PROGRAM OUTCOME (PO), PROGRAM SPECIFIC OUTCOME (PSO), COURSE OUTCOME (CO) (2021-22)

PROGRAM NAME	BCA

PROGRAM OUTCOME
PO1:To develop skilled and professionally motivated technocrats, equipped with critical reasoning and ethical values that fosters scientific temperament with a sense of social responsibility. PO2:To produce knowledgeable and competent human resources who are employable in all walk of life. PO3:To create, identify and implement appropriate techniques, resources, and modern engineering and IT tools. PO4:To impart expertise required for planning, designing and building complex software systems as well as provide support to automated systems. PO5:To build calibre to tackle both personal and social challenges and improve the quality of life.

PROGRAM SPECIFIC OUTCOME
PSO-1: Ability to acquire knowledge in various fields of computer science, and to apply in industry, entrepreneurship and/or higher studies, for a thriving career. **PSO-2:** Understanding to incorporate knowledge of computing and technological advances appropriate to the program. **PSO-3:** Ability to develop software systems to enable the convenient use of the computing system and possess technical credentials. **PSO-4:** Ability to exercise the principles of management and strategic concepts required for teamwork as well as team management.

COURSE OUTCOME			
SEMESTER	**COURSE NAME**	**COURSE CODE**	**COURSE OUTCOME**
I	**ESSENTIAL OF PROFFESSIONAL COMMUNICATION**	BCA 101	CO1: Students shall be able to understand English when it is spoken in various contexts and modify language to convey ideas to the audience clearly and concisely. CO2: Students shall be able to speak intelligibly using appropriate word stress, sentence stress and elementary intonation patterns. CO3: Students shall be able to write well-presented business document in the required format (Reports, Proposal, Business Letter, Basic E-mail etiquettes). CO4: Students shall locate direct information with associative comprehension and convey ideas accurately with aspects of grammar and vocabulary.
	PRINCIPLES OF MANAGEMENT	BCA 102	CO-1. To identify, analyze and express one's own stance on social responsibility and ethics of business circumstances. CO-2. To cogitate on evolution, functions and principles of Management, and comprehensively

			grasp managers' tasks such as planning, decision-making, directing, negotiating and problem-solving. CO-3. To develop cognizance of the importance of human behavior and analyze the complexities associated with management of the group behavior in the organization. CO-4. To understand the traits, dimensions, and styles of effective leaders and, the relationship between strategic, tactical, and operational plans for effective Management.
	MATHEMATICS-I	BCA 103	CO-1. Use matrices, determinants and techniques for solving systems of linear equations in the different areas of Linear Algebra, Solve Eigen value problems and apply Cayley Hamilton Theorem. CO-2. Study the functions of more than one independent variable and calculate partial derivatives along with their applications. CO-3. Explore the idea for finding the extreme values of functions and integrate a continuous function of two or three variables over a bounded region. CO-4. Understand Curl, divergence and gradient lines. Calculate line integral, surface integral and volume integral and correlate them with the application of Stokes, Green and Divergence theorem.
	COMPUTER FUNDAMENTAL AND PROGRAMMING IN C	BCA 104	CO-1. Understand the basics of binary arithmetic, digital computer and operating system. CO-2. Apply the concept of algorithm and flowcharts in programming. CO-3. Understand about writing, compiling and executing a program in C language. CO-4. Learn the fundamental building blocks of C Language like constants, variables, identifiers, operators, type conversion. CO-5. To write programs in C-language that involves decisions and iterations. CO-6. Understand the implementation of functions, arrays and pointers in C programming language.
	FUNDAMENTAL OF ENVIRONMENTAL SCIENCE	BCA 105	CO-1. Get the information about environment, ecosystem and also about its functions like Food chain, Ecological pyramids etc. CO-2. Get the complete information about EIA- Environmental Impact Assessment in which the student will get the knowledge about the projects and the process involved in getting the

			projects. CO-3. Get the knowledge about the different types of resources like land, water, mineral and energy and also about the effects of environment by the usage of these resources. Also get the knowledge about the analysis of polluted water. CO-4. Gain the knowledge about different types of pollution and their treatment techniques like waste water treatment, solid waste management etc., CO-5. Get the complete information about the all legal aspects of environment protection.
II	**MATHEMATCIS-II**	BCA201	CO-1. Calculate surface area and volume and correlate them with the application of integration. CO-2. Understand and implement the concept of differential equations and learn various methods to solve ordinary differential equations. CO-3. Identify a range of techniques to form the partial differential equations (PDF) and solutions of standard linear and non-linear PDFs. CO-4. Compute and interpret the results of Bivariate Regression and Correlation Analysis, for forecasting and investigating the relationships between them. Define and perform null hypothesis significance testing.
	ADVANCED PROFESSIONAL COMMUNICATION	BCA202	CO-1. Calculate surface area and volume and correlate them with the application of integration. CO-2. Understand and implement the concept of differential equations and learn various methods to solve ordinary differential equations. CO-3. Identify a range of techniques to form the partial differential equations (PDF) and solutions of standard linear and non-linear PDFs. CO-4. Compute and interpret the results of Bivariate Regression and Correlation Analysis, for forecasting and investigating the relationships between them. Define and perform null hypothesis significance testing.
	DIGITAL ELECTRONICS AND COMPUTER ORGANISATION	BCA203	CO-1. Gain knowledge of different types of number systems, and their conversions. CO-2. Design various logic gates and simplify Boolean functions. CO-3. Design various flip flops, shift registers and determining outputs.

			CO-4. Analyze, design and implement combinational logic circuits. CO-5. Perform computer arithmetic operations. CO-6. Understand the Control unit, memory design and I/O organization of computer system.
	DATA STRUCTURE USING C	BCA204	CO-1. Learn how to represent arrays, linked lists, stacks, queues in memory using the algorithms and their common applications. CO-2. Understand the concept of recursion, application of recursion and its implementation and removal of recursion. CO-3. Understand about various sorting and searching algorithms. CO-4. Implement Trees and Graphs along with their applications to solve some real-world problems.
	ACCOUNTING AND FINANCIAL MANAGEMENT	BCA205	CO-1. Understand the role of accounting and its limitations. CO-2. Prepare financial statements in accordance with Generally Accepted Accounting Principles. CO-3. Support at a basic level the recording and reporting of financial information for business. CO-4. Demonstrate an understanding the Tally in accounts. CO-5. Demonstrate knowledge of each step in the accounting cycle.
III	**COMPUTER BASED NUMERCAL AND STATISTICAL TECHNIQUES**	BCA 301	CO-1. Apply numerical methods to obtain the approximate solutions to the linear and nonlinear transcendental and polynomial equations and find error. CO-2. Identify numerical methods for various mathematical operations and tasks, such as interpolation formulae like forward, backward, and divided difference formulae. CO-3. Apply the appropriate techniques for numerical differentiation and integration problems. CO-4. Design the numerical solution of initial value problems of the ordinary differential equations with implicit and explicit methods as appropriate. CO-5. Work numerically on the partial differential equations using different methods through of finite difference.
	OBJECT ORIENTED PROGRAMMING USING JAVA	BCA 302	CO-1. Understand the basic concepts of object-oriented modeling and designing. CO-2. Write, compile, run, and test simple object-oriented Java programs.

			CO-3. Understand the use of inheritance, arrays and Interface in java. CO-4. Implement the concept of exception handling, threads and packages.
	OPERATING SYSTEM	BCA 303	CO-1. Analyze various process scheduling Algorithms and their comparisons. CO-2. Understand the process synchronization problems. CO-3. Implement the concept of deadlock detection and avoidance. CO-4. Compare and contrast various Memory management schemes and Page replacement policies. CO-5. Understand the concept of File and Disk management.
	MANAGEMENT INFORMATION SYSTEM	BCA 304	CO-1. Understand fundamental of information system. CO-2. Visualize structure of management information system & decision support system. CO-3. Learn various business application of information system. CO-4. Explore ERP, supply chain management and CRM based information system
	COMPUTER ARCHITECTURE	BCA 305	CO-1. Understand the instruction types and different architectures of a computer. CO-2. Learn about parallel computing and various performance metrics and measure. CO-3. Understand about pipelining concept and its scheduling. CO-4. Analyze partitioning & scheduling of program and get a detailed explanation of its flow mechanism
IV	**DISCRETE MATHEMATICS**	BCA 401	CO-1. Understand the concept of Set theory, relation &function. CO-2. Understand the concept of algebraic structures such as homomorphism, isomorphism and auto-morphism of groups. CO-3. Explore and analyze partial order sets and lattices. CO-4. Explore the concept of propositional logic and predicate logic.
	BUSINESS ECONOMICS	BCA 402	CO-1. To understand and incorporate principles of Business Economics and the theory of supply and demand for economic problems prevalent in the market. CO-2. To identify the various determinants of firm's demand for

			factor services, the relationship between investment and savings, and demonstrate investment multiplier. CO-3. To critique the various types of investment function analysis and understand the elements of social cost benefit analysis. CO-4. To study the process of calculating national income, identify its components (GDP, GNP, NNP) and demonstrate circular flow of income, monetary policy and international trade.
	COMPUTER GRAPHICS & MULTIMEDIA SYSTEM	BCA 403	CO-1. Learn about working of display systems. CO-2. Execute various Scan Conversion algorithms in laboratory so as to draw Graphics primitives. CO-3. Familiarize with 2D and 3D graphic concepts. CO-4. Create 2D objects using Geometrical Transformations. CO-5. Describe the types of media and define multimedia system. CO-6. Describe the stages of a project in multimedia and its hardware and software requirements.
	DATA BASE MANAGEMENT SYSTEM	BCA 404	CO-1. Understand database concepts, structures and query language. CO-2. Understand the E R model and relational model. CO-3. Design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS. CO-4. Create and manage database with all integrity constraints. CO-5. Refine the schema of database by applying normal forms. CO-6. Understand concept of transaction processing and concurrency control.
	SOFTWARE ENGINEERING	BCA 405	CO-1. Understand the basic concepts of software engineering. CO-2. Understand the requirement analysis and importance of SRS documentation. CO-3. Understand the designing principles of software product. CO-4. Learn about the working environment of CASE tools. CO-5. Apply various software measures and metrics for estimation.
V	**DATA COMMUNICATION AND COMPUTER NETWORK**	BCA 501	CO-1. Understand basic computer network technology. CO-2. Identify different types of network topologies and protocols. CO-3. Understand the layers of the OSI

			model and TCP/IP. CO-4. Understand the concept of IP addressing, subnetting and routing mechanisms.
	DESIGN ANALYISIS AND ALOGORITHM	BCA 502	CO-1. Implementation of various sorting algorithm and their comparisons. CO-2. Analyze the concept of Divide & Conquer and Greedy techniques. CO-3. Implementation of Dynamic Programming concept in solving various problems. CO-4. Understand the concepts such as NP-completeness and randomized algorithms.
	WEBDESIGN CONCEPT	BCA 503	CO-1. Understand the internet related concepts that are vital in understanding web application development. CO-2. Analyze and apply the role of markup languages like HTML, DHTML, and XML in the workings of the web and web applications. CO-3. Programming web pages with JavaScript. CO-4. Design and implement dynamic web pages using client-side programming Java Script and also develop the web application using servlet and JSP.
	UNIX AND SHELL PROGRAMMING	BCA 504	CO-1. Describe UNIX operating system commands. CO-2. Understand the UNIX Architecture, File systems and use of basic Commands. CO-3. Understand and analyze UNIX System calls, Process Creation, Control & Relationship. CO-4. Understand Shell Programming and to write shell scripts.
	DATA MINING AND DATA WAREHOUSING	BCA 5051 (ELECTIVE-I)	CO-1. Explore data warehouse and multi-dimensional data models. CO-2. Gain insight into the challenges and limitations of different data mining technology. CO-3. Understand the concepts such as classification, regression and clustering. CO-4. Understand the concept of OLAP in data warehousing.
	SOFTWARE TESTING METHODOLOGY	BCA 5052 (ELECTIVE-I)	CO-1. Explain fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.

			CO-2. Understand and implement the methods of functional and structural testing. CO-3. Plan a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report. CO-4. Understand the advanced software testing topics, such as object-oriented software testing methods, system testing and testing of internet applications.
	OPEN SOURCE SOFTWARE	BCA 5053 (ELECTIVE-I)	CO-1. Understand the concepts, strategies, and methodologies related to open-source software development. CO-2. Be familiar with open-source software products and development tools currently available on the market. CO-3. To utilize open-source software for developing a variety of software applications, particularly Web applications. CO-4. Understand the open-source operating system and implement the open-source database and programming languages.
	INFORMATION SYSTEM: ANALYSIS AND DESIGN & IMPLEMENTATION	BCA 5054 (ELECTIVE-I)	CO-1. Describe principles, concepts and practice of System Analysis and Design process. CO-2. Explain the processes of constructing the different types of information systems. CO-3. Understand the various software development life cycle models and system documentation. CO-4. Apply object-oriented concepts to capture a business requirement. CO-5. Learn the concept of system testing, evaluation and performance
VI	**E COMMERCE**	BCA 601	CO-1. Understand the foundations and importance of E-commerce. CO-2. Understand the concept of Mobile commerce. CO-3. Analyze the importance of encryption on E-commerce. CO-4. Determining the effectiveness of electronic payments as an emerging financial instrument
	CYBER LAW AND INTERNET SECURITY	BCA 602	CO-1. Understand the social and intellectual property issues emerging from cyber space. CO-2. Explore the legal and policy developments in various countries to regulate cyber space. CO-3. Understand the Intellectual Property Rights, Domain Names and Trademark Dispute.

