

**COURSE&PROGRAMOUTCOMESOF
(B.COM HON)**

Semester	Subject Name and Code	CourseOutcomes
SEM-1	subject 1 An introduction to Statistics	<p>CO-1: To provide a basic knowledge of the application of mathematics and statistics to business disciplines.</p> <p>CO-2: : Learn how to calculate and apply measures of location and measures of dispersion grouped and ungrouped data cases.</p> <p>CO-3: How to calculate and apply measures of location and measures of dispersion grouped and ungrouped data cases.</p> <p>CO-4: How to apply probability for taking various business decisions</p>
	subject 2 Business Communications	<p>CO-1: This subject prepares students in basic as well as business communication</p> <p>CO-2: To understand the importance of one-way, two-way, oral and written communications, group discussions etc.</p> <p>CO-3: How to write office memos and inter/intra office communications.</p> <p>CO-4: To understand the basics of the Spoken English for Business communication: Presentation of Plans, Objectives; speech-Preparation, Mode of delivery presentation; Addressing the Audience.</p> <p>CO-5: Explore the E – correspondence and its usage, impact etc</p> <p>...</p>
	subject 3 Business Organisation	<p>1: To understand about the Business Activities, Manufacturing, service Sectors, globalization, liberalization and privatization, Multinational corporations.</p> <p>2: To understand the Entrepreneurial opportunities i.e. Networking marketing, Franchising, Business Process Outsourcing, E-commerce and M-commerce.</p> <p>3: How to explore the business opportunities, idea generation, creativity & innovation.</p> <p>4: To aware about Product and pricing decisions, Distribution and promotional decisions, human resources etc.</p> <p>5: To understand the basics of the process on how to set up a small business, preliminary screening and aspects of the detailed Project report with their feasibility</p>
	subject 4 An Introduction to Accounting	<p>1: This subject provides an in-depth knowledge of basic accounting features to the students.</p> <p>2: To understand the role of accounting concepts and conventions in accounting</p> <p>3: To understand the Accounting process which starts from recording of business transactions to preparation of trial balance i.e. Journal, Ledger, Cash-Book and other subsidiary books etc.</p> <p>4: To learn how to prepare depreciation accounts in straight and written down value method.</p> <p>5: To understand the basic differences between capital and revenue expenditures and learn how to prepare financial statements for different organization from a trial balance.</p>
	subject 5 Fundamentals of Economics	<p>1: To know the basic concept of demand and supply and types of elasticity of demand: price, income and cross.</p> <p>2: To have the perfect knowledge of notion of indifference curve analysis of consumer behaviour and theory of revealed preference.</p> <p>3: To have in-depth knowledge of the consumer surplus and use the Indifference curves as an analytical tool.</p> <p>4: To get the insights of various factors of productions, production function, law of productions.</p> <p>5: To understand the basic differences between return to scale and factor.</p>

	subject 6 Business Law-I	<p>1: Provides basic understanding of provisions for successfully entering the various type of contacts.</p> <p>2: Business law helps the society in realizing the business ethics in order to run a proper and authenticated business.</p> <p>3: Knowledge of consumer protection act is important for both buyer and seller in making marketing decisions.</p> <p>4: Study of business law inculcates the capability to carefully analyze the situations through legal reasoning.</p> <p>5: Acquainting college students with the role of law in business endeavors</p>
SEM-2	subject 1 Financial Accounting for Business	<p>1: To differentiate among the Hire Purchase System, Installment Payment System & Lease accounting with their methods.</p> <p>2: To understand how to prepare accounts in dependent branches i.e debtors system, stock and debtors system, branch final accounts system and also to learn the accounting system through which Independent branches accounts are prepared.</p> <p>3: Applying the correct tools and techniques, learn the concept of data collection in research and various methods of Data collection, difference between Experiments and Surveys.</p> <p>4: To gain knowledge on Partnership, adjustment of capital in case of admission, retirement and death of a partner, dissolution of partnership firm, insolvency of partners (including Garner V/s Murrey Rule).</p> <p>5: To learn about how to prepare departmental accounts, Royalty Accounts, Revaluation Accounts and Realization Accounts.</p>
	subject 2 Business Economics	<p>1: Basic understanding of Cost of Production and apply the various cost concepts</p> <p>2: To have the insights of various markets structures and the equilibrium conditions of a firm and industry in short and long run.</p> <p>3: To analyse the market demand and supply and the models of Stability analysis-Walrasian and Marshallian.</p> <p>4: To know the various factors responsible for economic-Development: Physical and Capital Formation, and Technology.</p> <p>5: Analyse the several Sustainability Institutional factors / variables in development.</p>
	subject 3 Business Statistics	<p>1: This subject will introduce students to the quantitative tools that are necessary for day-to-day business needs.</p> <p>2: To develop an ability to analyse and interpret data to provide meaningful information to assist in making management decisions.</p> <p>3: How to apply discrete and continuous probability distributions to various business problems.</p> <p>4: Compute and interpret the results of Bivariate and Multivariate Regression and Correlation Analysis</p>
	subject 4 Business Management	<p>1: Described about different management theories – Taylor & Fayol.</p> <p>2: Acquired knowledge on scientific management – F.W.Taylor</p> <p>3: Described about different concept like staffing, departmentation & delegation.</p> <p>4: Understands about co-ordination & controlling</p>
	subject 5 Business Law-II	<p>1: Study of business law teaches how to manage finances as well as planning under various provisions.</p> <p>2: Enables the students to have interaction about various laws regarding working of factories.</p> <p>3: helpful while doing dealings in foreign exchange.</p> <p>4: Study of industrial law helps in creating knowledge about how to generate cordial environment in industry and amicable settlement of disputes arising between employers and employees</p> <p>5: Business law students are competent enough to have decisions regarding</p>

		their future career, profession, business.
	subject 6 Introduction to Computer (Theory)	<p>1: To know the basics of Computer System, Computer Software & Hardware and Information processing system</p> <p>. 2: To understand the differences of types of computer systems, input-output devices, storage devices, communication devices, configuration of hardware devices and their applications</p> <p>. 3: To learn about the personal computers, its components, hardware configuration, RAM, factors influencing PC performance, Database Systems</p> <p>4: To be familiar with Modern network Technologies i.e. LAN, WAN, MAN, E-mail, Internet technologies, World Wide Web and Internet browsing.</p> <p>5: To get practical learning on M.S.Word, Excel, Power Point, Internet Technology – Applications, manager., control panel, paintbrush, calculator, desk top, my computer, settings, find, run etc.</p>
SEM-3	subject 1 Business Mathematics	<p>1: To know the basics of Algebra, Adjoint and Inverse of Matrices.</p> <p>2: To understand the differences of Compound Interest, Annuities, Time value of Money.</p> <p>3: To learn about the Differentiation and Integration.</p> <p>4: To be familiar with Graphic Method, Simplex Method and Set theory.</p>
	subject 2 Corporate Accounting-I	<p>1: A comprehensive understanding of regulatory environment of issue and forfeiture of shares; redemption of preference shares and Buy back.</p> <p>2: Ability to accounting treatment for valuation of goodwill; valuation of securities; issue and redemption of debentures.</p> <p>3: An understanding of principles of amalgamation and internal reconstruction of companies as per AS-14.</p> <p>4: Ability to analyse the complex issues of holding companies accounts; profit or loss prior and subsequent to incorporation.</p> <p>5: To know the accounting environment and financial reporting requirements for companies and various corporate related issues.</p>
	subject 3 Cost Accounting	<p>1: Demonstrate domain knowledge in installation of costing system;</p> <p>2: Better knowledge about the how to get over from the labour turnover, overtime and idle time;</p> <p>3: Understanding the distribution scheme of production overhead and factory overhead;</p> <p>4: Getting the deep knowledge about the inter-process profit.</p>
	subject 4 Company Law- I	<p>1: Development of student skills in regulatory practice relating to company law.</p> <p>2: Provide students with knowledge and appreciation of the major core topics in company law.</p> <p>3: Helpful at the time of formation of company to the young entrepreneurs .</p> <p>4: Students become aware of legal nature and significance of limited liability of company.</p> <p>5: Understanding about borrowing powers of the company to the money lenders under companies act.</p>

	subject 5 Principles of Marketing	1: To know the concept of Marketing, and problems in marketing . 2: To understand the basis for market segmentation, Branding, trade-mark and product life cycle. 3: To be familiar with Pricing & Distribution channel factors affecting choice of a distribution channel. 4: To learn the New Product planning & development, branding, Packaging and labelling, Pricing Decisions and strategies . 5: Understanding the product Promotion, their Complexities and issues and advertising
	subject 6 Basics of Information Technology	1: To know the basics of Computer System, Computer Software & Hardware and Information processing system. 2: To understand the differences of types of computer systems, input-output devices, storage devices, communication devices, configuration of hardware devices and their applications. 3: To learn about the personal computers, its components, hardware configuration, RAM, factors influencing PC performance 4: To be familiar with Modern network Technologies i.e. LAN, WAN, MAN, E-mail, Internet technologies, World Wide Web and Internet browsing . 5: To get practical learning on M.S.Word, Excel, Power Point, Internet Technology – Applications, manager., control panel, paintbrush, calculator, desk top, my computer, settings, find, run etc.
SEM 4	subject 1 Corporate Accounting-II	1: To recognise and understand the ethical issues in while preparing Final Accounts of a company. 2: An understanding of the regulatory environment regarding accounts of Banking Companies and Underwriting of shares and debentures 3: The ability to prepare the accounts of Insurance Companies and consolidated accounts after Liquidation of companies 4: An understanding of accounting requirement of corporate groups like preparing the accounts of Electricity Companies . 5: To employ the critical thinking skills to analyse the accounting data as well as the effects of different accounting methods on financial statements of a company
	subject 2 Business Ethics	1: To know the importance of business, the community, and the ethical conduct of the business. 2: To reflect the ethical sphere of decision making and make the students capable to analyse and argue the ethical dimension. 3: To make the students aware of applying systematic ethical reasoning to business dilemma and communicate effectively in oral and written forms. 4: To introduce the most common theoretical perspective for understanding corporate social responsibility and give the understanding of the political, social, and economic drivers behind CSR . 5: To make the students competent in applying skills in integrated business areas.
	subject 3 Company Law -II	1: Study of company law facilitates the appreciation of legal limitations and constraints on company functioning. 2: Provide students with an awareness of current policy trends and developments in company law. 3: Guides the aspirant members and share holders of the company . 4: Student of company law is capable to present legal analysis and reasoned conclusions. 5: Study of company law provides information about how corporations, investors, directors, share holders and other stake holders interact with each other.

