of final accounts.

SEMESTER II

Course Code	**C21 DC 2.2**	**Course Title**	**Quantitative Analysis for Business Decisions I**
	Course Objectives		Course Outcomes
1	To understand the basic concepts of Mathematics.	CO1	Explain the concepts and use equations, formulae, and mathematical expressions and relationships in a variety of contexts
2	To have a proper understanding of mathematical application in commerce	CO2	Apply the knowledge in mathematics (, matrices, calculus) in solving business problems
3	To Develop abstract, logical and critical thinking and the ability to reflect critically upon their work and the work of others.	CO3	Ability to solve problems on Matrices and execute the laws of indices, law of and evaluate them.
		CO4	Analyse and demonstrate mathematical skills required in mathematically intensive areas in Economics and business.
		CO5	Ability to solve problems on Arithmetic progression, Geometric progression and construct logical application of these concepts.

SEMESTER II

Course Code	C21 DC 2.3	Course Title	Cost Accounting
	Course Objectives		Course Outcomes
1	To Provide an understanding of basic techniques of cost accounting and to develop the skills necessary to apply those techniques	CO1	To explain relevant cost concepts & classification of costs used in the manufacturing / service sector.
2	To provide an understanding of the use of cost accounting techniques in planning, control & decision making.	CO2	To explain the purposes of cost accounting
3	To provide an understanding of proper recording, presentation of cost data to management for measuring efficiency in cost control & cost reduction.	CO3	To apply costing principles in the decision making process.
		CO4	To prepare the production cost statement & cost of goods sold statement.
		CO5	To explain the relationship between cost & financial accounting.

SEMESTER II

Course Code	C21 OE 2.1	Course Title	Investing In Stock Market
	Course Objectives		Course Outcomes
1	Introduce students to monetary and financial markets in India and examine their structure, operations and products.	CO1	To identify and compare different investment options available for individual investors and to effectively manage their personal finances/investments.·
2	Enable the students with a conceptual framework of stock markets and commodity markets	CO2	Understand & interpret the mechanism of investing, investment process and market indices.
3	Develop an understanding of the principles of Investments in securities markets and provide the knowledge and skills required to undertake investments in stock market	CO3	Explain role and nature of stock market and range of services provided by these for individual investors
		CO4	Demonstrate an understanding of mutual fund investments, their advantages and disadvantages.
		CO5	.Understand & interpret the mechanism of investing, investment process and market indices.

SEMESTER II

Course Code	SBC 2.1	Course Title	Tally Prime Essentials
	Course Objectives		Course Outcomes
1	Expose the students to digitally apply the accounting concepts and conventions.	CO1	Students learn the basics of tally and importance of tally in today"s computerized environment.
2	To introduce the students to the Basic of Accounts and the usage of Tally for accounting purposes.	CO2	Students learn to prepare final accounts in tally along with cash flow statements and inventory analysis reports.
3	Develop the students' ability to use various tools in measuring and evaluating the performance of an entity	CO3	The course assist students to become job ready and opens up diversified career options.
		CO4	Reconcile bank statement with relevant subsidiary books of accounts.
		CO5	Possess required skill to be employed as a data entry operator

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		Bachelor of Business Administration (BBA)	
PROGRAM CODE		*IABBA01*	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	The programme aims to nurture the students in intellectual, technical, interpersonal and social skills with a focus on holistic education and development to make informed decisions and equips graduates with the skills required to lead management positions.	PO1	Demonstrate a deep understanding of functions of management communication ideas and principles.
PEO2	To provide students with modern business knowledge and competence in functional management disciplines.	PO2	Demonstrate an understanding of the knowledge of finance, accountancy, law, statistics, HR, operations, IT and management subjects required for business decisions and apply knowledge to integrate concepts from various disciplines, to identify and develop business strategies for effective problem-solving and decision-making in a contemporary organization environment.
PEO3	To promote management growth and entrepreneurship via experiential learning.	PO3	Apply the necessary competencies and skills with a creative mindset, to undertake entrepreneurship as a desirable and feasible career option and able to adapt effectively as an individual and as a member or leader in teams, and in multidisciplinary settings by demonstrating life skills, coping skills and human values.
PEO4	To instil professional ethics, human values, and social responsibility for the growth of organisations and societies.	PO4	This programme brings out reflective, scientific and creative thinking in the students which to get deeper insights into the business world and tackle complex situations with the help of skills and knowledge acquired.
PEO5	To educate future business professionals who are able to apply theoretical understanding toward the development of viable solutions to challenges that exist in the actual world.	PO5	Imbibe ethical practices in profession and appreciate sustainability and evince a sense of social responsibility in their respective environments, by becoming citizens working for the welfare and benefit of the society, at large. Achieve higher levels of proficiency and self-actualization through the pursuit of life-long learning.

SEMESTER I

Course Code	**M 21 DC 1.1**	**Course Title**	**Management Principles and Practice**
	Course Objectives		Course Outcomes
1	To provide an understanding of the functions and responsibilities of managers.	CO1	Able to demonstrate their understanding of various concepts, principles, and functions of business management.
2	To familiarize students with the tools and techniques to be used in the performance of the managerial job.	CO2	Able to Demonstrate the roles, skills and functions of management
3	To enhance students understanding to develop cognizance of the importance of management principles.	CO3	The ability to create organization structures based on authority, task and responsibilities.
		CO4	The ability to understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.
		CO5	The ability to understand the requirement of good control system and control techniques

SEMESTER I

Course Code	M 21 DC 1.2	Course Title	Fundamentals of Business Accounting
	Course Objectives		Course Outcomes
1	To acquaint students with the accounting concepts, tools and techniques influencing business organizations.	CO1	Acquire the knowledge in accounting, system of maintenance of accounts, journal, ledger, bill of exchange, and account current, average due date and bank reconciliation statement. The Ability to pass journal entries and prepare ledger accounts.
2	To make the students understand the basic accounting concepts and conventions	CO2	Familiarized and understand the basic accounting concepts and conventions, preparation of subsidiary books and final accounts, account of Consignment, Joint venture and non-trading concerns.
3	To enable them to work with ratio analysis and bank reconciliation statement	CO3	Develop the analytical skills in accounting equation, preparation of trial balance and suspense account, normal loss in consignment. Analysing the reasons for differences between pass book and cash book transactions in the Bank Reconciliation Statement.
		CO4	Acquire the ability to prepare the vertical and Horizontal Analysis and Ratio Analysis
		CO5	Students will able to analyse and interpret published financial information

SEMESTER I

Course Code	**M 21 DC 1.3**	**Course Title**	**Business Economics**
	Course Objectives		Course Outcomes
1	To impart the fundamentals of economics with an objective to develop the application based knowledge	CO1	Students are able to understand fundamental concepts in Economics and relate it to business
2	To apply micro economics concepts techniques in evaluating the business decisions taken by the firms	CO2	Able to analyze Consumer Behavior and understand how he behaves at different levels of satisfaction and to know indifferent behavior of the consumer. The Ability to prepare trial balance and final accounts of proprietary concern.
3	To develop basic knowledge on production cost and revenue.	CO3	Able to analyze Law of demand, concepts and determinants of demand Computation of demand forecasting
		CO4	Analyze the decisions made by the firm using different production techniques with element of time involved it.
		CO5	Able to understand macroeconomic concepts like NI, Business Cycle, Fiscal and Monetary Policy

SEMESTER I

Course Code	**M21 OE 1.1**	**Course Title**	**Business Organisation**
	Course Objectives		Course Outcomes
1	To impart the fundamentals of Business Organisation with an objective to develop the basic knowledge of operations and functions of orgainsation	CO1	An understanding of the nature, objectives and social responsibilities of business
2	To enable the use of basic concepts of management in business organization	CO2	An ability to describe the different forms of organisations
3	To have a proper understanding of social responsibility towards business and principles of management	CO3	An understanding of the basic concepts of management
		CO4	An understanding of functions of management.
		CO5	An understanding of different types of business combinations

SEMESTER II

Course Code	**M21 DC 2.1**	**Course Title**	**Functions of Management**
	Course Objectives		Course Outcomes
1	To provide an idea on various types of management.	CO1	Improved knowledge on various types of management.
2	To improve the overall employability skills of students.	CO2	Strong basics of all the different types of management.
3	To provide an understanding to students in choosing their specialization course of their interest.	CO3	Ease in choosing their specialization course of their interest.
		CO4	Improved management skills and employability skills.
		CO5	Improved skills in marketing, human resource, finance, events and service management.

SEMESTER II

Course Code	M21 DC 2.2	Course Title	Cost Accounting
	Course Objectives		Course Outcomes
1	The objective of this subject is to familiarize students with the various Concepts and element of cost.	CO1	Understand the concepts of preparation of cost sheet.
2	To enable students to reconcile results as per Cost and Financial Accounts	CO2	The various techniques used to find the pricing of materials.
3	To enable students to discuss the concepts related to Process Costing and enable them to make Process Accounts and Statements of joint products and by-products.	CO3	The Ability to analyze the wage rates.
		CO4	The Ability to prepare the machine hour rate and allocation of overhead distribution.
		CO5	Preparation of Reconciling the cost and financial accounts.

SEMESTER II

Course Code	**M21 DC 2.3**	**Course Title**	**Business Mathematics**
	Course Objectives		Course Outcomes
1	To provide basic knowledge of mathematics and their application to Commercial situations.	CO1	The Understanding of the basic concepts of business maths and apply them to create solve and interpret application problems in business
2	To make students equipped with the concepts of interest, rate of interest, annuity and installments.	CO2	Ability to solve problems on various types of equation.
3	To make students familiar with the concepts of ratio, proportion, variation and percentage.	CO3	Ability to solve problems on Matrices and execute the laws of indices, law of logarithm and evaluate them.
		CO4	Ability to apply the concept of simple interest and compound interest bills discounted etc. and apply them in day-to-day life.
		CO5	Ability to solve problems on Arithmetic progression, Geometric progression and construct logical application of these concepts.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		Bachelor of Computer Applications (BCA)	
PROGRAM CODE		*IABCA01*	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	Provide a strong foundation in both software and hardware aspects of computing and develop core competencies in developing computing-based solutions to real world problems	PO1	Acquire core competencies to design, implement and evaluate a computational system to meet desired needs within realistic constraints
PEO2	Provide opportunities to learn and apply modern techniques of data storage and analytics as well as apply problem solving techniques to create cutting-edge technology in various domains	PO2	Apply the mathematical and programming knowledge as well as standard software engineering practices and strategies to develop applications in various domains
PEO3	Equip students with excellent technical and communication skills to work independently on software projects or collaborate as an effective team member	PO3	Possess strong communication skills, acquaint with the contemporary trends in industry, collaborate with a team and create innovative solutions to existing problems based on legal and ethical principles
PEO4	Provide training in project development and research methods which includes analysis, designing algorithms as solutions to solve real world problems and inculcate ethical and moral values	PO4	Use research methods including design of experiments, analysis, interpretation of data, synthesis of information, developing GUI applications to provide authentic solutions to problems
PEO5	Encourage students to become entrepreneurs and also practice continuous learning in order to achieve professional and personal excellence	PO5	Adapt to technological advances through active participation in life-long learning to acquire professional excellence and become successful entrepreneurs or professionals contributing to the society

Course Code	B21DC 1.1	Course Title	Discrete Structures
	Course Objectives		Course Outcomes
1	To provide strong understanding of the concepts of sets, relations and functions.	CO1	Demonstrate the basic principles of sets and operations, relations and functions, mathematical induction.
2	To provide good foundation of probabilities and statistical analysis	CO2	Acquire ability to implement propositional and counting principles.
3	To distinguish between discrete and continuous random variable and to compute probabilities using discrete and continuous distribution.	CO3	Apply the recurrence relations in computer science specific problem domains
		CO4	Compute probabilities using discrete and continuous distribution and apply in real world problems
		CO5	Gain aptitude to implement practical solutions using graph theory

Course Code	B21DC 1.2	Course Title	Problem Solving Techniques Using C
	Course Objectives		Course Outcomes
1	To inculcate necessary skills to design algorithms and flowcharts for developing applications in order to solve real world problems	CO1	Gain ability to devise algorithms and draw flow charts in order to design solutions to problems
2	To provide good knowledge of structured programming concepts using C apply the concepts wisely	CO2	Capability to wisely use the program constructs and develop efficient C programs
3	To possess the ability to develop modular programs in C and subsequently develop small projects in C	CO3	Acquire knowledge of efficiently storing data in memory and retrieving using proper data structure
		CO4	Gain ability to develop modular programs to solve real world problems
		CO5	Capability to develop C programs for real world applications by applying suitable constructs and modularity

Course Code	B21DC 1.3	Course Title	Data Structures
	Course Objectives		Course Outcomes
1	To impart knowledge on storing and managing data in various structures	CO1	Gain good understanding of the concepts, types and operations of data structures
2	To emphasize the importance of data structures in developing and implementing efficient algorithms	CO2	Acquire skills to implement sorting, searching and implementation of higher order data structure using arrays
3	To understand the operations on different data structures and their applications	CO3	Understand the concept of dynamic memory allocation, types of linked lists and gain the ability to use linked list in developing solutions to real world problems
		CO4	Apply the concept of Stacks and Queues in real world applications
		CO5	Analyze and apply graph and tree data structure in the problems where non-linear data structures are required

Course Code	B21DC 1.4	Course Title	C Programming Lab
	Course Objectives		Course Outcomes
1	To impart practical knowledge of structured programming concepts using C	CO1	Become competent to develop c programs using control structures
2	To provide the ability to implement the derived data types using C language	CO2	Capability to wisely use the program constructs and develop efficient C programs
3	To inculcate the ability to develop modular programs in C	CO3	Acquire practical knowledge of efficiently storing data in memory and retrieving using proper data structure
		CO4	Capability to design modular programs to solve real world problems
		CO5	Capability to develop C programs for real world applications by applying suitable constructs and modularity

Course Code	B21DC 1.5	Course Title	DATA STRUCTURES LAB
	Course Objectives		Course Outcomes
1	To provide practical knowledge of storing and managing data in various structures	CO1	Gain good understanding of the concepts, types and operations of data structures by practically implementing them
2	To understand the importance of data structures and practically implementing efficient algorithms	CO2	Acquire programming skills to implement sorting, searching and higher order data structure using arrays
3	To instill the ability to practically implement the operations on different data structures and their applications	CO3	Gain ability to create programs using linked list to develop real world applications
		CO4	Capability to apply the concept of Stacks and Queues in real world applications
		CO5	Capability to analyze and apply graph and tree data structure in the problems where non-linear data structures are required

Course Code	21SBC1.1	Course Title	OFFICE MANAGEMENT TOOLS
	Course Objectives		Course Outcomes
1	To provide hands-on experience on word processing	CO1	Gain ability to create formatted documents
2	To impart the skills to work on data using spreadsheets	CO2	Acquire skills to analyze data using spread sheets
3	To equip the skills to design presentations	CO3	Gain the capability to design attractive presentations
		CO4	Acquire Skills to create charts in spreadsheets and visualize the data
		CO5	Gain knowledge of the usage of common shortcut keys in the office management tools

Course Code	B21DC2.1	Course Title	COMPUTER ARCHITECTURE
	Course Objectives		Course Outcomes
1	To provide and understanding of the basic concepts and structure of computers and concepts of Instruction code and computer register	CO1	comprehend the fundamental concepts of electronics
2	To instill knowledge of different types of addressing modes and data transfer techniques	CO2	Gain good understanding of the functional units of a processor
3	To provide knowledge of the memory hierarchy and types in computer architecture and concepts of parallel computing	CO3	Gain good knowledge on the addressing modes, instruction formats and program control statements
		CO4	Gain good knowledge of system memory hierarchy
		CO5	Apply basic concept of parallel computing

Course Code	B21 DC2.1	Course Title	Object Oriented Concepts using java
	Course Objectives		Course Outcomes
1	To impart knowledge of object-oriented programming concepts using Java	CO1	Gain good knowledge of object oriented concepts using java
2	To instill the skills to create graphical user interface using graphical tools	CO2	Acquire skills to design, write, and test Java programs to implement solutions to the given problem specifications
3	To provide the knowledge to design and implement both console based and GUI based Java applications	CO3	Ability to design and implement both console based and GUI based Java applications
		CO4	Gain capability to develop multithreaded applications and animations in Java
		CO5	Acquire skills to implement object-oriented projects using Java

Course Code	B21 DC2.2	Course Title	DATABASE MANAGEMENT SYSTEMS
	Course Objectives		Course Outcomes
1	To provide knowledge on how to organize and maintain data in a database	CO1	Gain good knowledge of the fundamental elements of relational database management systems
2	To instill an understanding of the underlying mathematical principles and concepts implemented in DBMS	CO2	Acquire knowledge of the concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL
3	To impart knowledge on storing, manipulating and retrieving efficiently and effectively the data using DBMS	CO3	Capability to design ER-models to represent simple database application scenarios
		CO4	Ability to convert the ER-model to relational tables, populate relational database and formulate SQL queries on data
		CO5	Acquire skills to improve the database design by normalization and familiarize themselves with transaction processing

SEMESTER II

Course Code	B21 DC2.3	Course Title	JAVA LAB
	Course Objectives		Course Outcomes
1	To provide clarity on fundamentals of Java programming	CO1	Gain good practical knowledge of object-oriented concepts using java
2	To impart good knowledge of object-oriented concepts through programming	CO2	Acquire programming skills to design Java programs inorder to implement programming solutions to real world problems
3	To instill the skills to design and implement GUI based Java applications	CO3	Ability to design and implement both console based and GUI based Java applications
		CO4	Gain capability to develop multithreaded applications and animations in Java
		CO5	Acquire skills to implement object-oriented projects using Java

SEMESTER II

Course Code	B21 DC2.4	Course Title	DATABASE MANAGEMENT SYSTEMS LAB
	Course Objectives		Course Outcomes
1	To provide hands-on experience on how to organize and maintain data in a database	CO1	Gain hands on experience of designing relational database management system applications
2	To instill the skills to implement relational algebra concepts while creating a database	CO2	Acquire practical knowledge of implementing the concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL
3	To impart knowledge on how to store , manipulate and retrieve efficiently and effectively the data using DBMS	CO3	Capability to implement relationships in simple database application scenarios
		CO4	Ability to convert the ER-model to relational tables, populate relational database and formulate SQL queries on data
		CO5	Acquire skills to improve the database design by normalization and familiarize themselves with transaction processing

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		*B.A (History, Political Science)*	
PROGRAM CODE		*IABOA06*	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	Enable students to understand Cultural and Socio-Political aspects of Human Society through the Basic Concepts, Principles and Scope of the Disciplines.	PO1	Holistically understand the various Concepts, Principles and Scope of Cultural and Social and Political aspects of Human Society.
PEO2	Enhance the ability to understand Theoretical Concepts related to History and Political Science.	PO2	Apply their understanding of the various theoretical concepts related to History and Political Science.
PEO3	Identify and provide exposure in various facets and issues related to Global, National and regional socio-cultural and political domains.	PO3	Emulate and Apply their understanding of issues related to Global, National and regional socio-cultural and political domains.
PEO4	Equip students with understanding on the formulation of sound Research by disseminating Research Methodologies.	PO4	Use skills related to observation, analysis and interpretation for the formulation of sound Research.
PEO5	Create a database of knowledge with the skills to critically evaluate and synthesize their understanding for application in career pursuits related to History and Political Science.	PO5	Interpret their subject knowledge with the ability to evaluate and synthesize their understanding for application in career pursuits related to History and Political Science.
PEO 6 (a)	Create a sense of objectivity in bringing forth a sound historiography by young minds that have been sensitized towards issues and various facets of Heritage and Cultural Studies.	PO 6 (a)	Objectively interpret and bring forth sound Historiography, while being sensitive towards the issues of Heritage and Cultural Studies.
PEO 6 (b)	Bring forth sensitized individual with the holistic awareness of the various dimensions of Policy making, Administrative functioning and Decision making in International as well as National Paradigms related to Political Science and it subsidiary disciplines.	PO 6 (b)	Holistically understand the various Concepts, Principles and Scope of Cultural and Social and Political aspects of Human Society.

History Syllabus

SEMESTER I

Course Code	**A21 HS 1.1**	**Course Title**	**Political History of Karnataka**
	Course Objectives		Course Outcomes
1	Understand the continuity of Political developments and strategies	CO1	Analysis the importance of causes for the rise of regional political dynasties
2	Understand contextual necessities which influenced the era of political supremacy	CO2	Familiarize Indian history and culture
3	Appreciate the confluence of diverse political elements	CO3	Understand contextual necessities which influenced the era of political supremacy.
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER I

Course Code	A21 HS 1.2	Course Title	Cultural Heritage of India
	Course Objectives		Course Outcomes
1	Provide an insight about the cultural development of Karnataka	CO1	Analyze the factors responsible for origin and decline of dynasties
2	Familiarize Karnataka history and culture	CO2	Familiarize Indian history and culture
3	Expertize to analyze further development of culture of Karnataka	CO3	Provide the opportunity to understand the process of cultural diversities
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER–I

Course Code	A21 OE 1.4	Course Title	Appreciating Art History of India
	Course Objectives		Course Outcomes
1	The paper provides an overview of the art in the Indian Subcontinent right from ancient to contemporary times	CO1	Distinguish between the different Schools of Art in Ancient India and specify the technique used for making sculptures, paintings and structural art.
2	It includes various aspects of art such as sculpture, architecture and paintings	CO2	recognize the various architectural forms (temples, mosques, forts and colonial buildings) which are part of the cultural heritage of India
3	To help students to gain a comprehensible insight into the most fascinating areas of Indian art and learn to appreciate the various art forms.	CO3	set apart the important traditions of paintings in India and outline the various art forms
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions

SEMESTER II

Course Code	A21 HS 2.1	Course Title	Political History of Karnataka
	Course Objectives		Course Outcomes
1	Understand the rise and fall of Political dynasties in Karnataka	CO1	Understand the rise and fall of regional variations
2	Familiarize with the patterns of administration	CO2	Familiarize Indian history and culture
3	Analyze the traditional values and ethos of political development	CO3	Study the complexities involved in polity of the time
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER II

Course Code	A21 HS 2.1	Course Title	Political History of Karnataka
	Course Objectives		Course Outcomes
1	Understand the rise and fall of Political dynasties in Karnataka	CO1	Understand the rise and fall of regional variations
2	Familiarize with the patterns of administration	CO2	Familiarize Indian history and culture
3	Analyze the traditional values and ethos of political development	CO3	Study the complexities involved in polity of the time
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER II

Course Code	A21 HS 2.2	Course Title	Cultural Heritage of Karnataka
	Course Objectives		Course Outcomes
1	Understand the concept of cultural heritage of Karnataka	CO1	Analyze the factors responsible for formation of pluralistic society Understand the concept "Unity in diversity".
2	Study various cultural factors which influence the flow of culture	CO2	Understand the concept "Unity in diversity".
3	Familiarize the factors which influenced in influencing culture and society	CO3	Familiarize Indian history and culture
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER II

Course Code	A21 OE 2.4	Course Title	Women in India
	Course Objectives		Course Outcomes
1	To help students understand the role played by women through the ages	CO1	Understand the scope of women's studies
2	To sensitize students to women's issues	CO2	Apply the objectives and scope of women's studies
3	To spread awareness about the rights of women	CO3	Evaluate the impact of the women's movement in the society
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions

POLITICAL SCIENCE
SEMESTER I

Course Code	**A21 PS 1.1**	**Course Title**	**Basic Concepts in Political Science**
	Course Objectives		Course Outcomes
1	Enable the students to understand about the nature and philosophy of Political Science and its interface with society.	CO1	Incorporate Principles of Political Science, theoretically and will gain knowledge to explain and analyze politics at large.
2	Enable the students to develop qualities of responsible and active citizens in a democracy.	CO2	The dynamics of politics.
3	To understand the relevance of the core concepts in the context of modern governance.	CO3	To inculcate the democratic spirit.
		CO4	To discuss the basic questions and issues related with our social, political and economic life of the civil society.
		CO5	Demonstrate critical thinking, including the ability to form an argument, about key issues of public policy and politics.

SEMESTER – I

Course Code	A21 PS 1.2	Course Title	Political Theory
	Course Objectives		Course Outcomes
1	This course aims to introduce certain key aspects of conceptual analysis in political theory and the skills required to engage in debates surrounding the application of the concepts.	CO1	At the end of the course the students shall understand - The nature and relevance of Political Theory.
2	To understand major political theories and ideologies.	CO2	The different concepts like Liberty, Equality, Justice and Rights.
3	To understand the contemporary ideological debates.	CO3	To reflect upon some of the important debates in Political Theory.
		CO4	To evaluate the concepts like Secularism.
		CO5	To understand and analyse the current theories in the modern world.

SEMESTER I

Course Code	A21 OE 1.3	Course Title	Human Rights
	Course Objectives		Course Outcomes
1	This course aims to introduce the students to basic concepts and practices of Human Rights in the global and local domain.	CO1	After completing this course students will be able to- Define the basic concept of Human Rights and its various formulations.
2	This course also exposes them to certain recent issues confronting the Human Rights debates.	CO2	Have necessary knowledge and skills for analyzing, interpreting, and applying the Human Rights standards and sensitize them to the issues.
3	Educate students to recognize and interpret the nature of and need for human rights to respond to moral violations such as genocide, slavery and trafficking, torture, denial of liberty, and world poverty.	CO3	Develop ability to critically analyze Human Rights situations around them.
		CO4	Reflectively evaluate the effectiveness of human rights practice on local, national or international humanitarian efforts
		CO5	Critically examine the impact of diverse geographic, cultural and theoretical contexts on the social acceptance and practical application of human rights norms.