			CO-4. Learn about developing secure information system and security policies to prevent criminal activity on the Internet.
	MOBILE COMPUTING	BCA 603	CO-1. Explain the principles and theories of mobile computing technologies. CO-2. Describe infrastructures and technologies of mobile computing technologies. CO-3. Learn the concept of cellular network and GSM. CO-4. List out the data management issues in mobile computing. CO-5. Understand the concept of Ad-hoc Network and Routing Protocols.
	OPTIMIZATION TECHNIQUES	BCA 6041 (ELECTIVE-II)	CO-1. Understand the theory of optimization methods and algorithms developed for solving various types of optimization problems. CO-2. Develop and promote research interest in applying optimization techniques in problems of Engineering and Technology. CO-3. Apply the mathematical results and numerical techniques of optimization theory to concrete Engineering problems.
	MICROPROCESSOR	BCA 6042 (ELECTIVE-II)	CO-1. Identify the basic element and functions of 8085 microprocessor. CO-2. Describe the general architecture & organization of 8085. CO-3. Analyze and suggest various machine cycles and addressing modes. CO-4. Apply the programming techniques in developing the assembly language program. CO-5. Differentiate various types of interrupts in 8085 microprocessors
	DATA COMPRESSION	BCA 6043 (ELECTIVE-II)	CO-1. Understand the concepts of commonly used lossless and lossy compression techniques. CO-2. Analyze the applications of Huffman coding, loss less image compression, Text compression, Audio Compression. CO-3. Analyze various Image compression and dictionary-based techniques. CO-4. Understand the statistical basis and performance metrics for lossless compression. CO-5. Understand the concept of scalar quantization in data compression techniques.
	CRYPTOGRAPHY	BCA 6044 (ELECTIVE-II)	CO-1. Learn the basic concepts of security threats, mechanisms and symmetric cryptography. CO-2. Understand the conventional encryption algorithms.

			CO-3. Understand modern block cipher and public key encryption techniques analysis. CO-4. Understand the concept of Hash functions and message authentication.

PROGRAM OUTCOME (PO) & COURSE OUTCOME (CO) (2021-22)

PROGRAM NAME	BCOM

PROGRAM OUTCOME
PO1: After completing BCOM students will gain expertise in accounting practices, financial system, taxation and its laws, business analysis and business management. **PO2:**The program will impart knowledge about applicability of financial techniques, project tools, forecasting of business and managing variations of businesses. **PO3:**The program is designed to develop entrepreneurial and strategic approach in students that will help the students to integrate at social level **PO4:**The program will develop the managing capabilities in students which will be enhanced by means of understanding global scenario of marketing and human resources management as well.

COURSE OUTCOME			
SEMESTER	**COURSE NAME**	**COURSE CODE**	**COURSE OUTCOME**
SEM I	Financial Accounting	P1	Acquire knowledge of the basic concepts and conventions of accounting. • Prepare accounts of a partnership firm. • Prepare accounts of special kinds such as Royalty accounts, Voyage accounts and Branch accounts. • Prepare accounts as per norms in case of Hire-Purchase & Installment Purchase as well as Insolvency of the business units. • Gain insight into the Indian & International accounting standards as well as IFRS. • Develop skills in understanding the process of insolvency and their books of accounts.
	Business Organization	P2	• Understand basics about a business organization and its various forms. • Understand the social responsibility of business towards the various stakeholders. • Get knowledge about computation and fixation of remuneration of labour and incentive plans. • Gain insight about features of stock exchanges and commodity exchanges and their working as well as regulation. • Gain knowledge of the new patterns of business operations and organisations i.e., Ebusiness, LLP, OPC. • Understand the various elements and principles of organisation.
	Micro Economics	P3	• Explain the role of scarcity,

			specialization, opportunity cost and cost/benefit analysis in economic decision-making. • Identify the determinants of supply and demand; demonstrate the impact of shifts in both market supply and demand curves on equilibrium price and output. • Summarize the law of diminishing marginal utility; describe the process of utility maximization. • Calculate supply and demand elasticities, identify the determinants of price elasticity of demand and supply, and demonstrate the relationship between elasticity and total revenue. • Describe the production function and the Law of Diminishing Marginal Productivity; calculate and graph short-run and long-run costs of production. • Relate to real world business scenario through study of various market forms. • Study the factors affecting distribution of income through an analysis of various factor payments. • Gain indepth insight and equip them to analyze the real economic situations more effectively with the help of practical problems using elementary mathematics.
	Currency Banking and Exchange	P4	• Have a sound theoretical base in various areas of banking and exchange. • Understand the channel for flow of money in the economy. • Analyse the role and importance of credit in the economy. • Get the insight knowledge about exchange rate and exchange control.
	Essentials of Management	P5	• Map the evolution of 'Management' as a discipline and as a process that helps in the analysis of internal and external environment. • Understand of the various aspects of Planning and decision making, and of Authority and Responsibility in a formal organization • Organise, motivate and lead in an organization • Understand Control functions and make simple applications
	Co-curricular Course I	P6	
SEM II	Corporate Accounting	P7	• Understand the features and accounting treatment of Shares and Debentures. • Knowledge about Accounting entries related to Redemption of Shares and Debentures. • Prepare of Company's Final Accounts. • Acquire knowledge of accounting

			procedure adopted during Amalgamation and Absorption of companies. • Acquire conceptual knowledge of Internal and External reconstruction of companies and their accounting treatment. • Knowledge regarding accounting treatment and procedure adopted at the time of winding up of companies.
	Business Regulatory Framework	P8	• Understand the nature and meaning of contracts, forms of contracts and essentials of a valid contract. • Gain insight into various kinds of contract. • Gain in-depth knowledge of Sales of Goods Act and Negotiable Instruments Act • Have knowledge of the fundamentals of Consumer Protection Act. • Keep updated about the amendments in these laws and regulations.
	Public Finance	P9	1. To introduce students to the public sector reform agenda with a focus on public finance issues; 2. To demonstrate administrative, political, and economic constraints to public finance reforms; 3. To develop analytical skills of the students in three major areas of public finance reforms (performance-based budgeting, mid-term financial planning, budget decentralization); 4. To train students how to develop budgeting and performance evaluation systems for public sector institutions; 5. To develop students' skills on how to write a public policy paper and make a presentation on public policy issue.
	Business Communication	P10	• Apply principles of effective communication in their verbal and non-verbal communication. • Write effective e-mails, memos, and business correspondence. • Illustrate presentation skills • Plan effective business meetings • Identify communication barriers
	Selling and Advertising	P11	Upon successful completion of this course the students will be able to demonstrate strong conceptual knowledge in the selling and advertising, students will be able to

			demonstrate its application for resolution of problems pertaining selling and advertising.
	Vocational Course I	P12	
SEM III	Business Finance	P13.	• Demonstrate an understanding of the overall role and importance of the finance function. • Understand the role and responsibilities of a Finance Manager in an organisation. • Gain knowledge of the concept of cost of capital, capitalisation; over and under capitalization. • Have knowledge about the short & long term sources of finance. • Apply ratio analysis as a tool of managing and controlling finances of a business entity. • Analyse the complexities associated with working capital management, and the financing approaches to working capital.
	Statistical Methods	P14.	• The course content of this paper has been designed with the assumption that students have no knowledge or rudimentary knowledge of Business Statistics. • The purpose is to enhance student's understanding of the fundamentals of statistics. • In this paper the students will be imparted the knowledge about the measures of descriptive as well analytical statistics and their application in different fields. These fields may include business, trade, industry, macroeconomic indicators, social phenomenon, day to day activities etc. • Through the study of this paper, students will become acquainted with specific skills of data collection, processing, presentation and application of statistical tools on these data. This is how they will know the characteristics of data and learn analysis, interpretation and prediction of unknown data.
	Banking Operations	P15	• Understand the core concepts of banking. • Acquainted with the knowledge of the functioning of the banking industry, especially that of India. • Understand the structure of banking

			system in India • Understand the operational aspect of commercial banks in India. • Learn and gain insights about negotiable instruments • Help understand various concepts like ATM, e-banking, Basel Norms, etc.
	Managing Human Resources	P16	• Develop the basic understanding about the importance of HR function • Learn the various concepts of Human Resource Management processes required to Induct and Recruit the employees • Develop the basic knowledge of Training and Performance Appraisal of employees • Learn important issues related to Compensation and Wage Administration
	Information Systems and E-Business	P17.	• Develop the functional knowledge of Computer Systems • Develop the thorough understanding of various Information Systems with particular focus on DSS, MIS, TP, EIS and, CRM Systems • Understand the basic knowledge of the applications of Database Management Systems and their development • Understand the concepts of E-Commerce with an application orientation
	Co-curricular Course II	P18.	
SEM IV	Cost Accounting	P19.	• Understand the nature and scope of Cost Accounting. • Gain knowledge about the advantages of cost accounting and classifications of various costs. • Acquire knowledge about accounting and control of material cost and labour cost. • Know overhead costing as well as and Apportionment and Absorption of Overheads. • Understand the methods of costing, marginal costing and budgetary control system. • Gain knowledge of Unit or Output costing as well as standard costing.
	Contemporary Audit	P20.	• Understand the concept, types & techniques of audit. • Gain knowledge of audit documentation, vouching and verification of assets and liabilities. • Understand provisions regarding appointment of a company auditor and learn about his powers and duties.

			• Have knowledge of special provisions for Government audit. • Gain insight into audit of special entities and emerging concepts in auditing as well as standards on auditing.
	Foreign Trade of India	P21.	1. Understand the underlying motives of international trade. 2. Know the composition, direction and volume of trade over a period of time. 3. Analyse with the current status and changing dynamics of India's foreign trade as well as the impact of policy changes on it. 4. Well-equipped when employed, whether in the field of industry or trade (export-import).
	Macro Economics	P22.	• The meaning and components of the National Income Accounts, especially GDP; the concept and working of multipliers; • The meaning of the business cycle and its phases and to manipulate the basic Aggregate Supply, Aggregate Demand model of the macro economy; • The meaning of unemployment and inflation data and how that data is collected and computed; • How fiscal policy operates, its tools, and its advantages and drawbacks; • How monetary policy operates, its tools, and its advantages and drawbacks.
	Institutional Framework for Business	P23.	Upon successful completion of this course the students will be able understand how the institutional framework for business will empower them to better locate and employ the opportunities available during the course of fulfilling their duties in various managerial roles. They would be able to take better decisions and design and provide better value to both their respective organizations and the various stakeholders involved. The knowledge of the institutional mechanisms will stand in good stead for the budding entrepreneurs of tomorrow.
	Vocational Course II	P24.	
SEM V	Goods and Service Tax (GST)	P25	• Learn the concept of Indirect tax from Pre-GST period to Post-GST period. • Understand the difference between forward charge, reverse charge mechanism and the difference between composite and

			mixed supply. • Know the contents and format for various documents like tax invoice, bill of supply, debit note, credit note etc. • Record and analyze the transactions for compliance under GST. • Understand the procedure for registration, payment and refund of GST as well as mechanism to determine it.
	Principles and Practice of Insurance	P26.	• Gain knowledge about the concept & purpose of insurance, Double insurance, Over insurance, Under-insurance and Re-insurance. • Gain insight about the Theories, Principles and Contracts of Insurance. • Learn various policies, Terms & conditions and Types of Life Insurance. • Gain knowledge regarding basic principles of Fire Insurance policy, assignment and claims. • Acquire knowledge on Principles, Types, Conditions and Warranties in Marine Insurance policy as well as marine losses.
	Introduction to Entrepreneurship	P27.	• Develop the concepts of Entrepreneurship and its practical significance • Develop the capability to identify business opportunities and work on them • Learn to develop a Business Plan with sufficient focus on Technology, Human Resource and management of Financial resources • Learn to source the funds and apply them efficiently
	Managing Business Operation	P28	Upon successful completion of this course the students will be able to comprehend the operational activities in any organization - Production based and/or Service Based. They will be able to effectively & efficiently execute different operational functions in any business organization
	Company Law and Practice	P29X	• Understand the nature, types and formation of companies in India • Understand and draft Memorandum of Association and Articles of Association • Plan the management of Share Capital and its Issuance • Understand the legal implications in appointment of company officials and conduct and scope of Company