	subject 4 Statistical Analysis with MS Excel	1: To gain familiarity with MS Excel while conducting a research. 2: Applying the correct tools and techniques, learn the concept of data collection in research and various methods of Data collection, difference between Experiments and Surveys. 3: Process of Data preparation, data entry, finding the missing values and outliers and correcting them. 4: Practical learning experience on various research tools using MS Excel such as Mean, Median, mode, range, Standard deviation, skewness, kurtosis. 5: Understanding Sampling, sampling and non-sampling errors, degree of freedom, standard error.
	subject 5 Financial Institutions & Markets	1: This subject prepares the students in understanding financial system and its history, operating procedure, and its relevance in Import & Export. 2: To gain knowledge on Financial Markets - Money and capital markets, Money market instruments and Recent trends in Indian money markets & capital market 3: To learn about the Process of issuing securities in primary and secondary market. 4: To differentiate between Hire Purchase and Leasing and to understand the problems and prospects of leasing Industry in India. 5: To provide exposure to students regarding Venture Capital, guidelines and initiative of venture capital in India.
	subject 6 Auditing	1: This paper gives the knowledge of examines the principles and practices of internal and external auditing. 2: The students can capable to understand the auditing as a component of recurrent and strategic activities. 3: The students also capable to understand risk assessment, internal control, systems evaluation, forensic accountability, and contemporary audit issues and challenges. 4: The students can learn about the Audit Report, Tax audit, Management audit and Cost audit.
SEM 5	subject 1 Financial Management	1: Measure risk and return and explain the trade-off between risk and return 2: Calculate the value of various financial assets like annuities, bonds, stocks, and retirement savings 3: List the primary sources of capital and incorporate their cost when making investment decisions 4: Estimate project cash flows to distinguish between value-creating and value destroying investments. 5: Estimate cash flows from a project, including operating, net working capital, and capital spending.
	subject 2 Investment Analysis	1: Value assets such as stocks and bonds. 2: Manage investment portfolios. 3: Optimally diversify portfolios 4: Allocate investments into stock and bond portfolios in accordance with a person's risk preferences. 5: Figure out when a trading account at a brokerage firm will receive a margin call.
	subject 3 Money Banking and	1: To differentiate among the Quantity Theory of Money-fisher, Cambridge and Keynesian theory of money. 2: To understand Definition of money, functions and importance of money, role of money in various economic systems, evils of money, classification of money, circular flow of money 3: Assessing the types of inflation, Theories of inflation, effects and consequences of inflation, control of inflation 4: To understand the basics of the credit, its definition, types, merits and demerits, credit and economic development. Functions of commercial Banks & Central Banks, process of credit creation and its limitations. 5: To understand the Control of money supply, Reserve Bank of India: its

		functions.
	subject 4 Contemporary Issues in Commerce	<ol style="list-style-type: none"> 1: Research and analyze complex contemporary commerce issues, and formulate well-reasoned and coherent arguments and reach well considered conclusions in relation to those issues. 2: Learn about Financial Innovations, Global Financial Crisis, Recent trends in Banking and Financial Services. 3: Focus on Challenges in Managing Workforce Diversity, Human Resource Accounting and Audit, HR challenges in Managing Technological Changes. 4: Reshaping Rural Marketing; Modern Retailing Challenges in India, Marketing through Social Networking Websites, Evolving E-Marketing in India
	subject 5 Income Tax	<ol style="list-style-type: none"> 1: Student will learn the keywords of Income Tax Act and exempted incomes. 2: Student will gain with the provisions regarding determination of salary income and house property income. 3: Student will become familiar with the provisions of income tax regarding assessment of business income and capital gains. 4: Students will know about the circumstances under which income of others will be clubbed in the income of assessee 5: Students will aware about the treatment of losses as per income tax law.
	subject 6 Entrepreneurship and Small Scale Business	<ol style="list-style-type: none"> 1: To differentiate among the Entrepreneur, Entrepreneurship & Enterprise with their Roles and functions. 2: To understand the role of Govt. Bodies such as Entrepreneurship Development Institute of India, National Institute of Entrepreneurship and Small Business Development towards the entrepreneurial motivation. 3: How to explore the business opportunities, idea generation, creativity & innovation 4: Assessing the sources of business ideas and conducting business research in selected venture 5: To understand the basics of the process on how to set up a small business, preliminary screening and aspects of the detailed Project report with their feasibility.
sem 6	subject 1 Accounting for Managers	<ol style="list-style-type: none"> 1: Demonstrate knowledge about various financial decision based on management accounting. 2: Provide knowledge about different type of ratio for organization like liquidity ratio, solvency ratio, activity ratio and income ratio. 3: Better understanding of the accounting for price level change. 4: Equip with the knowledge of difference type of variance.
	subject 2 : Project Planning and Management	<ol style="list-style-type: none"> 1: Manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders. 2: Utilize technology tools for communication, collaboration, information management, and decision support. 3: Apply project management practices to the launch of new programs, initiatives, products, services, and events relative to the needs of stakeholders. 4: Implement project management knowledge, processes, lifecycle and the embodied concepts, tools and techniques in order to achieve project success 5: Appraise the role of project management in organization chang

	subject 3 Income Tax Law and Administration	1: Student will learn about the procedure regarding furnishing of Income Tax Returns. 2: Student will gain about the provisions for assessment of firm, HUF and Association of Person. 3: Student will become familiar with the powers and duties of Income Tax Authorities and Assessment Procedure. 4: Students will know about the TDS and Advance Payment of Tax Provisions. 5: Students will aware about the various issues regarding Income Tax Administration.
	subject 4 Human Resource Management	1: This subject prepares the student for the most critical ingredient of the business i.e. HRM. 2: To be able to understand the Importance, Objective and Scope of Human Resource Management (HRM) . 3: To learn about the steps, Techniques/methods of Recruitment, Selection, Training and Management Development. 4: To gain an insight about the Wage and Salary Administration and Wage Incentives 5: To be able to develop strategic action plans by about Human Resources Development, Industrial Relationship and Industrial Unrest
	subject 5 Business Environment and International Business	1: Systematically explores the external environment-legal & regulatory, macroeconomic, cultural, political, technological and natural. 2: Analyze the environment of a business from the legal & regulatory, Macroeconomic, cultural, political, technological and natural perspectives. 3: Discuss the supply and demand theory and its impact on insurance . 4: Explain the effects of government policy on the economic environment and insurance industry . 5: Outline how an entity operates in a business environment.
	subject 6 Retail Management and Sales Procedures	1: To be able to understand the meaning of Retail, Retailing, Retailers, growth and present size of Indian retail, career and growth opportunities, latest Technology and future of retailing in India. 2: To learn about the different types of Retailing such as traditional retail formats vs. modern retail formats, Store and non-store, Franchiser- franchisee . 3: To gain an insight about the level of operations of retailing, their functions and strategy formulation. 4: To be able to develop strategic action plans to gain an edge over rivals. 5: Monitoring and evaluating their actions, pricing strategies and location strategies

**COURSE&PROGRAMOUTCOMESOF
(B.COM PASS COURSE)**

Semester	Subject Name and Code	Course Outcomes
SEM-1	subject 1 Business Management	After completing the course, the student shall be able to: <ul style="list-style-type: none"> • Understand dynamics of business organisations and management practices with respect to stakeholders. • Understand varied perspectives related to business environment and entrepreneurship. • Analyze how organisations adapt to an uncertain environment and decipher decision making techniques managers use to influence and control the internal environment. • Analyze the relationship amongst functions of management i.e. planning, organizing, directing and controlling. • Appreciate the change in working pattern of modern organisations.
	subject 2 Financial Accounting	<ul style="list-style-type: none"> • This subject provides an in-depth knowledge of basic accounting features to the students. • To understand the role of accounting concepts and conventions in accounting • To understand the Accounting process which starts from recording of business transactions to preparation of trial balance i.e. Journal, Ledger, Cash- Book and other subsidiary books etc. • To learn how to prepare depreciation accounts in straight and written down value method. • To understand the basics differences between capital and revenue expenditures and learn how to prepare financial statements for different organization from a trial balance.
	subject 3 Business Mathematics	<ul style="list-style-type: none"> • Comprehend the concept of systematic processing and interpreting the information in quantitative terms to arrive at an optimum solution to business problems. • Develop proficiency in using different mathematical tools (matrices, calculus, linear programming, and mathematics of finance) in solving daily life problems. • Acquire competence to use computer for mathematical computations, especially with Big data. • Obtain critical thinking and problem-solving aptitude. • Evaluate the role played by mathematics in the world of business and economy.

	subject 4 Basic of Computer	<ul style="list-style-type: none"> • Understand the various concepts and terminologies used in computer networks and internet and be aware of the recent developments in the fast changing digital business world. • Handle document creation for communication. • Acquire skills to create and make good presentations • Make various computations in the area of accounting and finance and represent the business data using suitable charts. S/He should be able to manipulate and analyze the business data for better understanding of the business environment and decision making • Understand and apply the various database concepts and tools in the related business areas with the help of suggested popular software
	subject 5 Business Economics	<ul style="list-style-type: none"> • To know the basic concept of demand and supply and types of elasticity of demand: price, income and cross. • To have the perfect knowledge of notion of indifference curve analysis of consumer behaviour and theory of revealed preference. • To have in-depth knowledge of the consumer surplus and use the Indifference curves as an analytical tool. • To get the insights of various factors of productions, production function, law of productions. • To understand the basic differences between return to scale and factor.
	subject 6 Business Communications	<ul style="list-style-type: none"> • This subject prepares students in basic as well as business communication. • To understand the importance of one-way, two-way, oral and written communications, group discussions etc. • How to write office memos and inter/intra office communications. • To understand the basics of the Spoken English for Business communication: Presentation of Plans, Objectives; speech-Preparation, Mode of delivery presentation; Addressing the Audience. • Explore the E – correspondence and its usage, impact etc
SEM-2	subject 1 Business Environment	<ul style="list-style-type: none"> • Systematically explores the external environment-legal & regulatory, macroeconomic, cultural, political, technological and natural. • Analyze the environment of a business from the legal & regulatory, Macroeconomic, cultural, political, technological and natural perspectives. • Discuss the supply and demand theory and its impact on insurance. • Explain the effects of government policy on the economic environment and insurance industry. • Outline how an entity operates in a business environment.