SEMESTER II

Course Code	A21 PS 2.1	Course Title	Western Political Thought
	Course Objectives		Course Outcomes
1	The Syllabus is designed to understand Political Philosophy, traditions that evolved in Europe from Ancient to the beginning of modern era.	CO1	At the end of the course the students shall understand – And get an introduction to the Schools of Political Thought and Theory making in the West.
2	To examine the contributions of the Greek, Medieval and early Modern thinker's Philosophical thought.	CO2	Introduce the richness and variations in the political perceptions of Western Thinkers.
3	To study the influence of the political thinkers in the present world.	CO3	Familiarize themselves to the Thought and Theory of Western Philosophy.
		CO4	Understand the relevance of concepts in present situation.
		CO5	Its enables those to analyse the Political thought.

SEMESTER II

Course Code	A21 PS 2.2	Course Title	Indian National Movement And Constitutional Development
	Course Objectives		Course Outcomes
1	To familiarize the students with the ideas of Nationalism and contemplate on how colonial rule was overthrown by the Indian Nationalists.	CO1	At the end of the course the students shall - Understand how the colonial rule was overthrown by the Indian nationalists.
2	To acquaint the students with the problems of Independent India.	CO2	Appreciate the ideals and values of Gandhi that resulted in freedom.
3	To enable the students to understand the role of India in World affairs and the contributions of great men towards freedom.	CO3	Examine the problem of Independent India and the role played by great leaders in solving them.
		CO4	Understand the structure and composition of Indian Constitution
		CO5	Understand and Evaluate the Indian Political scenario amidst the emerging challenges.

SEMESTER II

Course Code	A21 OE 2.3	Course Title	Indian Polity: Issues and Concerns
	Course Objectives		Course Outcomes
1	To make the students aware of different issues that exist in Indian polity.	CO1	At the end of the course the students shall - Understand the reasons behind the causes of these issues and also the constitutional provisions that existed.
2	Through this paper students need to understand the emerging issues and their causes to Indian Democracy.	CO2	Familiarize yourself with the debates that emerged.
3	To understand the nature and working of Indian Society.	CO3	Be able to suggest measures to control such issues.
		CO4	Analyze Society and Politics in India
		CO5	Understand and analyze about Regionalism- Reasons for the Growth, Forms and Measures

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		*B.A (History, Economics)*	
PROGRAM CODE		*IABOA05*	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	Develop student knowledge in understanding Socio-Cultural and Economic aspects of Human Society through the basic concepts, Principles and Methodologies used.	PO1	Understand Concepts, Models, and principles related to Socio-Cultural and Economic Aspects of Human Society.
PEO2	Enhance the ability to understand Theoretical Concepts related to History and Economics.	PO2	Apply their understanding of the various theoretical concepts related to History and Economics.
PEO3	Identify and provide exposure in various facets and issues related to Global, National and regional socio-cultural and economical aspects.	PO3	Apply techniques in solving issues and coordinate enterprising activities related to Global, National and regional socio-cultural and economical aspects.
PEO4	Equip students with understanding on the formulation of sound Research by disseminating Research Methodologies.	PO4	Use skills related to observation, analysis and interpretation for the formulation of sound Research.
PEO5	Create a database of knowledge with the skills to critically evaluate and synthesize their understanding for application in career pursuits related to History and Economics.	PO5	Interpret their subject knowledge with the ability to evaluate and synthesize their understanding for application in career pursuits related to History and Economics.
PEO 6 (a)	Bring forth Global Human Capital, Economic Problem Solvers and Employable sensitized productive Young Minds.	PO 6 (a)	Execute sound decisions related to Economics and its subsidiary disciplines.
PEO 6 (b)	Create a sense of objectivity in bringing forth a sound historiography by young minds that have been sensitized towards issues and various facets of Heritage and Cultural Studies.	PO 6 (b)	Objectively interpret and bring forth sound Historiography, while being sensitive towards the issues of Heritage and Cultural Studies.

HISTORY

SYLLABUS

SEMESTER I

Course Code	**A21 HS 1.1**	**Course Title**	**Political History of Karnataka**
	Course Objectives		Course Outcomes
1	Understand the continuity of Political developments and strategies	CO1	Analysis the importance of causes for the rise of regional political dynasties
2	Understand contextual necessities which influenced the era of political supremacy	CO2	Familiarize Indian history and culture
3	Appreciate the confluence of diverse political elements	CO3	Understand contextual necessities which influenced the era of political supremacy.
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER I

Course Code	A21 HS 1.2	Course Title	Cultural Heritage of India
	Course Objectives		Course Outcomes
1	Provide an insight about the cultural development of Karnataka	CO1	Analyze the factors responsible for origin and decline of dynasties
2	Familiarize Karnataka history and culture	CO2	Familiarize Indian history and culture
3	Expertize to analyze further development of culture of Karnataka	CO3	Provide the opportunity to understand the process of cultural diversities
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER I

Course Code	A21 OE 1.4	Course Title	Appreciating Art History of India
	Course Objectives		Course Outcomes
1	The paper provides an overview of the art in the Indian Subcontinent right from ancient to contemporary times	CO1	Distinguish between the different Schools of Art in Ancient India and specify the technique used for making sculptures, paintings and structural art.
2	It includes various aspects of art such as sculpture, architecture and paintings	CO2	recognize the various architectural forms (temples, mosques, forts and colonial buildings) which are part of the cultural heritage of India
3	To help students to gain a comprehensible insight into the most fascinating areas of Indian art and learn to appreciate the various art forms.	CO3	set apart the important traditions of paintings in India and outline the various art forms
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions

SEMESTER–II

Course Code	A21 HS 2.1	Course Title	Political History of Karnataka
	Course Objectives		Course Outcomes
1	Understand the rise and fall of Political dynasties in Karnataka	CO1	Understand the rise and fall of regional variations
2	Familiarize with the patterns of administration	CO2	Familiarize Indian history and culture
3	Analyze the traditional values and ethos of political development	CO3	Study the complexities involved in polity of the time
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER II

Course Code	A21 HS 2.2	Course Title	Cultural Heritage of Karnataka
	Course Objectives		Course Outcomes
1	Understand the concept of cultural heritage of Karnataka	CO1	Analyze the factors responsible for formation of pluralistic society Understand the concept "Unity in diversity".
2	Study various cultural factors which influence the flow of culture	CO2	Understand the concept "Unity in diversity".
3	Familiarize the factors which influenced in influencing culture and society	CO3	Familiarize Indian history and culture
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions performing arts, fairs and festivals

SEMESTER II

Course Code	A21 OE 2.4	Course Title	Women in India
	Course Objectives		Course Outcomes
1	To help students understand the role played by women through the ages	CO1	Understand the scope of women's studies
2	To sensitize students to women's issues	CO2	Apply the objectives and scope of women's studies
3	To spread awareness about the rights of women	CO3	Evaluate the impact of the women's movement in the society
		CO4	This course enables students to explore various aspects of cultural heritage and cultural diversity in historical perspective that discusses numerous cultural practices that have evolved over centuries. They will acquire knowledge of changing socio-cultural scenarios of India
		CO5	As well as they can gather knowledge about the cultural heritage, cultural forms and cultural expressions

ECONOMICS SYLLABUS

SEMESTER I

Course Code	A21 EC 1.1	Course Title	Basic Economics
	Course Objectives		Course Outcomes
1	The objective of the subject is to study basic economic problems as economist.	CO1	Develop the skill to Identify the facets of an economic problem.
2	To learn the market operations.	CO2	Enable the students to learn basic economic concepts and terms.
3	To improve clarity on concepts like production an consumption function.	CO3	Understand the operation of a market system.
		CO4	Analyse the production and cost relationships of a business firm
		CO5	Evaluate the pricing decisions under different market structures.

SEMESTER I

Course Code	A21 EC 1.2	Course Title	Contemporary Indian Economy
	Course Objectives		Course Outcomes
1	The objective of the subject is to study the current problems of economy	CO1	Understand the current problems of Indian Economy
2	To learn factors and policies responsible for growth in Indian Economy.	CO2	Identify the factors contributing to the recent growth of the Indian economy
3	To improve clarity on concepts like LPG and other foreign policies.	CO3	Evaluate impact of LPG policies on economic growth in India
		CO4	Analyze the sector specific policies adopted for achieving the aspirational goals
		CO5	Review various economic policies adopted

SEMESTER I

Course Code	A21 OE 1.1	Course Title	Pre -Reforms Indian Economy
	Course Objectives		Course Outcomes
1	To provide an understanding evolution of Indian Economy.	CO1	Trace the evolution of Indian Economy
2	To impart the knowledge on features of Indian Economy.	CO2	Identify the structural features and constraints of the Indian economy
3	To study the policies and plans responsible for growth and development of nation.	CO3	Evaluate planning models and strategy adopted in India
		CO4	Analyze the sector specific problems and contributions towards overall economic growth
		CO5	Review various economic policies adopted

SEMESTER II

Course Code	A21 EC 2.1	Course Title	Basic Economics – II
	Course Objectives		Course Outcomes
1	To provide an understanding of macro-economic system.	CO1	To Understand the operation of the overall economic system
2	To impart the knowledge on calculation of national Income.	CO2	To Calculate national income and related aggregates
3	To study the business cycle and macro-economic factors.	CO3	To Explain the relationship between macroeconomic aggregates
		CO4	To Analyse the nature of business cycles and policies towards controlling them
		CO5	To Evaluate the macroeconomic policies for solving major problems like poverty and unemployment

SEMESTER II

Course Code	A21 EC 2.2	Course Title	Karnataka Economy
	Course Objectives		Course Outcomes
1	To provide an understanding of Karnataka economic system.	CO1	To Understand the nature of economic growth and problems of Karnataka state.
2	To impart the knowledge on structural growth in Karnataka.	CO2	To Explain the process of structural growth in Karnataka economy
3	To study the policies and programs undertaken in Karnataka..	CO3	To Evaluate the policies and programmes undertaken by the Govt. of Karnataka for bringing about socioeconomic development
		CO4	To Analyse the nature of economic system in Karnataka Economy
		CO5	To Evaluate the growth in Karnataka Economy.

SEMESTER II

Course Code	A21 OE 2.1	Course Title	Contemporary Indian Economy
	Course Objectives		Course Outcomes
1	The objective of the subject is to study the current problems of economy	CO1	Understand the current problems of Indian Economy
2	To learn factors and policies responsible for growth in Indian Economy.	CO2	Identify the factors contributing to the recent growth of the Indian economy
3	To improve clarity on concepts like LPG and other foreign policies.	CO3	Evaluate impact of LPG policies on economic growth in India
		CO4	Analyze the sector specific policies adopted for achieving the aspirational goals
		CO5	Review various economic policies adopted

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		B.A.(Journalism,English)	
PROGRAM CODE		IABOA07	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To understand the basic concepts and perspectives of Journalism and English.	PO1	Understand and Identify the concepts of English and Journalism.
PEO2	To equip the learners with different aspects and theory related to Journalism and English.	PO2	Demonstrate the various aspects and theoretical framework in the study of English and Journalism.
PEO3	To familiarize students with different facets of the course related to Arts and prepare them for higher learning.	PO3	Establish familiarity on facets of the course and develop learning abilities in the field of English Literature and journalistic study.
PEO4	To acquaint learners with professional skills, ethical values and an exposure to the multidisciplinary research approach.	PO4	Learners will be proficient in applying the skills acquired through the multidisciplinary research in the field of Journalism and English Literature.
PEO5	Enable the learners to equip the analytical and social skills to enhance the learning abilities to meet the demands of the conventional and new career opportunities.	PO5	Analyze the process of receiving, modifying, fostering independence and working effectively in groups at personal and professional level.
		PO 6 (a)	Exhibit the ability to read, process, think critically and independently with an inclusive outlook and reflect being a responsible citizen by inculcating ethical thinking and a sense of social commitment.

JOURNALISM SYLLABUS

SEMESTER I

Course Code	**A21 JR 1.1**	**Course Title**	**Introduction to Journalism**
	Course Objectives		Course Outcomes
1	To introduce the concept of media and mass communication in general and journalism in particular	CO1	To identify the distinct nature of journalism and its professional aspects, including career opportunities.
2	To familiarize the students with different facets of journalism	CO2	To recognize and use terms specific to media.
3	To educate about the role of journalism in society and development	CO3	To recognize the significance of changes in the practice of journalism.
		CO4	To introduce the students with different dimensions of studying Journalism as a special discipline.
		CO5	To convey to the students how studying Journalism would lead them to the career path.

SEMESTER I

Course Code	A21 OE 1.2	Course Title	Writing For Media
	Course Objectives		Course Outcomes
1	To make them familiar with writing for media and develop interest in writing	CO1	After studying this course paper, the students are expected to utilise their writing skills as per the requirements of various media patterns.
2	Introduce the students to cultivating of sources.	CO2	The Programme can make the students familiar with writing for media and develop interest in writing
3	Equip the students with new trends in media writing.	CO3	To introduce the students cultivation of sources.
		CO4	The Programme will enhance the reading habits of the students and thereby improving their writing skills.
		CO5	The course would lead the students in contributing their writings to the media to become budding writers

SEMESTER–II

Course Code	A21 JR 2.1	Course Title	Computer Applications For Media
	Course Objectives		Course Outcomes
1	To introduce students to the basics of computers	CO1	The Programme act as a bridge between the media skills and computer skills which are essential for the profession of journalism.
2	To familiarize the students to the applications of computers in print and electronic journalism	CO2	The Programme would enhance the computer skills of the Journalism students which would help to seek jobs in the media.
3	To facilitate the students to learn the practical applications of computers at different levels in media	CO3	This Course is able to provide fundamental knowledge of computer applications with related to internet.
		CO4	After the course, the students would develop the computer skills is a pre requisite would be journalists, without which the present day media houses cannot function.
		CO5	The Programme for sure would enlighten the students about the significance of internet skills and digital media, especially the social media.

SEMESTER II

Course Code	A21 OE 2.1	Course Title	Photojournalism
	Course Objectives		Course Outcomes
1	To attract students towards photo journalism	CO1	The Programme delineates different dimensions of photography and its remarkable role in the Journalism including mobile journalism
2	To familiarize the students to techniques of photography and photo journalism	CO2	The programme provides knowledge about amalgamating both photography and journalism
3	To give a practical knowledge in the field of photography	CO3	The course disseminates valuable information on how to adopt photos to increase the readability in newspapers, electronic media and digital media
		CO4	By the end of the course the students should be able to categorise photography as a tool of enhancing the effect of mass media in relation to various modes.
		CO5	The Programme discusses about photography as a source for presenting news and views in a colourful manner

ENGLISH SYLLABUS

SEMESTER I

Course Code	A21 EN 1.1	Course Title	Introduction to Literature
	Course Objectives		Course Outcomes
1	Correctly define commonly used literary terms and concepts and use those terms and concepts to discuss and analyze works of literature.	CO1	Students are able to recognise the literary terms and analyse
2	Identify structural elements of works of poetry, fiction, and drama, and analyze how those elements help create specific meanings and effects	CO2	Students learn the elements of poetry, prose ,drama & fiction.
3	Compare works of literature in terms of theme, structure, and use of literary devices.	CO3	They are familiar with the theme and structure.
		CO4	Students would have learnt the facts of language and literature
		CO5	Students would have learnt to identify the works and analyse

SEMESTER I

Course Code	A21 EN 1.2	Course Title	Indian Writing in English Part I
	Course Objectives		Course Outcomes
1	Know the Introduction ,Understand, and critically analyze Indian Writing in English.	CO1	Students are able to speak about Indian Writing in English.
2	Identify the historical trajectories of various genres of Indian Writing in English	CO2	Students learn the historical aspects of various genres of Indian Writing in English
3	Critically engage with Indian Writing in English from various historical and social positions	CO3	They are aware of historical and social aspects in literature
		CO4	They learn the facts of Indianess.- language and literature
		CO5	Students would have learnt some works of Indian Authors.

SEMESTER II

Course Code	A21 EN 2.1	Course Title	Introduction to Phonetics and Linguistic
	Course Objectives		Course Outcomes
1	Identify and understand the basic concepts of language, linguistics and phonetics.	CO1	Students are able to understand and use the words in the required format.
2	Comprehend and be able to use the various structures and parts of a language	CO2	Students learn the elements of Language and its application in various works.
3	Understand and put into practice the various functions of language.	CO3	Students are familiar with the neutral accent and improve their general standard of pronunciation
		CO4	Students would have learnt the facts of language and literature
		CO5	Students would have learnt to Speak globally accepted English

SEMESTER II

Course Code	A21 EN 2.2	Course Title	Indian Writing in English – Part II
	Course Objectives		Course Outcomes
1	Identify the evolution in Indian writing in English.	CO1	Students are able to learn and understand the evolution of Indian Writing in English
2	Understand, speak and write about the writers and writings of the post-independence period in India	CO2	Students learn writers and writings of the post-independence period in India
3	Describe and differentiate the varieties of prose of major Indian writers	CO3	Students are familiar with the varieties of prose of major Indian writers
		CO4	Students would have learnt various forms of literature
		CO5	Students would have learnt to the figurative language used in the works by the Indian Writers

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME	B.A.(Journalism,Psychology)
PROGRAM CODE	IABOA08

Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	Understand the basic concepts and perspectives of Journalism and Psychology.	PO1	Identify the distinct nature of Journalism and Psychology
PEO2	Understand the basic aspects and theoretical framework of mass media and human behaviour.	PO2	Recognize the fundamental elements and theoretical underpinnings of Journalism and Psychology.
PEO3	Familiarize students with different facets of the course in particular.	PO3	Develop transferable skills and a deeper comprehension in the fields of social sciences.
PEO4	Establish moral standards and human values while exposing students to research methodologies.	PO4	Make a thorough evaluation and attempt to balance theoretical and research abilities.
PEO5	Inculcate the social skills necessary to handle the competencies in the challenging environment.	PO5A	Analyze the process of receiving, modifying, fostering independence and working effectively in groups at personal and professional level.
		PO5B	Evaluate the effective ways for enhancing interpersonal connections, managing stress and emotions efficiently, and improving language skills.

PSYCHOLOGY SYLLABUS

SEMESTER I

Course Code	**A21 PY 1.1**	**Course Title**	**FOUNDATIONS OF PSYCHOLOGY**
	Course Objectives		Course Outcomes
1	To understand the growing discipline of psychology	CO1	Students will understand the genesis of Psychology and its importance
2	To develop a knowledge base of human behaviour across the broad areas of psychology	CO2	Students will gain basic knowledge about Psychology
3	Awareness of the different fields of psychology and practical application of the principles of psychology in everyday life	CO3	Students understand the Applications of Psychology in various fields
4	To ingrain the concept of learning, remembering, behaving and to assess the cognitive abilities and motives	CO4	Students will understand the fundamental mental processes which are base for behaviour

SEMESTER I

Course Code	**A21OE 1.4**	**Course Title**	**PSYCHOLOGY OF HEALTH AND WELLBEING**
	Course Objectives		Course Outcomes
1	To promote healthier lifestyles and encourage the students to be more active	CO1	Understanding the spectrum of health and illness for better health management
2	Recognize the stressors and signs of stress	CO2	Identifying stresses in one's life and how to manage them
3	Ability to promote and maintain the physical and mental health	CO3	Understanding a variety of health announcing, health protective and health compromising behaviors and to be able to know their application in illness management

SEMESTER II

Course Code	**A21 PY 2.1**	**Course Title**	**FOUNDATIONS OF BEHAVIOUR**
	Course Objectives		Course Outcomes
1	To understand the dynamics of emotions and motivation.	CO1	Evaluate and understand the different human emotions
2	To understand theoretical concepts of Human Intelligence.	CO2	Critically evaluate and identify determinants of motivation
3	To analyze and relate the concepts of thinking, problem solving, reasoning and decision making to cognition	CO3	Compare and contrast different theories of intelligence
	To understand and classify the different types of Personality.	CO4	Differentiate the human personalities

SEMESTER–II

Course Code	A21OE2.5	Course Title	Psychology at Workplace
	Course Objectives		Course Outcomes
1	To understand the need for Psychology at workplace.	CO1	Identify stress of self and others at the workplace, and outline core competencies of emotional distress at the workplace.
2	To practice methods and to maintain positive Mental Health at workplace.	CO2	Better understanding of interpersonal relationships and the ability to cope with others.
3	To inculcate the effective types and need for counselling and counsellor at workplace.	CO3	Integrate and understand the essential need for employee counselling.
		CO4	Analyse work attitudes while critically evaluating perceptual biases and the factors that influence them.
		CO5	Comprehend the intricacies and imperativeness of job requirements, placements and modes of rewards in Industry.

JOURNALISM SYLLABUS

SEMESTER I

Course Code	**A21 JR 1.1**	**Course Title**	**Introduction to Journalism**
	Course Objectives		Course Outcomes
1	To introduce the concept of media and mass communication in general and journalism in particular	CO1	To identify the distinct nature of journalism and its professional aspects, including career opportunities.
2	To familiarize the students with different facets of journalism	CO2	To recognize and use terms specific to media.
3	To educate about the role of journalism in society and development	CO3	To recognize the significance of changes in the practice of journalism.
		CO4	To introduce the students with different dimensions of studying Journalism as a special discipline.
		CO5	To convey to the students how studying Journalism would lead them to the career path.

SEMESTER I

Course Code	A21 OE 1.2	Course Title	Writing For Media
	Course Objectives		Course Outcomes
1	To make them familiar with writing for media and develop interest in writing	CO1	After studying this course paper, the students are expected to utilise their writing skills as per the requirements of various media patterns.
2	Introduce the students to cultivating of sources.	CO2	The Programme can make the students familiar with writing for media and develop interest in writing
3	Equip the students with new trends in media writing.	CO3	To introduce the students cultivation of sources.
		CO4	The Programme will enhance the reading habits of the students and thereby improving their writing skills.
		CO5	The course would lead the students in contributing their writings to the media to become budding writers

SEMESTER II

Course Code	**A21JRN 2.1**	**Course Title**	**Computer Applications For Media**
	Course Objectives		Course Outcomes
1	To introduce students to the basics of computers	CO1	The Programme act as a bridge between the media skills and computer skills which are essential for the profession of journalism.
2	To familiarize the students to the applications of computers in print and electronic journalism	CO2	The Programme would enhance the computer skills of the Journalism students which would help to seek jobs in the media.
3	To facilitate the students to learn the practical applications of computers at different levels in media	CO3	This Course is able to provide fundamental knowledge of computer applications with related to internet.
		CO4	After the course, the students would develop the computer skills is a pre requisite would be journalists, without which the present day media houses cannot function.
		CO5	The Programme for sure would enlighten the students about the significance of internet skills and digital media, especially the social media.

SEMESTER II

Course Code	**A21OE2.2**	**Course Title**	**Photojournalism**
	Course Objectives		Course Outcomes
1	To attract students towards photo journalism	CO1	The Programme delineates different dimensions of photography and its remarkable role in the Journalism including mobile journalism
2	To familiarize the students to techniques of photography and photo journalism	CO2	The programme provides knowledge about amalgamating both photography and journalism
3	To give a practical knowledge in the field of photography	CO3	The course disseminates valuable information on how to adopt photos to increase the readability in newspapers, electronic media and digital media
		CO4	By the end of the course the students should be able to categorise photography as a tool of enhancing the effect of mass media in relation to various modes.
		CO5	The Programme discusses about photography as a source for presenting news and views in a colourful manner

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		**B.Sc (Biochemistry)**	
PROGRAM CODE		**IABOS07/IAB0S10**	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To provide students a comprehensive knowledge base in biochemistry that help instill deep interest in learning biochemistry, through analytical and application based courses.	PO1	Get exposed to advanced theoretical and practical concepts of Biochemistry
PEO2	To equip students with appropriate theoretical and practical skill sets to tackle issues and problems in the field of biochemistry.	PO2	Develop insight on the modern tools of biochemical research for real life problem solving
PEO3	To inculcate in students the critical analysis, questioning and reasoning skills and train them for a future career in higher studies and research.	PO3	Get familiarized with the advanced multidisciplinary allied areas of development in Biochemistry
PEO4	To encourage students build their potential for inter-disciplinary research, so that they can serve the society better.	PO4	Develop the requisite skills for enabling them to express and present their persuasive scientific ideas in bigger scientific platforms
PEO5	To produce students with leadership and professional integrity skills, thus enabling them to work in multidisciplinary and diverse professional platforms.	PO5	Demonstrate professional attitude and ethical responsibility to serve the society.

SEMESTER I

Course Code	**S21 BC1.1**	Course Title	**Chemical Foundation of Biochemistry – 1**
	Course Objectives		Course Outcomes
1	To understand chemical basis of bioprocesses, organization of organisms, fundamental properties of elements and units of measurements.	CO1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
2	To revisit the fundamentals concepts of chemical bonds, electronic configuration, concepts of acids/ bases/ buffers and their importance in biological systems.	CO2	To understand the concepts of mole, mole fraction, morality and to apply them in biochemical research.
3	To familiarize with thermodynamic concepts as applicable to biological processes.	CO3	To know the significance of chemical bonding, electronic configuration and theories of bond formation
		CO4	To understand the concepts of acids, bases, indicators, buffers and realize the importance of water as a universal solvent.
		CO5	To recognize the fundamentals of electrochemistry and the thermodynamic basis of biochemical reactions.