			Meetings
	Concepts of Valuation	P29Y	• Develop a thorough understanding of present and future value concepts • Grasp the techniques to estimate and analyze all types of Annuities • Fully understand the concepts of Fixed Income Securities and estimation of present and future values of their cash-flows • Develop a thorough knowledge of the concepts of Variable income securities (Shares) along with the knowledge of their Issuance and Trading in Capital Markets
SEM VI	Income tax Law and Accounts	P31.	• Know about the basic concept of Income Tax. • Understand the provisions of Income tax in order to minimize the ultimate tax liability by setting off loss due to agricultural Income. • Understand the provisions relating to residential status and incidence/charge of Tax. • Compute total income under five Heads of Income i.e. Salaries, House Property, Profits & Gains from Business & Profession, Capital Gains and Other Sources. • Acquire knowledge of the provisions and procedure for clubbing & aggregation of incomes and set-off & carry forward of losses. • Understand provisions about appeal & revision, tax penalties, offence and prosecutions.
	Principles and Practice of Marketing	P32.	• Have knowledge about marketing and its functions. • Understand what is a product, its classifications and product life cycle • Gain knowledge about the mechanism of price determination of a product in various markets. • Understand the need and significance of distribution channels. • Gain insight of the concept of advertising and how it affects the buying habits of a consumer**.** • Understand and trap the psyche of consumer in order to market a product.
	Indian Economy	P33.	1. Understand the fundamentals of Indian economy. 2. Analyze the changing dimensions of Indian economy. 3. Acquaint with changing dimensions of our economy. 4. Provide the knowledge about various

			policies and programmes run by our government and their impact on our economy.
	Applied Business Statistics	P34.	1. Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis; 2. Critically evaluate the underlying assumptions of analysis tools; 3. Understand and critically discuss the issues surrounding sampling and significance; Discuss critically the uses and limitations of statistical analysis; 4. Solve a range of problems using the techniques covered; 5. Conduct basic statistical analysis of data.
	Economics of Public Enterprises	P35X.	1. Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis; 2. Critically evaluate the underlying assumptions of analysis tools; 3. Understand and critically discuss the issues surrounding sampling and significance; Discuss critically the uses and limitations of statistical analysis; 4. Solve a range of problems using the techniques covered; 5. Conduct basic statistical analysis of data.
	Export Import Procedure and Documentation	P35Y	1. Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis; 2. Critically evaluate the underlying assumptions of analysis tools; 3. Understand and critically discuss the issues surrounding sampling and significance; Discuss critically the uses and limitations of statistical analysis; 4. Solve a range of problems using the techniques covered; 5. Conduct basic statistical analysis of data.
SEM VII	Accounting for Managers	P37	• Ability to understand the concept of Managerial Accounting along with the basic forms and norms of Managerial Accounting. • Ability to understand the terminologies associated with the field of Managerial Accounting and control along with their relevance. • Ability to identify the appropriate method and techniques of Managerial Accounting for

		solving different problems. • Ability to apply basic Managerial Accounting principles to solve business and industry related issues and problems. • Ability to understand the concept of Budgetary Control, Cash Flow Statement, Fund Flow Statement, Break Even Analysis etc.
Financial Planning	P38.	• Understand the premise of financial planning and identify the financial goals. • Critically evaluate the investment instruments suitable for different financial goals in different time span. • Apply appropriate financial instruments to manage individuals‘ finances. • Analyse investment in primary market
Rural Marketing	P39.	• Understand issues in rural marketing and characteristics of rural market. • Understand non-conventional methods of reaching rural markets. • Develop marketing strategy for rural markets. • Identify and explain factors which influence consumer behaviour. • Relate internal dynamics such as personality, perception, learning, motivation and attitude to the choices rural consumer make.
Labour Welfare Laws	P40X.	• Interpret the various provisions under the Act and understand how they can be used to improve industrial harmony. • Understand policies related to compensation, insurance, provident funds, gratuity etc. for the benefit of the company and employees. • Understand the role and complexities of trade unions in order to maintain cordial relations between management and labour. • Gain knowledge of the provisions of various acts like Payment of Gratuity Act, Workmen's Compensation Act, Trade Union Act, Employees' Provident Funds, Miscellaneous Provisions Act and its application for labour welfare
Legal Environment of Business	P40Y	• Create premise and clear understanding for legal aspects of transfer of property. • Comprehend and utilize laws relating

			to Societies and Trusts for start-ups and entrepreneurial ventures, independently. • Comprehend and utilize laws relating to Intellectual Property, Patents, Copyright, Trademark etc. • Learn about the legitimate rights and obligations under The Right to Information Act.
	Financial Institutions and Markets	P41X.	• Understand the working of financial institutions and markets both individually and as an interlinked system. • Understand the organization, role, functioning and need for regulation of different types of financial markets and the implications of the same on society. • Critically analyze the pivotal role of banking in a financial system and the reasons for it being among the most tightly regulated industries in the world. • Understand the impediments to financial inclusion and critically evaluate different ways of developing sustainable financial inclusion. Also critically analyse the working of the micro finance industry.
	Essentials of E-commerce	P41Y	This course is to familiarize the student with the basic of e-commerce and to comprehend its potential.
	Research Methodology	P42.	• Understand Research and identify research problems. • Learn Quantitative and Qualitative Methods of research. • Represent data in tabular as well as graphical manner. • Write Research paper and Preparation of Report
SEM VIII	MAJOR PROJECT	P43	

PROGRAM OUTCOME (PO) & COURSE OUTCOME (CO) (2021-22)

PROGRAM NAME	B.COM H

PROGRAM OUTCOME
PO1 Analytical thinking, problem solving & Innovation. **PO2** Cross cultural understanding. **PO3** Financial reporting and structuring. **PO4** Business knowledge, managerial decision making. **PO5** Essential skills for corporate.

COURSE OUTCOME			
SEMESTER	**COURSE NAME**	**COURSE CODE**	**COURSE OUTCOME**
I	**FINANCIAL ACCOUNTING**	BCH 101	CO1 Students learns the basic concepts of accounting and presentation of accounts. CO2 Students gains knowledge in the preparation of the profit and non profits organization. CO3 understand the concept of voyage and branch accounting. CO4 Students learns the depreciation calculation on the fixed assets and computation of claim under loss of stock CO5 Gains knowledge on calculation of profit for small traders.
	FINANCIAL MATHEMATICS	BCH 102	CO1.Explain the concepts and use equations, formulae, and mathematical expressions and relationships in a variety of contexts CO2Apply the knowledge in mathematics (algebra, matrices, calculus) in solving business Problems. CO3 Analyse and demonstrate mathematical skills required in mathematically intensive areas in Economics and business. CO4Integrate concept in international business concepts with functioning of global trade. CO5 To Develop proficiency in the application to solve business problems.
	FOREIGN TRADE OF INDIA	BCH 103	1. Students gain knowledge about internal and Foreign Trade 2. Students acquire knowledge on the theories of the International Trade 3. Students learn about composition of India's Foreign Trade before independence and during planning period

			4. Knowledge is gained by the students on trade policies, EXIM, ECGC,STC,MMTC, SEZ and many export promotion institutions 5. Students understand about the World Trade Organization with special reference to India, GATT, UNCTAD, India's Balance of trade and payments
	PRINCIPLES OF ECONOMICS	BCH 104	CO1 Students understands about the demand analysis and consumer behaviour. CO2 Students gained knowledge about the concepts in economics and Managerial Economics CO3 Students gains complete knowledge about the cost concepts and Production Function CO4 Students has a theoretical knowledge about the Pricing distribution methods CO5 Students acquires knowledge about the concept of Market Structure in detail.
	ESSENTIALS OF MANAGEMENT	BCH 105	CO1 Acquires knowledge in the process and levels of management in the organization. CO2 Students gains knowledge in planning and decision making activities in the organization. CO3It lets students understand types and structure of organization. CO4 Gains knowledge on staffing the employees. CO5 Students understand the do's and dont's of business.
	INDIAN ECONOMY & PUBLIC FINANCE	BCH 106	CO1 Students should know about economy and various sectors of economy and factors affecting the economy. CO2 Having knowledge of planning, and need of reforms in economy. CO3 Students should also have knowledge about role of government and budgets to run economy. CO4 Effect of government planning and expenditure on economy CO5 Students should able to relate themselves with economy
	HUMAN RESOURCE MANAGEMENT	BCH 201	1. To develop the understanding of the concept of human resource management and to understand its relevance in organizations. 2. To develop necessary skill set for application of various HR issues.

			3. To analyse the strategic issues and strategies required to select and develop manpower resources. 4. To integrate the knowledge of HR concepts to take correct business decisions. 5. To understand the concepts of remuneration plans
	BANKING OPERATIONS MANAGEMENT	BCH 202	CO1 Students gains knowledge about theoretical structures of banking system. CO2Students are trained and equipped with the skills of modern banking. CO3Students gains knowledge about commercial banks and its products. CO4 To develop and inculcate the traits of professionalism amongst the students. CO5Students are able to apply knowledge in order to explain banking service
	MANAGEMENT INFORMATION SYSTEM	BCH 203	1. To understand the basic principles and working of information technology. 2. Describe the role of information technology and information systems in business 3. To contrast and compare how internet and other information technologies support business processes. 4. To give an overall perspective of the importance of application of internet technologies in business administration.
	BUSINESS COMMUNICATION & OFFICE MANAGEMENT	BCH 204	1. To understand and demonstrate writing and speaking processes through invention, editing, and presentation 2. To understand and appropriately apply modes of expression, i.e., in written, and oral Communication. 3. Recognize basic traditional office management practices, emerging management tends. 4. Demonstrate effectiveness in planning, executing, and follow up of meetings 5. Understand how to use office equipments and role of office equipments in managing office.
	STATISTICAL METHODS	BCH 205	1. Understand a broad overview of statistics as a subject and can

			apply concepts in Business application. 2. Organize, collect and represent data for effective implementation of business process. 3. Understand the importance of summary measures to describe the characteristics of data set. 4. Analyze the relationship between two variables 5. Use various forecasting techniques and predictive techniques for the effective business planning.
	BUSINESS ENVIRONMENT	BCH 206	CO1 Students gains knowledge on business environment and its importance. CO2 Students learns on political and legal issues in business. CO3 They gain knowledge on social beliefs, customs and cultural heritage. CO4 Students have acquired knowledge on micro and macro-economic concepts. CO5 Students acquires knowledge on various financial service institutions
	COST ACCOUNTING	BCH 301	CO1 : Students gained knowledge on Management, financial and cost accounting differences CO2 : Students acquired knowledge on analysis and interpretation of financial Statements. CO3 : Students understand the basic concepts and processes used to determine product costs. CO4 : Students are able to interpret cost accounting statements. CO5 : Students are able to analyze and evaluate information for cost ascertainment, planning, control and decision making.
	BUSINESS LAWS	BCH 302	1. Knowledge and understanding of basic laws related to business 2. To develop the understanding to understand the legal issues of business 3. Exercise of proper professional and ethical responsibilities to the legal system 4. T o have an applicability of these laws.
	OPERATIONS MANAGEMENT	BCH 303	CO1: Identify the elements of operations management and

			various transformation processes to enhance productivity and competitiveness. CO2: Analyze and evaluate various facility alternatives and their capacity decisions. CO3: Develop aggregate capacity plans and MPS in operation environment. CO4: Plan and implement suitable materials handling principles and practices in the operations. CO5: Plan and implement suitable quality control measures in Quality Circles to TQM.
	MARKETING MANAGEMENT	BCH 304	CO1 : Students understand about the marketing and its various environmental factors CO2 : Gains knowledge on buyer behaviour and market segmentation CO3 : Students learns about various stages in Product Life Cycle CO4 : Gains knowledge in the marketing channels and sales management CO5 : Students gains knowledge on advertising and sales promotion
	INTERNATIONAL FINANCE	BCH 305	CO1: Determination of exchange rates, and their relationship with interest rates and inflation · CO2: Consequences of misalignment of exchange rates, the origins of financial crises · CO3: Different types of foreign exchange risks faced by the MNC · CO4: Identification and measurement of these risks · CO5: Management of foreign exchange risk via initiatives on and off balance sheet. The use of derivative instruments will be considered
	BUSINESS ECONOMICS	BCH 306	CO1 : Analyze the decisions taken by firms and households due to scarcity of resources. CO 2: Calculate the elasticity of demand and supply. CO3: Describe the laws and various concepts in production and costs. CO 4: Evaluate the various microeconomic theories CO5: Examine the causes of scarcity
IV	**MANAGEMENT ACCOUNTING**	BCH 401	1. 1. To enhance the abilities of learners to develop the concept of management accounting and its significance in the business.