	subject 2 Business Economics	<ul style="list-style-type: none"> • Basic understanding of Cost of Production and apply the various cost concepts • To have the insights of various markets structures and the equilibrium conditions of a firm and industry in short and long run. • To analyse the market demand and supply and the models of Stability analysis-Walrasian and Marshallian. • To know the various factors responsible for economic-Development: Physical and Capital Formation, and Technology. • Analyse the several Sustainability Institutional factors / variables in development
	subject 3 Financial Accounting	<ul style="list-style-type: none"> • Build an understanding of theoretical framework of accounting and be able to prepare financial statements. • Explain and determine depreciation and inventory value • Develop understanding of accounting for hire purchase transactions and lease transactions • Understand branch and departmental accounting • Develop the skill of preparation of trading and profit and loss account and balance sheet using computerized accounting or prepare accounts for dissolution of a partnership firm
	subject 4 Business Management	<ul style="list-style-type: none"> • To understand about the Business Activities, Manufacturing, service Sectors, globalization, liberalization and privatization, Multinational corporations. • To understand the Entrepreneurial opportunities i.e. Networking marketing, Franchising, Business Process Outsourcing, E-commerce and M-commerce. • How to explore the business opportunities, idea generation, creativity & innovation. • To aware about Product and pricing decisions, Distribution and promotional decisions, human resources etc. • To understand the basics of the process on how to set up a small business, preliminary screening and aspects of the detailed Project report with their feasibility.
	subject 5 Business Mathematics	<ul style="list-style-type: none"> • Comprehend the concept of systematic processing and interpreting the information in quantitative terms to arrive at an optimum solution to business problems. • Develop proficiency in using different mathematical tools (matrices, integration, differential equation linear and mathematics of finance) in solving daily life problems. • Acquire competence to use computer for mathematical computations, especially with Big data. • Obtain critical thinking and problem-solving aptitude.

	subject 6 Basic of Computer	<ul style="list-style-type: none"> • Understand the various concepts and terminologies used in computer networks and internet and be aware of the recent developments in the fast changing digital business world. • Handle document creation for communication. • Acquire skills to create and make good presentations • Make various computations in the area of accounting and finance and represent the business data using suitable charts. S/He should be able to manipulate and analyze the business data for better understanding of the business environment and decision making • Understand and apply the various database concepts and tools in the related business areas with the help of suggested popular software.
SEM-3	subject 1 Business regulatory framework-I	<ul style="list-style-type: none"> • Understand basic aspects of contracts for making the agreements, contracts and subsequently enter valid business propositions. • Handle the execution of special contracts used in different types of business. <ul style="list-style-type: none"> • Learn legitimate rights and obligations under The Sale of Goods Act.
	subject 2 Corporate Accounting-I	<ul style="list-style-type: none"> • A comprehensive understanding of regulatory environment of issue and forfeiture of shares; redemption of preference shares and Buy back. • Ability to accounting treatment for valuation of goodwill; valuation of securities; issue and redemption of debentures. • An understanding of principles of amalgamation and internal reconstruction of companies as per AS-14. • Ability to analyse the complex issues of holding companies accounts; profit or loss prior and subsequent to incorporation. • To know the accounting environment and financial reporting requirements for companies and various corporate related issues.
	subject 3 Business Statistics	<ul style="list-style-type: none"> • To provide a basic knowledge of the application of mathematics and statistics to business disciplines. • Learn how to calculate and apply measures of location and measures of dispersion grouped and ungrouped data cases. • How to calculate and apply measures of location and measures of dispersion grouped and ungrouped data cases. • How to apply probability for taking various business decisions.

	subject 4 Company Law- I	<ul style="list-style-type: none"> • Development of student skills in regulatory practice relating to company law. • Provide students with knowledge and appreciation of the major core topics in company law. • Helpful at the time of formation of company to the young entrepreneurs . • Students become aware of legal nature and significance of limited liability of company. • Understanding about borrowing powers of the company to the money lenders under companies act.
	subject 5 Human Resource Management	<ul style="list-style-type: none"> • Understand basic nature and importance of human resource management. • Analyze the current theory and practice of recruitment and selection. • Realize the importance of performance management system in enhancing employee performance. • Recommend actions based on results of the compensation analysis and design compensation schemes that are cost effective, that increase productivity of the workforce, and comply with the legal framework. • Understand role of modern HRM in meeting challenges of changing business environment.
	subject 6 Basics of Retailing	<ul style="list-style-type: none"> • To be able to understand the meaning of Retail, Retailing, Retailers, growth and present size of Indian retail, career and growth opportunities, latest Technology and future of retailing in India. • To learn about the different types of Retailing such as traditional retail formats vs. modern retail formats, Store and non-store, Franchiser- franchisee. • To gain an insight about the level of operations of retailing, their functions and strategy formulation. • To be able to develop strategic action plans to gain an edge over rivals. • Monitoring and evaluating their actions, pricing strategies and location strategies
SEM-4	subject 1 Corporate Accounting-II	<ul style="list-style-type: none"> • To recognise and understand the ethical issues in while preparing Final Accounts of a company. • An understanding of the regulatory environment regarding accounts of Banking Companies and Underwriting of shares and debentures • The ability to prepare the accounts of Insurance Companies and consolidated accounts after Liquidation of companies • An understanding of accounting requirement of corporate groups like preparing the accounts of Electricity Companies. • To employ the critical thinking skills to analyse the accounting data as well as the effects of

		different accounting methods on financial statements of a company.
subject 2 Business Statistics		<ul style="list-style-type: none"> • This subject will introduce students to the quantitative tools that are necessary for day-to-day business needs. • To develop an ability to analyse and interpret data to provide meaningful information to assist in making management decisions. • How to apply discrete and continuous probability distributions to various business problems. • Compute and interpret the results of Bivariate and Multivariate Regression and Correlation Analysis
subject 3 Marketing Management		<ul style="list-style-type: none"> • Develop understanding of basic concepts of marketing, marketing philosophies and environmental conditions effecting marketing decisions of a firm. • Understand the dynamics of consumer behaviour and process of market selection through STP stages. • Understand and analyze the process of value creation through marketing decisions involving product development. • Understand and analyze the process of value creation through marketing decisions involving product pricing and its distribution. • Understand and analyze the process of value creation through marketing decisions involving product promotion and also to equip them with the knowledge of various developments in marketing area that may govern marketing decisions of a firm.
subject 4 Business Regulatory Framework		<ul style="list-style-type: none"> • Understand basic aspects of contracts for making the agreements, contracts and subsequently enter valid business propositions. • Handle the execution of special contracts used in different types of business. • Learn legitimate rights and obligations under The Sale of Goods Act. • Acquire skills to initiate entrepreneurial ventures as LLP. • Understand the basic aspects consumer protection Act.
subject 5 Secretarial Practice:		<ul style="list-style-type: none"> • Understand the duties and responsibilities of company secretaries regarding the different provisions/functions/activities • Understand the rules and the broader procedural aspects involved in different types of companies covering the Companies Act 2013.

		<ul style="list-style-type: none"> • Comprehend and appropriately use the basic legal documents essential for operations and management of company. • Distinguish between varied company processes, meetings and decisions. • Know the framework of dividend distribution and role of auditors in a company. • Understand and evaluate working of depositories and their functions for working in stock market. Computer Applications
	subject 6 Corporate Law- II	<ul style="list-style-type: none"> • Development of student skills in regulatory practice relating to company law. • Provide students with knowledge and appreciation of the major core topics in company law. • Helpful at the time of formation of company to the young entrepreneurs . • Students become aware of legal nature and significance of limited liability of company. • Understanding about borrowing powers of the company to the money lenders under companies act.
SEM 5	subject 1 Cost Accounting - I	<ul style="list-style-type: none"> • Understand conceptual framework of Cost Accounting. • Understand in detail the accounting and control of material and labour cost. • Understand classification, allocation, apportionment and absorption of overheads in cost determination. • Calculate the cost of products, jobs, contracts, processes and services. • Have basic understanding of cost accounting book keeping systems and reconciliation of cost and financial account profits.
	subject 2 Entrepreneurship and small scale business	<ul style="list-style-type: none"> • To know the basics of Entrepreneurship, Factors & Problems (Operational and Non-Operational) and Obstacles. • To understand the Theories of Entrepreneurship, Schumpeter's, Ducker's and Walker's views on Entrepreneur. • To learn about the converting business opportunities into reality, feasibility Report and analysis, Entrepreneurial Problems. • To be familiar with External Environment Analysis, Venture Capital, entrepreneurship Development Programmes in India. • Understand the concept of small scale business tier problem and redressal machinery
	Subject 3 Accounting for Manager	<ul style="list-style-type: none"> • Understand thoroughly the conceptual framework of Management Accounting; different forms of accounting—Financial, Cost and Managerial; types of costs for decision making and cost control; cost control and cost reduction.

	<ul style="list-style-type: none"> • Understand the concept of marginal cost and marginal costing; preparation of income statements using absorption and variable costing; learning of cost-volume-profit analysis and break-even analysis using mathematical and graphical approaches; and their application in businesses. • Understand the concept of relevant cost and make decisions related to different business situations using marginal costing and differential costing techniques.
<p>Subject 4 International Business Environment</p>	<ul style="list-style-type: none"> • Understand the process of globalization, its impact on the evolution and growth of international business and to appreciate the changing dynamics of the diverse international business environment. • Analyze the theoretical dimensions of international trade and intervention measures adopted; to appreciate the significance of different forms of regional economic integration and to understand the concept of Balance of payment account and its components. • Understand the significance of different forms of regional economic integration and to appreciate the role played by various international economic organisations such as the WTO, UNCTAD, IMF and World Bank. • Familiarize students with the international financial environment, and get them acquainted with the basic features of the foreign exchange market – its characteristics and determinants. • Critically examine the concept and form of foreign direct investment, and to create awareness about emerging issues in international business such as outsourcing and ecological issues.
<p>Subject 5 Taxation Laws I</p>	<ul style="list-style-type: none"> • Understand the basic concepts in the law of income tax and determine the residential status of different persons. • Identify the five heads in which income is categorised and compute income under the heads ‘Salaries’ and ‘Income from House Property’. • Compute income under the head ‘ Profits and gains of business or profession’, ‘Capital gains’ and ‘Income from other sources’. • Understand clubbing provisions, aggregate income after set-off and carry forward of losses, and deductions allowed under the Income Tax Act; and further to compute taxable income and tax liability of individuals and firms. • Develop the ability to file online returns of income.