SEMESTER I

Course Code	**S21 BC1.2**	Course Title	**Volumetric Analysis – Practical I**
	Course Objectives		Course Outcomes
1	Familiarize students with the principles of analytical chemistry and basic analytical techniques such as volumetric analysis.	CO1	Understanding Good laboratory practices in a chemistry/biochemistry laboratory
2	Provide experimental practice of quantitative volumetric analysis.	CO2	Learn safety and precautionary measures for working in a laboratory.
3	Enable students to prepare standard solutions and perform chemical analysis.	CO3	Develop skill and proficiency in preparation of laboratory reagents
		CO4	Use of handling of glass wares, minor equipment for conducting experiments
		CO5	Develop skills to prepare standard chemical solutions and secondary standards

SEMESTER I

Course Code	S21 OE 1.1	Course Title	Biochemistry in Health and Disease
	Course Objectives		Course Outcomes
1	To provide knowledge about health and various terminologies used in health and disease conditions	CO1	To categorize terminologies related to health and world patterns of disease
2	To promote information about communicable & non-communicable diseases and their diagnosis, treatments and prevention	CO2	To outline the indications and diagnostic used in the identification and management of disease.
3	To analyze concepts of mental health and hygiene and requisite guidance and counseling	CO3	To relate health and disease conditions with their treatment as well as prevention methods
		CO4	To appreciate the concepts of mental health and hygiene, their basis and possible remedies
		CO5	To appraise health promotion in infections and available defences against them

SEMESTER II

Course Code	**S21 BC 2.1**	Course Title	**Chemical Foundation of Biochemistry – 2**
	Course Objectives		Course Outcomes
1	To understand reaction kinetics, concepts of colloids and their biological applications.	CO1	To understand the principles of chemical kinetics and their interpretation for biological systems
2	To revisit concepts of organic chemistry and learn the role of stereochemistry in biological systems.	CO2	To comprehend about types of colloids, their properties, examples and biological applications
3	To familiarize with types of organometallic compounds and their biological effects.	CO3	To analyze the concepts of stereochemistry of organic compounds and their importance in biomolecules
		CO4	To appreciate the roles of metals, non-metals, transition metals and organometallic compounds in biological systems.
		CO5	To study the properties of inorganic molecules and coordination coumpounds and understand the toxic effects of heavy metals.

SEMESTER II

Course Code	**S21 BC 2.2**	Course Title	**Qualitative and Quantitative Analysis – Practical 2**
	Course Objectives		Course Outcomes
1	Provide experimental practice of quantitative and qualitative inorganic analysis	CO1	Perform competently qualitative analysis of inorganic salt mixtures
2	Train students in basic physical chemistry laboratory techniques	CO2	Determine physical properties of liquids such as density, viscosity and surface tension
3	Develop skills in handling instruments and understand its application in research work.	CO3	Separate components from mixtures of organic compounds and determine distribution coefficients.
		CO4	Estimate concentration of a biomolecule by using colorimeter and then principles of Beer's Law
		CO5	Calibrate pH meter and determine pH of common daily life substances.

SEMESTER II

Course Code	**S21 OE 2.1**	Course Title	**Nutrition and Dietetics**
	Course Objectives		Course Outcomes
1	To introduce the students to the fundamentals of Nutrition, food and health and to familiarize them with importance of nutrition during various stages of life	CO1	The gain knowledge about energy requirements, energy content of foods and Recommended Dietary Allowances.
2	To understand the functions and role of macronutrients, their requirements and the effect of deficiency and excess.	CO2	To understand the functions and role of micro and macronutrients, their requirements and the effect of deficiency and excess.
3	To impart knowledge regarding nutritional disorders ranging from nutritional deficiencies to life style disorders and the importance of functional foods	CO3	To analyze the impact of various functional foods on our health.
		CO4	To apply basic nutrition knowledge in making food choices and obtaining an adequate diet.
		CO5	To gain competence in connecting the role of various nutrients in maintaining health and learn to enhance traditional recipes.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		**B.Sc (Biotechnology)**	
PROGRAM CODE		**IABOS07/IAB0S08**	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To make our students competent in the field of biotechnology and its allied areas.	PO1	Understanding concepts of Biotechnology and demonstrate interdisciplinary skills acquired in cell biology, genetics, biochemistry, microbiology, and molecular biology.
PEO2	To inculcate the capability to work as entrepreneurs and techno managers with strong ethics and communication skills.	PO2	Demonstrating the Laboratory skills in cell biology, basic and applied microbiology with emphasis on technological aspects.
PEO3	To equip the students to pursue higher education and research in reputed institutes at national and international level.	PO3	Competent to apply the knowledge and skills gained in the fields of Plant biotechnology, animal biotechnology and microbial technology in pharma, food, agriculture, beverages, herbal and nutraceutical industries.
PEO4	To develop a working knowledge of biotechnology product and processes.	PO4	Critically analyse the environmental issues and apply the biotechnology knowledge gained for conserving the environment and resolving the problems.
PEO5	To enable critical thinking and full-fledged grasp of essential aspects of bioethics inculcating a Value System among Students.	PO5	Demonstrate comprehensive innovations and skills in the fields of biomolecules, cell and organelles, molecular biology, bioprocess engineering and genetic engineering of plants, microbes, and animals with respect to applications for human welfare.

SEMESTER I

Course Code	S21 BT1.1	Course Title	Cell Biology and Genetics
	Course Objectives		Course Outcomes
1	To impart basic knowledge and understanding of cell, cell organelles, and their overall functioning.	CO1	Understand and appreciate the diversity of life as it evolved over time by processes of mutation, selection and genetic change.
2	To provide with strong fundamental understanding of biological existence, genetics of the cell with suitable foundation and appreciation of understanding of the cell.	CO2	Would be able to comprehend the structure of a cell with its organelles.
3	To educate the students with the concepts, principles and applications involved in the advancement of cell biology studies in line with the present development.	CO3	Can distinguish between the structure of prokaryotic and eukaryotic cell.
		CO4	Can explain the organization of genes and chromosomes, chromosome morphology and its aberrations
		CO5	Illustrate that fundamental structural units define the function of all living things.

Course Code	S21 BT1.2	Course Title	Cell Biology and Genetics – Practical
	Course Objectives		Course Outcomes
1	To impart basic knowledge and understanding of cell, cell organelles, and their overall functioning.	CO1	Understand and appreciate the diversity of life as it evolved over time by processes of mutation, selection and genetic change.
2	To provide with strong fundamental understanding of biological existence, genetics of the cell with suitable foundation and appreciation of understanding of the cell.	CO2	Would be able to comprehend the structure of a cell with its organelles.
3	To educate the students with the concepts, principles and applications involved in the advancement of cell biology studies in line with the present development.	CO3	Can distinguish between the structure of prokaryotic and eukaryotic cell.
		CO4	Can explain the organization of genes and chromosomes, chromosome morphology and its aberrations
		CO5	Illustrate that fundamental structural units define the function of all living things.

Course Code	**S21 OE 1.1**	Course Title	**Biotechnology for Human Welfare**
	Course Objectives		Course Outcomes
1	To impart basic knowledge and understanding of industrial biotechnology and imparting resource information.	CO1	The student will obtain a basic understanding about the resources and techniques involved in industrial biotechnology.
2	To educate and familiarise with the applications in environmental biotechnology.	CO2	To students will gain basic knowledge about the protection and caring the environment with the shared information.
3	To impart deeper understanding in forensic biotechnology and prepare for the expert qualities.	CO3	Students will be able to understand the beneficial and harmful effects of the compounds are being used in environment.
		CO4	The students will be familiar with the process and techniques involved in the forensic biotechnology.
		CO5	The student will develop an understanding about the various applications of forensic biotechnology and learn to perform, analyze and interpret the results.

Course Code	**S21 BT 2.1**	Course Title	**Microbiological Methods – Theory**
	Course Objectives		Course Outcomes
1	To impart basic knowledge and understanding modern microbiology and the technologies involved in it.	CO1	The student will obtain a basic understanding about the technologies involved in modern microbiology.
2	To assist with hands on laboratory experience in fundamental techniques like culturing and maintaining the microorganisms related to biotechnology.	CO2	To students will gain basic knowledge about the fundamental techniques involved in culture and maintenance of microorganisms pertaining to biotechnology.
3	To familiarise and educate the students with the antimicrobial strategies, modalities in applying for research area.	CO3	Students will be able understand the lifecycle of microbial growth and the parameters that can influence it.
		CO4	The students will be familiar with the antimicrobial strategies associated in maintenance of sterility.
		CO5	The student will develop an understanding about the various antimicrobial modalities available in natural and pharmaceutical domain and their applications in present day research arena.

Course Code	**S21 BT 2.2**	Course Title	**Microbiological Methods – Practical**
	Course Objectives		Course Outcomes
1	To impart basic knowledge and understanding modern microbiology and the technologies involved in it.	CO1	The student will obtain a basic understanding about the technologies involved in modern microbiology.
2	To assist with hands on laboratory experience in fundamental techniques like culturing and maintaining the microorganisms related to biotechnology.	CO2	To students will gain basic knowledge about the fundamental techniques involved in culture and maintenance of microorganisms pertaining to biotechnology.
3	To familiarise and educate the students with the antimicrobial strategies, modalities in applying for research area.	CO3	Students will be able understand the lifecycle of microbial growth and the parameters that can influence it.
		CO4	The students will be familiar with the antimicrobial strategies associated in maintenance of sterility.
		CO5	The student will develop an understanding about the various antimicrobial modalities available in natural and pharmaceutical domain and their applications in present day research arena.

Course Code	**S21 OE 2.1**	Course Title	**Applications of Biotechnology in Agriculture**
	Course Objectives		Course Outcomes
1	To impart basic knowledge and understanding of scope and concepts in Agriculture Biotechnology.	CO1	The student will gain a basic understanding about the concepts, importance and learn different fields of Biotechnology under Agriculture Biotechnology.
2	To detail and weigh the pros and cons of the case studies/practical topics/issues handled in the field of Agriculture Biotechnology.	CO2	The students will attain ability to study case given and judge the technicalities, detailed information about the case study offered as a successful graduate.
3	To make clear understanding about the Bt based products usage and update technologically.	CO3	Students will be able to understand the applications of technologies developed to support several industries in the Agriculture Biotechnology field.
		CO4	The students will get updated information on the developed Bt based products and judge the advantage of the innovative ways in overcoming the practical hurdles involved in technology.
		CO5	This helps students in updating the latest technology developed with their detailed approach in the safety concerns to the developer and end user.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		B.Sc (Chemistry)	
PROGRAM CODE		IABOS08/IAB0S09	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	Students will be well prepared for successful careers in the profession of an industry and/or in government in one or more disciplines of chemistry.	PO1	Create enthusiasm among students for chemistry and its application in various fields of life.
PEO2	Students will be academically prepared to become licensed professional chemists in due course and will contribute effectively in serving the society.	PO2	Provide students with broad and balanced knowledge and understanding of key concepts in chemistry.
PEO3	Students will be engaged in professional activities to enhance their own achievement and simultaneously contribute in service of humankind.	PO3	Develop in students a range of practical skills so that they can understand and assess risks and work safely measures to be followed in the laboratory.
PEO4	Students will be successful in higher education in Chemistry	PO4	Develop in students the ability to apply standard methodology to the solution of problems in chemistry.
PEO5	Students will provide leadership quality to work in all kinds of circumstances, diverse environments such as interdisciplinary and multidisciplinary learning systems.	PO5	Provide students with knowledge and skill towards employment or higher education in chemistry or multi-disciplinary areas.

Course Code	S21 CH 1.1	Course Title	Analytical and Organic Chemistry-I
	Course Objectives		Course Outcomes
1	The main objective is to provide to the students an in depth understanding of the basic concepts of chemical sciences.	CO1	Learn the concepts of chemical analysis, accuracy, precision and statistical data treatment
2	To enable them with tools needed for the practice of chemistry, which remains a discipline with much stress on experimentation.	CO2	Prepare the solutions after calculating the required quantity of salts in preparing the reagents/solutions and dilution of stock solution.
3	To provide a detailed knowledge of the terms, concepts, methods, principles and experimental techniques of chemistry.	CO3	Know the concept of volumetric and gravimetric analysis and deducing the conversion factor for determination
		CO4	Handle toxic chemicals, concentrated acids and organic solvents and practice safety procedures.
		CO5	Understand the concepts of Organic reactions and techniques of writing the movement of electrons, bond breaking, bond forming

SEMESTER I

Course Code	S21 CH 1.2	Course Title	Analytical and Organic Practicals-I
	Course Objectives		Course Outcomes
1	To understand the uses of analytical methods in chemistry.	CO1	Aware of methods of calibration of various glasswares.
2	To establish an appreciation of the role of chemistry in qualitative and quantitative analysis.	CO2	They will know the importance of purification of different chemicals
3	To introduce different experiments to develop the skills and strategic approaches for organic synthesis and its purifications.	CO3	Apply the organic synthetic strategies in multi-step synthesis
		CO4	Prepare organic compounds in an environmental friendly way
		CO5	Learn the qualitative and quantitative analysis of different chemicals

Course Code	S21 CH 2.1	Course Title	Inorganic and Physical Chemistry-I
	Course Objectives		Course Outcomes
1	To understand the structure of the atom, shapes of different orbital's and properties of periodic table	CO1	Students will learn the structure of an atom, electronic configuration. Schrodinger wave equation, Heisenberg's uncertainity principle, quantum numbers.
2	To develop the ability to correlate the chemical and physical properties of elements and their compounds in the periodic table	CO2	Students will understand periodic properties of elements and their compounds.
3	An overview of close packing of metallic crystals, unit cell and crystal lattice, determination of surface tension, viscosity and refractive index of liquids. Colligative properties	CO3	Students should be able to determine the difference between solids, liquids and gases.
		CO4	Students will be able to understand gas laws, theories and its application.
		CO5	Students will learn the physical properties of liquids and Colligative properties

Course Code	S21 CH 2.2	Course Title	Inorganic and Physical Practicals
	Course Objectives		Course Outcomes
1	To educate the methods of preparation of solutions different concentrations.	CO1	Students will be confident in preparing various concentration of different solution.
2	To measure different physical parameter like viscosity, surface tension.	CO2	They will get expertise in analysis of real time samples.
3	To confidently make use of different apparatus in the laboratory	CO3	Students will understands acid- base, redox and precipitation reactions
		CO4	Students will be able to determine the molecular weight of unknown compounds by using walker –Lumsden and cryoscopic methods.
		CO5	Students will be aware of determining physical constants of different chemicals.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		B.Sc (Computer Science)	
PROGRAM CODE		IABOS12/IAB0S013/IABOS14	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To instill a strong foundation of fundamental concepts in Mathematics and Computer science and demonstrate an independent thinking ability and knowledge to apply in various domains	PO1	**Scientific knowledge:** Apply the knowledge of mathematics and Computer Science to solve problems in various fields of science both in industry and research
PEO2	To impart knowledge on analyzing complex scientific problems and develop solutions using the principles of mathematics and Computer Science	PO2	**Problem analysis:** Identify, formulate and analyze complex scientific problems and develop substantiated solutions using the principles of Mathematics and Computer Science
PEO3	To develop robust communication skills as well as social, ethical and professional values and collaborate effectively with team members belonging to various domains	PO3	**Ethics, Individual and team work:** Acquire strong oral and written communication skills and function effectively as an individual, and as a member or leader in diverse teams in multidisciplinary scenarios by maintaining professional ethics, responsibilities and norms of scientific practice
PEO4	To inculcate strong interest in research and focus on solving problems with the methods imbibed from various disciplines of study	PO4	**Research interest:** Apply the techniques embraced from various disciplines and develop solutions to the research problems which would benefit mankind
PEO5	To develop entrepreneurs and Computer Science professionals by inculcating the practice of life-long learning for continuous personal enrichment and professional development	PO5	**Life-long learning:** Become competent to engage in independent and life-long learning and become successful entrepreneurs or Computer Science professionals

SEMESTER I

Course Code	S21 CS 1.1	Course Title	Problem Solving Techniques Using C
	Course Objectives		Course Outcomes
1	To inculcate necessary skills to design algorithms and flowcharts for developing applications in order to solve real world problems	CO1	Gain ability to devise algorithms and draw flow charts in order to design solutions to problems
2	To provide good knowledge of structured programming concepts using C apply the concepts wisely	CO2	Capability to wisely use the program constructs and develop efficient C programs
3	To possess the ability to develop modular programs in C and subsequently develop small projects in C	CO3	Acquire knowledge of efficiently storing data in memory and retrieving using proper data structure
		CO4	Gain ability to develop modular programs to solve real world problems
		CO5	Capability to develop C programs for real world applications by applying suitable constructs and modularity

SEMESTER I

Course Code	**S21 CS 1.2**	**Course Title**	**C Programming Lab**
	Course Objectives		Course Outcomes
1	To impart practical knowledge of structured programming concepts using C	CO1	Become competent to develop c programs using control structures
2	Tto provide the ability to implement the derived data types using C language	CO2	Capability to wisely use the program constructs and develop efficient C programs
3	To inculcate the ability to develop modular programs in C	CO3	Acquire practical knowledge of efficiently storing data in memory and retrieving using proper data structure
		CO4	Capability to design modular programs to solve real world problems
		CO5	Capability to develop C programs for real world applications by applying suitable constructs and modularity

SEMESTER II

Course Code	**S21 CS 2.1**	**Course Title**	**Data Structures**
	Course Objectives		Course Outcomes
1	To impart knowledge on storing and managing data in various structures	CO1	Gain good understanding of the concepts, types and operations of data structures
2	To emphasize the importance of data structures in developing and implementing efficient algorithms	CO2	Acquire skills to implement sorting, searching and implementation of higher order data structure using arrays
3	To understand the operations on different data structures and their applications	CO3	Understand the concept of dynamic memory allocation, types of linked lists and gain the ability to use linked list in developing solutions to real world problems
		CO4	Apply the concept of Stacks and Queues in real world applications
		CO5	Analyze and apply graph and tree data structure in the problems where non-linear data structures are required

SEMESTER II

Course Code	**S21 CS 2.2**	**Course Title**	**Data Structures Lab**
	Course Objectives		Course Outcomes
1	To provide practical knowledge of storing and managing data in various structures	CO1	Gain good understanding of the concepts, types and operations of datastructures by practically implementing them
2	To understand the importance of data structures and practically implementing efficient algorithms	CO2	Acquire programming skills to implement sorting, searching and higher order data structure using arrays
3	To instill the ability to practically implement the operations on different data structures and their applications	CO3	Gain ability to create programs using linked list to develop real world applications
		CO4	Capability to apply the concept of Stacks and Queues in real world applications
		CO5	Capability to analyze and apply graph and tree data structure in the problems where non-linear data structures are required

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		B.Sc (Genetics)	
PROGRAM CODE		IABOS10	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	Comprehensive, detailed understanding of the chemical basis of heredity and demonstrate mastery of cutting edge research approaches in genetics/genomics.	PO1	Understanding of how genetic concepts affect broad societal issues including health and disease, food and natural resources, environmental sustainability, etc.
PEO2	Enhance student knowledge to critically evaluate, and apply current theoretical perspectives in genetics including handling Bioinstrumentation and conduct of analytical techniques, cell biology, molecular biology, immunology and some of the other applied areas of study such as Clinical genetics, Nutritional Genetics, Medical therapeutic genetics, Pharmacogenetics, Animal cell culture techniques, Assisted reproductive technologies, Genetic Diagnostics, Bioinformatics and Research methods.	PO2	The knowledge required to design, execute, and analyse the results of genetic experimentation in animal and plant model systems.
PEO3	Develop student Logical thinking and reasoning and ability to rationally analyze and solve the problems related to animal and plant sciences.	PO3	The ability to recognize the experimental rationale of genetic studies as they are described in peer-reviewed research articles and grant proposals to federal and other funding agencies and also ability to evaluate conclusions that are based on genetic data
PEO4	Ability to work effectively in a heterogeneous team. Capable of using computers for biological simulation, computation and appropriate software for biostatistics, and employing search tools to locate, retrieve, and evaluate Genetic-related data.	PO4	Communication skills required in the discipline including oral presentations of research data, published research articles, grant proposals, and poster presentations at conferences
PEO5	Describe role of genetic and genomic assessment in clinical practice, including applications in disease screening, diagnosis, and pharmacogenetics. Also capable of self-paced and self-directed learning aimed at personal and social development	PO5	Teamwork and leadership skills including group analysis of data, working together in the research laboratory, joint compositions of written reports, substantive participation in research group meetings, etc.

Course Code	S21 GN 1.1	Course Title	Cell Biology And Genetics
	Course Objectives		Course Outcomes
1	Students will be able to understand and summarize the structures and functions of various cellular components, especially the membrane, organelles and chromosomes, molecular regulation of cell cycle and programmed cell death.	CO1	Apply a basic core of scientific knowledge to augment understanding of cell structure and function at the molecular level.
2	Students will describe the types and properties of cancer and identify the cellular and molecular mechanisms that are deregulated in cancerous cells.	CO2	Compare and contrast the events of cell division and programmed cell death.
3	Students will evaluate and expand their comprehension of genetics by applying this knowledge in a variety of problem-solving situations.	CO3	Acquire the basic principles of inheritance as formulated by Mendel and extension to mendelian inheritance including multiple allelism and gene interactions.
		CO4	Illustrate the properties of cancer cells and compare the types of cancers.
		CO5	Integrate the basic knowledge in cell biology and genetics with other related disciplines.

Course Code	S21 GN 2.1	Course Title	Bioinstrumentation And Animal Cell Culture
	Course Objectives		Course Outcomes
1	To enable students to understand different types of analytical techniques and equipment used in biology research.	CO1	The students are able to demonstrate a working knowledge of analytical techniques and laboratory equipment used in biology research.
2	To build a stable foundation of knowledge on the construction, components and working principles and use of various types of microscopes.	CO2	Equipped with in-depth knowledge of Compound microscopes, dark field microscopes, phase contrast microscopes, fluorescent microscopes and electron microscopes.
3	To enable students to understand the cell lines and culture media and cell culture methods	CO3	Acquired a thorough understanding of UV spectrophotometers, Atomic absorption spectroscopy (AAS), Electron Spin Resonance (ESR), Nuclear Magnetic Resonance (NMR) Spectrophotometers and Flame photometers.
		CO4	Understood the use of different types of chromatographs including ion exchange, gel filtration, HPLC, affinity chromatography, GC-MS.
		CO5	Able to demonstrate working knowledge of cell lines, culture media and cell culture methods.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		**B.Sc (Mathematics)**	
PROGRAM CODE		**IABOS13**	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To instill a strong foundation of fundamental concepts in electronics and computer science and demonstrate an independent thinking ability and knowledge to apply in various domains	PO1	Scientific knowledge: Apply the knowledge of electronics and computer science to solve problems in various fields of science both in industry and research
PEO2	To impart knowledge on analyzing complex scientific problems and develop solutions using the principles of electronics and computer science	PO2	Problem analysis: Identify, formulate and analyze complex scientific problems and develop substantiated solutions using the principles of electronics and computer science
PEO3	To develop robust communication skills as well as social, ethical and professional values and collaborate effectively with team members belonging to various domains	PO3	Ethics, Individual and team work: Acquire strong oral and written communication skills and function effectively as an individual, and as a member or leader in diverse teams in multidisciplinary scenarios by maintaining professional ethics, responsibilities and norms of scientific practice
PEO4	To inculcate strong interest in research and focus on solving problems with the methods imbibed from various disciplines of study	PO4	Research interest: Apply the techniques embraced from various disciplines and develop solutions to the research problems which would benefit mankind
PEO5	To develop entrepreneurs and electronics professionals by inculcating the practice of life-long learning for continuous personal enrichment and professional development	PO5	Life-long learning: Become competent to engage in independent and life-long learning and become successful entrepreneurs or electronics professionals

SEMESTER I

Course Code	S21 MT1.1	Course Title	Algebra-I and Calculus-I
	Course Objectives		Course Outcomes
1	To equip students with knowledge and insight in Algebra-I, Calculus-I and related fields.	CO1	Learn to solve system of linear equations.
2	To develop the ability to utilize the Mathematical problem solving methods and software applications in addressing practical issues	CO2	Solve the system of homogeneous and non homogeneous linear of m equations in n variables by using concept of rank of matrix for 2 and 3 variables, finding eigen values and eigen vectors.
3	To apply Mathematical problems and solutions in a variety of contexts related to science, technology, business and industry	CO3	Sketch curves in Cartesian, polar and pedal equations.
		CO4	Students will be familiar with the techniques of differentiation of function with real variables.
		CO5	Identify and apply the intermediate value theorems and evaluate limit of a function using L'Hospital rule.

SEMESTER I

Course Code	S21 OE1.1	Course Title	Mathematics for All-I
	Course Objectives		Course Outcomes
1	To equip students with knowledge and insight in Algebra, Percentages, Ratio & Proportions.	CO1	Learn to solve problems sets, relations functions.
2	To develop the ability to utilize the Mathematical problem solving methods to solve related real world problems	CO2	Solve the system of equations using Cramer's rule.
3	To apply Mathematical model and solve problems in a variety of contexts related to science, technology, business and industry	CO3	Solve problems on inverse of a square matrix of order 2 and 3.
		CO4	Students will be familiar with the techniques of finding percentages.
		CO5	Identify and solve problems on ratio and proportions.