		2. To enhance the abilities of learners to analyze the financial statements. 3. To enable the learners to understand, develop and apply the techniques of management accounting in the financial decision making in the business corporate. 4. . To make the students develop competence with their usage in managerial decision making and control
ORGANIZATIONAL BEHAVIOUR	BCH 402	CO1 Students came to know the need, scope and theories of organisation. CO2 Students gained knowledge on various motivational techniques of employees. CO3 Students learned knowledge on work environment and leadership styles. CO4 Students acquired knowledge on group dynamics in an organization. CO5 Students understood the climate and culture in an organization
COMPANY LAWS & SECRETARIAL PRACTICES	BCH 403	1. Comprehend the concepts, objectives and importance of Companies law. 2. Gain knowledge on companies and its process of incorporation. 3. Understanding of the different types of directors and kinds of company meetings. 4. Secretarial Practice' has been used to include knowledge, skills, procedure and methods of work to be performed by a Private Secretary. 5. Understand the process of winding up of companies.
OPERATIONS MANAGEMENT	BCH 404	1. To gain an understanding and appreciation of the principles and applications manufacturing/service firms. . 2. To develop skills necessary to effectively analyze and synthesize the many inter-relationships inherent in productive systems. 3. To reinforce analytical skills already learned, and build on these skills to further increase your of useful analytical tools for operations tasks. 4. To gain some ability to recognize situations in a production system

			environment to assist in decision making on operations management and strategy. 5. To understand how Enterprise Resource Planning and MRPII systems are used in managing operations
	INCOME TAX LAW AND ACCOUNTS	BCH 405	CO1 : Students have acquired knowledge on tax system in India. CO2 : Students have gained knowledge on Central Excise Duty. CO3 : Students have acquired knowledge on customs duty. CO4 : Students have learnt knowledge on sales tax. CO5 Students have learnt knowledge on VAT and Service Tax.
	INTERNATIONAL BUSINESS	BCH 406	1. It aims to provide students with practical tools and theoretical knowledge related to international trade . 2. the exploration of practical issues faced by business managers in international business situations. 3. Students will study international business at the nation-state level and at the level of the company. 4. It aims to help the students to understand and implement strategies to negotiate effectively within various cultural 5. It aims to help the students to understand the current conditions in developing emerging markets, and evaluate present and future opportunities and risks for international business activities.
V	**EXPORT IMPORT PROCEDURE AND DOCUMENTATION**	BCH 501	1. To develop the understanding of foreign trade. 2. To understand various terms and agreements associated with foreign trade. 3. To have an overview of various methods and schemes of export. 4. To make him understand and capable of take the advantage of export promotion schemes of government. 5. Role of banks in export promotion and documentation.

INDUSTRIAL LAWS	BCH 502	CO1 Students should able to elaborate the concept of Industrial Relations. CO2 The students should able to illustrate the role of trade union in the industrial setup. CO3 Students should able to outline the important causes & impact of industrial disputes. CO4 Students should able to elaborate Industrial Dispute settlement procedures.. CO5 Student should be able to summarize the important provisions of Wage Legislations, in reference to Payment of Wages Act 1936.
CONSUMER BEHAVIOUR & ADVERTISEMENT MANAGEMENT	BCH 503	1. Remember the key terms, definitions and concepts used in the study of consumer behavior 2. Understand and demonstrate how as a marketer you can use your knowledge of consumer behavior concepts to develop better marketing program and strategies to influence those behavior 3. Critically evaluate the effectiveness of various advertisements and promotions and their attempt to influence the behavior of individuals 4. Analyse the trends in consumer behavior and apply them to the marketing of an actual product or service
BUSINESS FINANCE	BCH 504	5. To develop an understanding of the conceptual framework of Business Finance. 6. To understand the concepts of Business finance with their environment. 7. To develop the understanding of the concepts of capital structure and application. 8. To develop the understanding of the concepts of working capital . 9. To understand the concept of cost of capital.
FINANCIAL MARKET OPERATIONS	BCH 505(FOS)	1. To develop the understanding of Indian financial system. 2. To understand the concept of primary and secondary markets. 3. Develop the knowledge the functions of primary and secondary markets. 4. To develop the understanding of acts related to primary and

			secondary markets. 5. Should have the knowledge of various stock markets in india.
	INSURANCE AND RISK MANAGEMENT	BCH 506(FOS)	1. Understand the meaning, need and types of insurance. 2. Understand the risk and types of risk which can be insured. 3. To have an understanding of types of insurance. 4. Claims and procedure of claim 5. To have the knowledge of various acts related with insurance.
VI	**GOODS AND SERVICES TAX IN INDIA**	BCH 601	6.
	BUSINESS POLICY	BCH 602	1. To understand and to be able to formulate organizational vision, mission, goals, and objectives. 2. To understand, develop and apply strategies and action plans to achieve an organization's vision, mission, and goals. 3. To develop skills for assessing business environment determining risks and to make sound business decisions and achieves effective outcomes. 4. To evaluate and rectify plans, programs and procedures in order to achieve organizational goals.
	GOVERNANCE & BUSINESS ETHICS	BCH 603	1. Understand about the concept of business ethics. 2. Acquired knowledge about corporate social responsiveness and corporate citizenship. 3. Describe about different concepts in understanding corporate governance. 4. Acquaint with the various concepts and aspects of corporate social responsibility
	CONTEMPRARY AUDIT	BCH 604	1. Described about the concept, types & methods of auditing. 2. Acquired knowledge about vouching of cash and credit transactions. 3. Verification of assets and liabilities. 4. Comprehend the knowledge about appointment, rights, duties and responsibility of auditor. 5. Acquired knowledge of audit documentation and audit evidence.
	FINANCIAL SERVICES	BCH 605(FOS)	CO1 Students gained knowledge on role of financial service sector.

			CO2 Acquired knowledge on functions of NIM, SEBI. CO3 Students understood the concepts of leasing, factoring and hire purchase. CO4 Gained knowledge on project investment. CO5 Learns the concept of role of UTI and mutual funds
	SECURITY ANALYSIS & PORTFOLIO MANAGEMENT	BCH 606(FOS)	CO1: To provide a theoretical and practical background in the field of investments. CO2: Designing and managing the bond as well as CO3: equity portfolios in the real word. Valuing equity and debt instruments. CO4: Measuring the portfolio performances CO5: Evaluating the portfolio performances

PROGRAMME OUTCOME (PO) & COURSE OUTCOME (CO) (2021-22)

PROGRMME NAME	BBA

PROGRAMME OUTCOME

- Ensure and understand professional augmentation taking place in the global as well as domestic business arena.

● To reduce the gap between industry and academia, with the right blend of theory and practice.

● To nurture their talent for becoming good leaders and assets for an organization.

● To gain an in-depth knowledge and analytical skills which will enable them to effectively and efficiently carry out various Trade and Marketing operations of an organization in the emerging globalized environment.

● Develop Critical attitude necessary for "life-long learning" through this course

COURSE OUTCOME			
SEMESTER	**COURSE NAME**	**COURSE CODE**	**COURSE OUTCOME**
SEM I	Principals of Management	P1	**Course Outcome:** The objective for this course to provide an understanding of the task and functions of management and to acquaint the participants with the developments in concept. Theories and practices in the overall field of management
	Business Organisations	P2	**Course outcomes:** The objective of this course is to develop an understanding on several important aspects of an organization, not just from an economic point of view but also considering organizations as part of society. It also includes analysis of the source of wealth creation, with a brief description of the environment and the key internal factors of an organization. The course introduces the students with the most important concepts of the dynamic framework of an organization.
	Financial & Management Accounting - I	P1'	**Course outcomes**: The aim of the course is to build knowledge and understanding of Financial and Management accounting among the student. The basic objective of this course is to enable the students to learn, explain and integrate the fundamental concepts, principles and techniques of accounting. Along with successfully applying the techniques and methods practically in order to analyze business performance, planning , decisions making and controlling the

			outcomes
	Business Communication	P2'	**Course Outcome:** This course aims to develop communication skills in equip students with a broad based knowledge business communication.
	Computer & IT Applications - I	P1"	**Course outcomes:** The course aims to familiarize the students with computers & its applications in the field of business.
	PERSONALITY DEVELOPMENT AND GROOMING	**CC1**	**Course outcomes:** The objective of this course is to familiarize the students with the conceptual background, theories and techniques of Personality and teaches the basic techniques of how an organization manages and develops its people .
SEM II	Organizational Behaviour	P3	**Course Outcome:** To provide knowledge about Organizational Behavior, individual and group behavior and give an overview about change in organization and QWL.
	Managerial Economics	P4	**Course Outcome:** To impart basic knowledge of the concepts and tools of Economic Analysis as relevant for Business Decision-Making.
	Financial & Management Accounting - II	P3’	**Course Outcome** The aim of the course is to extend and enhance the knowledge and understanding of Financial and Management accounting among the student. The basic objective of this course is to enable the students to learn and explain advanced concepts, principles and techniques of accounting. The practical application of the knowledge will help them in developing the skill of using these advanced methods in effective decision making.
	Business Environment	P4'	**Course outcomes**: The objective of this paper is to give the basic knowledge about the business environment in industry.
	Quantitative Techniques - I	P2"	**Course outcome:** The Course aims at providing students insight about the mathematical terms and their appropriate usage in business problems.
	RESUME WRITING AND CORPORATE COMMUNICATION	**CV1**	**Course outcomes:** The course is designed to empower students to carry out day to day communication at work place by adequate understanding of various types of communication and use of technology to facilitate efficient interpersonal communication. The course will also equip with effective writing skills necessary for resume building and other forms of written corporate communication.
SEM III	Financial Management	P5	**Course outcomes:** The aim of the course is to build knowledge and understanding of Financial

			Management among the student. The course seeks to give detailed knowledge about the subject matter by instilling them basic ideas about Financial Management. The outcome of the course will be as follows – To provide knowledge about business finance and investment decisions. To provide knowledge about financing and dividend decision. To give an overview about working capital.
	Operations Management	P6	**Course outcome**: The purpose of this course is to develop an understanding of issues and challenges involved in the area of Operation Management among under graduate students. The course aims to equip the students with basic management decisions regarding production & operation, designing decisions and designing of a production system.
	Marketing Management	P5’	**Course outcome:** The purpose of this course is to develop an understanding of the underlying concepts, strategies and the issues involved in the exchange of products and services.
	Human Resource Management	P6'	**Course outcomes:** The objective of this course is to familiarize the students with the conceptual background, theories and techniques of Human Resource Management and teaches the basic techniques of how an organization acquires, rewards, motivates, and manages its people effectively.
	Computer & IT Applications - II	P3"	**Course outcomes:** Students acquire skills of using end-user software for communication, data transformation and presentation.
	Interview Preparation & Planning	**CC2**	
SEM IV	Taxation & Laws	P7	**Course outcomes:** The aim of the course is to build knowledge, understanding about taxation among the student. The course seeks to give detailed knowledge about the subject matter by imparting them basic ideas about Income Tax.
	Logistic & Supply Chain Management	P8	Course outcomes: The objective of this paper is to give the basic knowledge about the Supply Chain Management for goods and services.
	Customer Relationship Management	P7’	**Course outcomes:** Customer Relationship Management, also known as CRM, helps businesses successfully implement strategies, practices and technologies aimed at winning and retaining customers profitably. The objective of this course is to equip the students with a sound foundation of CRM concepts and best practices in

			Industry.
	Industrial Relations Management	P8'	**Course Outcome**: The objective of the course is to make the students aware and understand about the dynamics of the industrial relations in the rapidly changing environment and also, they will have knowledge about the disciplinary procedure and grievance management process along with their implementation aspect.
	Quantitative Techniques - II	P4"	**Course outcomes:** The course aims to build skills for statistical and mathematical inferences of business data and acquaint the students with various quantitative tools and techniques used in business decision making
	Role Play and Simulation	**CV2**	**Course Outcome:** To learn about industry working and daily facing situations in various departments. The subject provide command and knowledge to deal the situation in various hierarchy of management. Student will learn situation handling at various levels through simulation.
SEM V	Entrepreneurship and Family Business - I	P9	Course outcomes: This course provides students with a solid introduction to the entrepreneurial process of creating new businesses, role of Creativity and innovation in Entrepreneurial start-ups, manage family-owned companies, context of social innovation and social entrepreneurship and issues and practices of financing entrepreneurial businesses.
	Business Policy & Strategic Management – I	P10	**Course outcomes:** The purpose of this course is to develop an understanding of underlying concepts, tools, frameworks, issues and challenges involved in the area of Business Policy & Strategic Management - I for Under-graduates. The course aims to achieve development of an understanding of the increasing competition as well as not for profit business policies, strategies and the practice in organizations to be aware of the different circumstances and situations arising from ever changing strategic situation.
	Consumer Behavior	P11Y	**Course outcomes**: The course of Consumer Behaviour aims at enabling students to understand the process of consumer behaviour, issues and dimensions, various internal and external factors that influence consumer behaviour and to apply this understanding to the development of marketing strategy.