	Subject 6 Financial Markets operations	<ul style="list-style-type: none"> • Understand the meaning and scope of financial markets as well as institutions in India. • Understand the concepts of Money Market and Capital Market • Explain Commercial Banking and its Current developments. • Explain concept of Non-Banking Financial Companies (NBFC's) • Examine the Financial Services Industry
SEM 6	Subject 1 Auditing	<ul style="list-style-type: none"> • Differentiate between different aspects of auditing especially for internal check, internal control and for overall corporate governance. • Understand the concept of corporate governance in organisations and its essence for management. • Provide and assimilate information leading to failure of organisation and corporate scams. • Comprehend the governance framework for an organisation provided by different regulatory bodies in India and Abroad. • Recognise the essence of ethics in business. Company Law After completing the course, the student shall be able to: <ul style="list-style-type: none"> • Understand the rules and the broader procedural aspects involved in different types of companies covering the Companies Act 2013. • Comprehend and appropriately use the basic legal documents essential for operations and management of company. • Distinguish between varied company processes, meetings and decisions. • Know the framework of dividend distribution and role of auditors in a company. • Understand and evaluate working of depositories and their functions for working in stock market.
	Subject 2 Taxation Laws II	<ul style="list-style-type: none"> • Understand clubbing provisions, aggregate income after set -off and carry forward of losses, and deductions allowed under the Income Tax Act; and further to compute taxable income and tax liability of individuals and firms. • Develop the ability to file online returns of income. • Understand the concept of appeals punishment prosecution etc • To know about the different types of assessment
	Subject 3 Financial Management	<ul style="list-style-type: none"> • Explain the nature, scope and objective of financial management, along with Time Value of Money, Risk & Return. • Analyze Capital Budgeting Process and Techniques including NPV, IRR and Profitability Index. • Examine various Capital structure theories and estimating cost of capital. • Critically examine basic Theories and policies of Dividend.

	<ul style="list-style-type: none"> • Estimate working capital along with an overview of cash receivables and inventory management.
Subject 4 Goods and Service Tax	<ul style="list-style-type: none"> • Connect with the genesis of goods and services tax (GST), decipher the constitutional amendment carried out to install GST in India and comprehend the composition and working of GST council. • Understand the meaning of supply under GST law, differentiate between intra-state and inter-state supply, comprehend rules related to the place of supply and compute the value of supply. • Comprehend the utilization of input tax credit, and the reverse charge mechanism of paying GST and to know the procedure for claiming refund under GST law. • Understand the provisions for registration under GST along with special provisions such as those related to anti-profiteering and avoidance of dual control. • Know the basic concepts of Customs Act and to compute the assessable value for charging customs duty.
Subject 5 International Marketing	<ul style="list-style-type: none"> • To know the concept of International Marketing, problems in international marketing and ways to be international. • To understand the external marketing environment and different International market entry strategies. • To be familiar with different techniques of foreign market selection, their segmentation, positioning. • How to make successful International Marketing Plan, Organising and controlling, evaluating the Impact of globalisation. • To learn the New Product planning & development, branding, Packaging and labelling, Pricing Decisions and strategies.
Subject 6 Cost Accounting	<ul style="list-style-type: none"> • Demonstrate domain knowledge in installation of costing system; • Better knowledge about the how to get over from the labour turnover, overtime and idle time; • Understanding the distribution scheme of production overhead and factory overhead • Making the decisions regarding make or buy • understand the concept of contract costing process costing • To know the basics of standard costing variance analysis budgetary control and marginal costing

COURSE & PROGRAM OUTCOMES OF

B.A Hindi Hons

Semester	Subject Name and Code	Course Outcomes
सह.1	हिन्दी नाटक	<p>पहला प्र'न पत्र हिन्दी नाटक सेमेस्टर एक के अन्तर्गत हिन्दी ऑनर्स में विद्यार्थियों को दो नाटक पढ़ाए जाते हैं। मिस्टर अभिमन्यू और भाम्बूक। बच्चों नाटकों को पढ़कर खुद को ज्ञानवर्धक पाते हैं इन्हीं नाटकों में राष्ट्रीयता की भावना का परिचय मिलता है। बच्चों में राष्ट्रीयता की भावना को उजागर किया जाता है।</p> <p>सेमेस्टर एक के दौरान ही विद्यार्थियों को दूसरा प्र'न- पत्र भाषा विज्ञान और हिन्दी भी पाठ्यक्रम पढ़ाया जाता है। जहाँ भाषा अध्ययन की दि'गाएँ , हिन्दी की बोलियाँ, स्वर ,व्यंजन और नागरी लिपि की विशेष'ताएँ, मानकीकरण आदि प्र'न पाठ्यक्रम में शामिल हैं। यहाँ विद्यार्थियों को भाषा विज्ञान से सम्बंधित समस्त जानकारी उपलब्ध करवाई जाती है। जो आगे चलकर उनको एम0ए0 हिन्दी में भी पढ़नी होती है। एम0ए0 हिन्दी करने से पहले वो भाषा विज्ञान के बारे में काफी ज्यादा जानकारी यहाँ से ही प्राप्त कर लेते हैं।</p>
सह.2	हिन्दी उपन्यास	<p>तीसरा प्र'न पत्र ..हिन्दी उपन्यास चौथा प्र'न पत्र साहित्य लोचन</p> <p>सेमेस्टर द्वितीय के दौरान इन्हीं विद्यार्थियों को पाठ्यक्रम में तीसरा प्र'न पत्र हिन्दी उपन्यास पढ़ाया जाएगा। पाठ्यक्रम में निर्धारित उपन्यास हैं।</p> <p>1 .त्याग पत्र.....जैनेन्द्र कुमार 2 महाभोज ... मन्मू भण्डारी</p> <p>विद्यार्थी हिन्दी के उपन्यास साहित्य का वि'िष्ट ज्ञान प्राप्त करते हैं। इन्हीं उपन्यासों के माध्यम के अन्य उपन्यास लेखक और उनकी रचनाओं का वि'िष्ट ज्ञान प्राप्त करते हैं। इसी सेमेस्टर में चौथा प्र'न पत्र साहित्यलोचन भी पढ़ाया जाता है। यहाँ भारतीय एवं पा'चात्य काव्य -'ास्त्र के सिद्धांतों को पढ़ाया जाता है। विद्यार्थियों में भारतीय एवं पा'चात्य काव्य-'ास्त्र की समझ विकसित होगी। कृतियों के वि'लेशन हेतु भारतीय एवं पा'चात्य चिन्तन का पक्ष स्पष्ट होगा।</p> <p>पाठ्यक्रम इस प्रकार हैं :-</p> <ol style="list-style-type: none"> 1 काव्य का स्वरूप, तत्व, प्रयोजन । 2. रस सिद्धांत, अलंकार, रीति, ध्वनि , वक्रोक्ति, औचित्य सिद्धांत 3 प्लेटो, अरस्तु, लोजाइनस, कॉलरिज के सिद्धांत 4. अभिजात्यवाद, स्वच्छन्दतावाद, मार्क्सवाद, मनोवि'लेशनवाद शामिल है।
सह.3	मध्यकालीन हिन्दी कविता	<p>पांचवा प्र'न-पत्र - मध्यकालीन हिन्दी कविता छठा प्र'न-पत्र-आधुनिक हिन्दी कविता</p> <p>सातवां प्र'न-पत्र-कहानी साहित्य</p> <p>सेमेस्टर-3 मध्यकालीन हिन्दी कविता पेपर-5</p> <p>हिन्दी साहित्य के इतिहास का वि'लेशणात्मक ज्ञान देना विभिन्न कवियों एवं उनकी कविताओं का वि'िष्ट ज्ञान देना। विद्यार्थियों में हिन्दी के प्रमुख कवि एवं उनकी कविताओं की समझ विकसित होगी। पाठ्यक्रम में शामिल कवि -कबीरदास, सूरदास, तुलसीदास ,रैदास के पद एवं दोहे।</p> <p>पेपर -6 (आधुनिक हिन्दी -कविता)</p> <p>हिन्दी साहित्य के इतिहास में शामिल आधुनिक कवियों एवं उनकी कविताओं का वि'िष्ट ज्ञान देना।</p>

		<p>छायावादी हिन्दी कवि</p> <ol style="list-style-type: none"> 1 जंय'ंकर प्रसाद 2 सूर्यकान्त त्रिपाठी निराला 3 सुमित्रानन्दन पन्त 4 महादेवी वर्मा <p>1 छायावादोत्तर हिन्दी कवि - 1 स0 ही0 वा0 अज्ञेय</p> <ol style="list-style-type: none"> 2 धर्मबीर भारती 3 नागार्जुन 4 दुश्यन्त कुमार 5 कुंवर नारायण भामिल है। <p>(कहानी साहित्य, पेपर-7)</p> <p>हिन्दी कथा -साहित्य का वि'लेशणात्मक ज्ञान देना कहानी एवं उनके लेखकों का वि'श्ट ज्ञान देना। कहानियों को पढकर विधार्थी खुद को ज्ञानवर्धक पाते है। उनको जीवन की समझ विकसित होगी। कहानियों में विधार्थी -प्रेमचन्द की भातरंज के खिलाडी।</p> <p>जैनेन्द्र कुमार -जाहनवी</p> <p>निर्मल वर्मा-परिन्दे</p> <p>कमले'वर-कस्बे का आदमी</p> <p>राजेन्द्र यादव-खेल -खिलौने</p> <p>भीश्म साहनी-अमृतसर आ गया।</p> <p>मन्वू भण्डारी -त्रि'ंकू</p> <p>फणी'वरनाथ- लाल पान की बेगम</p> <p>ओमप्रका'ी वाल्मीकि-प्रमो'ान</p> <p>ममता कालिया -आपकी छोटी लडकी।</p>
मड.4	निबंध साहित्य	<p>आठवा प्र'न पत्र -निबंध साहित्य</p> <p>नौवा प्र'न पत्र-संस्मरण और आत्मकथा</p> <p>दसवां प्र'न पत्र- हिन्दी साहित्य का इतिहास(आदिकाल,भक्तिकाल, रीतिकाल)</p> <p>हिन्दी साहित्य में गद्य विधाओं के अर्न्तगत (निबंध साहित्य)इतिहास का वि'लेशन विभिन्न लेखकों एवं उनके निबंधों की समस्त जानकारी प्राप्त करके खुद को ज्ञानवर्धक पाते है।</p> <p>निर्धारित निबंधों में - बालकृष्ण भट्ट,महावीर प्रसाद द्विवेदी, अध्यापक पूर्ण सिंह, रामधारी दिनकर,अज्ञेय,डा0नगेन्द्र, रामबिलास भार्मा, हजारी प्रसाद द्विवेदी, जैसे निबंधकार भामिल हैं।</p> <p>प्र'न-पत्र-9 में संस्मरण और आत्मकथा</p> <ol style="list-style-type: none"> 1 पथ के साथी- महादेवी वर्मा 2 क्या भूलूँ क्या याद करू- हरिवं'ेराय बचन । <p>दसवाँ प्र'न-पत्र (हिन्दी साहित्य का इतिहास)</p> <p>विधार्थियों को हिन्दी साहित्य के इतिहास का वि'लेशणात्मक ज्ञान देना इतिहास लेखक, प्रमुख इतिहास ग्रन्थों की जानकारी विधार्थियों को मिलेगी। हिन्दी साहित्य इतिहास की लेखन परम्परा , आदिकालीन, भक्तिकालीन एवं समस्त रीतिकालीन साहित्य से विधार्थी परिचित होंगे।</p>
मड.5	हिन्दी साहित्य का इतिहास (आधुनिक काल)	<p>पेपर-11 हिन्दी साहित्य का इतिहास (आधुनिक काल)</p> <p>पेपर-12 पत्रकारिता और अनुवाद</p> <p>पेपर -13 काव्यांग परिचय</p> <p>पेपर-11 के अन्तर्गत आधुनिक काल (काव्य का इतिहास)जिसमें -भारतेन्दु युग, छायावाद ,प्रगतिवाद,नयी कविता सम्बंधित वि'श्ट ज्ञान विधार्थियों को प्राप्त होता है। इनकी समझ विकसित होती है।</p> <p>खण्ड(ख)के अर्न्तगत गद्य का इतिहास</p>