SEMESTER I

Course Code	S21 OE1.1	Course Title	Business Statistics
	Course Objectives		Course Outcomes
1	Provide an introduction to basics of statistics within a financial context	CO1	Acquired knowledge to Frame and formulate management decision problems
2	To enable students to use statistical techniques for analysis and interpretation of business data.	CO2	Understood the basic concepts underlying quantitative analysis
3	To apply Statistical methods and solve problems in a variety of contexts related to business and industry	CO3	Identify types of data and visualization, analysis and interpretation
		CO4	Employ suitable test procedures for the given data set
		CO5	Ability to apply suitable Statistical methods for the real world problems

SEMESTER–II

Course Code	S21 MT 2.1	Course Title	Algebra-II and Calculus-II
	Course Objectives		Course Outcomes
1	To equip students with knowledge and insight in Algebra-II, Calculus-II and related fields.	CO1	Recognize the mathematical objects called Groups.
2	To develop the ability to utilize the Mathematical problem solving methods and software applications in addressing practical issues	CO2	Link the fundamental concepts of groups and symmetries of geometrical objects.
3	To apply Mathematical problems and solutions in a variety of contexts related to science, technology, business and industry	CO3	Explain the significance of the notions of Cosets, normal subgroups and factor groups.
		CO4	Understand the concept of differentiation and fundamental theorems in differentiation and various rules.
		CO5	Find the extreme values of functions of two variables, understand the concept of integral calculus and their significance

SEMESTER II

Course Code	S21OE1.1	Course Title	Mathematics for All-I
	Course Objectives		Course Outcomes
1	To equip students with knowledge and insight in Mathematical Logic, Commercial Arithmetic's and Measures of Central Tendency.	CO1	This course will enable the student to integrate concept in international science, technology, business and industry.
2	To develop the ability to utilize the Mathematical problem solving methods to solve related real world problems	CO2	This course will enable the student to evaluate the legal, social and economic environment of science, technology, business and industry.
3	To apply Mathematical model and solve problems in a variety of contexts related to science, technology, business and industry	CO3	This course will enable the student to apply decision-support tools to science, technology, business and industry in decision making.
		CO4	This course will enable the student to apply knowledge of business concepts and functions in an integrated manner.
		CO5	This course will enable the student to do analysis, presentation and interpretation of numerical data in real world problems.

Course Code	S21 OE2.1	Course Title	Biostatistics
	Course Objectives		Course Outcomes
1	To enable the students to identify the variables of biological studies and explore the tools of classification and presentation.	CO1	Acquired knowledge to Frame and formulate Biological decision problems
2	To study the probability notion, models and their applications in the study of biological phenomenon.	CO2	Understood the basic concepts underlying quantitative analysis of Biological data
3	To acquire knowledge on sampling distribution and testing of hypotheses.	CO3	Identify types of Biological data and visualization, analysis and interpretation
		CO4	Employ suitable test procedures for the given Biological data set
		CO5	Ability to apply suitable Statistical methods for the real world problems of Biological data

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME

NAME OF THE PROGRAMME		B.Sc (Electronics)	
PROGRAM CODE		IABOS12	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To instill a strong foundation of fundamental concepts in electronics and computer science and demonstrate an independent thinking ability and knowledge to apply in various domains	PO1	**Scientific knowledge:** Apply the knowledge of electronics and computer science to solve problems in various fields of science both in industry and research
PEO2	To impart knowledge on analyzing complex scientific problems and develop solutions using the principles of electronics and computer science	PO2	**Problem analysis:** Identify, formulate and analyze complex scientific problems and develop substantiated solutions using the principles of electronics and computer science
PEO3	To develop robust communication skills as well as social, ethical and professional values and collaborate effectively with team members belonging to various domains	PO3	**Ethics, Individual and team work:** Acquire strong oral and written communication skills and function effectively as an individual, and as a member or leader in diverse teams in multidisciplinary scenarios by maintaining professional ethics, responsibilities and norms of scientific practice
PEO4	To inculcate strong interest in research and focus on solving problems with the methods imbibed from various disciplines of study	PO4	**Research interest:** Apply the techniques embraced from various disciplines and develop solutions to the research problems which would benefit mankind
PEO5	To develop entrepreneurs and electronics professionals by inculcating the practice of life-long learning for continuous personal enrichment and professional development	PO5	**Life-long learning:** Become competent to engage in independent and life-long learning and become successful entrepreneurs or electronics professionals

SEMESTER I

Course Code	**S21 EL1.1**	**Course Title**	**Electronic Devices And Circuits**
	Course Objectives		Course Outcomes
1	To understand various fundamental principles of network analysis	CO1	Study and analyze basic networks using network theorems in a systematic manner
2	To understand number systems and Boolean algebra and become familiar with the basic operation of electronic devices	CO2	Build simple electronic circuits used in various applications.
3	To design electronic circuits, devices and gadgets	CO3	Describe the behaviour of basic semiconductor devices and reproduce the I-V characteristics of diode/BJT devices
		CO4	Apply standard device models to explain/calculate critical internal parameters of semiconductor devices.
		CO5	Understand the basic knowledge of digital system building blocks, effectively can construct simple digital designs with the knowledge of Boolean algebra

SEMESTER I

Course Code	**S21 OE1.1**	**Course Title**	**Domestic Equipment Maintenance**

	Course Objectives		Course Outcomes
1	To understand the working and parts of Geyser and cooker	CO1	Gain the knowledge on Geyser, micro oven, AC, refrigerator and cooker
2	To gain the knowledge on micro oven and refrigerator	CO2	Able to understand the common faults and their troubleshooting in cooker, refrigerator, Geyser and micro oven,
3	To know about the working process of AC and general faults	CO3	Able to understand the manufacturing process of air conditioner, refrigerator, Geyser and micro oven,
		CO4	Able to understand the electrical wring diagram
		CO5	Ability to repair/replace the components of Geyser, micro oven, AC, refrigerator and cooker

SEMESTER II

Course Code	S21 EL 2.1	Course Title	Analog And Digital Electronics
	Course Objectives		Course Outcomes

1	To recognize the various working principles of widely used electronic devices, linear and digital ICs	CO1	Able to explain the behavior and characteristics of power devices such as UJT, SCR, Diac, Triac etc.
2	The students will learn the design and working of BJT, JFET, MOSFET	CO2	Able to calculate various device parameters' values from their IV characteristics
3	The students will learn arithmetic circuits, multiplexing and demultiplexing operations and a few logic families,	CO3	Able to understand op-amp and its applications
		CO4	Able to understand basic logic gates, concepts of Boolean algebra and techniques to reduce/simplify Boolean expressions
		CO5	Able to analyze combinatorial and sequential circuits

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NAME OF THE PROGRAMME		B.Sc (Physics)	
PROGRAM CODE		IABOS14	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To instill a strong foundation of fundamental concepts in electronics and computer science and demonstrate an independent thinking ability and knowledge to apply in various domains	PO1	**Scientific knowledge:** Apply the knowledge of Physics to solve problems in various fields of science both in industry and research
PEO2	To impart knowledge on analyzing complex scientific problems and develop solutions using the principles of electronics and computer science	PO2	**Problem analysis:** Identify, formulate and analyze complex scientific problems and develop substantiated solutions using the principles of Physics and computer science
PEO3	To develop robust communication skills as well as social, ethical and professional values and collaborate effectively with team members belonging to various domains	PO3	**Ethics, Individual and team work:** Acquire strong oral and written communication skills and function effectively as an individual, and as a member or leader in diverse teams in multidisciplinary scenarios by maintaining professional ethics, responsibilities and norms of scientific practice
PEO4	To inculcate strong interest in research and focus on solving problems with the methods imbibed from various disciplines of study	PO4	**Research interest:** Apply the techniques embraced from various disciplines and develop solutions to the research problems which would benefit mankind
PEO5	To develop entrepreneurs and electronics professionals by inculcating the practice of life-long learning for continuous personal enrichment and professional development	PO5	**Life-long learning:** Become competent to engage in independent and life-long learning and become successful entrepreneurs or electronics professionals

PHYSICS SYLLABUS

SEMESTER I

Course Code	S21 PH1.1	Course Title	Mechanics and Properties of Matter
	Course Objectives		Course Outcomes
1	Identify the errors in the measurement of physical quantities.	CO1	Identify physical quantities and their associated units and dimensions and knowledge of errors in the measurement.
2	Recall and understand Newtonian mechanics and Einstein's Special Theory of Relativity	CO2	Remembering Newton's laws of motion, gravitation, concept of work and energy.
3	Understand the properties of matter such as elasticity, surface tension and viscosity	CO3	Understand the basics of Special Theory of Relativity and dynamics of rigid bodies
		CO4	Knowledge of how various elastic moduli can be determined
		CO5	Measuring surface tension and viscosity and appreciating the methods adopted.

SEMESTER I

Course Code	S21OE1.1	Course Title	Climate Science

	Course Objectives		Course Outcomes
1	To understand the difference between weather and climate	CO1	Ability to understand the difference between climate and weather and also the composition present in the atmosphere
2	To gain knowledge on greenhouse gases	CO2	Gain the knowledge on temperature variation in the atmosphere
3	To know the modelling of the atmosphere	CO3	Students can acquire knowledge on the construction of models in weather forecasting and prediction
4	To understand global warming, increase in the concentration of CO_2 and other greenhouse gases	CO4	Students will be able to understand greenhouse effect and global warming
		CO5	Students will be able to use geoengineering tools to mitigate global warming

SEMESTER II

Course Code	S21 PH2.1	Course Title	Electricity and Magnetism

	Course Objectives		Course Outcomes
1	Recall and demonstrate the laws of electrostatics and apply it to different charge distributions.	CO1	Able to demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.
2	Understand the AC circuits using j operator method and transient currents in DC circuits	CO2	Able to explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields and AC circuits using j operator method
3	To gain the knowledge of properties of electromagnetic waves and classification of magnetic materials.	CO3	Gain the knowledge of transient currents in DC circuits.
		CO4	Able to discuss the propagation of electromagnetic waves and their properties and able to classify materials based on magnetism
		CO5	Able to apply various network theorems such as Superposition, Thevenin, Norton, Reciprocity, Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis, and electrical machines.

SEMESTER II

Course Code	S21OE2.1	Course Title	Medical Physics
	Course Objectives		Course Outcomes
1	To provide a detailed overview of the human anatomy	CO1	Gain the knowledge about the anatomy of human body and the functioning of the various organ systems, their structure, functions and physiology
2	To gain knowledge on the basic diagnostic tools such as X-rays, Ct scan, MRI scan, ultrasound and the principles of physics behind their working	CO2	Understand the production and use of X-rays in diagnosis.
3	To provide the knowledge of the clinical aspects of radiation therapy and brachytherapy	CO3	Knowledge of basic principle and working of imaging techniques like X-rays, CT, MRI and Ultrasound scan
		CO4	Explain the biological aspects of radiation therapy, production of radioisotopes and use of radioisotopes in therapy
		CO5	Describe the principle of brachytherapy and classification of brachytherapy techniques.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		B.Sc (Microbiology)	
PROGRAM CODE		IABOS09	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To provide in-depth knowledge on core areas of biosciences in a wide- ranging context which involves the use of evolved and practicable skills for a lifelong learning.	PO1	Get exposed to strong theoretical and practical background in the fundamental concepts.
PEO2	To make students competent in the field of biosciences and allied areas by providing them hands-on experience using multifarious tools and techniques.	PO2	Develop an ability to solve, analyze and interpret data generated from laboratory work and research activities that help to develop critical understanding of the latest development in the core areas of biosciences.
PEO3	To inculcate, facilitate, motivate and promote knowledge to critically evaluate, and apply technical skills to validate and solve environmental, industrial and agricultural issues through core bio-scientific interventions.	PO3	Be able to use skills required for the extraction, separation, and synthesis of a variety of biomolecules utilized in clinical diagnosis, pharmaceutical, industrial, agricultural sector or in research laboratories.
PEO4	To develop graduates with a strong professional ethics and moral duties combined with enhanced vocabulary that will positively affect their profession, community, society and nation at large.	PO4	Apply knowledge and understandings of Biological Science and skills to new and unfamiliar contexts to identify, analyze problems, issues and seek solutions to real-life problem
PEO5	To equip students so as to take up a suitable career in industry or research or from a multidisciplinary environment from the imbibed communicative, linguistic, analytical and bioinstrumentation competencies.	PO5	Get exposed to strong theoretical and practical background in the fundamental concepts.

SEMESTER I

Course Code	S21 MB1.1	Course Title	General Microbiology
	Course Objectives		Course Outcomes
1	The objective of the course is to Know General bacteriology and microbial techniques for isolation of pure cultures of bacteria, fungi and algae.	CO1	Comprehend the various methods for identification of unknown microorganisms.
2	To Master aseptic techniques and be able to identify the unknown microorganisms.	CO2	Apply practical skills in microscopy handling and staining techniques.
3	To understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes.	CO3	Understand about the various physical and chemical means of sterilization.
		CO4	Understand the microbial transport systems and the modes and mechanisms of energy conservation in microbial metabolism.
		CO5	Knowledge about the microbial nutrition - Autotrophy and heterotrophy mode of nutrition.

SEMESTER II

Course Code	S21 MB 2.1	Course Title	Microbial Biochemistry and Physiology
	Course Objectives		Course Outcomes
1	The major objective of the course is to develop a clear understanding of various aspects of microbial physiology along with diverse metabolic pathways existing in bacteria in relation to its survival and propagation.	CO1	Evaluate the metabolic process of microbial system
2	To provide the core principles and specialized knowledge of Carbohydrates, Lipids, Proteins, Vitamins, Porphyrin, cellular transport, law of thermodynamics, Lipid and Nitrogen metabolism.	CO2	Apply the knowledge of biomolecules in biochemistry
3	To acquaint various life processes like photosynthesis, respiration, fermentation and anaerobic respiration.	CO3	Analysis of the mechanism of bioenergetics and photosynthesis.
		CO4	Analysis of the mechanism of fermentation and anaerobic respiration.
		CO5	Able to predict the intermediate product which can be used for industrial production processes.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		B.Sc (Zoology)	
PROGRAM CODE		IABOS11	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	To provide quality education in the branch of Zoology	PO1	The programme offers both classical as well as modern concepts of Zoology in higher education. It enables the students to study animal diversity in both local and global environments
PEO2	To facilitate Higher Education & Research in zoology.	PO2	To make the study of animals more interesting and relevant to human studies more emphasis is given to branches like behavioural biology, evolutionary biology and economic zoology. More of upcoming areas in cell biology, genetics, molecular biology, biochemistry, genetic engineering and bioinformatics have been also included
PEO3	To provide Quality education offering skill-based programs and motivate the students for self-employment in applied branches of Zoology.	PO3	Equal importance is given to practical learning and presentation skills of students. The lab courses provide the students necessary skills required for their employability
PEO4	To inculcate the Value-based education and entrepreneurial skills among the students.	PO4	Skill enhancement courses in classical and applied branches of Zoology enhance enterprising skills of students. The global practices in terms of academic standards and evaluation strategies
PEO5	To inculcate the spirit of resource conservation and love for nature	PO5	Provides opportunity for the mobility of the student both within and across the world. The uniform grading system will benefit the students to move across institutions within India to begin with and across countries.

Course Code	S21 ZO1.1	Course Title	Cytology, Genetics and Infectious Diseases
	Course Objectives		Course Outcomes
1	To understand the structures and purposes of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles	CO1	The structure and function of the cell organelles. The chromatin structure and its location
2	To gain knowledge on gene structure, chromosomes and proteins, structure of DNA	CO2	The basic principle of life, how a cell divides leading to the growth of an Organism and also reproduces to form a new organism
3	To identify common infectious diseases and describe the common transmission mechanisms, preventive measures	CO3	How a cell communicates with its neighbouring cells
		CO4	The principles of inheritance, Mendel's laws and the deviations.
		CO5	How environment plays an important role by interacting with genetic factors. Detect chromosomal aberrations in humans and study of pedigree analysis.

SEMESTER II

Course Code	S21 ZO 2.1	Course Title	Biochemistry and Physiology
	Course Objectives		Course Outcomes
1	To introduce the organic structure of living systems mainly dealing with biomolecules like carbohydrates, proteins, lipids, nucleic acids etc. and their metabolism	CO1	To develop a deep understanding of structure of biomolecules like proteins, lipids and carbohydrates. How simple molecules together form complex macromolecules
2	To understand the structure, functions and the mechanism of action of enzymes	CO2	To understand the thermodynamics of enzyme catalyzed reactions
3	To comprehend basic concepts and knowledge of structure and functioning of different systems in body.	CO3	Mechanisms of energy production at cellular and molecular levels. To understand various functional components of an organism.
		CO4	To explore the complex network of these functional components.
		CO5	To comprehend the regulatory mechanisms for maintenance of function in the body.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs), PROGRAMME OUTCOMES (POs) & COURSE OUTCOMES (COs) MANUAL

NAME OF THE PROGRAMME		M.Sc DATA SCIENCE	
PROGRAM CODE		IAMOS09	
Programme Educational Objectives(PEOs)		Programme Outcome(POs)	
PEO1	Develop in-depth understanding of the key technologies in Data Science	PO1	Apply Quantitative modeling and Data analysis techniques to solve real-world problems, communicate findings, and effectively present results
PEO2	Gain ability to design integrated solutions to problems by applying principles of Data Science	PO2	Apply Data-driven insights to business and industry
PEO3	Provide strong core training both theoretically and practically to create adept data scientists	PO3	Employ cutting edge tools and technologies to analyze Big Data
PEO4	Exposure to real-world problems in order to adapt easily to the industry demands	PO4	Build intelligent machines by applying appropriate algorithms Build a career in Data Science and adapt to industry demands
PEO5	Inculcate values and make students realize the significance of ethics in a professional environment	PO5	Pursue quality research in Data Science and develop solutions to societal needs

SEMESTER I

Course Code	MDS101	Course Title	Introduction To Data Science
	Course Objectives		Course Outcomes
1	To understand the applications of Data Science	CO1	Explore data science and data engineering
2	To provide in-depth knowledge of principles of Data Science, techniques and applications	CO2	Apply Data-Driven Insights to Business and Industry
3	To gain an insight into data driven programming	CO3	Create and analyze Data through Visualizations
		CO4	Build Models that Operate Internet-of-Things Devices
		CO5	Apply Domain Expertise to Solve Real World Problems Using Data Science

SEMESTER I

Course Code	MDS102	Course Title	Mathematical And Statistical Foundation For Data Science
	Course Objectives		Course Outcomes
1	To introduce students to the fundamental mathematical concepts required for Data Science	CO1	Apply mathematics and statistics for applications in Data Science
2	To enable students in applying the fundamentals of statistics to assess descriptive measures and probability for data analysis	CO2	Demonstrate expertise on the topics Eigenvalues, Eigenvectors and Inner Product Spaces
3	Able to apply mathematics and statistics in Data Science applications	CO3	Apply the concept of correlation, linear and non-linear regressions to data science problems
		CO4	Infer the concept of correlation and regression for relating two or more related variables
		CO1	Demonstrate the probabilities for various events

SEMESTER I

Course Code	MDS103	Course Title	Python Programming
	Course Objectives		Course Outcomes
1	Understand the concept of functions, list, dictionaries	CO1	Gain knowledge of the concepts of functions, list, dictionaries
2	Acquire skills to create object oriented programs in Python	CO2	Acquire knowledge of creation and usage of Python libraries.
3	3. Gain ability to access database and handle files from python programs	CO3	Gain ability to perform file handling and database operations using Python.
		CO4	Become competent in using numpy and pandas
		CO5	Become proficient in object oriented programming using python

SEMESTER I

Course Code	MDS104	Course Title	Big Data Analytics
	Course Objectives		Course Outcomes
1	To provide an overview of fundamental concepts of big data and analytics	CO1	Understand the fundamentals of various big data analytics techniques
2	To gain knowledge of the tools required for working with big data like Hadoop, NoSql MongoDB	CO2	Work with big data analysis techniques and explore the big data analytics techniques .business applications
3	To gain ability to integrate large amounts of data	CO3	Acquire fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics
		CO4	Develop Big Data Solutions using Hadoop EcoSystem
		CO5	Become proficient to handle big data projects

SEMESTER I

Course Code	MDS105	Course Title	Python Programming Lab
	Course Objectives		Course Outcomes
1	Understand practically the concept of functions, list, dictionaries	CO1	Gain practical knowledge of the concepts of functions, list, dictionaries
2	Acquire skills to create object oriented programs in Python	CO2	Acquire knowledge of creation and usage of Python libraries
3	Gain ability to access database and handle files from python programs	CO3	Become competent in file handling using Python
		CO4	Access database from Python program
		CO5	Acquire ability to create object oriented programs in python

SEMESTER I

Course Code	MDS106	Course Title	Big Data Analytics Lab
	Course Objectives		Course Outcomes
1	To provide an overview of fundamental concepts of big data and analytics	CO1	Solve Big Data problems using HADOOP
2	To gain knowledge of the tools required for working with big data like Hadoop, NoSql MongoDB	CO2	Ability to use Spark
3	To gain ability to integrate large amounts of data	CO3	Ability to Comprehend query processing using map-reduce
		CO4	Become competent in CRUD operations on MongoDB
		CO5	Acquire skills to handle big data projects

SEMESTER II

Course Code	MDS201	Course Title	Advanced Algorithms
	Course Objectives		Course Outcomes
1	Analyze variety of algorithms with practical applications emphasizing optimal Solution of each algorithm	CO1	Gain knowledge of various designing paradigms in formulating algorithm
2	Identify most suitable algorithm for a given task in order to save time and cost Resources	CO2	Understand approximation algorithms and implement in solving the problems
3	To be aware of complex problems such as NP Hard and NP-complete problems	CO3	Explore various string matching/pattern matching algorithm widely used in machine learning automation
		CO4	Gain exposure to parallel algorithms, parallel time and processors time complexity
		CO5	Acquire knowledge and implement probabilistic and randomized algorithms

SEMESTER II

Course Code	**MDS202**	**Course Title**	**Machine Learning**
	Course Objectives		Course Outcomes
1	To understand the concepts and techniques of Machine Learning	CO1	Gain ability to comprehend supervised, unsupervised and reinforcement learning
2	To gain knowledge of classification and regression models	CO2	Acquire skills to apply the appropriate machine learning strategy for any given problem
3	To apply the various dimensionality reduction techniques	CO3	Modify existing machine learning algorithms to improve classification efficiency
		CO4	Create Ensemble models to improve performance of the classifier
		CO5	Competency to apply dimensionality reduction on high dimensional datasets

SEMESTER II

Course Code	MDS203	Course Title	Cloud Computing
	Course Objectives		Course Outcomes
1	To make students to be aware of various cloud computing models, strength and weakness of cloud	CO1	Analyze various cloud programming models and apply them to solve problems on the cloud
2	Enabling students to understand security, privacy and interoperability	CO2	Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing
3	To help and motivate students to undertake projects in cloud environment	CO3	Explain the core issues of cloud computing such as security, privacy, and interoperability
		CO4	Acquire knowledge of system, network and storage virtualization and outline their role in enabling the cloud computing system model
		CO5	Ability to comprehend Service Oriented Architecture[SOA] and its services in Business and IT in cloud environment

SEMESTER II

Course Code	MDS204	Course Title	Advanced Algorithms Lab
	Course Objectives		Course Outcomes
1	To research a specific algorithm with different set of values and to plot graph to understand its behavioral patterns with respect to input size n	CO1	Gain knowledge of different design techniques and their implementation.
2	To handle string matching problems using naïve Bayes classification and KMP problems in order to compare performance	CO2	Understand algorithm efficiency computation and write effective algorithms
3	To make the students to find out optimized solution in algorithms using research statistics	CO3	Implement pattern matching algorithm
		CO4	Apply sorting algorithms to improve program performance
		CO5	Implement Parallel algorithm to improve efficiency

SEMESTER II

Course Code	**MDS205**	**Course Title**	**Machine Learning Lab Using Python**
	Course Objectives		Course Outcomes
1	To understand practically the concepts and techniques of Machine Learning	CO1	Gain practical knowledge of fundamental concepts and methods of machine learning, statistical pattern recognition and its applications.
2	To gain practical knowledge of classification and regression models	CO2	Gain ability to analyze and evaluate algorithms for pattern classification
3	To apply the various dimensionality reduction techniques and ensemble models in ML Projects	CO3	Gain ability to comprehend simple models and Ensemble models
		CO4	Acquire skills to design ML algorithms for classification in Python and test them with benchmark data sets
		CO5	Become competent to develop ML projects

SEMESTER II

Course Code	MDS206	Course Title	Professional Ethics and Corporate Governance
	Course Objectives		Course Outcomes
1	To instill Moral, Social Values and Loyalty in a professional environment	CO1	Realize the importance of human values
2	To make students aware of the impact of non-ethical practices.	CO2	Understand that excessive desires of the mind make a person unethical and restless, while fewer desires lead to peace and professional progress
3	To create an awareness on Professional Ethics and Human Values	CO3	Interpret and apply a professional code of ethics relevant to the data science
4	To understand organizational culture and to adapt to changing cultures without compromising ethical values	CO4	Assess the benefits of restraining from unethical practices like bribery, extortion, nepotism, nexus between politicians and industrialists
5	To Understand professional code of ethics relevant to the data science		

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B.Sc. (Biochemistry & Microbiology)

PO	Programme Outcomes
PO1	Develop comprehensive knowledge and understanding in the field of Life sciences.
PO2	Inculcate complex problem solving ability using analytical thinking, reasoning, and creativity along with good communication skills.
PO3	Demonstrate research related skills along with coordinating and collaborating abilities.
PO4	Develop leadership abilities with a knowledge of time management, community engagement and service.
PO5	Demonstrate capability to use advanced digital and technological skills for the benefit of society.