	Business Ethics	P9’	**Course outcomes:** The aim of the course is to develop basic understanding about Business Ethics among the students. It also seeks to establish the importance of adopting ethical practices in business organizations.
	Business Laws	P10’	**Course outcomes:** The objective of the course is to familiarize the participants with legal perspective of the business and to give the basic knowledge about the rules and regulation of execution of Business.
	Internship		
SEM VI	Entrepreneurship and Family Business - II	P12	**Course outcomes:** The course is designed as a broad overview of entrepreneurship, including identifying a winning business opportunity, gathering funding for and launching a business, growing the organization and harvesting the rewards. It is an integrative course—one that combines material introduced to the students in core courses and applies it to the design and implementation of new ventures. The students are expected to have completed courses in Management Principles, Marketing, HRM, Productions & Operations, Economics, Accounting & Finance.
	Business Policy & Strategic Management - II	P13	**Course outcome:** The purpose of this course is to develop an understanding of issues and challenges involved in the area of Business Policy & Strategic Management – II for Under-graduates. To comprehend strategic management process, understand interrelationship between formulation and implementation and apply administrative and leadership skills for successful implementation of strategies.
	E - Commerce	P14X	**Course outcomes:** Understand the fundamental principles of e-Business and e- Commerce; Learn the technologies enabling e-commerce.
	Talent Management & HRIS	P14Y	**Course outcomes:** Students will be able to understand and articulate advanced concepts of human resource placements within organization. Apply talent positioning within the subsidiaries and business units.
	Corporate Governance and Corporate Social Responsibility	P11’	**Course outcomes:** The objective of this course is to familiarize the students with the conceptual background, theories and techniques of Corporate Governance and teaches the basic techniques of how an organization manages its people to contribute for the

			society through Corporate Social Responsibility
	Management Information System	P12’	**Course outcomes:** Students will be able to understand and articulate fundamental concepts of information systems management. Apply IT to solve common business problems. Plan and implement effective IT solutions to business problems. Apply the ethical aspects of information technology use in the organization.
	Minor Project		
SEM VII	Decision Sciences	P15	**Course outcomes:** The basic objectives of this course is to impart knowledge of different quantitative models & operations research techniques used in business decisions and management
	Project Management	P16	**Course outcomes:** Students will be able to understand the characteristics of Project and Project Management Knowledge**.** The students will understand the managerial process along with tools and techniques used in Project management Knowledge**.** Students will understand the scheduling and monitoring process in Project.
	Business Analytics	P17	**Course Outcomes:** Understand the fundamentals of business analytical, data handling and related research issues.
	Banking Operations Management	P18X	**Course Outcome:** The objective for this course to provide an understanding of the functions and role of banking institutions. It will also help in understanding the important rights and duties of bankers and their operations
	Retail & Rural Marketing	P18Y	**Course Objective:** To equip students with the necessary skills required for handing the various functions connected with retail operations. To familiarise the students with the concepts, tools & techniques useful to a manager in the field of rural marketing
	Insurance & Risk Management	P19X	**Objective:** The objective of this course is to familiarize students with the concept of risk, its principles and practices being followed in the insurance sector to manage risk. The students will also learn risk management process and applications
	Service and Industrial Marketing	P19Y	**Course outcome:** To provide in- depth understanding of nature, peculiarities and demands on service provider for effective design of marketing strategies for a service business. To developing an understanding of issues involved in marketing of industrial products.
	Research Methodology		**Course Outcomes:** Develop understanding on various kinds of

			research, objectives of doing research, research process, research designs and sampling. Have basic knowledge on qualitative research techniques, and adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis. Basic awareness of data analysis-and hypothesis testing procedures
SEM VIII	**MAJOR PROJECT**		

PROGRAM OUTCOME (PO) & COURSE OUTCOME (CO) (2021-22)

PROGRAM NAME	BVOC –SOFTWARE DEVELOPMENT

PROGRAM OUTCOME

- PO1: Improve their computer literacy, their basic understanding of operative systems and a working knowledge of software commonly used in academic and professional environments.
- PO2: Do Academic and Professional Presentations - Designing and delivering an effective presentation and developing the various IT skills to the electronic databases.
- PO3: Use the Systems Analysis Design paradigm to critically analyse a problem. Solve the problems (programming, networking, and database and Web design) in the Information Technology environment. Function effectively on teams to accomplish a common goal and demonstrate professional behavior.
- PO4: Develop IT-oriented security issues and protocols. Design and implement a web page.

COURSE OUTCOME			
SEMESTER	**COURSE NAME**	**COURSE CODE**	**COURSE OUTCOME**
	Fundamentals of Computers and Information Technology	BVNSD 1.1	**CO1:** Analyse the fundamental concepts of computers with the present level of knowledge of the students. **CO2:** Understand the operating systems, programming languages, peripheral devices, networking, multimedia and internet **CO3:** Understand binary, hexadecimal and octal number systems and their arithmetic. **CO4:** Visualize how computer network work.
	Problem Solving Techniques and C Programming	BVNSD 1.2	**CO1:** Understand the syntax and semantics of the C language **CO2:** Recognize how to develop and implement a program in the C language **CO3:** Demonstrate an understanding of basic building block of programming. **CO4:** Design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.
	Web Designing	BVNSD 1.3	**CO 1:** Understand principle of Web page design and about types of websites.

			CO 2: Visualize and Recognize the basic concept of HTML and application in web designing. **CO 3:** Recognize and apply the elements of Creating Style Sheet (CSS). **CO 4:** Understand the basic concepts of responsive web page. **CO 5:** Apply the basic concepts of Java Script.
	Introduction to Database management System	BVNSD 1.4	**CO1:** Design SQL queries to create database tables and make structural modifications. **CO2:** Design SQL queries to add data to the database, edit existing data, and to delete data from the database. **CO3:** Implement basic and advanced SQL queries to retrieve data from the database. **CO4:** Understand and applies indexing mechanisms in databases.
	Fundamental of Mathematics	BVNSD 1.5	**CO1:** Understand the Matrices and operations. **CO2:** Analyse the basic principles of sets and operations in sets, demonstrate an understanding of relations and functions and be able to determine their properties. **CO3:** Demonstrate different traversal methods for trees and graphs, Model problems in Computer Science using graphs and trees. **CO4:** Understand the Lattices, Boolean Algebra and Theory of Logic.
	CC1	BVNSD 1.6	
	Data Structures Using C	BVNSD 2.1	**CO1:** Analyze algorithms and algorithm correctness. **CO2:** Implement searching and sorting techniques. **CO3:** Demonstrate stack, queue and linked list operation.

			CO4: Understand the concepts of tree and graphs.
	Lab on Data Structures and C Programming (Practical Paper)	BVNSD 2.2	**CO1:** Analyze and write code linked list programs. **CO2:** Implement code searching and sorting techniques. **CO3:** Demonstrate & code stack, queue and tree list operation. **CO4:** Implement code graphs concepts
	PHP	BVNSD 2.3	**CO1:** Understand about installation, configuration, and administer PHP, web server, and database tools and extensions. **CO2:** Apply Object-Oriented Design principles in PHP. **CO3:** Write code for connection to databases to fetch, store, and update persistent information. **CO4:** Analyse learn to avoid SQL injection attacks using parameter binding and input sanitization. **CO5:** Understand business logic in the database using stored procedures in addition Test and debug object-oriented PHP scripts.
	Computer Graphics and Multimedia	BVNSD 2.4	**CO1:**Understand the basics of computer graphics, different graphics systems and applications of computer graphics **CO2:**Apply the tools of Adobe Photoshop and coral draw. **CO3:**Implement the use of social media effectively for productive use
	Communication Skills	BVNSD 2.5	**CO1:**Understand the parameters of communication for developing practical approach to be implemented further. **CO2:** Understand how to shape their personality with the help of different skills of interactions that can be used at organizational level. **CO3:**Present themselves by means of subjective practical skills that can be used at global level.

			CO4: Develop their fluency in speaking, reading and writing English language.
	CV1	BVNSD 2.6	
	ASP.NET and C#	BVNSD 3.1	**CO1**: Understand the Microsoft .NET Framework and ASP.NET page structure. **CO2:** Design web application with variety of controls. **CO3:** Access the data using inbuilt data access tools. **CO4:** Implement Microsoft ADO.NET to access data in web Application **CO5:** Configure and deploy Web Application **CO6:** Develop secured web application
	Lab on ASP.NET and C# (Practical Paper)	BVNSD 3.2	**CO1**: Understand the Microsoft .NET Framework and ASP.NET page structure. **CO2:** Design web application with variety of controls. **CO3:** Access the data using inbuilt data access tools. **CO4:** Implement Microsoft ADO.NET to access data in web Application **CO5:** Configure and deploy Web Application **CO6:** Develop secured web application
	Data Communication and Computer Network	BVNSD 3.3	**CO1:**Understand basic computer network technology. **CO2:**Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer. **CO3:**Analyse the different types of network devices and their functions within a network **CO4:** Implement security of the data over the network. **CO5:**Understand Cryptographic and various Cryptographic Techniques **CO6:**Protect any network from the threats in the world.
	Operating System	BVNSD 3.4	**CO1:** Describe and explain the fundamental components of a computer

			operating system **CO2:** Define, restate, discuss, and explain the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems **CO3:** Analyse and extrapolate the interactions among the various components of computing systems. **CO4:** Design and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems
	Digital Electronics	BVNSD 3.5	**CO1:** Analyse the structure of number systems and perform the conversion among different number systems. **CO2:** Implement logical expressions using Boolean algebra, k-map and tabulation method and implement the functions using logic gates. **CO3:** Realize combinational circuits for given application. **CO4:** Design and analyses synchronous and asynchronous sequential circuits using flip-flops. **CO5:** Implement combinational logic circuits using programmable logic devices.
	CC2	BVNSD 3.6	
	Python Programming	BVNSD 4.1	**CO1:** Implement simple Python programs. **CO2:** Develop Python programs with conditionals and loops. **CO3:** Apply Python functions and to use Python data structures - lists, tuples, dictionaries **CO4:** Apply searching, sorting and merging in Python
	Design and Analysis of Algorithms	BVNSD 4.2	**CO1:** Implement new algorithms, prove them correct, and analyze their

			asymptotic and absolute runtime and memory demands. **CO2:** Understand the Advanced Data Structures **CO3:** Implement the Divide and Conquer, Greedy Methods and Trees. **CO4:** Apply the Dynamic Programming with examples.
	Software Engineering	BVNSD 4.3	**CO1:** Understand of the analysis and design of complex systems. **CO2:** Apply software engineering principles and techniques. **CO3:** Develop, maintain and evaluate large-scale software systems. **CO4:** Produce efficient, reliable, robust and cost-effective software solutions. **CO5:** Implement independent research and analysis. **CO6:** Understand and meet ethical standards and legal responsibilities.
	E-Commerce and M-commerce	BVNSD 4.4	**CO1:** Analyse the impact of E-commerce & M-commerce on business models and strategy. **CO2:** Understand the major types of E-commerce & M-commerce. **CO3:** Apply the process that should be followed in building an E-commerce & M-commerce presence. **CO4:** Understand the key security threats in the E-commerce & M-commerce environment.
	Cyber Security	BVNSD 4.5	**CO1:**Understand, appreciate, employ, design and implement appropriate security technologies and policies to protect computers and digital information. **CO2:** Evaluate Information Security threats and vulnerabilities in Information Systems and apply security measures to real time scenarios **CO3:** Analyse common trade-offs and compromises that are made in the design and development process of Information Systems.
	VC2	BVNSD 4.6	

	JAVA Programming	BVNSD 5.1	**CO1:** Understand Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc. **CO2:** Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms. **CO3:** Implement the principles of inheritance, packages and interfaces.
	Data warehousing and Mining	BVNSD 5.2	**CO1:**Design a Data warehouse system and perform business analysis with OLAP tools. **CO2:**Apply suitable pre-processing and visualization techniques for data analysis **CO3:**Apply frequent pattern and association rule mining techniques for data analysis **CO4:**Apply appropriate classification and clustering techniques for data analysis
	Software Testing	BVNSD 5.3	**CO1:**Understand the challenges and problems faced, what is testing, types of testing and the models. **CO2:**Understand the different types of testing with their workings. **CO3:**Describe the techniques used in static testing **CO4:**Visualize the methods used to perform dynamic testing and case studies on it. **CO5:** Understand how to manage the testing process by developing the related documents. **CO6:**Analyze why tools are required, how to use them and understand the ethics required.
	Network and Information Security	BVNSD 5.4	**CO1:**Identify some of the factors driving the need for network security **CO2:**Identify and classify particular examples of attacks **CO3:**Understand Distributed Computing techniques, Synchronous and Processes. **CO4:**Apply Shared Data access and Files concepts **CO5:**Develop basic understanding of security, cryptography, system attacks

			and defenses against them. **CO6:**Analyse message passing, client-server and peer -to-peer models to understand distributed computing paradigms.
	Cryptography.	BVNSD 5.5A	**CO1:** Understand security of the data over the network. **CO2:** Do research in the emerging areas of cryptography and network security. **CO3:** Implement various networking protocols. **CO4:** Protect any network from the threats in the world.
	Relational Database Management System Using Oracle	BVNSD 5.5B	**CO1:** Implement basic concepts of Database Systems in Database design **CO2:**Apply SQL queries to interact with Database **CO3:**Design a Database using normalization. **CO4:**Apply normalization on database design to eliminate anomalies **CO5:**Analyze database transactions and can control them by applying ACID properties.
	Internship/ Term Paper	BVNSD 5.6	
	Artificial Intelligence	BVNSD 6.1	**CO1:** Understand the basic of Artificial Intelligence. **CO2:** Implement the searching techniques of AI and Knowledge Representation & Reasoning. **CO3:** Analyse the Machine Learning and techniques. **CO4:** Analyse the Pattern Recognition and Classification Techniques.
	Internet of Things	BVNSD 6.2	**CO1:** Understand the Components that form part of IoT Architecture. **CO2:** Determine the most appropriate IoT Devices and Sensors based on Case Studies. **CO3:** Setup the connections between the Devices and Sensors.