		<p>हिन्दी नाटक,एकांकी ,कहानी, निबंध ,उपन्यास,आलोचना ,आत्मकथा ,जीवनी आदि के अर्न्तगत आने वाली इतिहास की संपूर्ण जानकारी से बच्चों को अवगत कराया जाता है। यही पाठ्यक्रम आगे उनको एम0 ए0 हिन्दी में अवगत कराया जाता है। उनको आगे किसी भी प्रकार की कठिनाई नहीं होती है।</p> <p>पेपर -12 पत्रकारिता और अनुवाद</p> <p>हिन्दी पत्रकारिता का वि'लेशणात्मक ज्ञान को बच्चों को प्राप्त होता है। पत्रकारिता में बेहतर भविश्य के लिए नींव यही से तैयार की जाती है। पत्रकारिता के विभिन्न प्रकार, संवाददाता, संपादकीय ,साक्षात्कार, प्रेस ,आचार संहिता आदि प्रमुख विशयों की जानकारी उनको मिलती है।</p> <p>अनुवाद की प्रकिया एवं विधि, अनुवाद के गुण, सफल अनुवाद, अनुवाद का महत्व काव्यानुवाद आदि का वि'लेशणात्मक ज्ञान विधार्थी प्राप्त करते है। अनुवाद की सैद्धान्तिक समझ और माध्यमों का ज्ञान एवं अनुवाद के क्षेत्रों की समझ विकसित होती है।</p> <p>पेपर -13 काव्यांग परिचय</p> <p>महाकाव्य,खण्ड काव्य ,गीतिकाव्य, हिन्दी साहित्य की अन्य गद्य विधाएं उपन्यास, नाटक , कहानी, निबंध संपूर्ण अलंकार ,छन्द ,काव्य गुण, भाव्य भाक्तियाँ आदि का वि'लेश ज्ञान एवं समझ विकसित की जाती है। उनके बेहतर भविश्य के लिए एम0 ए0 हिन्दी में यही पाठ्यक्रम शामिल किया जाता है।</p>
<p>मड.6</p>	<p>निबंध लेखन</p>	<p>पेपर-14 निबंध लेखन</p> <p>पेपर-15 वि'लेश कवि- कबीरदास</p> <p>पेपर-16 वि'लेश कवि- सूरदास</p> <p>पेपर-17 वि'लेश कवि -निराला</p> <p>पेपर-18 वि'लेश कवि -अज्ञेय</p> <p>पेपर-19 वि'लेश लेखक- उपन्यासकार (प्रेमचन्द)</p> <p>पेपर-20 वि'लेश लेखक-नाटककार (जय'ंकर प्रसाद)</p> <p>पेपर-21 वि'लेश लेखक-निबंधकार (आचार्य रामचन्द्र भुक्ल)</p> <p>निबंध लेखन पेपर-14 में साहित्यिक , सामान्य एवं सूक्तिपरक निबंधों का वि'लेश एवं वि'लेशणात्मक ज्ञान दिया जाता है। विधार्थी बेहतर भविश्य के लिए एवं मानवीय समझ विकसित करने के लिए इन निबंधों का गहन अध्ययन करते है।</p> <p>अहिंसा परमोःधर्म ,नर न हो निरा'ंग करो मन को , परहित सरस धर्म नहीं भाई ,महजब नही सिखाता आपस में वैर रखना, जीओ और जीने दो, मनुश्य वही जो मनुश्य के लिए मरे, भ्रष्टाचार कारण और निवारण,पर्यावरण और हम मानवधिकार आदि निबंधों को पढकर विद्यार्थी खुद को ज्ञानवर्धक पाते है और दे'ंग एवं अपने प्रति जागृत और सचेत होते है।</p> <p>पेपर -15,16,17,18 से विधार्थी किसी एक प्र'न का चयन करते है। जो वो खु'ंगी से अपनी इच्छा से लेते है।</p> <p>कबीर दास, सूरदास, निराला,अज्ञेय एक का चयन करके खुद के ज्ञान को विकसित करते है। कबीर के पद, सूरदास का भ्रमरगीत, निराला का राग विराग, अज्ञेय : संपादक विधानिवास मिश्र।</p> <p>पेपर -19,20 एवं 21 से विधार्थी किसी एक प्र'नपत्र का चयन करते है।</p> <p>प्रेमचन्द के उपन्यास</p> <p>1 सेवासदन</p> <p>2 रंगभूमि</p> <p>नाटककार प्रसाद 1 ध्रुवस्वामिनी</p> <p>2 अजात'ंगु</p> <p>आचार्य भुक्ल - 1 चिन्तामणि भाग एक</p> <p>हिन्दी साहित्य की गद्य विधाएं उपन्यास, नाटक,निबंधों का वि'लेशणात्मक ज्ञान विधार्थी प्राप्त करते है।</p>

		विभिन्न विधाओं में से एक विद्या का चयन करके अपने स्वतन्त्र अस्तित्व का परिचय देते हैं। भविष्य को ध्यान में रखते हुए अपनी इच्छानुसार एक विशय का चयन करके अपनी समझ को विकसित करते हैं।
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ProgramOutcomes

PO-1: fdlh भी सभ्यता एवं संस्कृति से जुड़ाव का माध्यम मातृभाषा ही होती हैं।

क.2रू वर्तमान भौतिकवादी युग में संवेदन'ून्य हो रहे युवाओं में मातृभाषा में रचित साहित्य मानवीय मूल्यों की स्थापना करता है।

क.3रू वर्तमान परिपेक्ष्य में हिन्दी में रोजगार की अपार सम्भावनाएँ परिलक्षित होंगी (अनुवाद,पत्रकारिता,बैंक ,हिन्दी ऑफिसर ,केन्द्रीय िक्षण संस्थाओ में हिन्दी विशय-वि'ैशज्ञ आदि) ।

क.4रू सूचना प्रौद्योगिकी युग में हिंदी सरलीकरण व जानकारी ।

क.5रू वै'िवक परिदृ'य में छात्र -छात्राओं में भोध के प्रति रुचि जागृत करना

क.6रू वाक्पटुता आती है व बौद्धिक क्षमता का विकास होता है।

क.7रू महाकाव्यो जैसे -रामचरितमानस,साकेत ,प्रियप्रवास ,कामायनी आदि से प्रेरणादायक व िक्षापद जानकारी प्राप्त करने में सक्षम होंगे एवम संत महात्माओ जैसे - कबीरदास ,तुलसीदास ,जायसी आदि की दिव्य वाणी से आध्यात्मिक ज्ञान एवं संपूर्ण विकास ।

क.8रू सामाजिक ,साहित्यिक व व्यावसायिक गतिविधियों से प्रभाव'ाली संचार व प्रभाव'ाली रिपोर्ट लेखन व प्रस्तुतीकरण ।

क.9रू जटिल साहित्यिक एवं व्याकरणिक कार्यों के लिए उचित तकनीकियों स्रोतो और आधुनिक सूचना तकनीकी का उचित चुनाव व प्रयोग ।

क.10 सामाजिक,सांस्कृतिक एवं साहित्यिक दृष्टिकोण से जिम्मेदार नागरिस बनेंगे ।

ProgrammeSpecific Outcomes

कै.1रू बी0 ए0 हिन्दी आनर्स का पाठ्यक्रम जिसका उद्दे'य विद्यार्थियों के ज्ञान को विकसित करते हुए उनमें गहन अध्ययन, एम0ए0 हिन्दी एवं भोध की उत्कंठ को विकसित करना ठे

कै.2रू यही विद्यार्थी हिन्दी साहित्य को पढकर समाज की नकारात्मक भाक्तियों के विरुद्ध समानता और बंधुत्व स्थापित कर सकते है। मानवता की भावना का विस्तार कर सकते है।

कै.3रू सीखना एक सत्त , व्यापक एवं जीवन पर्यत चलने वाली प्रकिया है।यदि सीखने का माध्यम मातृभाषा हो तो यह सीखना सरल, सहज, प्रभाव'ाली एवं रोचक बन जाता है। िक्षक,समाज व भौक्षणिक प्र'ासक सभी मिलकर इसके लिए प्रयास करते है। इन प्रयासों का उद्दे'य िक्षा स्तर पर हिन्दी सीखने पर विद्यार्थियों का सर्वांगीण विकास करना है। उच्चतर िक्षा स्तर पर हिन्दी सीखने पर विद्यार्थियों से आ'गा की जाती है।

कै.4रू सीखना एक सत्त , व्यापक एवं जीवन पर्यत चलने वाली प्रकिया है।यदि सीखने का माध्यम मातृभाषा हो तो यह सीखना सरल, सहज, प्रभाव'ाली एवं रोचक बन जाता है। िक्षक,समाज व भौक्षणिक प्र'ासक सभी मिलकर इसके लिए प्रयास करते है। इन प्रयासों का उद्दे'य िक्षा स्तर पर हिन्दी सीखने पर विद्यार्थियों का सर्वांगीण विकास करना है। उच्चतर िक्षा स्तर पर हिन्दी सीखने पर विद्यार्थियों से आ'गा की जाती है।