S21 BC 1.1: CHEMICAL FOUNDATION OF BIOCHEMISTRY – 1

CObj	Course Objectives
CObj_1	To understand chemical basis of bioprocesses, organization of organisms, fundamental properties of elements and units of measurements.
CObj_2	To revisit the fundamentals concepts of chemical bonds, electronic configuration, concepts of acids/ bases/ buffers and their importance in biological systems.
CObj_3	To familiarize with thermodynamic concepts as applicable to biological processes.

CO	Course Outcomes After completion of this course, students should be able to:
CO1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
CO2	To understand the concepts of mole, mole fraction, morality and to apply them in biochemical research.
CO3	To know the significance of chemical bonding, electronic configuration and theories of bond formation
CO4	To understand the concepts of acids, bases, indicators, buffers and realize the importance of water as a universal solvent.
CO5	To recognize the fundamentals of electrochemistry and the thermodynamic basis of biochemical reactions.

S21 MB 1.1: GENERAL MICROBIOLOGY

CObj	Course Objectives
CObj_1	The objective of the course is to Know General bacteriology and microbial techniques for isolation of pure cultures of bacteria, fungi and algae.
CObj_2	To Master aseptic techniques and be able to identify the unknown microorganisms.
CObj_3	To understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes.

CO	Course Outcomes
CO1	Comprehend the various methods for identification of unknown microorganisms.
CO2	Apply practical skills in microscopy handling and staining techniques.
CO3	Understand about the various physical and chemical means of sterilization.
CO4	Understand the microbial transport systems and the modes and mechanisms of energy conservation in microbial metabolism.
CO5	Knowledge about the microbial nutrition - Autotrophy and heterotrophy mode of nutrition.

S21 BC 2.1: CHEMICAL FOUNDATION OF BIOCHEMISTRY – 2

CObj	Course Objectives
CObj_1	To understand reaction kinetics, concepts of colloids and their biological applications.
CObj_2	To revisit concepts of organic chemistry and learn the role of stereochemistry in biological systems.
CObj_3	To familiarize with types of organometallic compounds and their biological effects.

CO	Course Outcomes
CO_1	To understand the principles of chemical kinetics and their interpretation for biological systems
CO_2	To comprehend about types of colloids, their properties, examples and biological applications
CO_3	To analyze the concepts of stereochemistry of organic compounds and their importance in biomolecules
CO_4	To appreciate the roles of metals, non-metals, transition metals and organometallic compounds in biological systems.
CO_5	To study the properties of inorganic molecules and coordination compounds and understand the toxic effects of heavy metals.

S21 MB 2.2: MICROBIAL BIOCHEMISTRY AND PHYSIOLOGY

CObj	Course Objectives
CObj_1	The major objective of the course is to develop a clear understanding of various aspects of microbial physiology along with diverse metabolic pathways existing in bacteria in relation to its survival and propagation.
CObj_2	To provide the core principles and specialized knowledge of Carbohydrates, Lipids, Proteins, Vitamins, Porphyrin, cellular transport, law of thermodynamics, Lipid and Nitrogen metabolism.
CObj_3	To acquaint various life processes like photosynthesis, respiration, fermentation and anaerobic respiration.

CO	Course Outcomes
CO_1	Evaluate the metabolic process of microbial system
CO_2	Apply the knowledge of biomolecules in biochemistry
CO_3	Analysis of the mechanism of bioenergetics and photosynthesis.
CO_4	Analysis of the mechanism of fermentation and anaerobic respiration.
CO_5	Able to predict the intermediate product which can be used for industrial production processes.

S21 BC 3.1: BIOORGANIC CHEMISTRY

COobj	Course Objectives
CObj_1	To understand general reaction mechanisms of organic compounds and the concepts of allides, alcohols and carbonyl compounds.
CObj_2	To revisit the fundamentals concepts of primary and secondary metabolites of cells.
CObj_3	To familiarize with bioorganic compounds like nutrients, proteins, vitamins and drugs.

CO	Course Outcomes
CO1	To appreciate the concepts of reaction mechanisms of hydrocarbons.
CO2	To understand the properties and importance of halides, alcohols and carbonyl compounds
CO3	To know the significance of primary metabolites in living organisms such as carboxylic acids, amines and heterocyclic compounds.
CO4	To understand the significance of secondary metabolites in living organisms, such as terpenes and alkaloids.
CO5	To recognize the fundamentals of nutrition, nutrients and understand about drugs and antibiotics.

S21 MB 3.1 - MICROBIAL DIVERSITY

COobj	Course Objectives
CObj_1	To expand knowledge on evolution and microbial diversity.
CObj_2	To understand bacterial taxonomy.
CObj_3	To study various classes of fungi in terms of their characteristic features.

CO	Course Outcomes
CO1	To demonstrate an understanding of bacterial, fungal, cyanobacterial, viral and rickettsial classifications, culturing, reproduction and significance.
CO2	The student will learn the techniques of studying bacterial growth curveand factors affecting growth curve.
CO3	The students will gain knowledge about role of macronutrients and micronutrients in growth of microbes.
CO4	Develop an understanding of physiological and molecular diversity withina community of microbes.
CO5	Understand the principles and methods behind studying and identifying cultured and uncultured microorganisms.

S21 BC 4.1: ANALYTICAL BIOCHEMISTRY

CObj	Course Objectives
CObj_1	To understand the strategies in biochemical investigations employing various basic biochemical techniques.
CObj_2	To understand the principles and applications of various techniques employed for separation and analysis of biomolecules.
CObj_3	To familiarize with basic culture techniques in microbiology.

CO	Course Outcomes
CO_1	To understand the principles of biochemical analysis employing various bioanalytical techniques.
CO_2	To comprehend about general principles of various chromatographic techniques useful for bioanalysis.
CO_3	To analyze biomolecules using electrophoretic methods.
CO_4	To appreciate the importance of spectroscopic techniques in molecular analysis.
CO_5	To study the properties of microorganisms and their handling techniques.

S23 MB 4.1: SOIL, AGRICULTURAL AND ENVIRONMENTAL MICROBIOLOGY

CObj	Course Objectives
CObj_1	To study the properties of soil, their microbial diversity and plant microbe interaction
CObj_2	To understand the involvement of various microbes in biogeochemical cycles and plant diseases
CObj_3	To evaluate the air and water quality using different methods of quality parameters

CO	Course Outcomes *After completion of this module, students should be able to:*
CO1	Understand the structure of soil profile and its microorganisms
CO2	Evaluate the plant microbe interaction
CO3	Discuss the mechanisms of pathogenesis, symptoms and control measures of plant diseases
CO4	Applications of various techniques to understand the microbial diversity in the air
CO5	Evaluation of water quality using different methods of quality parameters

S21 BC 5.1: BIOCHEMISTRY OF MACROMOLECULES

CObj	Course Objectives
CObj_1	To understand chemical basis of biological process.
CObj_2	To revisit the fundamental concepts of correlation of macromolecules and its chemical reactions.
CObj_3	To familiarize with understanding of significance of macromolecular structures in understanding the life process.

CO	Course Outcomes
CO_1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
CO_2	To understand the basic concepts of carbohydrate structures and biological roles relevant to living cell growth and division.
CO_3	To know the significance of coordination of lipid molecules and their properties in a living cell structure.
CO_4	To understand the structural and chemical properties of amino acids and proteins in living systems.
CO_5	To understand the composition and structure of RNA and DNA those regulate the biological process.

S21 BC 6.1: HUMAN PHYSIOLOGY AND CELL BIOLOGY

CObj	Course Objectives
CObj_1	To understand the structures and purposes of basic components of cells, especially membranes and organelles
CObj_2	To revisit the fundamentals concepts of cells and tissues, organ systems and their working
CObj_3	To familiarize with physiology and biochemistry of processes and organization of various organ systems

CO	Course Outcomes
CO1	To appreciate the concepts of cell biology, tissue organization, organ systems and physiological processes
CO2	To comprehend the structural organization, functioning and important cellular events of cells and cell organelles
CO3	To understand importance of tissues, and organization, dynamics and role of organs in circulatory and skeletal systems
CO4	To understand the biochemistry and physiology of digestive, excretory and respiratory systems
CO5	To recognize the fundamentals of biochemistry and physiology of muscular, nervous and endocrine systems

S21 MB 5.1 – MICROBIAL GENETICS AND MOLECULAR BIOLOGY

CObj	Course Objectives
CObj_1	The major objective of the course is to understand how microorganisms can be used as tools to understand various biological phenomena.
CObj_2	To acquaint types of mutation, gene regulation and transposable element
CObj_3	To acquire in-depth study on structure and organization of chromosome, replication process, transcription process, translation process and mutagenesis.

CO	Course Outcomes
CO_1	Outline the structure of the prokaryotic and eukaryotic genome and discuss the types of mutation and DNA repair mechanism.
CO_2	Analyze the genetic recombination and the overview of bacterial genetic maps and interpret the gene transfer mechanism in bacteria.
CO_3	Understand the central dogma and regulation of gene expression.
CO_4	Evaluate the operon model and molecular techniques with different samples.
CO_5	Apply the recombinant DNA technology in the agricultural, medical and industrial and environmental field.

S21 MB 6.1 – IMMUNOLOGY AND MEDICAL MICROBIOLOGY

COobj	Objective
CObj_1	To develop students' understanding of medical microbiology with hand on experience in the isolation and identification of the microorganisms from different clinical samples
CObj_2	To strengthen the knowledge of students in immunology and immunodiagnostics
CObj_3	To explain the various pathological events during the progression of an infectious disease caused by common pathogenic microorganisms

CO	Outcome
CO1	Illustrate the cells, tissues, organs of the immune system and types of immunity.
CO2	Understand the properties, functions of Antigens, antibodies and complement system and antigen and antibody reactions
CO3	Analyze the symptoms, pathogenesis, laboratory diagnosis and control measures of bacterial, fungal, viral and protozoa
CO4	Elaborate the antimicrobial agents to handle microorganism in risk groups
CO5	Apply the immuno and molecular techniques for the diagnosis of disease.

S21 BC 7.1: ENZYMOLOGY

COobj	Course Objectives
CObj_1	To provide detailed knowledge about enzymes, the biological catalysts with remarkable properties.
CObj_2	To outline the diverse applications of enzymes in disease diagnosis and therapy as well as in industry
CObj_3	To develop an understanding of enzyme kinetics, mechanism of enzyme action, enzyme inhibition and their regulation.

CO	Course Outcomes
CO_1	To understand the nature and importance of enzymes in living systems.
CO_2	To gain insight into the molecular basis of catalysis by enzymes and the underlying basis of their specificity
CO_3	To comprehend the applications of enzymes in research and medicine as well as in industry, which will bolster their foray into industrial and biomedical research.
CO_4	To analyze the concepts of kinetics of enzyme catalyzed reactions, their mechanisms of enzyme action and clinical importance of enzyme inhibitors
CO_5	To appreciate how enzymes are regulated and the physiological importance of enzyme regulation in the cell

S21 BC 8.1: INTERMEDIARY METABOLISM

CObj	Course Objectives
CObj_1	To understand the concepts of biochemical reactions in cells.
CObj_2	To familiarize with understanding of metabolic pathways both catabolism and anabolism, and energy production.
CObj_3	To revisit the fundamental concepts of correlation of macromolecules and their chemical reactions.

CO	Course Outcomes
CO_1	To appreciate the basics of biochemical reactions and its molecular and functional connection to the organization of a cell and sub-cellular components
CO_2	To know the fates of different types of carbohydrates and its regulation that can influence the growth and existence of living organism.
CO_3	To analyze the significance of lipid metabolic pathways
CO_4	To understand degradative and biosynthetic reactions of amino acids and nucleotides and associated metabolic disorders.
CO_5	To evaluate the biochemistry behind photosynthesis process and nitrogen fixation.

S21 MB 7.1 – FOOD AND DAIRY MICROBIOLOGY

CObj	Objective
CObj_1	To understand microbiology of fermented food commodities.
CObj_2	To describe the role of microorganisms in food spoilage and principles of food preservation.
CObj_3	To analyze the microbiological quality control, and quality schemes.

CO	Outcome
CO1	Analyze the character of microbes in food spoilage using various examination and evaluation of preservation techniques for food.
CO2	Evaluate the microbiology of fermented milk products.
CO3	Discuss the government regulatory practices and policies in food quality and safety.
CO4	Apply the techniques to assay the food borne infections and intoxication.
CO5	Create the knowledge about the microbial food products and determine the role of various agencies in food sanitation and control.

S21 MB 8.1 – INDUSTRIAL MICROBIOLOGY AND BIOPROCESS TECHNOLOGY

CObj	Course Objectives
CObj_1	The major objective of the course is to provide the design of bioreactors, media formulations and factors affecting the industrial production of bio-chemicals along with approaches that can be used for enhanced production.
CObj_2	To analyze the role of micro-organism in production of organic acids, alcohols, wine, vinegar, enzymes, vitamins, antibiotics, amino-acids and steroids
CObj_3	To understand the strategies for development of microbial strains, process optimization, large scale production and product recovery will be covered for industrially relevant microbial products and therapeutic proteins

CO	Course Outcomes
CO_1	General design of fermenter, media and the process of fermentation and optimization of fermentation process
CO_2	Isolation of industrially important microbial strains and fermentation media
CO_3	Students will be able to select industrially important microbes for economical use including protein products.
CO_4	Types of fermentation processes, bio-reactors and measurement of fermentation parameters
CO_5	Microbial production of industrial products (microorganisms involved, media, fermentation conditions, downstream processing and uses)

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B.Sc. (Genetics & Biotechnology)

S23 GN 1.1: PRINCIPLES OF GENETICS

CObj	Course Objectives
CObj_1	To provide comprehensive understanding of the historical development of Genetics as a scientific discipline and its significance in modern biology and to introduce students to Mendel's laws of inheritance and their applications in understanding genetic patterns and traits in various organisms.
CObj_2	To familiarize with the concept of gene interaction and how multiple genes can influence the expression of a trait.
CObj_3	To understand the structure and organization of chromosomes in prokaryotic and eukaryotic cells and their roles in inheritance and genetic stability and to comprehend the mechanisms and factors involved in sex determination in different organisms.

CO	Course Outcomes After completion of this course, students should be able to:
CO1	Explain the historical milestones in the field of genetics, the contributions of key scientists to its development and to apply Mendel's laws to predict and analyze patterns of inheritance for single gene traits in various organisms.
CO2	Describe different types of gene interactions (e.g., dominance, co-dominance, epistasis) and their impact on phenotype and analyze and interpret genetic data involving multiple alleles at a gene locus.
CO3	Compare and contrast the structure of prokaryotic and eukaryotic chromosomes, understanding their differences and functions and describe karyotype and ideogram.
CO4	Elucidate the features of polytene chromosomes, lampbrush chromosomes and B chromosomes.
CO5	Analyze the mechanisms of sex determination in different organisms, including the role of sex chromosomes and environmental factors.

S23 BT 1.1: CELL BIOLOGY

CObj	Course Objectives
CObj_1	To introduce the fundamentals of Cell Biology.
CObj_2	To educate the students about the origin and reproduction of cells.
CObj_3	To impart the knowledge of cell to cell interactions and their functions.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Comprehend the knowledge of structure and functions of various cellorganelles.
CO2	Apply the general principles of cell to cell communication.
CO3	Describe the fundamentals of cell growth and reproduction.
CO4	Compare the mechanism of cell aging and cell death.
CO5	Elucidate and interpret the cellular responses.

S21 GN 2.1: BIOINSTRUMENTATION AND ANIMAL CELL CULTURE

CObj	Course Objectives
CObj_1	To provide students with a comprehensive understanding of the principles underlying bioinstrumentation, including the design and application of instruments used in biological research and analysis.
CObj_2	To equip students with the skills and knowledge necessary for successful cultivation and maintenance of animal cells in in vitro.
CObj _3	To foster an interdisciplinary approach by teaching students how to integrate bioinstrumentation techniques with animal cell culture processes, enabling them to design experiments and analyze biological samples using appropriate instruments.

CO	Course Outcomes After completion of this course, students should be able to:
CO1	Explain the principles and applications of various bioinstruments used in biological research and industry. Demonstrate proficiency in bioinstrumentation showcasing adeptness in experimental setup and data acquisition.
CO2	Apply cell culture techniques in ensuring the successful cultivation and manipulation of animal cells in a laboratory setting.
CO3	Design and execute experiments that involve the integration of bioinstrumentation and animal cell culture.
CO4	Analyze data obtained from bioinstrumentation and cell culture experiments, demonstrating the ability to interpret results critically.
CO5	Apply critical thinking skills to troubleshoot issues that may arise during bioinstrumentation experiments or cell culture processes.

S23 BT 2.1: MICROBIOLOGY

CObj	**Course Objectives**
CObj_1	To impart basic knowledge and understanding modern microbiology and the technologies involved in it.
CObj_2	To assist with hands on laboratory experience in fundamental techniques like culturing and maintaining the microorganisms related to biotechnology.
CObj_3	To familiarize and educate the students with the antimicrobial strategies, modalities in applying for research area.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Comprehend the basic understanding about the technologies involved in modern microbiology.
CO2	Apply the knowledge about the fundamental techniques involved in culture and maintenance of microorganisms pertaining to biotechnology.
CO3	Analyze the lifecycle of microbial growth and the parameters that can influence it.
CO4	Interpret on the antimicrobial strategies associated in maintenance of sterility.
CO5	Evaluate the various antimicrobial modalities available in natural and pharmaceutical domain and their applications in present day research arena.

S23 GN 3.1: MOLECULAR BIOLOGY

CObj	Course Objectives
CObj_1	To provide comprehensive understanding of salient features and structure of nucleic acids.
CObj_2	To gain understanding of the key events of prokaryotic and eukaryotic replication, transcription, translation and mechanism of gene regulation and relevance of genomics and proteomics in biological sciences.
CObj_3	To develop adequate understanding of mutations and DNA repair mechanisms and their role in various genetic disorders.

CO	Course Outcomes After completion of this course, students should be able to:
CO1	Elaborate the structure of nucleic acids and fundamental role of DNA and RNA as the genetic material in living organisms.
CO2	Differentiate and analyze the mechanism of DNA replication, transcription and translation in prokaryotes and eukaryotes.
CO3	Discuss the post- transcriptional and post- translational modifications in eukaryotes and its significance.
CO4	Analyze the mechanisms of regulation of gene expression in prokaryotes and eukaryotes.
CO5	Evaluate the beneficial and harmful effects of mutations and describe the role of DNA repair mechanisms in various genetic disorders.

S23 BT 3.1: BIOCHEMISTRY

CObj	Course Objectives
CObj_1	Enable the Students to Understand the Basic Concepts in Biological Chemistry with the Emphasis on Biomolecules and its Function in Living Systems.
CObj_2	Enable the Students to get an overall Understanding on Metabolic reactions in Living Systems.
CObj_3	Enable the Students to Understand the basics of different Analytical Instruments Concepts, Working Principle, Construction, Interpretation of Results and Applications

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Provide scientific basics of the life processes at the molecular level and to explain the Structure, Function and Inter-relationships of Biomolecules.
CO2	Acquire knowledge on the building blocks of the macromolecules, their chemical properties, their modification and their importance in normal functioning of Living Systems.
CO3	Apply the metabolic pathways and identify how the abnormalities disturb the normal homeostasis and link with pathological conditions.
CO4	Acquaint on handling and critically analyzing various Laboratory Equipments.
CO5	Enrich the skills with contemporary sophisticated equipment, able to elucidate and characterize their salient features.

S21 GN 4.1: HUMAN GENETICS AND GENETIC COUNSELING

CObj	Course Objectives
CObj_1	To acquire knowledge in basic concepts of Human Genetics.
CObj_2	To provide in-depth knowledge in pedigree analysis and inheritance of Human traits.
CObj_3	To gain knowledge and understanding about Genetic Counseling and identification of specific diseases.

CO	Course Outcomes After completion of this course, students should be able to:
CO1	Build a stable foundation of knowledge in basic concepts of human genetics.
CO2	Describe various patterns of inheritance, pedigree analysis and study the distribution of alleles governing human traits.
CO3	Derive a comprehensive understanding of the methods used in mapping complex traits.
CO4	Prepare a strong knowledge-base of various genetic disorders affecting humans.
CO5	Describe the basic concepts of genetic counseling and its components.

S23 BT 4.1: BIOSTATISTICS AND BIOINFORMATICS

CObj	Course Objectives
CObj	To imbibe the fundamental and technical knowledge of identification of research problem, collection of data, statistical analysis with suitable parameters and softwares, and interpretation of the results through a better problem solving approach.
CObj	To understand the basic principles and concepts of computers, bioinformatics, tools and statistical analysis software required for analysis of sequence identification, analysis tools like BLAST and MSA, proper target identification and phylogenetic analysis for meaningful conclusion.
CObj	To familiarize about the holistic approach of problem solving with experimental setup and results use statistical analysis and various bioinformatics tools.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Learn the fundamental way of solving problems in simpler manner to plan experiments, gather data, analyze statistically and conclude the results in scientific manner.
CO2	Efficiently analyze the experimental data recorded from their projects or laboratory experiments in a logical approach and statistically proof.
CO3	Gain insight into the basic aspects of computer application, its hardware and software, architecture, types of networking and file transfer protocols for efficient data transfer.
CO4	Familiarize with the usage of sequence information through analytical knowledge of various databases, database query, sequence analysis, prediction and respective interaction of proteins, with phylogenetic tree construction for evolutionary analysis.
CO5	Understand the depth of the analyzing the observed data in the heuristic approach through fundamental statistical tools and bioinformatics software in deducing the specific results.

S21 GN 5.1: GENETIC ENGINEERING

CObj	Course Objectives
CObj_1	To provide adequate knowledge on salient features and applications of tools used in RDT.
CObj_2	To gain understanding of the methodology involved and the various techniques used in construction of recombinant DNA.
CObj_3	To comprehend the various applications of Genetic Engineering.

CO	Course Outcomes After completion of this course, students should be able to:
CO1	Elucidate the features of various tools used in genetic engineering.
CO2	Understand the steps involved in recombinant DNA technology.
CO3	Analyze and implement the PCR and DNA sequencing techniques in molecular biology and recombinant DNA technology.
CO4	Evaluate the applications of recombinant DNA technology.
CO5	Execute laboratory experiments using the standard methods and techniques in molecular biology, with the appropriate analysis and interpretation of results obtained.

S21 GN 6.1 POPULATION AND EVOLUTIONARY GENETICS

COobj	Course Objectives
CObj_1	To provide a comprehensive overview of the concept of Evolution.
CObj_2	To explain the origin of life and explore salient features of various theories and mechanisms of evolution and speciation.
CObj_3	To impart detailed key concepts of population Genetics in terms of Hardy-Weinberg law.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Map out and perform a sequence of end-to-end genetic data analyzes to contextually address a biological question about a local species of flora/fauna.
CO2	Analyse the theories of evolution and its effect of systematic and dispersive forces on the population.
CO3	Design phylogenetic trees and highlight their construction along with interpretation.
CO4	Evaluate the structure of population with the in depth understanding of gene pool, deme and panmictic unit.
CO5	Apply the knowledge speciation mechanisms in inbreeding and its effect on genotype frequencies.

S23 BT 5.1: GENOMICS AND PROTEOMICS

COobj	Course Objectives
CObj_1	To understand the principles and concepts of genomics and proteomics and introduces the relatively new and cutting edge discipline of genomics.
CObj_2	Aims to provide students with an overview of revolutionary genome sequencing technologies and their applications.
CObj_3	To lay a strong technical foundational skills about the breakthrough technologies in the construction of genome and proteome maps of prokaryotes and eukaryotes.

CO	Course Outcomes After completion of this module, students should be able to
CO1	Comprehend the basic conceptual and working knowledge about the genomics and proteomics.
CO2	Apply the knowledge about the basic concepts of sequencing, guidelines and procedures for protein purification and characterization techniques
CO3	Analyze the technological advances led to conceptual advances in genomics.
CO4	Interpret on the applications of genomics and proteomics to human disease, crop improvement, and other applied areas.
CO5	Evaluate the significance of databases and computational tools to ‘omics’ data analysis, online data repositories, resources and utilize major web resources in genomics.

S23 BT 6.1: PLANT BIOTECHNOLOGY

CObj	Course Objectives
CObj_1	Make students to develop depth knowledge on biotechnological tools and techniques involved in plant improvement.
CObj_2	Disseminate students with precise understanding on principles and techniques of plant tissue culture.
CObj_3	Inculcate a critical thinking on the role of genetic engineering in plants and transgenic technology with current studies.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Comprehend the conceptual understanding of biotechnological tools and techniques in plant improvement.
CO2	Apply the knowledge on basic concepts in plant tissue culture and establishment different types of *in vitro* cultures for plant regeneration.
CO3	Analyze the in-depth knowledge in gene manipulation strategies and gene transfer techniques.
CO4	Interpret on the development of transgenic plants and its application.
CO5	Evaluate the concepts of intellectual property rights and biosafety measures.

S21 GN 7.1: DEVELOPMENTAL GENETICS & PHARMACOGENETICS

CObj	Course Objectives
CObj_1	To provide the fundamental understanding of the process that controls embryonic development, analyze Cell fate and pattern formation, molecular analysis of basic body plan.
CObj_2	To enable students to comprehend how basic pharmacokinetic processes are defined, expressed and affected; how pharmacokinetics together with pharmacodynamics determine the effect intensity and effect duration of a drug.
CObj_3	To impart knowledge of basic concepts of toxicology and pharmacogenetics, applications of pharmacogenetics and the process of drug development.