			CO4: Evaluate the appropriate protocol for communication between IoT. **CO5:** Analyze the communication protocols for IoT. **CO6:** Design some IOT based project.
	Mobile application development using Android	BVNSD 6.3	**CO1:** Understand various concepts of mobile programming that make it unique from programming for other platforms, **CO2:** Visualize mobile applications on their design pros and cons, **CO3:** Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces, **CO4:** Program mobile applications for the Android operating system that use basic and advanced phone features, and **CO5:** Deploy applications to the Android marketplace for distribution.
	Digital Marketing	BVNSD 6.4	**CO1: U**nderstand the concept of Digital Marketing & E-commerce in today's scenario. **CO2:** Create and maintain a good website and blog posts. **CO3:** Understand and apply SEO and Email Marketing in today's modern world **CO4:** Apply Social Media Marketing techniques via various platforms **CO5:** Implement various Analytics tools of online marketing
	Cryptography LAB (Practical Paper)	BVNSD 6.5A	**CO1: U**nderstand basic cryptographic algorithms, message and web authentication and security issues. **CO2:** Understand information system requirements for both of them such as client and server. **CO3:** Apply the current legal issues towards information security.
	RDBMS LAB(Practical Paper)	BVNSD 6.5B	**CO1:**Understand, appreciate and effectively explain the underlying

			concepts of database technologies. **CO2:**Design and implement a database schema for a given problem-domain. **CO3:**Normalize a database. **CO4:**Populate and query a database using SQL DML/DDL commands. **CO5:**Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS. **CO6:** Implement programming PL/SQL including stored procedures, stored functions, cursors, packages.
	Minor Project	BVNSD 6.6	
	Advanced JAVA Programming	BVNSD 7.1	**CO1:** Understand graphical User Interface (GUI) networking, and database manipulation. **CO2:** Apply advanced technology in Java such as Internationalization, and Remote method Invocation **CO3:** Understand how to work with JavaBeans. **CO4:** Apply web application using Java Servlet and Java Server Pages technology.
	Machine Learning	BVNSD 7.2	**CO1:** Understand the Machine Learning and Approaches. **CO2:** Understand the Regression and Support Vector Machine. **CO3:** Understand the Decision Tree Learning and Instance-Based Learning. **CO4:** Apply the Reinforcement Learning and Genetic Algorithms
	Data Science	BVNSD 7.3	**CO1:** Understand the basics of Data Science. **CO2:** Implement data analysis using R. **CO3:** Understand statistical foundation for data science.
	Cloud Computing	BVNSD 7.4A	**CO1:** Understand the fundamental principles of distributed computing. **CO2:** Understand how the distributed

		computing environments known as Grids can be built from lower level services. **CO3:** Analyse the importance of virtualization in distributed computing and how this has enabled the development of Cloud Computing. **CO4:** Analyze the performance of Cloud Computing. **CO5:** Apply the concept of Cloud Security. **CO6:** Understand the Concept of Cloud Infrastructure Model
Linux Server Administration	BVNSD 7.4B	**CO1:** Understand concepts of Linux OS basics **CO2:** Apply various Linux based administration tasks **CO3:** Implement Linux OS based server configuration, management and administration
Theory of Computation	BVNSD 7.5A	**CO1:** Understand the Automata and Grammars. **CO2:** Understand the Regular Languages, Regular expression Applications and Limitation of Finite Automata. **CO3:** Analyse the Context free grammar, Context Free Languages Ambiguity in Grammar and Push down automata. **CO4:** Understand the Turing machines, Recursive and recursively enumerable languages.
Compiler Design	BVNSD 7.5B	**CO1:** Acquire knowledge of different phases and passes of the compiler and also able to use the compiler tools like LEX, YACC, etc. Students will also be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers. **CO2:** Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR,

			CLR, and LALR parsing table. **CO3:** Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes. **CO4:**Understand about run time data structure like symbol table organization and different techniques used in that.
	Research Methodology	BVNSD 7.6	**CO1:**Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling. **CO2:**Understand the qualitative research techniques **CO3:**Apply measurement & scaling techniques as well as the quantitative data analysis **CO4:**Understand data analysis-and hypothesis testing procedures
	MAJOR PROJECT	BVNSD 8	

PROGRAMME OUTCOME (PO), PROGRAMME SPECIFIC OUTCOME (PSO), COURSE OUTCOME (CO) (2021-22)

PROGRMME NAME	BSC

PROGRAMME OUTCOME
1. Ability to communicate mathematical ideas clearly using correct mathematical terminology and proper mathematical notation and use their mathematical knowledge to solve problems. 2. Develop appreciation and competency for application of mathematical approaches and techniques to variety of problems and applications to problems in other disciplines such as engineering, business and other decisional sciences. 3. Prepare sound mathematical base for enhancing understanding in interdisciplinary subjects such as physics, engineering, computer science etc. and for pursuing Master's Degree in Mathematics or Engineering/Computer science/ Business/Economics 4. Utilize mathematical skills to coach school and college students or enhance their own career prospects through pursuit of advanced degree in mathematics or full-fill prerequisites of eligibility for various national and international competitive examinations. **5.** Comprehend, analyse and apply knowledge gained to formulate research objectives, adopt appropriate methodology in identified research area to provide plausible mathematical solutions in chosen research project. 6. Build solid foundation to pursue Masters degree in Mathematics with research orientation as a prerequisite for Ph.D. in Mathematics. **Programme Specific Outcomes** 1. To formulate, analyze, and solve problems through application of fundamental mathematical techniques 2. To develop the ability to determine the validity of a given argument, develop mathematical thinking and be able to solve mathematical problems and construct mathematical proofs independently. 3. To demonstrate an understanding of the foundations of various branches of mathematics and apply the same to formulate and develop mathematical arguments in a logical manner. 4. Apply knowledge and mathematical skills to translate information presented into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion. 5. Investigate and apply mathematical solutions in a variety of contexts related to science, technology, business and industry, and illustrate these solutions using symbolic, numeric, or graphical methods. 6. Build a solid foundation for higher studies in mathematics and other disciplines requiring quantitative techniques and enhancing their career prospects through success in competitive examinations for further academic progression or placement in various positions requiring mathematical or quantitative background as a pre-requisite.

MATHS DEPARTMENT

COURSE OUTCOME			
SEMESTER	**COURSE NAME**	**COURSE CODE**	**COURSE OUTCOME**
SEM I	Differential Calculus	P-1	1. Know the concepts of calculus, namely, limits, continuity, differentiability of functions of one and two variables and their applications in the form of mean value theorem and Taylor's theorem. 2. Sketch curves in a plane using its mathematical properties in the different coordinate systems of reference. 3. Apply derivatives in Optimization, Social sciences, Physics and Life sciences etc. 4. Get knowledge of curvature, asymptotes, envelopes and evolutes
	Matrices and Algebra	P-2	1. Find the rank and eigen values of matrices. 2. Study the system of linear

			homogeneous and non-homogeneous equations. 3. Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc. 4. Link the fundamental concepts of Groups and symmetrical figures. 5. Analyze the subgroups of cyclic groups. 6. Explain the significance of the notion of cosets, normal subgroups, and factor group. 7. Understand the concepts of rings, subrings and fields.
SEM II	Integral Calculus	P-3	1. Some of the families and properties of Riemann integrable functions, and the applications of the fundamental theorems of integration. 2. Beta and Gamma functions and their properties. 3. The valid situations for the inter-changeability of differentiability and integrability with infinite sum, and approximation of transcendental functions in terms of power series. 4. Compute area of surfaces of revolution and the volume of solids by integrating over cross-sectional areas.
	Geometry	P-4	1. To learn and visualize the fundamental ideas of coordinate geometry. 2. To describe some surfaces by using analytical geometry. 3. To gain knowledge about regular geometrical figures and their properties.
SEM III	Ordinary Differential Equations	P-5	1. Formulate Differential Equations for various Mathematical models. 2. Solve first order non-linear differential equation and linear differential equations of higher order using various techniques. 3. Apply these techniques to solve and analyze various mathematical models.
	Mechanics	P-6	1. The significance of mathematics involved in physical quantities and their uses. 2. To understanding the various concepts of basic mechanics like simple harmonic motion, motion under other laws and forces. 3. To study and to learn the cause-effect related to these.

			4. The applications in observing and relating real situations/structures.
SEM IV	Mathematical Methods	P-7	1. To develop mathematical skills in calculus and analysis. 2. To get knowledge of Laplace Transforms and Fourier series. 3. To get acquainted with the essentials of calculus of variations.
	Linear & Abstract Algebra	P-8	1. The fundamental concept of Rings, Fields, subrings, integral domains and the corresponding morphisms. 2. The concept of linear independence of vectors over a field, the idea of basis and the dimension of a vector space. 3. Basic concepts of linear transformations, the Rank-Nullity Theorem, matrix of a linear transformation and the change of basis. 4. Automorphisms for constructing new groups from the given group. 5. Group actions, Sylow theorems and their applications to check nonsimplicity. 6. Compute inner products and determine orthogonality on vector spaces.
SEM V	Numerical Analysis	P-9	1. Some numerical methods to find the zeroes of nonlinear functions of a single variable and solution of a system of linear equations, up to a certain given level of precision. 2. Interpolation techniques to compute the values for a tabulated function at points not in the table. 3. Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical solutions.
	Analysis	P-10	1. Understand the basic concepts of metric spaces. 2. Know the concepts such as open balls, closed balls, compactness, connectedness etc. 3. Understand the significance of differentiability of complex valued functions leading to the understanding of Cauchy-Riemann equations. 4. Evaluate the contour integrals and understand the role of Cauchy-Goursat theorem and the Cauchy integral formula. 5. Expand some simple functions as their Taylor and Laurent series, classify the nature of singularities, find residues and apply Cauchy Residue theorem to evaluate integrals.

	Integral & Partial Differential Equations	P-11A	1. Describe different types of Linear integral equations and partial differential equations for the impart knowledge of formulation of practical problems of applied mathematics. 2. Understand the theoretical basic behavior of different types of arising problems such as Fredholm, Volterra, Singular, Hilbert and Cauchy integral equations. 3. Explain the foundations of various problems related to Wave, Laplace and Diffusion equations by the method of separation of variables. 4. Deal with problems in applied mathematics, theoretical mechanics and mathematical physics and engineering.
	Discrete Mathematics	P-11B	1. Lattices and their types. 2. Boolean algebra, switching circuits and their applications. 3. Graphs, their types and its applications in study of shortest path algorithms. 4. Display familiarity with the mathematical models which are the integral part of the hardware and software of computer science. 5. Elaborate and expand their understanding of the tools helpful in the implementation of circuit design, AI algorithms and compiler construction.
	Number Theory	P-11C	1. To have knowledge of primes, congruences, quadratic residues and primitive roots. 2. Solving Diophantine equations. 3. Derive generating functions and recurrence relations.
SEM VI	Advanced Algebra	P-12	1. Give the structure of an abelian group of a given order. 2. Construct the splitting field extension of a given polynomial. 3. Understand the interplay of group theory and field theory. 4. Determine the minimal polynomial of an algebraic element
	Differential Geometry & Tensor Analysis	P-13	1. Explain the concept of differentiable geometry. 2. Understand the concepts of tensors in differentiable geometry. 3. Apply various concept of differential calculus in tensors.
	Advanced Differential Equations	P-14A	1. Solve the system of 1st order differential equations, 2nd order differential

			equations, nth order differential equations, oscillatory equation, stability and unstability of linear and non-linear system of equations. 2. Conceptualize Green's functions and nature of critical points. 3. Prove advanced understanding of topics in applied mathematics, computational physics etc
	Operations Research	P-14B	1. Be able to understand the application of OR and frame a LP Problem with solution 2. Be able to build and solve Transportation and Assignment problems using appropriate method. 3. Be able to design and solve simple models of CPM and queuing to improve decision making and develop critical thinking and objective analysis of decision problems. 4. to take best course of action out of several alternative courses for the purpose of achieving objectives by applying game theory and sequencing models.
SEM VII	Topology	P-15	Course Outcomes: 1. Define and illustrate the concept of topological spaces and continuous functions, 2. Illustrate the concept of limit point, dense sets, interior, exterior, boundary points. 3. Identify and understand bases, sub-bases and different type of spaces like Lindelof, Separable, and their properties.
	Fluid Mechanics	P-16	Course Outcomes: 1. understand the concept of fluid and their classification, models and approaches to study the fluid flow. 2. formulate mass and momentum conservation principle and obtain solution for non viscous flow. 3. know potential theorems, minimum energy theorem and circulation theorem. 4. understand two dimensional motion, circle theorem and Blasius theorem.
	Geometry of Manifolds	P-17	1. Elaborate the concept of differentiable manifolds and their examples. 2. Clarify the concepts of vector fields, tangent vectors & tangent spaces in a manifold. 3. Apply various concepts of

			differential calculus to the settings of abstract set called manifold. 4. Use Riemannian metric on a given manifold to find the various types of curvatures with emphasis on the surface/ types of manifold. 5. Bring out different connections on Riemannian manifold and its properties. 6. Calculate curvature tensor & tensors of respective connections.
	Complex Analysis	P-18	1. Understand the topics of Complex Analysis needed to pursue research in pure mathematics. 2. Understand the properties of maximum modulus of a Complex valued function and the results based on that property. 3. Develop manipulation skills in the use of Rouche's theorem and Argument Principle. 4. Show knowledge of Gamma and Zeta functions with their properties and relationships. 5. Understand the Harmonic functions defined on a disc and concerned results. 6. Make factorization of entire functions having infinite number of zeros.
	Module Theory	P-19A	1. Identify cyclic modules, simple modules, finitely generated modules etc. 2. Find a basis of a free module. 3. Use the basis to describe module homomorphisms. 4. Describe the structure of a finitely generated module over a PID.
	Measure Theory & Integration	P-19B	1. Display understanding of the essential foundations of important aspect of mathematical analysis. 2. Explain the measurability of a set of real numbers and measurable functions. 3. Differentiate between the Riemann integral and the Lebesgue integral. 4. Apply the Measure theory and theory of the integral in other branches of pure and applied mathematics.
SEM VIII	MAJOR PROJECT		