**COURSE & PROGRAM OUTCOMES OF
Mathematics (BA & BSc)**

Semester	Subject Name and Code	Course Outcomes
SEM-1	ALGEBRA	<p>CO-1: Paper:Algebra Subject: Mathematics The course will enable the students to</p> <p>CO-2: Recognize Symmetric, Skew-symmetric, Hermitian and skew Hermitian matrices</p> <p>CO-3: Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix.</p> <p>CO-4: Perform Elementary Operations on matrices and find Rank of a matrices</p> <p>CO-5: Compute the characteristic polynomial, eigenvalues, eigenvectors, and eigenspaces, as well as the geometric and the algebraic multiplicities of an eigenvalue and apply the basic diagonalization result.</p> <p>CO-6: Find eigen values and corresponding eigenvectors for a square matrix.</p>
	CALCULUS	<p>CO-1: Sketch the curves in Cartesian and polar coordinates as well as learn techniques of sketching the conics</p> <p>CO-2: Visualize three dimensional figures and calculate their volumes and surface areas.</p> <p>CO-3: Understand limits, continuity and derivatives of functions of single variable.</p> <p>CO-4: Compute area of surfaces of revolution and the volume of solids by integrating over cross-sectional areas.</p> <p>CO-5: Compute successive differentials.</p> <p>CO-6: Understand asymptotes, reduction formula, rectification.</p>
	SOLID GEOMETRY	<p>CO1: Learn concepts in two-dimensional geometry.</p> <p>CO2; Identify and sketch conics namely, ellipse, parabola and hyperbola.</p> <p>CO3: Learn about three-dimensional objects such as spheres, conicoids, straight lines and plane</p>
SEM-2	Differential Equations	<p>CO-1: Learn basics of differential equations and mathematical modeling.</p> <p>CO-2: Formulate differential equations for various mathematical models.</p> <p>CO-3: Solve first order non-linear differential equations and linear differential equations of higher order using various techniques.</p> <p>CO-4: Apply these techniques to solve and analyze various mathematical models.</p>

	NUMBER THEORY AND TRIGONOMETRY	<p>CO-1: Learn about some fascinating discoveries related to the properties of prime numbers.</p> <p>CO-2: • Know about number theoretic functions and modular arithmetic.</p> <p>CO-3: • Learn about equivalent classes and cardinality of a set.</p> <p>CO-4: • Use modular arithmetic and basic properties of congruence.</p> <p>CO-5: Solve linear, quadratic and system of linear congruence equations.</p> <p>CO-6: Employ De Moivre's theorem in a number of applications to solve numerical problems</p>
	VECTOR CALCULUS	<p>CO-1: Compute Scalar and vector product of three vectors and four vectors and Reciprocal vectors.</p> <p>CO-2: Compute and apply gradient, divergence and curl of functions.</p> <p>CO-3: Transform curvilinear coordinates to Cartesian coordinates and vice versa.</p> <p>CO-4: Apply Gauss, Green and Stocks Theorem.</p>
SEM-3	Advanced Calculus	<p>CO-1: Have a rigorous understanding of the concept of limit of a function.</p> <p>CO-2: Learn about continuity and uniform continuity of functions defined on intervals.</p> <p>CO-3: Understand geometrical properties of continuous functions on closed and bounded intervals.</p> <p>CO-4: Learn extensively about the concept of differentiability using limits, leading to a better understanding for applications.</p> <p>CO-5: Know about applications of mean value theorems and Taylor's theorem.</p> <p>CO-6: Learn basics of differential geometry</p>
	PARTIAL DIFFERENTIAL EQUATIONS	<p>CO-1: Formulate, classify and transform first order PDEs into canonical form.</p> <p>CO-2: Learn about method of characteristics and separation of variables to solve first orders PDE's.</p> <p>CO-3: Classify and solve second order linear PDEs.</p> <p>CO-4: Learn about Cauchy problem for second order PDE and homogeneous and non homogeneous wave equations.</p> <p>CO-5: Apply the method of separation of variables for solving many well-known second order PDEs</p>
	STATICS	<p>CO-1: Understand Composition and resolution of forces, Parallel forces, Moments and Couples..</p> <p>CO-2: • Derive Analytical conditions of equilibrium of coplanar forces. •</p> <p>CO-3: Understand the concept of Friction and Centre of Gravity. •</p> <p>CO-4: Understand the concept of Virtual work, Wrenches, Stable and unstable equilibrium</p>
	Sequence and series	<p>CO-1: Understand the real numbers and their basic properties</p> <p>CO-2: Be familiar with convergent and Cauchy sequences.</p> <p>CO-3: Test the convergence and divergence of infinite series of real numbers.</p> <p>CO-4: Test the behavior of sequences.</p> <p>CO-5: Learn about power series expansion of some elementary functions</p>

SEM-4	Special Functions and Integral Transforms	<p>CO-1: Derive Series solution of differential equations.</p> <p>CO-2: • Explore Legendre and Hermite differentials equations and their solutions. •</p> <p>CO-3: Understand and use Laplace and Fourier transforms and their Properties. • Approximate transcendental functions in terms of power series as well as, differentiation and integration of power series</p> <p>CO-4: Approximate transcendental functions in terms of power series as well as, differentiation and integration of power series</p>
	Programming in C and Numerical Methods	<p>CO-1: Learn basics of Programming of C.</p> <p>CO-2: Learn 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.</p> <p>CO-3: Know about methods to solve system of linear equations, such as Gauss–Jacobi, Gauss–Seidel and SOR methods.</p>
Sem 5	GROUP AND RINGS	<p>CO-1: Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc. •</p> <p>CO-2: Link the fundamental concepts of groups and symmetrical figures. •</p> <p>CO-3: Analyze the subgroups of cyclic groups and classify subgroups of cyclic groups. •</p> <p>CO-4: Explain the significance of the notion of cosets, normal subgroups and factor groups. ...</p> <p>CO-5: • Know about group homomorphism and group isomorphism. •</p> <p>CO-6: Learn about the fundamental concept of rings, integral domains and fields. •</p> <p>CO-7: Know about ring homomorphism's and isomorphism's theorems of rings. • Appreciate the significance of unique factorization in rings and integral domains</p> <p>...</p>
	REAL ANALYSIS	<p>CO-1: Learn about some of the classes and properties of Riemann integral functions, and the applications of the Fundamental theorems of integration. •</p> <p>CO-2: Know about improper integrals including, beta and gamma functions.</p> <p>CO-3: • Learn about Cauchy criterion for uniform convergence and Weierstrass M-test for uniform convergence. •</p> <p>CO-4: Learn various natural and abstract formulations of distance on the sets of usual or unusual entities. Become aware one such formulations leading to metric spaces. •</p> <p>CO-5: Learn about the two important topological properties, namely connectedness and compactness of metric spaces</p>
	LINEAR ALGEBRA	<p>CO-1: Learn about the concept of linear independence of vectors over a field, and the dimension of a vector space.</p> <p>CO-2: • Basic concepts of linear transformations, dimension theorem, matrix representation of a linear transformation, and the change of coordinate matrix..</p> <p>CO-3: • Compute inner products and determine orthogonality on vector spaces, including Gram–Schmidt orthogonalization to obtain</p>

		<p>orthonormal basis. •</p> <p>CO-4: Find the adjoint, normal, unitary and orthogonal operator</p>
SEM 6	NUMERICAL ANALYSIS	<p>CO-1: Understand Finite Differences operators and their relations. •</p> <p>CO-2: Use Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula. •</p> <p>CO-3: Use Interpolation techniques to compute the values for a tabulated function at points not in the table. •</p> <p>CO-4: Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical solutions</p>
	REAL AND COMPLEX ANALYSIS	<p>CO-1: Use Jacobins, Beta and Gama functions, Double and Triple integrals, Drichlet's integrals, change of order of integration in double integrals. •</p> <p>CO-2: Understand Fourier expansion of piecewise monotonic functions, Properties of Fourier Coefficient, Stereographic projection of complex numbers. •</p> <p>CO-3: Explore Analytic functions and their properties. • Use different type of transformations.</p>
	DYNAMICS	<p>CO-1: Understand the concept of Velocity and acceleration along radial, transverse, tangential and normal directions as well as Relative velocity and acceleration. •</p> <p>CO-2: Understand the terminology of Mass, Momentum and Force. •</p> <p>CO-3: State and apply Newton's laws of motion. • Understand General motion of a rigid body. •</p> <p>CO-4: Study Central Orbits, Kepler laws of motion</p>

B.Sc. Non-Medical

Semester	Subject Name and Code	Course Outcomes
SEM-1	<i>Mechanics</i>	<p>CO-1. Mechanics of single And system of particles.</p> <p>CO-2. Conservation of Linear and angular momentum, and their use in real-life problems.</p> <p>CO-3. Lagrangian equation of motion and using this equation. We can get complete information of particles i.e. position, velocity and acceleration.</p> <p>CO-4. Rotation of rigid body and parameter associated with it. Understanding of rotational motion of the rigid body.</p>
	<i>Electricity, Magnetism and Electromagnetic Theory</i>	<p>CO-1. Basics of electromagnetics.</p> <p>CO-2. Electrostatic field and Gauss Law , its application to find out the electric field for different configuration of charge</p> <p>CO-3. Magneto-statics and different laws, domain theory, cycle of magnetization, Hysteresis loop of different materials, classification of magnetic materials.</p> <p>CO-4. Electromagnetic theory, Maxwell equation, and electromagnetic waves , their application in ICT.</p>
SEM-2	<i>Properties of Matter, Kinetic Theory and Relativity</i>	<p>CO-1. Elasticity Hooke’s law and application of these laws to find out the strength of material used for different application</p> <p>CO-2. Kinetic theory of gases. Its application in our daily life. “We can understand the whole thermodynamics in a kitchen”</p> <p>CO-3. Theory of relativity, Galilean and Lorentz transformation, their application to justify space contraction, time dilation, velocity addition theorem, mass dilation etc.</p>
	<i>Electromagnetic Induction and Electronic Devices</i>	<p>CO-1. DC transient (voltage and current equation of RL, RC and RLC ckt)</p> <p>CO-2. AC transient (voltage and current equation of RL, RC and RLC ckt)</p> <p>CO-3. Basics of semiconductor and semiconductor devices i.e. solar cell photo diode LED</p> <p>CO-4. Application of Diodes : rectifier, Zener Diode, I-V characteristics and application in voltage regulation</p> <p>CO-5. Basics of transistors and cathode ray oscilloscope</p> <p>CO-6. Application of transistor as an amplifier And application positive feedback to generate sinusoidal signal (Oscillator)</p>