CO	Course Outcomes After completion of this course, students should be able to:
CO1	Provide an in-depth account of molecular events of fertilization and genetics of multicellularity cleavage in early development.
CO2	Analyze the early vertebrate development and morphogenetic and cell movement, analyze cell fate and pattern formation in different organisms and illustrate the role of environment in development.
CO3	Correlate the relationship between pharmacokinetics and pharmacodynamics, and also comprehend toxicology to prevent adverse medication implications in patients and to relate the concepts with the best and advanced clinical practice to augment drug delivery care.
CO4	Apply principles underlying pharmacogenetics and evaluate how genetic variations in drug-metabolizing enzymes, drug transporters, and drug targets can influence individual responses to medications.
CO5	Evaluate the process of drug development and account for critical factors and decision points in the drug development process.

S21 GN 8.1: BIOMEDICAL GENETICS

CObj	Course Objectives
CObj_1	To acquaint with various genetically inherited and infectious diseases.
CObj_2	To provide comprehension of the molecular basis of common diseases and predict inheritance patterns.
CObj_3	To demonstrate mastery of cutting edge research approaches in developing various molecular therapeutics.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Demonstrate an integrated understanding of the mechanisms underlying genetically inherited diseases, infectious diseases, and common diseases influenced by genetic factors.
CO2	Apply problem-solving skills in interpreting genetic susceptibility and multifactorial inheritance models.
CO3	Illustrate the role of genetic and genomic assessment in clinical practice, including applications in disease screening, diagnosis, and treatment.
CO4	Illustrate the production of recombinant proteins and their application in the medical field.
CO5	Apply the understanding of Genetics in biomedical research and industry.

S23 BT 7.1: IMMUNOLOGY

CObj	Course Objectives
CObj_1	To enable students to understand the fundamental principles of immunology and medical biotechnology based on their knowledge of basic courses like biochemistry, genetics, cell biology and microbiology.
CObj_2	To inculcate the deployment of the basic knowledge in understanding the mechanism of immune system functioning and the various techniques involved in medical biotechnology.
CObj_3	To equip the students with the research aptitude to integrate the theoretical knowledge with research experiments by providing latest technologies developed and instil creativity by exposure to the current case studies.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Comprehend the understanding and compare the primary and secondary immune response with the appropriate examples.
CO2	Apply the knowledge of the antigen antibody interactions, diverse diagnostic techniques involved and explore the principle of vaccination.
CO3	Analyse the pathophysiology of human diseases and underlying concepts of tumour biology.
CO4	Interpret on the pharmaceutical biology concepts and to update the knowledge on designing drugs and clinical trials.
CO5	Evaluate and judge the knowledge of immunology and medical Biotechnology for utilization in executing and management in career.

S21 BT 8.1: BIOPROCESS TECHNOLOGY

CObj	Course Objectives
CObj_1	Impart knowledge on Design and Operations of Fermentation Processes and to endow the students with the basics of Microbial Kinetics.
CObj_2	Evaluate the Formulation of Media and Types of Bioreactors for Industrially Important Microbes.
CObj_3	Understand the Applications of Bioprocess Technology in Production of Microbial Products, Vaccines and Antibiotics.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Comprehend the knowledge of bioprocess technology and formulate, execute the isolation and screening of industrially important microbes.
CO2	Apply and develop an understanding of bioreactors – design, functions and process control
CO3	Analyse the requisites for upstream – scale up process and assess the strategies of downstream processing for product recovery
CO4	Interpret on the experimental knowledge of microbial production of various industrial products such as alcohol, organic acids, amino acids, antibiotics, exo-polysaccharides, enzymes, vitamins etc.
CO5	Evaluate the scientific and technological knowledge on the use of Bioprocesses for industrial products on the cell and process level.

S21 ZO1.1: Cell Biology, Cytogenetics and Infectious diseases

CObj_ID	Course Objectives
CObj_1	To impart detailed understanding of structures and purpose of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, and organelles
CObj_2	To understand the structure of eukaryotic genomes from the level of the chromosomes to the level of the genes.
CObj_3	To gain basic knowledge on infectious and non-infectious diseases

CO_ID	Course Outcomes
CO_1	Acquire comprehensive knowledge of the basic aspects of cell cycle and know the importance of various cells in body of organisms
CO_2	Gain better understanding about the scope of cell biology
CO_3	Demonstrate the ability to integrate physiology from the cellular and molecular level to the organ system and organismic level of organization.
CO_4	Demonstrate knowledge of cellular and organ systems function.
CO_5	Acquire knowledge and skills about causes and prevention of infectious diseases

BC 1.1: Chemical Foundation of Biochemistry – 1

CObj_ID	Course Objectives
CObj_1	To understand chemical basis of bioprocesses, organization of organisms, fundamental properties of elements and units of measuments.
CObj_2	To revisit the fundamentals concepts of chemical bonds, electronic configuration, concepts of acids/ bases/ buffers and their importance in biological systems.
CObj_3	To familiarize with thermodynamic concepts as applicable to biological processes.

CO_ID	Course Outcomes
CO_1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
CO_2	To understand the concepts of mole, mole fraction, morality and to apply them in biochemical research.
CO_3	To know the significance of chemical bonding, electronic configuration and theories of bond formation
CO_4	To understand the concepts of acids, bases, indicators, buffers and realize the importance of water as a universal solvent.
CO_5	To recognize the fundamentals of electrochemistry and the thermodynamic basis of biochemical reactions.

S21ZO2.1: **Biochemistry and Physiology**

CObj_ID	Course Objectives
CObj_1	To familiarize the students with major biomolecules namely carbohydrates, lipids, proteins and nucleic acids which are important for the structural organization and functions of the cells.
CObj_2	To impart detailed understanding of the organic structure of living systems acids, laying the foundation for other advanced courses like molecular biology, immunology.
CObj_3	To gain basic knowledge on integrated aspect of functioning of the individual and all the systems in totality in body.

CO_ID	Course Outcomes
CO_1	Identify the structures of biomolecules, their chemical properties, functions and their roles in biological systems
CO_2	Understand enzymes and how they catalyse reactions as well as enzyme kinetics.
CO_3	Describe the synthesis of proteins, lipids, nucleic acids, and carbohydrates
CO_4	Demonstrate the ability to integrate physiology from the cellular and molecular level to the organ system and organismic level of organization.
CO_5	Understand the functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems;

BC 2.1: Chemical Foundation of Biochemistry – 2

CObj_ID	Course Objectives
CObj_1	To understand reaction kinetics, concepts of colloids and their biological applications.
CObj_2	To revisit concepts of organic chemistry and learn the role of stereochemistry in biological systems.
CObj_3	To familiarize with types of organometallic compounds and their biological effects.

CO_ID	Course Outcomes
CO_1	To understand the principles of chemical kinetics and their interpretation for biological systems
CO_2	To comprehend about types of colloids, their properties, examples and biological applications
CO_3	To analyze the concepts of stereochemistry of organic compounds and their importance in biomolecules
CO_4	To appreciate the roles of metals, non-metals, transition metals and organometallic compounds in biological systems.
CO_5	To study the properties of inorganic molecules and coordination coumpounds and understand the toxic effects of heavy metals.

S21 ZOO 3.1: Molecular Biology, Bioinstrumentation and Techniques in Biology

CObj_ID	Course Objectives
CObj_1	To impart detailed understanding of key events of molecular biology like salient features of nucleic acids, mechanism of DNA Replication, central dogma of biology, Transcription and Translation in Prokaryotes.
CObj_2	To understand the applications of the instruments that are routinely used for the characterization of biomolecules
CObj_3	To gain basic knowledge on the theory, operation and function of analytical instruments.

CO_ID	Course Outcomes
CO_1	Acquire better understanding and comprehensive knowledge of the basic and essential aspects of molecular biology subject which in turn helps to develop professional skills in the field of molecular biology.
CO_2	Explain in a simple way how DNA, RNA and proteins are being synthesized and describe how gene expression is regulated in cells
CO_3	Discuss the applications and principle involved in bio instruments used in analytical laboratories
CO_4	Describe the methodology involved in biotechniques
CO_5	Demonstrate knowledge and practical skills of using instruments in biology

S21 BC 3.1: Bioorganic chemistry

CObj	Course Objectives
CObj_1	To understand general reaction mechanisms of organic compounds and the concepts of allides, alcohols and carbonyl compounds.
CObj_2	To revisit the fundamentals concepts of primary and secondary metabolites of cells.
CObj_3	To familiarize with bioorganic compounds like nutrients, proteins, vitamins and drugs.

CO	Course Outcomes
CO1	To appreciate the concepts of reaction mechanisms of hydrocarbons.
CO2	To understand the properties and importance of allides, alcohols and carbonyl compounds.
CO3	To know the significance of primary metabolites in living organisms such as carboxylic acids, amines and heterocyclic compounds.
CO4	To understand the significance of secondary metabolites in living organisms, such as terpenes and alkaloids.
CO5	To recognize the fundamentals of nutrition, nutrients and understand about drugs and antibiotics.

S21ZOO 4.1: Gene Technology, Immunology and Computational Biology

CObj	Course Objectives
CObj_1	To acquire knowledge on basics and applications of recombinant DNA technology in biotechnological research
CObj_2	To gain understanding on immunological response and how it is regulated
CObj_3	To comprehend the creative use of modern tools and techniques for manipulation and analysis of genomic sequences.

CO	Course Outcomes
CO1	Outline the fundamental steps of genetic engineering and describe the versatile tools and techniques employed in genetic engineering
CO2	Gain knowledge on the applications of rDNA technology from academic and industrial perspective.
CO3	Understand cellular and molecular basis of immune responsiveness
CO4	Gain insights in Primary and Secondary organs of Immune system.
CO5	Understand knowledge on Protein and Genome Databases, Data Retrieval tools

S21 BC 4.1: Analytical Biochemistry

CObj_ID	Course Objectives
CObj_1	To understand the strategies in biochemical investigations employing variousbasic biochemical techniques.
CObj_2	To understand the principles and applications of various techniques employedfor separation and analysis of biomolecules.
CObj_3	To familiarize with basic culture techniques in microbiology.

CO_ID	Course Outcomes
CO_1	To understand the principles of biochemical analysis employing variousbioanalytical techniques.
CO_2	To comprehend about general principles of various chromatographictechniques useful for bioanalysis.
CO_3	To analyze biomolecules using electrophoretic methods.
CO_4	To appreciate the importance of spectroscopic techniques in molecularanalysis.
CO_5	To study the properties of microorganisms and their handling techniques.

S21ZO5.1: Non-chordates and Economic Zoology

CObj	Course objective
CObj_1	To understand the taxonomic position of non-chordate
CObj_2	To understand the body organization and general characteristics of animals belonging to different phyla
CObj_3	To understand the experiential learning on the methodology and economic aspects of culturing animals

CO	Course outcomes After completion of this module, students should be able to
CO1	Develop appreciation on diversity of life on earth.
CO2	Recognize different levels of biological diversity through the systematic classification of non-chordates
CO3	Comprehend the evolutionary significance of non-chordates
CO4	Understand the economic aspects of culturing animals
CO5	Acquire knowledge on various useful and harmful organisms

S21ZO6.1: Chordates and Comparative Anatomy

CObj	**Course objective**
CObj_1	To understand different categories of chordates and the general characters of chordates
CObj_2	To understand the level of organization in chordate subphylum and their origin and evolutionary relationship
CObj_3	To find differences and similarities between the body structure of species to predict whether they are related to a common ancestor or not.

CO	Course outcomes After completion of this module, students should be able to
CO1	Describe unique characters of chordates
CO2	Recognize the life functions of chordates.
CO3	Understand the ecological role of different groups of chordates.
CO4	Identify the major organs common in organisms
CO5	Compare and contrast the anatomical systems of different organisms

BC 5.1: Biochemistry of Macromolecules

CObj	Course Objectives
CObj_1	To understand chemical basis of biological process.
CObj_2	To revisit the fundamental concepts of correlation of macromolecules and its chemical reactions.
CObj_3	To familiarize with understanding of significance of macromolecular structures in understanding the life process.

CO	Course Outcomes
CO_1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
CO_2	To understand the basic concepts of carbohydrate structures and biological roles relevant to living cell growth and division.
CO_3	To know the significance of coordination of lipid molecules and their properties in a living cell structure.
CO_4	To understand the structural and chemical properties of amino acids and proteins in living systems.
CO_5	To understand the composition and structure of RNA and DNA those regulate the biological process.

BC 5.3: Human Physiology and Cell Biology

COobj	Course Objectives
CObj_1	To understand the structures and purposes of basic components of cells, especially membranes and organelles
CObj_2	To revisit the fundamentals concepts of cells and tissues, organ systems and their working
CObj_3	To familiarize with physiology and biochemistry of processes and organization of various organ systems

CO	Course Outcomes
CO1	To appreciate the concepts of cell biology, tissue organization, organ systems and physiological processes
CO2	To comprehend the structural organization, functioning and important cellular events of cells and cell organelles
CO3	To understand importance of tissues, and organization, dynamics and role of organs in circulatory and skeletal systems
CO4	To understand the biochemistry and physiology of digestive, excretory and respiratory systems
CO5	To recognize the fundamentals of biochemistry and physiology of muscular, nervous and endocrine systems

S21ZO7.1: Evolutionary and Developmental biology

COobj	Course objective
CObj_1	To demonstrate understanding of ecological and evolutionary processes
CObj_2	To describe the theory of natural selection and to understand how species evolve
CObj_3	To understand the complete process of development in organisms

CO	Course outcomes After completion of this module, students should be able to
CO1	Describe evolutionary history of man.
CO2	Describe origin of species on earth.
CO3	List the types of characteristics that make an organism ideal for the study of developmental biology.
CO4	Recognize the events that lead to fertilization
CO5	Distinguish between evolutionary and developmental biology

S21ZO8.1: Environmental biology, Wild life conservation & Management

CObj	Course objective
CObj_1	To study the factors those maintains or degrade biodiversity.
CObj_2	To learn about sustainability, energy efficient & climate-appropriate solutions
CObj_3	To learn about Maintenance of threatened species and protect species which are on the verge of extinction

CO	Course outcomes After completion of this module, students should be able to
CO1	Apply the scientific method and quantitative techniques to describe, monitor and understand environmental systems.
CO2	Use interdisciplinary approaches such as ecology, economics, ethics and policy to devise solutions to environmental problems.
CO3	Gain knowledge in ecological field methods
CO4	Appreciate & implement situation analysis for conservation and management
CO5	Understand the applications of emerging tools and techniques in wildlife conservation.

BC 6.1: Enzymology

CObj	Course Objectives
CObj_1	To provide detailed knowledge about enzymes, the biological catalysts with remarkable properties.
CObj_2	To outline the diverse applications of enzymes in disease diagnosis and therapy as well as in industry
CObj_3	To develop an understanding of enzyme kinetics, mechanism of enzyme action, enzyme inhibition and their regulation.

CO	Course Outcomes
CO_1	To understand the nature and importance of enzymes in living systems.
CO_2	To gain insight into the molecular basis of catalysis by enzymes and the underlying basis of their specificity
CO_3	To comprehend the applications of enzymes in research and medicine as well as in industry, which will bolster their foray into industrial and biomedical research.
CO_4	To analyze the concepts of kinetics of enzyme catalyzed reactions, their mechanisms of enzyme action and clinical importance of enzyme inhibitors
CO_5	To appreciate how enzymes are regulated and the physiological importance of enzyme regulation in the cell

BC 6.3: Intermediary Metabolism

CObj	Course Objectives
CObj_1	To understand the concepts of biochemical reactions in cells.
CObj_2	To familiarize with understanding of metabolic pathways both catabolism and anabolism, and energy production.
CObj_3	To revisit the fundamental concepts of correlation of macromolecules and their chemical reactions.

CO	Course Outcomes
CO_1	To appreciate the basics of biochemical reactions and its molecular and functional connection to the organization of a cell and sub-cellular components
CO_2	To know the fates of different types of carbohydrates and its regulation that can influence the growth and existence of living organism.
CO_3	To analyze the significance of lipid metabolic pathways
CO_4	To understand degradative and biosynthetic reactions of amino acids and nucleotides and associated metabolic disorders.
CO_5	To evaluate the biochemistry behind photosynthesis process and nitrogen fixation.

B.Sc. (G-Bc)

S21 GN 1.1: Cell Biology and Genetics

CObj	Course Objectives
CObj_1	Students will be able to understand and summarize the structures and functions of various cellular components, especially the membrane, organelles and chromosomes, molecular regulation of cell cycle and programmed cell death.
CObj_2	Students will describe the types and properties of cancer and identify the cellular and molecular mechanisms that are deregulated in cancerous cells.
CObj_3	Students will evaluate and expand their comprehension of genetics by applying this knowledge in a variety of problem-solving situations.

CO	Course Outcomes
CO_1	Apply a basic core of scientific knowledge to augment understanding of cell structure and function at the molecular level.
CO_2	Compare and contrast the events of cell division and programmed cell death.
CO_3	Acquire the basic principles of inheritance as formulated by Mendel and extension to mendelian inheritance including multiple allelism and gene interactions.
CO_4	Illustrate the properties of cancer cells and compare the types of cancers.
CO_5	Integrate the basic knowledge in cell biology and genetics with other related disciplines.

BC 1.1: Chemical Foundation of Biochemistry – 1

CObj_ID	Course Objectives
CObj_1	To understand chemical basis of bioprocesses, organization of organisms, fundamental properties of elements and units of measurements.
CObj_2	To revisit the fundamentals concepts of chemical bonds, electronic configuration, concepts of acids/ bases/ buffers and their importance in biological systems.
CObj_3	To familiarize with thermodynamic concepts as applicable to biological processes.

CO_ID	Course Outcomes
CO_1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
CO_2	To understand the concepts of mole, mole fraction, morality and to apply them in biochemical research.
CO_3	To know the significance of chemical bonding, electronic configuration and theories of bond formation
CO_4	To understand the concepts of acids, bases, indicators, buffers and realize the importance of water as a universal solvent.
CO_5	To recognize the fundamentals of electrochemistry and the thermodynamic basis of biochemical reactions.

S21 GN 2.1: Bio Instrumentation and Animal Cell Culture

CO	Course Objectives
CObj_1	To Comprehend the principles of Genetics and link it to modern applications in human genetics and genomics.
CObj_2	To Illustrate genetic structure, function and change.
CObj_3	To Evaluate and apply the expansive territories of cutting edge fields of study like Cytogenetics, molecular genetics, applied genetics, bioinformatics in present day research.

CO_ID	Course Outcomes
CO_1	It provides an understanding of the principles of biology and genetics to build a sound foundation of knowledge of various fields of genetic study.
CO_2	It paves way for an in-depth understanding of the deviant patterns of inheritance and concepts of chromosomal sex determination.
CO_3	The course helps to integrate the basic knowledge in genetics with other related disciplines.
CO_4	It enables the students to obtain a knowledge base of the various application of genetics in various fields and industries.
CO_5	The course enables students demonstrate proficiency in quantitative reasoning and inculcate acute analytical and interpretation skills requiredto excel and further their scientific career in the field.

BC 2.1: Chemical Foundation of Biochemistry – 2

CObj_ID	Course Objectives
CObj_1	To understand reaction kinetics, concepts of colloids and their biological applications.
CObj_2	To revisit concepts of organic chemistry and learn the role of stereochemistry in biological systems.
CObj_3	To familiarize with types of organometallic compounds and their biological effects.

CO_ID	Course Outcomes
CO_1	To understand the principles of chemical kinetics and their interpretation for biological systems
CO_2	To comprehend about types of colloids, their properties, examples and biological applications
CO_3	To analyze the concepts of stereochemistry of organic compounds and their importance in biomolecules
CO_4	To appreciate the roles of metals, non-metals, transition metals and organometallic compounds in biological systems.
CO_5	To study the properties of inorganic molecules and coordination coumpounds and understand the toxic effects of heavy metals.

S21 GN 3.1: Biomolecules and Molecular Genetics

CObj_ID	Course Objectives
CObj_1	To provide in-depth understanding of types of Biomolecules.
CObj_2	To impart knowledge about biological pathways in metabolism of Biomolecules.
CObj_3	To acquire knowledge on basic concepts on mutagens and mutagenic agents.

CO_ID	Course Outcomes
CO_1	Describe biological pathways involved in biosynthesis and metabolism of Biomolecules.
CO_2	Obtain a comprehensive understanding of salient features and structure of nucleic acids.
CO_3	Build a strong knowledge-base of prokaryotic and eukaryotic replication, transcription andtranslation.
CO_4	Gain knowledge of basic concepts of mutation, mutagenesis and mutagenic agents and their effects, effects of physical and chemical mutagens.
CO_5	Derive an understanding of bacterial genetics and recombination in bacteria.

S21 BC 3.1: Bioorganic chemistry

CObj	Course Objectives
CObj_1	To understand general reaction mechanisms of organic compounds and the concepts of allides, alcohols and carbonyl compounds.
CObj_2	To revisit the fundamentals concepts of primary and secondary metabolites of cells.
CObj_3	To familiarize with bioorganic compounds like nutrients, proteins, vitamins and drugs.

CO	Course Outcomes
CO1	To appreciate the concepts of reaction mechanisms of hydrocarbons.
CO2	To understand the properties and importance of allides, alcohols and carbonyl compounds.
CO3	To know the significance of primary metabolites in living organisms such as carboxylic acids, amines and heterocyclic compounds.
CO4	To understand the significance of secondary metabolites in living organisms, such as terpenes and alkaloids.
CO5	To recognize the fundamentals of nutrition, nutrients and understand about drugs and antibiotics.

S21 GN 4.1: Human Genetics and Genetic Counseling

CObj_ID	Course Objectives
CObj_1	To enable the Students to acquire knowledge in basic concepts of Human Genetics.
CObj_2	To provide in-depth knowledge in pedigree analysis and inheritance of Human traits.
CObj_3	To impart knowledge and understanding about Genetic counselling and identification of specific diseases.

CO_ID	Course Outcomes
CO_1	Build a stable foundation of knowledge in basic concepts of human genetics.
CO_2	Describe various patterns of inheritance, pedigree analysis and study the distribution of alleles governing human traits.
CO_3	Derive a comprehensive understanding of the methods used in mapping complex traits.
CO_4	Build a strong knowledge-base of various genetic disorders afflicting humans.
CO_5	Gain knowledge of basic concepts of genetic counseling and its components.

S21 BC 4.1: Analytical Biochemistry

CObj_ID	Course Objectives
CObj_1	To understand the strategies in biochemical investigations employing various basic biochemical techniques.
CObj_2	To understand the principles and applications of various techniques employed for separation and analysis of biomolecules.
CObj_3	To familiarize with basic culture techniques in microbiology.

CO_ID	Course Outcomes
CO_1	To understand the principles of biochemical analysis employing various bioanalytical techniques.
CO_2	To comprehend about general principles of various chromatographic techniques useful for bioanalysis.
CO_3	To analyze biomolecules using electrophoretic methods.
CO_4	To appreciate the importance of spectroscopic techniques in molecular analysis.
CO_5	To study the properties of microorganisms and their handling techniques.

S21 GN 5.1: GENETIC ENGINEERING

THEORY

CObj	Course Objectives
CObj_1	To provide adequate knowledge on salient features and applications of tools used in RDT.
CObj_2	To enable students to understand the methodology involved and the various techniques used in construction of recombinant DNA.
CObj_3	To enable students to comprehend the various applications of RDT.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Elucidate the features of various tools used in genetic engineering.
CO2	Understand the steps involved in recombinant DNA technology.
CO3	Analyze and implement the PCR and DNA sequencing techniques in molecular biology and recombinant DNA technology.
CO4	Understand the applications of recombinant DNA technology.
CO5	Execute laboratory experiments using the standard methods and techniques in molecular biology, with the appropriate analysis and interpretation of results obtained.

S21 GN 6.1 ADVANCED PLANT AND ANIMAL TISSUE CULTURE TECHNOLOGY

CObj	Course Objectives
CObj_1	To enable students to demonstrate a sound knowledge of the fundamentals principles of plant and animal tissue culture.
CObj_2	To widen the knowledge of classical and modern plant and animal biotechnology processes, including breeding of healthy breeds, breeds with improved characteristics and breeds for biomolecule production.
COb_ 3	To facilitate the students to obtain skills on biotechnological processes such as cell tissue and organ culture, gene transfer with its applicative value in agriculture, pharmaceutical and food industry, and in ecology.

	Course Outcomes
CO1	Comprehend and describe various protocols of plant and animal cell, tissue, and organ culture as well as the scientific principles underlying the protocols.
CO2	To apply tissue culture technology for clonal propagation, assisting plant breeding and improvement, recovering cell lines from transformed cells, and production of valuable biochemical molecules.
CO3	To Initiate, analyze and identify concepts and strategies for molecular plant secondary metabolite engineering.
CO4	Acquired awareness of regulations and laws pertaining to ethical concerns using animals for genetic testing.
CO5	Apply knowledge acquired to explore the various applications of organ culture in biomedical research.

BC 5.1: Biochemistry of Macromolecules

COobj	Course Objectives
CObj_1	To understand chemical basis of biological process.
CObj_2	To revisit the fundamental concepts of correlation of macromolecules and its chemical reactions.
CObj_3	To familiarize with understanding of significance of macromolecular structures in understanding the life process.

CO	Course Outcomes
CO_1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
CO_2	To understand the basic concepts of carbohydrate structures and biological roles relevant to living cell growth and division.
CO_3	To know the significance of coordination of lipid molecules and their properties in a living cell structure.
CO_4	To understand the structural and chemical properties of amino acids and proteins in living systems.
CO_5	To understand the composition and structure of RNA and DNA those regulate the biological process.