PHYSICS DEPARTMENT

COURSE OUTCOME			
SEMESTER	**COURSE NAME**	**COURSE CODE**	**COURSE OUTCOME**
SEM I	Mechanics and Wave motion	P-1	1. The students would clearly understand the conflict between Newtonian mechanics and Special Relativity and thus would know how the progress of the revolutionary scientific ideas is made through logical evidences and observations. 2. They would be able to understand the differences between inertial and noninertial frames and see how pseudo-forces arise in non-inertial frames. 3. They would have a clear understanding of the dynamics of conservative and non-conservative forces in real life such as in gravitational fields or mechanical systems having friction etc. 4. They would feel the thrill to know that the same set of laws that work for planetary and galactic motions also work in our daily life. Further, they would be able to do mathematical calculations with application of these laws to various objects and artificial satellites. 5. They would be able to understand and calculate various macroscopic elastic properties as the response of the widely used materials through the application of simple classical laws. 6. The students would be able to understand and apply the properties of oscillations (natural, damped and forced), and waves and appreciate their omnipresence in various phenomena around us.
	Optics	P-2	1. The student will get an introduction to the discipline of optics and its role in daily life. 2. The optics course will give the student a basic knowledge of interference, diffraction and polarization. 3. The student will be able to analyze and calculate interference between light waves and application of the theory to various interferometers along with their practical applications. 4. The student would know the conditions for near and far-field diffraction

			and be able to calculate the far-field diffraction from gratings and simple aperture functions. 5. The student would understand how the polarization of light changes at reflection and transmission at interfaces.
SEM II	Electricity and Magnetism	P-3	1. Understand the basic mathematical concepts related to Electromagnetic fields, and use the understanding of calculus along with basic principles to solve problems encountered in science. 2. Comprehend and apply the understanding of fundamental laws and concepts in electricity and magnetism, primarily with regard to Maxwell's laws, to explain natural physical processes and related technological advancements. 3. Learn about the origin and basic properties of static as well as dynamic Electric and Magnetic fields, and the kinds of physical phenomena they generate - Electromagnetic waves and their properties. 4. Account for the importance of electricity and magnetism in society, especially with regard to technological applications. 5. Visualize and design experiments based on the basic concepts of electricity and magnetism, and obtain information in order to explore physical principles.
	Mechanics/ EM & Optics Lab	P-4	Experimental physics has the most striking impact on the industry wherever the instruments are used to determine the thermal and electronic properties. The following outcomes are expected by this laboratory course: 1. Students will achieve measurement precision. 2. Students will verify the conceptual learning through experiments in these areas. 3. Students will better appreciate the theoretical concepts in mechanics, electricity and magnetism, and optics through experiments. 4. Online Virtual Lab Experiments are expected to give insight in the simulation techniques, and provide basis for modeling.
SEM III	Heat and Thermodynamics	P-5	Course outcomes 1. The students will understand the fundamental principles of

			thermodynamics, including the first and second laws. 2. They would learn the idea of entropy and associated theorems, and the thermodynamic potentials and their physical meanings. 3. Students will have an understanding of Maxwell's thermodynamic relations. 4. They will acquire the knowledge about the fundamentals of gas kinetic theory and transport phenomenon.
	Perspectives of Quantum Physics	P-6	1. It will help students understand the basics concepts of Quantum Physics. 2. It will make students understand the development of quantum mechanics as a continuity of classical concepts and also as a leap jump from classical to quantum world of Physics. 3. A student will be able to understand as to how the inadequacies of classical Physics were overcome by various concepts and theoretical developments of modern Physics i.e. Understand how major concepts developed and changed over time. 4. A study of the Heisenberg's Uncertainty principle and its applications will make students understand the most modern concept of wave particle duality as to how a wave could behave like a particle and how a particle could behave like a wave. 5. An appreciation of the Schrödinger Wave Equation and its application to various problems in quantum mechanics will make students more analytical. This will give them the needed tool to solve problems across science subjects as Schrödinger equation appears in multidisciplinary subjects. 6. It will make students capable of analyzing and solving problems using reasoning skills based on the concepts of modern physics.
SEM IV	Electronics	P-7	1. Utility of resonant circuits and AC bridges. 2. The basic electronic devices and their applications. 3. Transistor biasing. 4. Concept of frequency response, bandwidth and audio amplifiers. 5. Feedback circuits 6. The importance of amplitude

			modulation and demodulation 7. Applications of various electronic instruments.
	Heat and Electronics Lab	P-8	1. Experimental physics has the most striking impact on the industry wherever the instruments are used to determine the thermal and electronic properties. 2. Measurement precision and perfection is achieved through Lab Experiments. 3. Online Virtual Lab Experiments give an insight in simulation techniques and provide a basis for modeling.
SEM V	Solid State Physics	P-9	1. The crystal geometry with respect to symmetry operations 2. The power of X-ray diffraction and the concept of reciprocal lattice 3. The various properties based on crystal bindings 4. Lattice dynamics and its influence on the properties of materials, 5. Physics of electrons in solids and 6. Magnetic, dielectric and superconducting properties of solids along with recent published results by various researchers. 7. Such study would provide a foundation for research in condensed matter physics, material science and nanotechnology.
	Nuclear Physics	P-10	1. Grasp the knowledge about basic nuclear properties and nuclear models for a better understanding of nuclear reaction dynamics. 2. Analyze quantum mechanical phenomena in nuclear physics and develop an understanding of quantum mechanics also. 3. Comprehend the general understanding of phenomena like nuclear fusion and fission and develop the skills required for solving basic problems in nuclear physics at different nuclear energy ranges. 4. Develop the basic understanding of accelerator physics and particle detectors. 5. Acquire and apply basic nuclear physics knowledge in subjects such as medicinal, archaeology, geology, and other multidisciplinary fields of Physics and Chemistry.
	Lasers and Optoelectronics I	P-11X	1. Opting for this course will give the students an opportunity to know and

			understand applications of fiber optics and laser technology. 2. Students will be able to appreciate the importance of lasers, fiber optical methods and sensors in all spheres of life i.e. various communication requirements, medical, travel etc. 3. Students will learn about optical fibers in detail and will be able to appreciate the current communication system existing globally. 4. They will also gain the knowledge of basic concepts of optical communication and of different types of optical fibers thereby getting enabled to appreciate the huge advantage of such systems. 5. Students will be able to know about various types of fiber optic sensors and their use in the areas of security, safety, medical and space ventures. 6. Finally, students may emerge with an idea for new sensor or a new application of the existing ones.
	The Second Quantum Revolution	P-11Y	1. To understand the main ideas of quantum computation. 2. To develop an understanding of the fundamental concepts of the field. 3. To equip the student with enough technical expertise to may be take up a career in this new, exciting and rich field of research. 4. To introduce some experimental developments pertaining to quantum computers.
SEM VI	Advanced Lab	P-12	1. Measurement precision and perfection is achieved through Lab Experiments. 2. The experiments in advance laboratory will enable students to be industry ready in the field of electronics. 3. The exposure to this laboratory will enable students to do research in applied optics and optoelectronics. 4. The students will be able to appreciate the concept of electronic communication. 5. Online Virtual Lab Experiments give an insight in simulation techniques and provide a basis for modeling.
	Atomic & Molecular Spectroscopy	P-13	1. After completion of the course students will be able to understand the spectra produced by one and two valence electron systems, intensity of spectral lines and effect of magnetic field on one electron systems as well as origin of hyperfine structure. 2. Students will acquire knowledge of

			rotational, vibrational and electronic spectra of molecules in addition to acquaintance with the principle of electron spin and nuclear magnetic resonance, nuclear quadrupole spectroscopy and their applications. 3. They will also learn the Laser principle, basic Lasers and its applications
	History of Science in India	P-14X	1. Students will realize and sense the excitement how deeply the mysteries of the starry sky and several socio-cultural aspects of human coexistence with nature have puzzled the great minds of all times in India and motivated them into extensive enquiry. 2. Students will learn about the long tradition of the monumental ancient-to-modern wisdom in science contributed by Indian scientists with their sheer dedication and intellect despite the obvious lack of adequate resources and experimental facilities. 3. They would clearly understand how the scientific ideas progress through the application of mathematics built on reason and logical methods and ultimately lead to scientific revolutions. 4. Thus, students will appreciate the role of human observations in verification of the scientific principles and necessity of the technological tools to add to or modify or overturn the already acquired knowledge along the line of history.
	Plasma Physics and Space Science	P-14Y	1. After completing the course the students will understand the basic concepts of plasma physics and will have very good knowledge of mathematical models for plasma and will be able to distinguish the dynamics of plasmas and neutral fluid media. 2. They will be able to describe the propagation of waves in plasmas and will have good insight into plasma instabilities. 3. Students will be able to know about the atmospheric structures, the Sun-Earth system and space weather. 4. The students will feel a great deal of excitement with our current understanding into the mysteries of the stars and universe, especially with the modern state-of-the-art

			technology like “Hubble Space Telescope” and “Planck” spacecraft..
SEM VII	Classical and Statistical Mechanics	P-15	1. Understand the concepts of generalized coordinates and D’Alembert’s principle. 2. Understand the Lagrangian dynamics and the importance of cyclic coordinates. 3. Comprehend the difference between Lagrangian and Hamiltonian dynamics. 4. Recognize the difference between macro-state and microstate. 5. Comprehend the concept of ensembles and partition function. 6. Applications of Bose-Einstein and Fermi-Dirac distribution laws. 7. Understand the White Dwarf Stars, Chandrasekhar Mass Limit
	Mathematical Physics	P-16	1. The primary objective is to teach the students basic mathematical methods that will be used in solving physical problems. 2. Students will learn the required mathematical techniques which will be useful in many other courses in higher education. 3. The emphasis will be to teach Mathematical Physics as a tool to create and develop new knowledge. 4. Understanding the mathematical Physics will enable students to solve advanced problems in various fields of Physics.
	Classical Field Theory of Electrodynamics and General Relativity	P-17	1. The primary focus of this course lies at the stimulating understanding of classical field theories and their applications in the modern research. 2. The students will learn to design and use the mathematical apparatus for building Lagrangian and Hamilitonian formulations of Electrodynamics and General relativity as the two fundamental force fields of nature. 3. They will appreciate how electromagnetic fields behave in the presence of gravity, as quite a realistic situation. 4. The students will grasp and appreciate the amazing insights into the equivalence principle and the whole edifice of Einstein’s General

			Relativity applicable up to Planckian scales. 5. They will feel the excitement and learn about the recently observed messengers of gravitational waves, in addition to the already existing electromagnetic signals. 6. Students will learn about the monumental contributions of Indian scientists like A. K. Raychaudhuri, P.C. Vaidya and C.V. Vishveshwara in the field of gravitation and gravitational waves. 7. The students will eventually learn how to formulate a field theory on their own by considering the key conditions as constraints on the action principle and viability with observations.
	Lasers and Optoelectronics II	P-18X	1. Using their knowledge of optical fibers students will learn optical communication, required coding, bandwidth budget, waveguides and optical couplers. 2. Students will learn about fabrication of integrated optical devices, various optic effects and various types of sensors using optical fibers. 3. Students will learn the fundamental mechanism in Lasers like Mode selection, Mode Locking and Q-switching. 4. Students will know about various types of lasers available and their applications. 5. Students will learn how the optical fibers are used in sensor applications. 6. Students will learn concepts of fiber optic communication.
	Advanced Electronics	P-18Y	1. Knowledge of Network theorems, 2. Study the drift and diffusion of charge carriers in a semiconductor. 2. Study of special diodes 3. Study of the working, properties and uses of FETs and MOSFET 4. Comprehend the design and operations of SCRs and UJTs. 5. Understand various number systems and binary codes. 6. Familiarize with binary arithmetic. 7. Study the working and properties of various logic gates.
	X-rays	P-19X	1. Students learn about the various methods of X-rays generation, safety concerns in the X-ray generation. 2. Students will be able to learn the theoretical background of the X-rays

			diffraction. 3. Students will get knowledge about the X-ray Films and their processing. 4. They will also understand the Diffraction of X-rays via several methods to obtained photograph pattern of various crystals and their studies. 5. Students will learn about the X-ray absorption and spectroscopic techniques.
	Mathematical Methods & Numerical Techniques	P-19BY	1. Understand numerical techniques to find the roots of equations and solution of system of linear equations. 2. Understand the difference operator, use of interpolation and matrices. 3. Understand numerical differentiation and integration and numerical solutions of ordinary and partial differential equations. 4. Applying numerical techniques to solve physics problems.
SEM VIII	Advanced Quantum Mechanics	P-20	1. Students will learn the basic concepts of Quantum mechanics which applies to all the physical systems irrespective of their size and can be beautifully perceived at atomic and subatomic level. 2. Students will be able to understand the various operators used to represent dynamic variables. 3. The eigen values and eigen functions of linear harmonic oscillator and Hydrogen atom will help students to understand the behaviour of microscopic systems. 4. The students shall have a good exposure to the approximation methods.
	Material Science and Nanotechnology	P-21	1. Develop the basic concept of materials science and acquire an understanding of various characterization techniques and potential applications of Nanomaterials as well. 2. Understand about the structure of materials and classification of nanostructures and effects of quantum confinement on the electronic structure of nanomaterials. 3. Comprehend the behavior of nanostructures in quantum mechanical approach. 4. Identify the different ways of nanomaterials synthesis and their characterization techniques.