SEM-3	<i>Computer Programming and Thermodynamics</i>	<p>CO-1. Understand the basic concepts of Thermodynamics and Thermodynamical Variable.</p> <p>CO-2. Different Laws and its application (Carnot Cycle).</p> <p>CO-3. Draw and understand the flow Chart and its Interpretation.</p> <p>CO-4. Understand conversion :Binary to digital conversion. IF ,DO Loop .Applications of Claperyon Equation, Maxwell Function (F,H,G,U)and Relation</p>
	<i>Waves and Optics</i>	<p>CO-1. The concept of Transverse and Longitudenal Waves.</p> <p>CO-2. Concept of Fourier series and transforms.</p> <p>CO-3. Aberrations in lenses and their removal.</p> <p>Interference by division of wavefront</p>
SEM-4	<i>Statistical Mechanics</i>	<p>CO-1. Understand the basic concepts of Thermodynamics and Probability</p> <p>CO-2. Different aspects of Statistics to understand Thermodynamical System.</p> <p>CO-3. Understand the different Quantum mechanics on particles and its Interpretation.</p> <p>CO-4. Understand Fermi gas, Photon gas, Boson gas and zero point energy.</p> <p>CO-5. Applications of STASTICS to develop Radiation Law and Specific Heat (metal)Relation.</p>
	<i>Waves and Optics</i>	<p>CO-1. Interference by Division of Amplitude: Colour of thin, films, wedge shaped film, Newton's rings.</p> <p>CO-2. Interferometers: Michelson's interferometer and its application to (I) Standardisation of a meter (II) determination of wave length.</p> <p>CO-3. Fresnel's Diffraction: Fresnel's half period zones, zone plate, diffraction at a straight edge, rectangular slit and circular aperture.</p> <p>CO-4. Fraunhoffer diffraction : One slit diffraction, Two slit diffraction N-slit diffraction, Plane transmission granting spectrum, Dispersive power of a grating , Limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating.</p> <p>CO-5. Polarization: Polarisation and Double Refraction : Polarisation by reflection, Polarisation by scattering, Malus law, Phenomenon of double refraction,</p> <p>CO-6. Huygen's wave theory of double refraction (Normal and oblique incidence),</p> <p>CO-7. Analysis of Palorised light : Nicol prism, Quarter wave plate and half wave plate, production and detection of (i)</p>

		Plane polarized light (ii) Circularly polarized light and (iii) Elliptically polarized light, CO-8. Optical activity, Fresnel's theory of rotation, Specific rotation, Polarimeters (half shade and Biquartz).
Sem 5	<i>Solid State Physics</i>	CO-1. Understand different types of lattices. CO-2. Crystal structures of different materials CO-3. Understand the x ray diffraction and different experimental methods of it CO-4. Understand Reciprocal lattice of different lattices. Know about Specific heat of solids
	<i>Quantum Mechanics</i>	CO-1. Understand Photoelectric effect, Compton effect. CO-2. Understand about concept of wave duality. Understand about wave function and its significance. Understand particle potential energy at different positions in Lattice
SEM 6	<i>Atomic , Molecular and Laser Physics</i>	CO-1. Understand atomic model and different atomic spectra. CO-2. Understand effects of Magnetic and Electric field on spectra. CO-3. Understand molecular spectra. CO-4. Understand basics of LASER ,its construction and working .Know about application of LASER
	<i>Nuclear Physics</i>	CO-1. Understand basic properties of Nucleus. CO-2. Know about construction of mass spectrograph and its working. CO-3. Understand alpha decay, beta decay, gamma particle. CO-4. Understand nuclear reactions and conservation laws. CO-5. Know about Nuclear reactors.

**COURSE & PROGRAM OUTCOMES OF
BA (HONS) ECONOMICS**

SEMESTER	Subject Name and Code	COURSE OUTCOMES
1	Indian Economy: Problems and Prospects –I	<p>CO-1 By this paper will make students to understand about the basic features of an Indian Economy and Economic planning. The demographic features of our population and structural change in income distribution is also clear in student’s mind. CO-2 This paper also highlights the poverty and unemployment problem in our economy. The students will understand the features and recent trends of Indian agriculture.</p>
1	Micro Economics-I	<p>CO-1 :This subject will explore the subject matter of economics and to discuss about the elementary theories of demand, supply and market.</p> <p>CO-2 This paper will also focuses on theory of consumer preference and choice and theory of firm including the concept of production, cost and revenue.</p> <p>CO-3 The students will also understand in this paper about the basic concept of market which includes perfect competition, monopoly, monopolistic competition.</p>
1	Mathematics for Economic Analysis –I	<p>CO-1:This paper will make students to understand the concept of real number system, set and set operations, relation and functions, solution of linear and quadratic equation and how these concepts help in economic analysis.</p> <p>CO-2 This subject will also focuses on economic analysis of matrices and determinant, differentiation, constrained and unconstrained optimization.</p>
1	Basic concept in Sociology	<p>CO-1:This subject will develop the students to a sociological way of thinking. It provides an understanding of the discipline of Sociology and</p>

		<p>sociological perspective. CO-2 The students will understand how Sociology differ from and similar to other social sciences and their areas of interdependence. Students will Know the basic Social progresses i.e. cooperation, competition, conflict, accommodation, assimilation</p>
1	English –I	<p>CO-1 :This subject will enable students to acquire composition and communication skills through learning fundamental grammar and its usage, as well as through various exercises in comprehension and composition;</p> <p>CO-2 they are also equipped with theoretical and practical applications of communication skills, through mock-interviews and mock-presentations.</p>
2	Indian Economy: Problems and Prospects-II	<p>CO-1 :This paper will helps in understanding the features of Indian economy. It also focuses on the growth trends of agriculture and industry sector in economic development.</p> <p>CO-2 This paper also make students to understand the features of Indian tax structure and features of economic reforms in India.</p>
2	Micro Economics- II	<p>CO-1:This subject will explain how price and output can be determine under imperfect competition. theory of factor pricing and alternative theory of the firm i.e. Baumal’s, Bain’s and full cost pricing rule has also been cleared in this subject.</p> <p>CO-2 This paper also introduce the concept of welfare economics to the students.</p>
2	Mathematics for Economic Analysis – II	<p>CO-1 :This paper will make students to understand how integration, differential equation, difference equation and linear programming helps in economic analysis.</p>
2	Society, Culture and Social Change	<p>CO-1 :This subject will clarify and broaden the structure of Indian society and changing aspects with</p>

		<p>the process. Social change has central concern of sociological study. Change has its pattern which is spelt out by various factors. This paper also provides a whole idea to the students about the process, theories and factors of social change. CO-2 They can relate their experience with theoretical explanation. provides an understanding of the interrelation between population and society. The students will also get an idea about population dynamics and its impact on society</p>
2	English –II	<p>CO-1: This paper is aimed at introducing students to English Poetry and short stories written by Indian authors so as to familiarise them with these literary genres and the socio-cultural backgrounds that produced them</p>
3	Economic History of India 1857-1947	<p>CO-1:The course exposes the students to understanding the intricacies of india’s economic, political and social developments in the past.</p> <p>CO-2 It develops analytical skills, and will be useful in a variety of careers in academics, research, journalism, private sector and government.</p>
3	Macro Economics - I	<p>CO-1 :This course enables students to analyse the macroeconomic performances of various countries using formal analytical tools.</p> <p>CO-2 It also allows them to evaluate important macroeconomic policies and their implications.</p>
3	Development Economics - I	<p>CO-1 :This course introduces students to the basics of development economics, with in depth discussions of the concepts of development, growth, poverty, inequality as well as the underlying political institutions.</p>

3	Welfare Economics -I	CO-1 :This course will help students understand the key issues related to the welfare economics. Explains various concepts given by different economists.
3	Statistics for Economic Analysis -I	CO-1 :At the end of the course, the students should understand the concepts of random variables and be familiar with some commonly used discrete and continuous distributions of random variables. CO-2 An important learning outcome of the course will be the capacity to analyse statistics in everyday life to distinguish systematic differences among populations from those that result from random sampling.
4	Computer Applications in Economic Analysis	CO-1 :This course aims to develop the basic computer knowledge among students and application of computer in economic analysis and research. CO-2 Also introduces students to the different software used for research.
4	Macro Economics - II	CO-1 :This course aims to develop the broad conceptual frameworks which will enable students to learn the concept of multiplier, general price level, rate of interest, macro economic policies, economic growth and trade cycle.
4	Development Economics - II	CO-1 : This course teaches the students various aspects of the Indian economy, as well as important themes relating to the environment and sustainable development. It also introduces them to some issues of globalization.
4	Welfare Economics -II	CO-1 : This course will help students understand the key issues related to the welfare economics. Explains various concepts given by different economists.
4	Statistics for Economic Analysis -II	CO-1 : An important learning outcome of the course will be the capacity to analyse statistics in everyday life to distinguish systematic differences among populations from those that result from random sampling.

		CO-2 The course includes correlation and regression, time series, probability and its distribution.
5 & 6	History of Economic Thought	<p>CO-1 : The course introduces students to basic concepts of the History of Economic Thought. The course contents are the ancient authors, Medieval economic thought, the mercantilist, the Physiocrats, the classics Adam Smith, Malthus, Ricardo, Marx. The beginnings of mathematical economics. The Marginalism and the neo classical approach. The new classical school.</p> <p>Recent developments in economic theory.</p> <p>After completion of this course students are expecting to:</p> <ol style="list-style-type: none"> 1. understand the evolutionary course of the development of economic thinking 2. understand the contribution of major economist in the past to build modern economic analysis 3. Process and critically evaluate the arguments of each school of economic thought
5th	Econometrics	<p>CO-1 : This subject deals with the application of statistical tools for estimating economic relationships, testing economic hypothesis and forecasting. After completing this course the students will be able to:</p> <ol style="list-style-type: none"> 1. Estimate and interpret the parameters of multiple regressions 2. Test for mis-specification and parameter restrictions. 3. Work out solutions for violations of classical assumption. Suggest methods for choosing between models. 4. Specify dummy variables to reflect shifts and links in relationships.

5	Basics of Financial Markets	CO-1 : Students should be able to properly evaluate investment risks, build relationships with various financial institutions and intermediaries, evaluate the investment as financial asset and use the various tools of the financial markets, use strong financial analytical skills and apply them to solve investment decision.
5th	Economics of Agriculture	CO-1 : Students should be able to use concept approaches and methods from agricultural economics. Curricula in their carrier or future studies to understand and evaluate issues, plans and projects.
5 th & 6th	International Economics	CO-1 : This course provide strong theoretical background to the students on international trade. It also help to understand the empirical aspects such as :trade reforms and their impact on Indian economy. Explain liberlisation of World trade and International trade. CO-2 Explain exchange markets and exchange rate systems. Analyze International Monetry system and its importance and Foreign payments balance.
6th	Economics of Industry	CO-1 : This is a course for Industrial economics which deals with basics concepts of Industry, Market product, Industrial Location and Industrial marketing.
6th	Economics of Public Finance	CO-1 : Considering the increasing role of Government in economy, this course aims to generates theoretical and empirical understanding of students about different aspects of Government activities and their rationality. CO-2 It covers fundamental concepts of public expenditure, public revenue and public debt with special reference of Indian economy.
6th	Human Resource Development	CO-1 : On successful completion of this course students will be able to: 1.Explain HRD and its theories, the difference between education, training, learning and the concept of the transfer of learning.