BC 5.3: Human Physiology and Cell Biology

COobj	Course Objectives
CObj_1	To understand the structures and purposes of basic components of cells, especially membranes and organelles
CObj_2	To revisit the fundamentals concepts of cells and tissues, organ systems and their working
CObj_3	To familiarize with physiology and biochemistry of processes and organization of various organ systems

CO	Course Outcomes
CO1	To appreciate the concepts of cell biology, tissue organization, organ systems and physiological processes
CO2	To comprehend the structural organization, functioning and important cellular events of cells and cell organelles
CO3	To understand importance of tissues, and organization, dynamics and role of organs in circulatory and skeletal systems
CO4	To understand the biochemistry and physiology of digestive, excretory and respiratory systems
CO5	To recognize the fundamentals of biochemistry and physiology of muscular, nervous and endocrine systems

S21 GN 7.1: DEVELOPMENTAL GENETICS & PHARMACOGENETICS

CObj	Course Objectives
CObj_1	To provide the fundamental understanding of the process that controls embryonic development, analyze Cell fate and pattern formation, molecular analysis of basic body plan.
CObj_2	To enable students to comprehend how basic pharmacokinetic processes are defined, expressed and affected; how pharmacokinetics together with pharmacodynamics determine the effect intensity and effect duration of a drug.
CObj_3	To familiarize students with the basic concepts of toxicology and pharmacogenetics, applications of pharmacogenetics and the process of drug development.

CO	Course Outcomes After completion of this module, students should be able to:
CO1	Provide an in-depth account of molecular events of fertilization and genetics of multicellularity cleavage in early development.
CO2	Give an account of early vertebrate development and morphogenetic and cell movement, analyze cell fate and pattern formation in different organisms and illustrate the role of environment in development.
CO3	Understand and correlate the relationship between pharmacokinetics and pharmacodynamics, and also comprehend toxicology to prevent adverse medication implications in patients and to relate the concepts with the best and advanced clinical practice to augment drug delivery care.
CO4	Understand the basic principles underlying pharmacogenetics and evaluate how genetic variations in drug-metabolizing enzymes, drug transporters, and drug targets can influence individual responses to medications.
CO5	Outline the process of drug development and account for critical factors and decision points in drug development process.

S21 GN 8.1 POPULATION AND EVOLUTIONARY GENETICS

THEORY

CObj	COURSE OBJECTIVES
CObj_1	To provide a comprehensive overview of the concept of Evolution.
CObj_2	To explain the origin of life and explore salient features of various theories and mechanisms of evolution and speciation.
CObj_3	To impart detailed key concepts of population Genetics in terms of Hardy-Weinberg law.

CO	COURSE OUTCOMES After completion of this module, students should be able to
CO1	Obtain an academic specialty besides evolutionary trends.
CO2	Acquire in-depth understanding on theories of evolution.
CO3	Gain a glimpse of phylogenetic trees and highlight their construction along with interpretation.
CO4	Earn knowledge on mechanism of speciation.
CO5	Receive adequate information on concepts of population Genetics.

BC 6.1: Enzymology

COobj	Course Objectives
CObj_1	To provide detailed knowledge about enzymes, the biological catalysts with remarkable properties.
CObj_2	To outline the diverse applications of enzymes in disease diagnosis and therapy as well as in industry
CObj_3	To develop an understanding of enzyme kinetics, mechanism of enzyme action, enzyme inhibition and their regulation.

CO	Course Outcomes
CO_1	To understand the nature and importance of enzymes in living systems.
CO_2	To gain insight into the molecular basis of catalysis by enzymes and the underlying basis of their specificity
CO_3	To comprehend the applications of enzymes in research and medicine as well as in industry, which will bolster their foray into industrial and biomedical research.
CO_4	To analyze the concepts of kinetics of enzyme catalyzed reactions, their mechanisms of enzyme action and clinical importance of enzyme inhibitors
CO_5	To appreciate how enzymes are regulated and the physiological importance of enzyme regulation in the cell

BC 6.3: Intermediary Metabolism

CObj	Course Objectives
CObj_1	To understand the concepts of biochemical reactions in cells.
CObj_2	To familiarize with understanding of metabolic pathways both catabolism and anabolism, and energy production.
CObj_3	To revisit the fundamental concepts of correlation of macromolecules and their chemical reactions.

CO	Course Outcomes
CO_1	To appreciate the basics of biochemical reactions and its molecular and functional connection to the organization of a cell and sub-cellular components
CO_2	To know the fates of different types of carbohydrates and its regulation that can influence the growth and existence of living organism.
CO_3	To analyze the significance of lipid metabolic pathways
CO_4	To understand degradative and biosynthetic reactions of amino acids and nucleotides and associated metabolic disorders.
CO_5	To evaluate the biochemistry behind photosynthesis process and nitrogen fixation.

B.Sc. (C-Mb)

DSC-1: Analytical and Organic Chemistry-I

CObj_ID	Course Objectives
CObj_1	The main objective is to provide to the students an in depth understanding of the basic concepts of chemical sciences.
CObj_2	To enable them with tools needed for the practice of chemistry, which remains a discipline with much stress on experimentation.
CObj_3	To provide a detailed knowledge of the terms, concepts, methods, principles and experimental techniques of chemistry.

CO_ID	Course Outcomes
CO_1	Learn the concepts of chemical analysis, accuracy, precision and statistical data treatment
CO_2	Prepare the solutions after calculating the required quantity of salts in preparing the reagents/solutions and dilution of stock solution.
CO_3	Know the concept of volumetric and gravimetric analysis and deducing the conversion factor for determination
CO_4	Handle toxic chemicals, concentrated acids and organic solvents and practice safety procedures.
CO_5	Understand the concepts of Organic reactions and techniques of writing the movement of electrons, bond breaking, bond forming

S21 MB 1.1: General Microbiology

CObj_ID	Course Objectives
CObj_1	The objective of the course is to Know General bacteriology and microbial techniques for isolation of pure cultures of bacteria, fungi and algae.
CObj_2	To Master aseptic techniques and be able to identify the unknown microorganisms.
CObj_3	To understand the basic microbial structure and function and study the comparative characteristics of prokaryotes and eukaryotes.

CO_ID	Course Outcomes
CO_1	Comprehend the various methods for identification of unknown microorganisms.
CO_2	Apply practical skills in microscopy handling and staining techniques.
CO_3	Understand about the various physical and chemical means of sterilization.
CO_4	Understand the microbial transport systems and the modes and mechanisms of energy conservation in microbial metabolism.
CO_5	Knowledge about the microbial nutrition - Autotrophy and heterotrophy mode of nutrition.

DSC-2: Inorganic and Physical Chemistry-I

CObj_ID	Course Objectives
CObj_1	To understand the structure of the atom, shapes of different orbital's and properties of periodic table
CObj_2	To develop the ability to correlate the chemical and physical properties of elements and their compounds in the periodic table
CObj_3	An overview of close packing of metallic crystals, unit cell and crystal lattice, determination of surface tension, viscosity and refractive index of liquids. Colligative properties

CO_ID	Course Outcomes
CO_1	Students will learn the structure of an atom, electronic configuration. Schrodinger wave equation, Heisenberg's uncertainity principle, quantum numbers.
CO_2	Students will understand periodic properties of elements and their compounds.
CO_3	Students should be able to determine the difference between solids, liquids and gases.
CO_4	Students will be able to understand gas laws, theories and its application.
CO_5	Students will learn the physical properties of liquids and Colligative properties

S21 MB 2.1: Microbial Biochemistry and Physiology

CObj_ID	Course Objectives
CObj_1	The major objective of the course is to develop a clear understanding of various aspects of microbial physiology along with diverse metabolic pathways existing in bacteria in relation to its survival and propagation.
CObj_2	To provide the core principles and specialized knowledge of Carbohydrates, Lipids, Proteins, Vitamins, Porphyrin, cellular transport, law of thermodynamics, Lipid and Nitrogen metabolism.
CObj_3	To acquaint various life processes like photosynthesis, respiration, fermentation and anaerobic respiration.

CO_ID	Course Outcomes
CO_1	Evaluate the metabolic process of microbial system
CO_2	Apply the knowledge of biomolecules in biochemistry
CO_3	Analysis of the mechanism of bioenergetics and photosynthesis.
CO_4	Analysis of the mechanism of fermentation and anaerobic respiration.
CO_5	Able to predict the intermediate product which can be used for industrial production processes.

DSC-3: Analytical and Organic Chemistry-II

Course Objectives:

1) Interrelationship among frequency, wavelength and wave number and importance of validation parameters of an instrumental method will be taught
2) Principle,instrumentationandapplicationsofspectrophotometry,nephelometryand turbidometry will be taught
3) Fundamentalsofseparationmethodsandprinciplesofpaper,thinlayerandcolumnchrom atographywillbetaught
4) Principle, types and applications of solvent extraction will be taught
5) Principle and mechanism of ion-exchange, types of resins and domestic and industrial applications of ion-exchange chromatography will be taught
6) The concept of mechanism and its importance will be taught to the student
7) Conceptandimportanceofintermediatesinorganicchemistrywillbetaughttakingprope rexamples
8) The various techniques for identification of reaction mechanism will be taught to the student taking proper examples
9) Concept of stereochemistry and its importance will be taught.
10) Thevariousprojectionformulaeandthetechniquesofdesignatingthemoleculesinto R,S,D,Lwillbetaughttaking proper examples
11) The theory and concept of Cis-,Trans-isomerism and its importance and the techniques to differentiate between them will be taught taking examples

Course Specific Outcomes

After the completion of this course, the student would be able to

1) Understandtheimportanceoffundamentallawandvalidationparametersinchem icalanalysis
2) Know how different analytes in different matrices (water and real samples) can be determined by spectrophotometric, nephelometric and turbidimetric methods.
3) Understand the requirement for chemical analysis by paper, thin layer and column chromatography.
4) Apply solvent extraction method for quantitative determination of metal ions in different samples
5) Utilize the ion-exchange chromatography for domestic and industrial applications
6) Explain mechanism for a given reaction.
7) Predict the probable mechanism for a reaction. Explain the importance of reaction intermediates, its role and techniques of generating such intermediates
8) ExplaintheimportanceofStereochemistryinpredictingthestructureandpropertyoforg anicmolecules.
9) Predict the configuration of an organic molecule and able to designate it.
10) Identify the chiral molecules and predict its actual configuration

S21 MB 3.1 - Microbial diversity

CObj	Course Objectives
CObj_1	To expand knowledge on evolution and microbial diversity.
CObj_2	To understand bacterial taxonomy.
CObj_3	To study various classes of fungi in terms of their characteristic features.

CO	Course Outcomes
CO1	To demonstrate an understanding of bacterial, fungal, cyanobacterial, viral and rickettsial classifications, culturing, reproduction and significance.
CO2	The student will learn the techniques of studying bacterial growth curve and factors affecting growth curve.
CO3	The students will gain knowledge about role of macronutrients and micronutrients in growth of microbes.
CO4	Develop an understanding of physiological and molecular diversity within a community of microbes.
CO5	Understand the principles and methods behind studying and identifying cultured and uncultured microorganisms.

DSC-4: Inorganic and Physical Chemistry-II

Course Objectives:

Students learn about

1. Different types of bonding in molecules/compounds/ions
2. The structures of molecules/compounds/ions based on differentmodels/theories
3. Properties of compounds based on bonding and structure
4. The fundamentals of thermodynamics including the laws, the concept ofentropy and free energy functions and their applications.
5. The concepts of surface chemistry, catalysis and their applications.
6. The theoretical and experimental aspects of chemical kinetics including basic theories of reaction rates and methods of determining order.
7. Electrochemistry dealing with electrolytes in solution. Conductance measurements and applications. Concept of ionic mobility and their determination.

Course outcomes: After the completion of this course, the student would be able to

1. Predict the nature of the bond formed between different elements
2. Identify the possible type of arrangements of ions in ionic compounds
3. Write Born - Haber cycle for different ionic compounds
4. Relate different energy parameters like, lattice energy, entropy, enthalpy andsolvation energy in the dissolution of ionic solids
5. Explain covalent nature in ionic compounds
6. Write the M.O. energy diagrams for simple molecules
7. Differentiate bonding in metals from their compounds
8. Learn important laws of thermodynamics and their applications to various thermodynamic systems
9. Understand adsorption processes and their mechanisms and the function and purpose of a catalyst

S21 MB 4.1: Microbial Enzymology and Metabolism

CObj	**Course Objectives**
CObj_1	To understand the mechanism of enzyme kinetics
CObj_2	To develop clear understanding of various aspects of microbial physiology along with diverse metabolic pathways existing in bacteria in relation to its survival and propagation
CObj_3	To provide the core principles and specialized knowledge of Carbohydrates, Lipids, Proteins metabolism
CO	**Course Outcomes**
CO1	The students will be able to make qualitative and quantitative descriptionof the basic enzymatic phenomena and processes
CO2	Understand the importance of mathematical and statistical methods required for the description, interpretation of enzymatic phenomena and processes
CO3	Knows the basic concepts, terms and techniques used in enzymology
CO4	Understand the regulation of biochemical pathway and possible process modifications for improved control over microorganisms for microbial product synthesis.
CO5	Concepts of lipid and nitrogen metabolism, oxidation of fatty acid

Course Code: S21 CHE5.1

Course Name: (Selected topics in Inorganic Chemistry)

CObj_ID	**Course Objectives**
CObj_1	To explore in depth specialized areas of chemistry of materials, including ores, metals, acids and bases and to understand how metals are extracted from their ores.
CObj_2	understand the trends in properties and reactivity of the s, p-block elements and noble gases
CObj_3	To become familiar with some of the roles of inorganic polymer and its applications in day to day life.

CO	**Course Outcomes** After completion of this module, students should be able to
CO1	Analyze fundamental aspects of main group chemistry, including trends in oxidation states, periodic properties and complex formation tendency.
CO2	Pursuing research in the field of chemical metallurgy.
CO3	Familiar with a variety of different methods for synthesizing inorganic materials and principles of inorganic polymer synthesis.
CO4	Deduce the shape (geometry) of molecules using radius ratio rules & VSEPR theory.
CO5	Draw MO diagrams for a few homo- & hetero-nuclear diatomic molecules and to calculate the bond order

Course Code: S21 CHE6.1
Course Name: (Selected topics in Organic chemistry)

CObj_ID	Course Objectives
CObj_1	Differentiate chiral and achiral molecules.
CObj_2	Identify the stereo centers in a molecule and assign the configuration as R or S
CObj_3	Know about the most important simple heterocyclic ring systems containing heteroatom and their systems of nomenclature and numbering.

CO	Course Outcomes After completion of this module, students should be able to
CO1	Elucidate structure of organic compounds with specific examples of terpenes and alkaloids by practical approach.
CO2	Understand the applications of these compounds including their medicinal applications through their reaction chemistry.
CO3	Learn about basic principles of UV, IR and NMR spectroscopic techniques to interpret the spectra to determine structure and stereochemistry of known and unknown compounds
CO4	Develop a sound understanding of the fundamental concepts of stereochemistry
CO5	Understand thoroughly the chemistry of compounds having nitrogen containing functional groups, heterocyclic, polynuclear hydrocarbons, alkaloids and terpenes which includes various methods for synthesis.

S21 MB 5.1 – Microbial Genetics and Molecular Biology

CObj_ID	Course Objectives
CObj_1	The major objective of the course is to to understand how microorganisms can be used as tools to understand various biological phenomena.
CObj_2	To acquaint types of mutation, gene regulation and transposable element
CObj_3	To acquire in-depth study on structure and organization of chromosome, replication process, transcription process, translation process and mutagenesis.

CO_ID	Course Outcomes
CO_1	Outline the structure of the prokaryotic and eukaryotic genome and discuss the types mutation and DNA repair mechanism.
CO_2	Analyze the genetic recombination and the overview of bacterial genetic maps and interpret the gene transfer mechanism in bacteria.
CO_3	Understand the central dogma and regulation of gene expression.
CO_4	Evaluate the operon model and molecular techniques with different samples.
CO_5	Apply the recombinant DNA technology in the agricultural, medical and industrial and environmental field.

S21 MB 6.1 – Immunology and Medical Microbiology

	Objective
CObj_1	To develop students' understanding of medical microbiology with hand on experience in the isolation and identification of the microorganisms from different clinical samples
CObj_2	To strengthen the knowledge of students in immunology and immunodiagnostics
CObj_3	To explain the various pathological events during the progression of an infectious disease caused by common pathogenic microorganisms

	Outcome
CO1	Illustrate the cells, tissues, organs of the immune system and types of immunity.
CO2	Understand the properties, functions of Antigens, antibodies and complement system and antigen and antibody reactions
CO3	Analyze the symptoms, pathogenesis, laboratory diagnosis and control measures of bacterial, fungal, viral and protozoa
CO4	Elaborate the antimicrobial agents to handle microorganism in risk groups
CO5	Apply the immuno and molecular techniques for the diagnosis of disease.

S21 CHE7.1: Selected topics in Physical Chemistry

CObj_ID	Course Objectives
CObj_1	To expose students to various physical methods like electrochemical techniques.
CObj_2	To teach students the titrimetric and instrumental methods for analytical studies.
CObj_3	To study the advanced methods of analysis.

CO	Course Outcomes After completion of this module, students should be able to
CO1	Develop skills in distillation, solvent extraction, TLC and column chromatography.
CO2	Know different chemical equilibriums and relationship between them.
CO3	Know why there is lowering in vapour pressure , Rault's law , Henry's law and their applications
CO4	Study about elevation in boiling point and depression in freezing point, their conditions of occurrence and effects.
CO5	Know how to determination of basicity / proticity of a polyprotic acid by the thermo chemical method.

S21 CHE8.1: Spectroscopy

CObj_ID	Course Objectives
CObj_1	To impart the knowledge of electronic, rotation, vibration. NMR, FTIR, ESR, spectroscopy and their applications.
CObj_2	The course will provide and introduction to modern optical spectroscopic and imaging techniques and their applications to biology and chemistry.
CObj_3	To understand the role of symmetry in electronic spectroscopy

CO	Course Outcomes After completion of this module, students should be able to
CO1	Recognize spectroscopy in microwave, Rotational spectra of rigid diatomic molecules, selection rules, interaction of spectral lines
CO2	Learn Electronic spectra of diatomic molecules Born-oppenheimer approximation
CO3	Find fine structure of ESR absorption, Hyperfine structure, Double resonance in ESR, Techniques of ESR spectroscopy.
CO4	Understand Principles and Applications of Mossbauer spectroscopy
CO5	Aware of the fine structure of ESR absorption, Hyperfine structure, Double resonance in ESR, Techniques of ESR spectroscopy.

S21 MB 7.1 – Food and Dairy Microbiology

	Objective
CObj_1	To understand microbiology of fermented food commodities.
CObj_2	To describe the role of microorganisms in food spoilage and principles of food preservation.
CObj_3	To analyze the microbiological quality control, and quality schemes.

	Outcome
CO1	Analyze the character of microbes in food spoilage using various examination and evaluation of preservation techniques for food.
CO2	Evaluate the microbiology of fermented milk products.
CO3	Discuss the government regulatory practices and policies in food quality and safety.
CO4	Apply the techniques to assay the food borne infections and intoxication.
CO5	Create the knowledge about the microbial food products and determine the role of various agencies in food sanitation and control.

S21 MB 8.1 – Industrial Microbiology and Bioprocess Technology

CObj_ID	Course Objectives
CObj_1	The major objective of the course is to provide the design of bioreactors, media formulations and factors affecting the industrial production of bio-chemicals along with approaches that can be used for enhanced production.
CObj_2	To analyze the role of micro-organism in production of organic acids, alcohols, wine, vinegar, enzymes, vitamins, antibiotics, amino-acids and steroids
CObj_3	To understand the strategies for development of microbial strains, process optimization, large scale production and product recovery will be covered for industrially relevant microbial products and therapeutic proteins

CO_ID	Course Outcomes
CO_1	General design of fermenter, media and the process of fermentation and optimization of fermentation process
CO_2	Isolation of industrially important microbial strains and fermentation media
CO_3	Students will be able to select industrially important microbes for economical use including protein products.
CO_4	Types of fermentation processes, bio-reactors and measurement of fermentation parameters
CO_5	Microbial production of industrial products (microorganisms involved, media, fermentation conditions, downstream processing and uses)

B.Sc. BC-BT
BC 1.1: Chemical Foundation of Biochemistry – 1

CObj_ID	Course Objectives
CObj_1	To understand chemical basis of bioprocesses, organization of organisms, fundamental properties of elements and units of measuments.
CObj_2	To revisit the fundamentals concepts of chemical bonds, electronic configuration, concepts of acids/ bases/ buffers and their importance in biological systems.
CObj_3	To familiarize with thermodynamic concepts as applicable to biological processes.

CO_ID	Course Outcomes
CO_1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
CO_2	To understand the concepts of mole, mole fraction, morality and to apply them in biochemical research.
CO_3	To know the significance of chemical bonding, electronic configuration and theories of bond formation
CO_4	To understand the concepts of acids, bases, indicators, buffers and realize the importance of water as a universal solvent.
CO_5	To recognize the fundamentals of electrochemistry and the thermodynamic basis of biochemical reactions.

S21 BT 1.1: Cell Biology

CObj_ID	Course Objectives
CObj_1	To impart basic knowledge and understanding of cell, cell organelles, and their overall functioning.
CObj_2	To provide with strong fundamental understanding of biological existence, genetics of the cell with suitable foundation and appreciation of understanding of the cell.
CObj_3	To educate the students with the concepts, principles and applications involved in the advancement of cell biology studies in line with the present development.

CO_ID	Course Outcomes
CO_1	Understand and appreciate the diversity of life as it evolved over time by processes of mutation, selection and genetic change.
CO_2	Would be able to comprehend the structure of a cell with its organelles.
CO_3	Can distinguish between the structure of prokaryotic and eukaryotic cell.
CO_4	Can explain the organization of genes and chromosomes, chromosome morphology and its aberrations
CO_5	Illustrate that fundamental structural units define the function of all living things.

BC 2.1: Chemical Foundation of Biochemistry – 2

CObj_ID	Course Objectives
CObj_1	To understand reaction kinetics, concepts of colloids and their biological applications.
CObj_2	To revisit concepts of organic chemistry and learn the role of stereochemistry in biological systems.
CObj_3	To familiarize with types of organometallic compounds and their biological effects.

CO_ID	Course Outcomes
CO_1	To understand the principles of chemical kinetics and their interpretation for biological systems
CO_2	To comprehend about types of colloids, their properties, examples and biological applications
CO_3	To analyze the concepts of stereochemistry of organic compounds and their importance in biomolecules
CO_4	To appreciate the roles of metals, non-metals, transition metals and organometallic compounds in biological systems.
CO_5	To study the properties of inorganic molecules and coordination coumpounds and understand the toxic effects of heavy metals.

S21 BT 2.1: Microbiological Methods

CObj_ID	Course Objectives
CObj_1	To impart basic knowledge and understanding modern microbiology and the technologies involved in it.
CObj_2	To assist with hands on laboratory experience in fundamental techniques like culturing and maintaining the microorganisms related to biotechnology.
CObj_3	To familiarise and educate the students with the antimicrobial strategies, modalities in applying for research area.

CO_ID	Course Outcomes
CO_1	The student will obtain a basic understanding about the technologies involved in modern microbiology.
CO_2	To students will gain basic knowledge about the fundamental techniques involved in culture and maintenance of microorganisms pertaining to biotechnology.
CO_3	Students will be able understand the lifecycle of microbial growth and the parameters that can influence it.
CO_4	The students will be familiar with the antimicrobial strategies associated in maintenance of sterility.
CO_5	The student will develop an understanding about the various antimicrobial modalities available in natural and pharmaceutical domain and their applications in present day research arena.

S21 BC 3.1: Bioorganic chemistry

CObj	Course Objectives
CObj_1	To understand general reaction mechanisms of organic compounds and theconcepts of allides, alcohols and carbonyl compounds.
CObj_2	To revisit the fundamentals concepts of primary and secondary metabolites ofcells.
CObj_3	To familiarize with bioorganic compounds like nutrients, proteins, vitaminsand drugs.

CO	Course Outcomes
CO1	To appreciate the concepts of reaction mechanisms of hydrocarbons.
CO2	To understand the properties and importance of allides, alcohols and carbonylcompounds.
CO3	To know the significance of primary metabolites in living organisms such ascarboxylic acids, amines and heterocyclic compounds.
CO4	To understand the significance of secondary metabolites in living organisms,such as terpenes and alkaloids.
CO5	To recognize the fundamentals of nutrition, nutrients and understand aboutdrugs and antibiotics.

S21 BT 3.1: Biomolecules

COobj	Course Objectives
CObj_1	To familiarize the students with the principal biomolecules.
CObj_2	To familiarize the students with the basic knowledge about the functioning of specialized molecules like enzymes and hormones.
CObj_3	To provide the students with the basic concept of biophysics and familiarize them with methodologies employed to detect and quantitate different biomolecules.

CO	Course Outcomes
CO1	The students will gain fundamental knowledge about the structure and chemistry of the principal biomolecules like carbohydrates, proteins and lipids as well as the importance of these biomolecules in living organisms.
CO2	Students will develop an understanding regarding the diversity of the biomolecules, and their roles in organisms.
CO3	The students will develop a basic understanding about the diversity, structure, and importance of specialized molecules like enzymes and hormones in living organisms.
CO4	The students will develop fundamental concepts like—pH and chemical bonding— that are crucial for the functioning of the biomolecules.
CO5	The students will become familiar with basic detection and separation techniques like spectroscopy, chromatography, centrifugation etc.