			5. Gain knowledge of basic theories of thin films, their deposition techniques and applications
	MAJOR PROJECT		

CHEMISTRY DEPARTMENT

COURSE OUTCOME			
SEMESTER	**COURSE NAME**	**COURSE CODE**	**COURSE OUTCOME**
SEM I	Inorganic Chemistry 1	P1	CO-1 Structure of atoms and associated important rules, importance of chemistry of elements. CO-2 Ionic, covalent and non-covalent bonding which always play pivotal role in deciding the chemistry and properties of any compound/material. CO-3 Periodic properties of elements and several parameters associated with elements CO-4 Solid state chemistry which forms the basis of the development of targeted crystalline solids inculcating varied defects which induces variety of materials properties viz. piezoelectricity. CO-5 Chemistry of elements belonging to s-block, noble gases and main group.
	Organic Chemistry 1	P2	CO-1 Understand different organic compounds with respect to the functional group and thus capable to name the organic compounds as per IUPAC nomenclature. CO-2 Understand the basics of chemical reactions i.e. Substrate and Reagent, types of Reagents, Electrophilic and Nucleophilic Homolytic and heterolytic fission. Electron mobility, Inductive effect etc. CO-3 Recognize and draw constitutional isomers, stereoisomers, including enantiomers and diasteromers, racemic mixture and meso compounds. CO-4. Understand fundamental principles of organic chemistry and predict outcomes and derive mechanism of various types of organic reactions. CO-5 Understand various types of reactive intermediates and factors

			affecting their stability CO-6 Understand the nomenclature, synthesis, isomerism and physical properties of alkanes and cycloalkanes. CO-7 Understand the concept of Aromaticity of benzenoids & nonbenzenoids, the preparation, reactivity & structure of aromatic compounds. CO-8 Learn the preprations, reactivity & stereochemistry of SN1 &SN2 reactions of Halogen compounds.
SEM II	Physical Chemistry 1	P3	CO-1- Students would gain knowledge regarding the basic of computers and mathematical concepts of log, permutation and combination, differential and integration of some relevant functions. CO-2- Student would gain understanding of gaseous state, critical phenomenon, liquid state, solid state, colloidal state and liquid crystals. CO-3- It would help students recognize the importance of chemical kinetics and catalysis.
	Chemistry Practical 1	P4	CO-1. the student will be able to analyse the given mixture and identify anions and cations present. CO-2. achieve knowledge about different types of reaction. CO-3. understand various tests to identify the radicals. CO-4. able to write reactions and structure. CO-5. acquire the skill to perform the experiment in the real lab once they understand different steps in the procedure. CO-6. Having expertise in making solutions accurately. CO-7. To acquired enough knowledge to answer questions based on experiments.
SEM III	Physical Chemistry 2	P5	CO-1- After the completion of the semester, student will acquire knowledge of first law and second law of thermodynamics, thermochemistry, entropy enthalpy etc. CO-2- It will also make them familiar with conductance, equivalent conductance, Kohlrausch's law, Ostwald dilution law, Deby-Huckel Onsagar

			equation, e.m.f. of cell, types of cell, liquid junction potential, pH and pka, Henderson- Hazel equation etc.
	Chemistry Practical 2	P6	CO-1. By interpreting the real gases, the student will be able to solve the problems. CO-2. Describes the ideal and real gases. CO-3. By interpreting some properties of liquids and solids, the student will be able to solve the problems. CO-4. Interpreting the phase equilibrium in simple systems, the student will be able to answer the questions. CO-5. Adopt distribution law to explain various phases. CO-6. By describing the ideal solution, the student will be able to recognize, use and compare the colligative properties. CO-7. Explain various reactions based on kinetics. CO-8. describe the kinds of solutions.
SEM IV	Inorganic Chemistry 2	P7	CO-1 Chemistry of transition and inner-transition elements. These insights are important as they help in the rational selection of the cations of these elements for tailor-made syntheses of newer complexes CO-2 Concepts of coordination chemistry and their applications CO-3 Importance of different acid-base concepts which forms the basis of rational ligand designing and coordination complex formation for specific bioinorganic, materials and optoelectronic applications. CO-4 Importance and different chemical aspects of non-aqueous solvents which now-a-days are gaining importance in varied targeted syntheses of drugs and materials for technological applications
	Organic Chemistry 2	P8	CO-1 The preparation and chemical reactions of Alcohols and Epoxides - Alcohols Dihydric alcohols: (Ethylene Glycol) CO-2 Understanding the order of reactivity of different carboxylic acid derivatives and the reactivity of different carboxylic acid derivatives. CO-3 Able to recognize structures of

			acid halides, esters, amides, acid anhydrides. CO-4 Able to write down structure of phenol and phenoxide ion and chemical reactions of phenols. CO-5 Know the mechanism of named reactions of carbonyl compounds and condensation reactions as well as their use in food and pharmaceuticals
SEM V	Organic Chemistry 3	P9	CO-1 The organometallic compounds such as Grignard reagent which have been widely used on both laboratory and commercial scale and is one of the most common organometallic reagents used for the formation of carbon– carbon bonds. Organosulphur compounds which have therapeutic use and pharmacology CO-2 Carbohydrate, its classification and use in the food industry etc. CO-3 Protein, aminoacid and peptides. Chemical structure of RNA and DNA. CO-4 Various polymers, their method of polymerization and their use in industry
	Chemistry Practical 3	P10	CO-1 Having acquired knowledge to handle instruments and its calibration. CO-2 Explain the structure and bonding in molecules / ions and predict the structure of molecules / ions. – CO-3 Explain selected crystal structures, explain and perform calculations of the lattice enthalpy of ionic compounds. – CO-4 Having knowledge of Beer Lamberts law CO-5 To separate compounds chromatographically. CO-6 Able to make solutions accurately to perform conductance experiments. CO-7 To understand making circuit connections and taking observations.
	Analytical Chemistry	P 11X	CO 1. Understand the basic of this course and think & develop new ideas and concepts in analytical chemistry. CO 2 . Know about electroanayltical, thermoanalytical, radiochemical, chromatographic and spectral techniques. CO 3. To study concepts and theories behind basic methods and techniques used in analytical chemistry. This

			theory can be used to solve many rigorous problems of universe. CO 4. To prepare the students for further research in analytical methods of chemistry.
	Chemical Energetic and Radiochemistry	P 11Y	CO 1. Understand the introductory quantum mechanics and concept of third law of thermodynamics, distribution law and phase rule. CO 2. Get introduced to the law of photochemistry and photosensitized reactions energy transfer processes. CO 3. Study about the dilute solutions and colligative properties. CO 4. Get familiar with radiopharmaceuticals and radiochemistry.
SEM VI	Inorganic Chemistry 3	P12	CO-1 Semi-modern concepts of metal ligand bonding in coordination complexes CO-2 Inorganic polymers viz. silicones which find applications in materials pharmaceutical industries and surgery too. Phosphazenes which in last couple of years had witnessed significant development as emerging smart materials. CO-3 Class-a and class-b donor-acceptors, symbiotic relationship
	Quantum Mechanics and Spectroscopy	P13	CO-1 Infrared spectroscopy in which characteristic absorptions of various functional groups. CO-2 Ultraviolet absorption spectroscopy, Beer Lambert Law, types of electronic transitions and the effect of conjugation and concept of chromophore and auxochrome. CO-3 Nuclear magnetic resonance, interpretation of NMR spectra of simple organic molecule. CO-4 Quantum mechanics as well as of spectroscopy. They will have comprehensive understanding of valence bond model and molecular orbital model.
	Polymer Chemistry	P14X	CO-1. define related concepts of polymers. CO-2. summarize historical evolution of the polymers. CO-3. recognize monomers and polymers. CO-4. evaluate the structure of polymers.

			CO-5. recognize bonds between polymer chains. CO-6. debate thermal character and affecting factors of thermal behaviours. CO-7. use determining method of molecular weights. CO-8. categorize polymers. CO-9. explain polymers production processes.
	Chemistry of Natural Products	P14Y	CO1 Learn the different types of alkaloids, steroids, vitamins & terpenes etc and their chemistry and medicinal importance. CO2 Explain the importance of natural compounds as lead molecules for new drug discovery. CO3 Explain vitamins Chemistry and Physiological significance of Vitamin CO4 Elaborate general methods of structural elucidation of compounds of natural origin. CO5 Learn advanced methods of structural elucidation of compounds of natural origin.
SEM VII	Inorganic, Organic and Physical Chemistry	P15	CO 1. Cover wide area of studies of interdisciplinary area of the three branches of chemistry CO 2. Have ideas of catalysis, kinetics and free energy relationship. CO 3. Study stereochemical aspects of molecules and understand the spatial arrangements and its importance.
	Bioinorganic, Bioorganic and Biophysical Chemistry	P16	CO 1. Have ideas of metalloenzymes, bioenergetics, transport and storage of dioxygen, electron transfer, metal storage and metals in medicine. CO 2. Cover wide area of studies of interdisciplinary area of biology and chemistry. CO 3. It includes the study of both natural phenomena such as the behaviour of metalloproteins as well as artificially introduced metals.
	Chemistry Practical 4	P17	CO-1. Qualitative analysis of inorganic mixtures of 8 radicals CO-2. Qualitative analysis and determination of two metal ions volumetrically and gravimetrically. CO-3. The preparation of selected inorganic compounds and their characterization. CO-4. Qualitative analysis of three

			component organic mixtures. CO-5. students should be able to check the purity of organic molecules by the use of TLC and how to calculate their Rf values. CO-6. Two steps synthesis involving different name reactions. CO-7. The basic knowledge of conductance, electrochemistry, potentiometry and the kinetics of decomposition of the complexes spectrophotometrically
	Supramolecular Chemistry	P18X	CO 1. Have understanding of theories behind supramolecular interaction and various classes of host-guest chemistry and its applications. CO 2. Develop ideas for further research in the field of supramolecular chemistry. CO 3. Molecular recognition, complex formation and host design, templates and self-assembly through various examples and applications.
	Chemistry of Analgesics and Antipyretics	P18Y	CO-1. The structural activity relationship of different class of drugs. CO-2. The synthesis of drug molecules using the reactions of synthetic organic chemistry. CO-3. Well acquainted with the synthesis of some important class of drugs. CO-4. The mechanism pathways of certain class of medicinal compounds and their modes of action with receptors. CO-5. The chemistry of drugs with respect to their pharmacological activity.
	Science and Technology of Cosmetics	P19X	CO-1. This course allows students to understand and learn about the chemistry of cosmetics. CO-2. More specifically, this course aims to introduce the scientific aspects such as chemical, physical and biological functions of different ingredients present in the cosmetics. CO-3. This course also gives information about the formulation and technology of cosmetics

	Research Methodology	RM	CO-1. Minimize the risk of injury or illness to laboratory workers by ensuring that they have the training, information, support and equipment needed to work safely in the laboratory. CO-2. Have understanding of different purification criteria at separation and be able to account for fundamental separation processes and their connection to molecular properties. CO-3. IUPAC awareness on the world authority on chemical nomenclature, terminology, standardized methods for measurement, atomic weights and many other critically-evaluated data. CO-4. Developing skill for systematic, articulate and orderly presentation of research work in a written form containing relevant information on the research work carried out.
SEM VIII	MAJOR PROJECT		