S21 BC 4.1: Analytical Biochemistry

CObj_ID	Course Objectives
CObj_1	To understand the strategies in biochemical investigations employing variousbasic biochemical techniques.
CObj_2	To understand the principles and applications of various techniques employedfor separation and analysis of biomolecules.
CObj_3	To familiarize with basic culture techniques in microbiology.

CO_ID	Course Outcomes
CO_1	To understand the principles of biochemical analysis employing variousbioanalytical techniques.
CO_2	To comprehend about general principles of various chromatographictechniques useful for bioanalysis.
CO_3	To analyze biomolecules using electrophoretic methods.
CO_4	To appreciate the importance of spectroscopic techniques in molecularanalysis.
CO_5	To study the properties of microorganisms and their handling techniques.

S21 BT 4.1 **Course Name: Molecular biology**

CObj	Course Objectives
CObj_1	To have basic knowledge of transmission genetics, hereditary mechanism and mutations.
CObj_2	To know the complex organization of the genetic material of prokaryotes and eukaryotes and gene expression studies.
CObj_3	To understand the significance of central dogma of Molecular Biology.

CO	Course Outcomes
CO1	To have a firm foundation in the fundamentals of Molecular Biology.
CO2	To develop an understanding of the cells, Cell organelles and its various cellular mechanisms.
CO3	To analyze the mechanisms associated with Gene Expression at the level of Transcription and Translation.
CO4	To explore the mechanisms associated with Regulation of Gene Expression in Prokaryotes and Eukaryotes.
CO5	To analyze the genotypic and phenotypic relationship of normal and mutant types.

BC 5.1: Biochemistry of Macromolecules

COobj	Course Objectives
CObj_1	To understand chemical basis of biological process.
CObj_2	To revisit the fundamental concepts of correlation of macromolecules and its chemical reactions.
CObj_3	To familiarize with understanding of significance of macromolecular structures in understanding the life process.

CO	Course Outcomes
CO_1	To appreciate Biochemistry as a discipline by understanding the chemical basis of biological systems.
CO_2	To understand the basic concepts of carbohydrate structures and biological roles relevant to living cell growth and division.
CO_3	To know the significance of coordination of lipid molecules and their properties in a living cell structure.
CO_4	To understand the structural and chemical properties of amino acids and proteins in living systems.
CO_5	To understand the composition and structure of RNA and DNA those regulate the biological process.

BC 5.3: Human Physiology and Cell Biology

COobj	Course Objectives
CObj_1	To understand the structures and purposes of basic components of cells, especially membranes and organelles
CObj_2	To revisit the fundamentals concepts of cells and tissues, organ systems and their working
CObj_3	To familiarize with physiology and biochemistry of processes and organization of various organ systems

CO	Course Outcomes
CO1	To appreciate the concepts of cell biology, tissue organization, organ systems and physiological processes
CO2	To comprehend the structural organization, functioning and important cellular events of cells and cell organelles
CO3	To understand importance of tissues, and organization, dynamics and role of organs in circulatory and skeletal systems
CO4	To understand the biochemistry and physiology of digestive, excretory and respiratory systems
CO5	To recognize the fundamentals of biochemistry and physiology of muscular, nervous and endocrine systems

S21 BT5.1: Recombinant DNA Technology

CObj	Course objectives
CObj_1	To understand the principles and concepts of genetic engineering, tools required for cloning and expression of gene.
CObj_2	To gain technical knowledge about the creation of recombinant DNA *in vitro* and to select the transformed cells expressing the given gene of interest and protein.
CObj_3	To familiarize about the construction of gene libraries, the identification of gene, gene alteration, modification, gene transfer and breakthrough technologies and their potential applications in various fields of life sciences.

CO	Course outcomes After completion of this module, students should be able to
CO1	Imbibe basic conceptual knowledge about the genetic engineering and the requirements to the gene cloning experimentations.
CO2	Gain the applications of rDNA molecules and their introduction into diverse host cells by recombinant DNA techniques.
CO3	Familiarize with the screening and selection methods adopted in identifying the recombinant clones expressing desired traits.
CO4	Develop know how about the construction of gene banks and their applications in cloning of gene.

CO5	Understand the advanced technical knowledge about the potential applications of genetic engineering and next generation technologies.

BC 6.1: Enzymology

CObj	**Course Objectives**
CObj_1	To provide detailed knowledge about enzymes, the biological catalysts with remarkable properties.
CObj_2	To outline the diverse applications of enzymes in disease diagnosis and therapy as well as in industry
CObj_3	To develop an understanding of enzyme kinetics, mechanism of enzyme action, enzyme inhibition and their regulation.

CO	**Course Outcomes**
CO_1	To understand the nature and importance of enzymes in living systems.
CO_2	To gain insight into the molecular basis of catalysis by enzymes and the underlying basis of their specificity
CO_3	To comprehend the applications of enzymes in research and medicine as well as in industry, which will bolster their foray into industrial and biomedical research.
CO_4	To analyze the concepts of kinetics of enzyme catalyzed reactions, their mechanisms of enzyme action and clinical importance of enzyme inhibitors
CO_5	To appreciate how enzymes are regulated and the physiological importance of enzyme regulation in the cell

BC 6.3: Intermediary Metabolism

CObj	**Course Objectives**
CObj_1	To understand the concepts of biochemical reactions in cells.

CObj_2	To familiarize with understanding of metabolic pathways both catabolism and anabolism, and energy production.
CObj_3	To revisit the fundamental concepts of correlation of macromolecules and their chemical reactions.

CO	**Course Outcomes**
CO_1	To appreciate the basics of biochemical reactions and its molecular and functional connection to the organization of a cell and sub-cellular components
CO_2	To know the fates of different types of carbohydrates and its regulation that can influence the growth and existence of living organism.
CO_3	To analyze the significance of lipid metabolic pathways
CO_4	To understand degradative and biosynthetic reactions of amino acids and nucleotides and associated metabolic disorders.
CO_5	To evaluate the biochemistry behind photosynthesis process and nitrogen fixation.

S21 BT 6.1: Plant Biotechnology

CObj	**Course objectives**
CObj_1	Make students to develop depth knowledge on biotechnological tools and techniques involved in plant improvement.
CObj_2	Disseminate students with precise understanding on principles and techniques of plant tissue culture.
CObj_3	Inculcate a critical thinking on the role of genetic engineering in plants and transgenic technology with current studies.

CO	**Course outcomes**

	After completion of this module, students should be able to
CO1	Develop conceptual understanding of biotechnological tools and techniques in plant improvement.
CO2	Acquaint with basic concepts in plant tissue culture and establishment different types of *in vitro* cultures for plant regeneration.
CO3	Gain in-depth knowledge in gene manipulation strategies and gene transfer techniques.
CO4	Have profound understanding on the development of transgenic plants and its application.
CO5	Familiarize with concepts of intellectual property rights and biosafety measures.

S21 BT 7.1: Immunology and Medical Biotechnology

CObj	**Course objectives**
CObj_1	To enable students to understand the fundamental principles of immunology and medical biotechnology based on their knowledge of basic courses like biochemistry, genetics, cell biology and microbiology.
CObj_2	To inculcate the deployment of the basic knowledge in understanding the mechanism of immune system functioning and the various techniques involved in medical biotechnology.
CObj_3	To equip the students with the research aptitude to integrate the theoretical knowledge with research experiments by providing latest technologies developed and instill creativity by exposure to the current case studies.

CO	**Course outcomes** After completion of this module, students should be able to
CO1	Understand and compare the primary and secondary immune response with the appropriate examples.
CO2	Understand the antigen antibody interactions, diverse diagnostic techniques involved and explore the principle of vaccination.

CO3	Recognise the pathophysiology of human diseases and underlying concepts of tumor biology.
CO4	Acquaint with the pharmaceutical biology and to update the knowledge on designing drugs and clinical trials.
CO5	Compare, analyse, and judge the knowledge of immunology and medical Biotechnology for utilization in executing and management in career.

S21 BT 8.1: Bioprocess technology

CObj	**Course Objectives**
CObj_1	Impart knowledge on Design and Operations of Fermentation Processes and to endow the students with the basics of Microbial Kinetics.
CObj_2	Evaluate the Formulation of Media and Types of Bioreactors for Industrially Important Microbes.
CObj_3	Understand the Applications of Bioprocess Technology in Production of Microbial Products, Vaccines and Antibiotics.

CO	**Course Outcomes** After Completion of this Module, Students should be able to
CO1	Get acquainted the field of Bioprocess technology and Formulate, Execute the Isolation and Screening of Industrially Important Microbes.
CO2	Develop an understanding of Bioreactors – Design, Functions and Process Control
CO3	Requisites for Upstream – Scale Up Process and Assess the Strategies of Downstream Processing for Product Recovery
CO4	Acquire Experimental Knowledge of Microbial Production of various Industrial Products such as Alcohol, Organic Acids, Amino acids, Antibiotics, Exopolysaccharides, Enzymes, Vitamins etc.
CO5	Integrate Scientific and Technological Knowledge on the use of Bioprocesses for Industrial Products on the Cell and Process Level.

B.Sc. C-BT

S21 BT 1.1: Cell Biology

CObj_ID	Course Objectives
CObj_1	To impart basic knowledge and understanding of cell, cell organelles, and their overall functioning.
CObj_2	To provide with strong fundamental understanding of biological existence, genetics of the cell with suitable foundation and appreciation of understanding of the cell.
CObj_3	To educate the students with the concepts, principles and applications involved in the advancement of cell biology studies in line with the present development.

CO_ID	Course Outcomes
CO_1	Understand and appreciate the diversity of life as it evolved over time by processes of mutation, selection and genetic change.
CO_2	Would be able to comprehend the structure of a cell with its organelles.
CO_3	Can distinguish between the structure of prokaryotic and eukaryotic cell.
CO_4	Can explain the organization of genes and chromosomes, chromosome morphology and its aberrations
CO_5	Illustrate that fundamental structural units define the function of all living things.

DSC-1: S21 CH 1.1 -Analytical and Organic Chemistry-I

CObj_ID	Course Objectives

CObj_1	The main objective is to provide to the students an in depth understanding of the basic concepts of chemical sciences.
CObj_2	To enable them with tools needed for the practice of chemistry, which remains a discipline with much stress on experimentation.
CObj_3	To provide a detailed knowledge of the terms, concepts, methods, principles and experimental techniques of chemistry.

CO_ID	Course Outcomes
CO_1	Learn the concepts of chemical analysis, accuracy, precision and statistical data treatment
CO_2	Prepare the solutions after calculating the required quantity of salts in preparing the reagents/solutions and dilution of stock solution.
CO_3	Know the concept of volumetric and gravimetric analysis and deducing the conversion factor for determination
CO_4	Handle toxic chemicals, concentrated acids and organic solvents and practice safety procedures.
CO_5	Understand the concepts of Organic reactions and techniques of writing the movement of electrons, bond breaking, bond forming

S21 BT 2.1: Microbiological Methods

CObj_ID	Course Objectives
CObj_1	To impart basic knowledge and understanding modern microbiology and the technologies involved in it.
CObj_2	To assist with hands on laboratory experience in fundamental techniques like culturing and maintaining the microorganisms related to biotechnology.
CObj_3	To familiarise and educate the students with the antimicrobial strategies, modalities in applying for research area.

CO_ID	Course Outcomes
CO_1	The student will obtain a basic understanding about the technologies involved in modern microbiology.
CO_2	To students will gain basic knowledge about the fundamental techniques involved in culture and maintenance of microorganisms pertaining to biotechnology.
CO_3	Students will be able understand the lifecycle of microbial growth and the parameters that can influence it.
CO_4	The students will be familiar with the antimicrobial strategies associated in maintenance of sterility.
CO_5	The student will develop an understanding about the various antimicrobial modalities available in natural and pharmaceutical domain and their applications in present day research arena.

DSC-2: S21 CH- 2.1 Inorganic and Physical Chemistry-I

CObj_ID	Course Objectives
CObj_1	To understand the structure of the atom, shapes of different orbital's and properties of periodic table
CObj_2	To develop the ability to correlate the chemical and physical properties of elements and their compounds in the periodic table
CObj_3	An overview of close packing of metallic crystals, unit cell and crystal lattice, determination of surface tension, viscosity and refractive index of liquids. Colligative properties

CO_ID	Course Outcomes
CO_1	Students will learn the structure of an atom, electronic configuration. Schrodinger wave equation, Heisenberg's uncertainity principle, quantum numbers.
CO_2	Students will understand periodic properties of elements and their compounds.
CO_3	Students should be able to determine the difference between solids, liquids and gases.

CO_4	Students will be able to understand gas laws, theories and its application.
CO_5	Students will learn the physical properties of liquids and Colligative properties

S21 BT 3.1: Biomolecules

CObj	**Course Objectives**
CObj_1	To familiarize the students with the principal biomolecules.
CObj_2	To familiarize the students with the basic knowledge about the functioning of specialized molecules like enzymes and hormones.
CObj_3	To provide the students with the basic concept of biophysics and familiarize them with methodologies employed to detect and quantitate different biomolecules.

CO	**Course Outcomes**
CO1	The students will gain fundamental knowledge about the structure and chemistry of the principal biomolecules like carbohydrates, proteins and lipids as well as the importance of these biomolecules in living organisms.
CO2	Students will develop an understanding regarding the diversity of the biomolecules, and their roles in organisms.
CO3	The students will develop a basic understanding about the diversity, structure, and importance of specialized molecules like enzymes and hormones in living organisms.
CO4	The students will develop fundamental concepts like—pH and chemical bonding— that are crucial for the functioning of the biomolecules.
CO5	The students will become familiar with basic detection and separation techniques like spectroscopy, chromatography, centrifugation etc.

DSC-3: Analytical and Organic Chemistry-II

Course Objectives:

12) Interrelationship among frequency, wavelength and wave number and importance of validation parameters of an instrumental method will be taught
13) Principle,instrumentationandapplicationsofspectrophotometry,nephelometryand turbidometry will be taught
14) Fundamentals ofseparationmethodsandprinciplesofpaper,thinlayerandcolumn chromatography willbetaught
15) Principle, types and applications of solvent extraction will be taught
16) Principle and mechanism of ion-exchange, types of resins and domestic and industrial applications of ion-exchange chromatography will be taught
17) The concept of mechanism and its importance will be taught to the student
18) Concept and importance of intermediates in organicchemistrywillbetaughttakingproperexamples
19) Thevarioustechniquesforidentificationofreactionmechanismwillbe taughttothestudenttaking properexamples
20) Conceptofstereochemistryanditsimportancewillbetaught.
21) Thevariousprojectionformulaeandthetechniquesofdesignatingthemoleculesinto R,S,D,Lwillbetaughttaking properexamples
22) ThetheoryandconceptofCis-,Trans-isomerism anditsimportanceandthetechniquestodifferentiatebetweenthemwillbetaughtt akingexamples

CourseSpecific Outcomes

Afterthecompletionofthiscourse,thestudentwouldbeableto

11) Understandtheimportanceoffundamentallawandvalidationparameter sinchemicalanalysis
12) Knowhowdifferentanalytesindifferentmatrices(waterandrealsamples)canbedeter minedbyspectrophotometric,nephelometricandturbidimetricmethods.
13) Understand the requirement for chemical analysis by paper, thin layer and columnchromatography.
14) Applysolventextractionmethodforquantitativedeterminationofmetalionsindiffe rentsamples
15) Utilize the ion-exchange chromatography for domestic and industrialapplications
16) Explainmechanismforagivenreaction.
17) Predictthe probablemechanismforareaction. Explain the importance of reaction intermediates, its role and techniques ofgeneratingsuchintermediates

18) ExplaintheimportanceofStereochemistryinpredictingthestructureandpropertyoforganicmolecules.
19) Predicttheconfigurationofan organicmoleculeandabletodesignateit.
20) Identifythechiralmoleculesandpredict itsactual configuration

Course Code S21 BT 4.1 **Course Name: Molecular biology**

CObj	**Course Objectives**
CObj_1	To have basic knowledge of transmission genetics, hereditary mechanism and mutations.
CObj_2	To know the complex organization of the genetic material of prokaryotes and eukaryotes and gene expression studies.
CObj_3	To understand the significance of central dogma of Molecular Biology.

CO	**Course Outcomes**
CO1	To have a firm foundation in the fundamentals of Molecular Biology.
CO2	To develop an understanding of the cells, Cell organelles and its various cellular mechanisms.
CO3	To analyze the mechanisms associated with Gene Expression at the level of Transcription and Translation.
CO4	To explore the mechanisms associated with Regulation of Gene Expression in Prokaryotes and Eukaryotes.
CO5	To analyze the genotypic and phenotypic relationship of normal and mutant types.

DSC-4: S21 CH- 4.1- Inorganic and Physical Chemistry-II

Course Objectives:

Students learn about

- Different types of bonding in molecules/compounds/ions
- The structures of molecules/compounds/ions based on different models/theories
- Properties of compounds based on bonding and structure
- The fundamentals of thermodynamics including the laws, the concept of entropy and free energy functions and their applications.
- The concepts of surface chemistry, catalysis and their applications.
- The theoretical and experimental aspects of chemical kinetics including basic theories of reaction rates and methods of determining order.

- Electrochemistry dealing with electrolytes in solution. Conductance measurements and applications. Concept of ionic mobility and their determination.

Course outcomes: After the completion of this course, the student would be able to

- Predict the nature of the bond formed between different elements
- Identify the possible type of arrangements of ions in ionic compounds
- Write Born-Haber cycle for different ionic compounds
- Related different energy parameters like lattice energy, entropy, enthalpy and solvation energy in the dissolution of ionic solids
- Explain covalent nature in ionic compounds
- Write the M.O. energy diagrams for simple molecules
- Differentiate bonding in metals from their compounds
- Learn important laws of thermodynamics and their applications to various thermodynamic systems
- Understand adsorption processes and their mechanisms and the function and purpose of a catalyst

Course Code: S21 BT5.1 Course Name: Recombinant DNA Technology

CObj	**Course objectives**
CObj_1	To understand the principles and concepts of genetic engineering, tools required for cloning and expression of gene.
CObj_2	To gain technical knowledge about the creation of recombinant DNA *in vitro* and to select the transformed cells expressing the given gene of interest and protein.
CObj_3	To familiarize about the construction of gene libraries, the identification of gene, gene alteration, modification, gene transfer and breakthrough technologies and their potential applications in various fields of life sciences.

CO	Course outcomes After completion of this module, students should be able to
CO1	Imbibe basic conceptual knowledge about the genetic engineering and the requirements to the gene cloning experimentations.
CO2	Gain the applications of rDNA molecules and their introduction into diverse host cells by recombinant DNA techniques.
CO3	Familiarize with the screening and selection methods adopted in identifying the recombinant clones expressing desired traits.
CO4	Develop know how about the construction of gene banks and their applications in cloning of gene.
CO5	Understand the advanced technical knowledge about the potential applications of genetic engineering and next generation technologies.

Course Code: S21 CHE5.1
Course Name: (Selected topics in Inorganic Chemistry)

CObj_ID	Course Objectives
CObj_1	To explore in depth specialized areas of chemistry of materials, including ores, metals, acids and bases and to understand how metals are extracted from their ores.
CObj_2	understand the trends in properties and reactivity of the s, p-block elements and noble gases
CObj_3	To become familiar with some of the roles of inorganic polymer and its applications in day to day life.

CO	Course Outcomes After completion of this module, students should be able to
CO1	Analyze fundamental aspects of main group chemistry, including trends in oxidation states, periodic properties and complex formation tendency. .

CO2	Pursuing research in the field of chemical metallurgy.
CO3	Familiar with a variety of different methods for synthesizing inorganic materials and principles of inorganic polymer synthesis.
CO4	Deduce the shape (geometry) of molecules using radius ratio rules & VSEPR theory.
CO5	Draw MO diagrams for a few homo- & hetero-nuclear diatomic molecules and to calculate the bond order

Course Name: (Selected topics in Organic chemistry)
Course Code: S21 CH 6.1

CObj_ID	**Course Objectives**
CObj_1	Differentiate chiral and achiral molecules.
CObj_2	Identify the stereo centers in a molecule and assign the configuration as R or S
CObj_3	Know about the most important simple heterocyclic ring systems containing heteroatom and their systems of nomenclature and numbering.

CO	**Course Outcomes** After completion of this module, students should be able to
CO1	Elucidate structure of organic compounds with specific examples of terpenes and alkaloids by practical approach.
CO2	Understand the applications of these compounds including their medicinal applications through their reaction chemistry.
CO3	Learn about basic principles of UV, IR and NMR spectroscopic techniques to interpret the spectra to determine structure and stereochemistry of known and unknown compounds
CO4	Develop a sound understanding of the fundamental concepts of stereochemistry

CO5	Understand thouroughly the chemistry of compounds having nitrogen containing functional groups, heterocyclic, polynuclear hydrocarbons, alkaloids and terpenes which includes various methods for synthesis .

Course Code: S21 BT 6.1 Course Name: Plant Biotechnology

CObj	**Course objectives**
CObj_1	Make students to develop depth knowledge on biotechnological tools and techniques involved in plant improvement.
CObj_2	Disseminate students with precise understanding on principles and techniques of plant tissue culture.
CObj_3	Inculcate a critical thinking on the role of genetic engineering in plants and transgenic technology with current studies.

CO	**Course outcomes** After completion of this module, students should be able to
CO1	Develop conceptual understanding of biotechnological tools and techniques in plant improvement.
CO2	Acquaint with basic concepts in plant tissue culture and establishment different types of *in vitro* cultures for plant regeneration.
CO3	Gain in-depth knowledge in gene manipulation strategies and gene transfer techniques.
CO4	Have profound understanding on the development of transgenic plants and its application.
CO5	Familiarize with concepts of intellectual property rights and biosafety measures.

S21 BT 7.1 Course Name: Immunology and Medical Biotechnology

CObj	**Course objectives**
CObj_1	To enable students to understand the fundamental principles of immunology and medical biotechnology based on their knowledge of basic courses like biochemistry, genetics, cell biology and microbiology.
CObj_2	To inculcate the deployment of the basic knowledge in understanding

	the mechanism of immune system functioning and the various techniques involved in medical biotechnology.
CObj_3	To equip the students with the research aptitude to integrate the theoretical knowledge with research experiments by providing latest technologies developed and instill creativity by exposure to the current case studies.

CO	**Course outcomes** After completion of this module, students should be able to
CO1	Understand and compare the primary and secondary immune response with the appropriate examples.
CO2	Understand the antigen antibody interactions, diverse diagnostic techniques involved and explore the principle of vaccination.
CO3	Recognise the pathophysiology of human diseases and underlying concepts of tumor biology.
CO4	Acquaint with the pharmaceutical biology and to update the knowledge on designing drugs and clinical trials.
CO5	Compare, analyse, and judge the knowledge of immunology and medical Biotechnology for utilization in executing and management in career.

Course Code: S21 BT 8.1 Course Name: Bioprocess technology

CObj	**Course Objectives**
CObj_1	Impart knowledge on Design and Operations of Fermentation Processes and to endow the students with the basics of Microbial Kinetics.
CObj_2	Evaluate the Formulation of Media and Types of Bioreactors for Industrially Important Microbes.
CObj_3	Understand the Applications of Bioprocess Technology in Production of Microbial Products, Vaccines and Antibiotics.

CO	Course Outcomes After Completion of this Module, Students should be able to
CO1	Get acquainted the field of Bioprocess technology and Formulate, Execute the Isolation and Screening of Industrially Important Microbes.
CO2	Develop an understanding of Bioreactors – Design, Functions and Process Control
CO3	Requisites for Upstream – Scale Up Process and Assess the Strategies of Downstream Processing for Product Recovery
CO4	Acquire Experimental Knowledge of Microbial Production of various Industrial Products such as Alcohol, Organic Acids, Aminoacids, Antibiotics, Exopolysaccharides, Enzymes, Vitamins etc.
CO5	Integrate Scientific and Technological Knowledge on the use of Bioprocesses for Industrial Products on the Cell and Process Level.

Course Code: S21 CHE7.1
Course Name: (Selected topics in physical Chemistry)

CObj_ID	Course Objectives
CObj_1	To expose students to various physical methods like electrochemical techniques.
CObj_2	To teach students the titrimetric and instrumental methods for analytical studies.
CObj_3	To study the advanced methods of analysis.

CO	Course Outcomes After completion of this module, students should be able to
CO1	Develop skills in distillation, solvent extraction, TLC and column chromatography.
CO2	Know different chemical equilibriums and relationship between them.
CO3	Know why there is lowering in vapour pressure , Rault's law , Henry's law and their applications
CO4	Study about elevation in boiling point and depression in freezing point, their conditions of occurrence and effects.
CO5	Know how to determination of basicity / proticity of a polyprotic acid by the thermo chemical method.

Course Code: S21 CHE8.1
Course Name: (Spectroscopy)

CO	Course Outcomes After completion of this module, students should be able to
CO1	Recognize spectroscopy in microwave, Rotational spectra of rigid diatomic molecules, selection rules, interaction of spectral lines
CO2	Learn Electronic spectra of diatomic molecules Born-oppenheimer approximation
CO3	Find fine structure of ESR absorption, Hyperfine structure, Double resonance in ESR, Techniques of ESR spectroscopy.
CO4	Understand Principles and Applications of Mossbauer spectroscopy
CO5	Aware of the fine structure of ESR absorption, Hyperfine structure, Double resonance in ESR, Techniques of ESR spectroscop

CObj_ID	Course Objectives
CObj_1	To impart the knowledge of electronic, rotation, vibration. NMR, FTIR, ESR, spectroscopy and their applications.
CObj_2	The course will provide and introduction to modern optical spectroscopic and imaging techniques and their applications to biology and chemistry.
CObj_3	To understand the role of symmetry in electronic spectroscopy,