		<p>2.Critique the relationship between organizational development and HRD contribution to organizational effectiveness.</p> <p>3.Apply and evaluate a learning process starting with training needs, analysis to assessment and evaluation process.</p> <p>4.Evaluate the HRD role dealing with contemporary challenges.</p>
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ProgramOutcomes

- **PO-1:** Becoming more employable: One of the reasons why you should opt for this course is that it will enhance your employability. After studying Economics, you will have a wide range of career options to choose from. Having knowledge in multiple avenues will also help you in getting a good starting salary package.
- **PO-2:**Gaining confidence in communication: Another reason why you should consider getting this degree is that you will be able to develop plentiful soft skills. One of those soft skills is your communication abilities. You will be able to speak and write in an efficient and precise manner.
- **PO-3:**Gaining knowledge: Gaining a lot of knowledge in the field of Economics is another advantage of this course. You can use this knowledge to work on individual projects or to collaborate with a team of like-minded people. The skills that you gain during this course will empower you and give you the confidence to solve real-world problems.
- **PO-4:**People Skills: Economists need to have people skills that would assist them to work in a team. Senior-level Economists are sometimes put in situations where they have to manage some projects and lead a group of people. They need to be able to communicate with their team to supervise them efficiently--that is why it is important to have such soft skills.
- **PO-5:**Personality development: Being proficient in a practical and useful subject like Economics will add an edge to your personality and make you appear more intelligent and charismatic to the outside world. You would easily be able to

contribute to the welfare of society by solving problems both at the micro and the macro.

Programme Specific Outcomes BA(HONS)ECONOMICS

- **PSO-1:** To expose the students to the basic concepts of micro economics and macroeconomic theory
- **PSO-2 :**To equip the students with mathematical, statistical and econometric tools to analyze economic problems
- **PSO-3 :**To formally analyze the theory of consumer behaviour, producer behaviour, markets, factor pricing , cost structure and revenue through advanced micro economic theory
- **PSO-4 :** To make students understand the long run dynamic issues like growth and technical progress
- **PSO-5 :** To familiarize students to the basic concepts and theories of international trade, determinants, and dynamic effects of trade policies
- **PSO-6 :** To make the students understand the functioning of banks , monetary and financial sectors of the economy, role of financial markets and Institutions , budget and balance of payments
- **PSO-7:** To expose the students to various economic problems and issues related to growth, development, sustainable development, environment with special reference to India

**COURSE & PROGRAM OUTCOMES OF
CHEMISTRY HONOURS (B.SC.)**

Semester	Course Code	Course Outcomes
SEM-1	Inorganic Chemistry	<p>CO-1: To know extra nuclear structure of atom, concept of wave function and quantum numbers.</p> <p>CO-2: To learn about the basic concepts and types of chemical bonding formation of chemical bonds, hybridization and dipole moment of molecules, Modern approaches of chemical bonding (Molecular Orbital Theory)</p> <p>CO-3: To know the different trends of s, p, d and f-block elements. To acquire knowledge of Linnett's theory</p> <p>CO-4: To learn the basics concepts of ionic structure of different ionic solids.</p> <p>CO-5: To understand the basic concept of Born haber Cycle and band Theories.</p>
	Physical Chemistry	<p>CO-1: To understand the basic concept of kinetic theory of gases , Ideal gas equation and vanderwalls gas equation</p> <p>CO-2: To understand Maxwells distribution law of velocity and energies, Collision number and collision frequency.</p> <p>CO-3: To learn about adsobtion and different adsorption isotherms and isobars (Freundlieh, Langmuir and BET).</p> <p>CO-4: To learn the basic concepts of enzyme catalyst and Micharlis Menton Equation.</p> <p>CO-5: To understand about the different laws of crystallography and determination of crystal structure.</p> <p>CO-6: To study the liquid state and its properties like vapor pressure, viscosity and surface tension.</p>
	Organic chemistry	<p>CO-1: To understand about structure and bonding of organic compounds and concept of aromaticity, isomerism and its types.</p> <p>CO-2: To learn stereochemistry of chiral compounds; concept of D-L, R-S and E-Z nomenclature, Conformational isomerism, asymmetric synthesis.</p> <p>CO-3: To understand about mechanism of organic reactions, reactive intermediates and different purification techniques of organic compounds.</p> <p>CO-4: To learn about IUPAC nomenclature, methods of preparation, chemical reactions of alkanes and cycloalkanes.</p>

SEM-2	Inorganic Chemistry	<p>CO-1: To learn about chemistry of S-block elements and different theories of Precipitation.</p> <p>CO-2: To Know about theory of Qualitative and quantitative inorganic analysis.</p> <p>CO-3: To understand about the chemistry of P- block elements of Gp 13-17.</p> <p>CO-4: To Know about chemistry of Fullerenes, carbide, Inter halogen compounds and chemistry of nobel gases.</p>
SEM-3	Physical Chemistry	<p>CO-1: To learn in detail about chemical kinetics of 0,1,2,3 order reaction and their half life.</p> <p>CO-2: To gain vast knowledge on electrolytes, Kohlrausch law, Arrhenius theory.</p> <p>CO-3: To understand transport no. and its method of calculation. Application of conductivity measurements.</p> <p>CO-4: To study thermo chemistry and chemical energetic of chemical reactions.</p>
	Organic Chemistry	<p>CO-1: To learn about IUPAC nomenclature, methods of preparation, and chemical reactions of Alkenes. Industrial applications if ethylene and propene. Coal, petroleum and petrochemicals:</p> <p>CO-2: To learn about IUPAC nomenclature, methods of preparation, and chemical reactions of Cycloalkenes, Dienes, Alkynes and Poly Nuclear Hydrocarbons</p> <p>CO-3: To Understand concept of Arenes and Aromaticity and Methods of formation and chemical reactions of alkylbenzenes, alkynylbenzenes and biphenyl.</p> <p>CO-4: To know about Nomenclature and classes of alkyl halides, methods of formation, chemical reactions Alkyl and Aryl Halides. Polyhalogen compounds: chloroform, carbon tetrachloride. Synthesis and uses of DDT and BHC.</p>
	Inorganic Chemistry	<p>CO-1: To learn in detail about Werner's coordination theory and valence bond theory of transition metal complexes.</p> <p>CO-2: To gain vast knowledge on Oxidation and Reduction Frost, Latimer and Pourbaix diagrams, Non-aqueous solvents.</p> <p>CO-3: To understand characteristic properties of d-block elements. Properties of the elements of the first transition series, their binary compounds and complexes.</p> <p>CO-4: To learn about Chemistry of Ti, V, Cr, Mn, Fe and Co in various oxidation state</p>

SEM-4

Physical Chemistry	<p>CO-1: To learn about first law of thermodynamics, Internal energy, enthalpy, Heat capacity. Joule- Thomson effect and inversion temperature</p> <p>CO-2: To Know about the law of chemical equilibrium, Equilibrium constant and free energy function, isotherms and reaction isochor, Classius - Claperon equation and its application.</p> <p>CO-3: To Learn about Colloids, classification of colloids, stability of colloids, protective colloids Hardy-schulze Rule, gold number</p> <p>CO-4: To Know about Nernst distribution law, Application of distribution law.</p>
Organic Chemistry	<p>CO-1: To learn about nomenclature, methods of formation, chemical reactions of —Monohydric , dihydric , Trihydric alcohols.</p> <p>CO-2: To learn about Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols, phenols, Ethers and Epoxides</p> <p>CO-3: To Understand Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids. Methods of formation and chemical reactions of halo acids.</p> <p>CO-4: To know about Ultraviolet (UV) absorption spectroscopy Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. Woodward-Fieser rules.</p>
Inorganic Chemistry	<p>CO-1: To understand Chemistry of Elements of Second and Third Transition Series</p> <p>CO-2: To learn about Isopolyacids of Mo and W, Acids and Bases.</p> <p>CO-3: To Understand General Principles of Metallurgy of important metals like Ag, Au, Zn, Cu, and Ni.</p> <p>CO-4: To know about Chemistry of Lanthanide and actinide Elements</p>
Physical Chemistry	<p>CO-1: To learn in detail about Second law of thermodynamics, Carnot Cycle and its efficiency, Gibbs function (G) and Helmholtz function (A).</p> <p>CO-2: To gain vast knowledge on Gibb Helmholtz equation and its application, clausius- clapeyron equation Nernst heat theorem. Third law of thermodynamics and its applications</p> <p>CO-3: To understand electrolytic and galvanic cells, Electrochemical series and its significance.</p> <p>CO-4: To learn about Theories of reaction rates, Simple collision theory.</p> <p>CO-5: To acquire knowledge of Buffers solution, Buffer action, corrosion, types, theories and methods of controlling it.</p>

	Organic Chemistry	<p>CO-1: To learn in detail about Infrared (IR) absorption spectroscopy and Applications of IR spectroscopy in structure elucidation of organic compounds</p> <p>CO-2: To understand Structure, nomenclature, physical properties and Stereochemistry of amines.</p> <p>CO-3: To understand Mechanism of diazotisation, structure of benzene diazonium chloride and Nitro Compounds</p> <p>CO-4: To learn about Nomenclature and structure of Aldehydes and Ketones, Wittig reaction, Mannich reaction, Michael reaction, Baeyer–Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner</p>
Sem 5	Inorganic Chemistry 1	<p>CO-1 Metal- ligand Bonding in Transition Metal Complexes: TO understand the elementary idea of crystal-field theory its splitting in various complexes.</p> <p>CO-2 Magnetic Properties of Transition Metal complexes: To understand the L-S coupling, application of magnetic moment data for 3d-metal complexes.</p> <p>CO-3 TO study the thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes.</p> <p>CO-4 To study the Types of electronic transitions.</p> <p>CO-5 To study the Synthesis, properties nature of bonding, structures and applications.</p>
	Inorganic Chemistry 2	<p>CO-1 To learn about the metal carbon bonding, their nature, classification and their derivatives</p> <p>CO-2 Structure and bonding in organ metallic compounds</p> <p>CO-3 To acquire knowledge about the role of inorganic metal ions in biological system</p> <p>CO-4 To gain the knowledge about the role of metal ions in medicinal chemistry specially cu, Co and Au complexes</p> <p>CO-5 To study Corrosion and Passivity</p>
	Physical Chemistry 1	<p>CO-1 To study the Solution and collective – properties, Experimental methods for determining various colligative properties. Abnormal molar mass. Degree of dissociation and association of solutes.</p> <p>CO-2 Rotational Spectroscopy; determination of bond length, qualitative description of nonrigid rotator and Isotopic effect.</p> <p>CO-3 Phase equilibrium, To study the Statement and meaning of the terms phase, component and degree of freedom.</p> <p>CO-4 To study the Photo chemical reactions and their difference with thermal reaction law of photo chemistry. Grothus, Drapper law, Stark Einstein law, Lambert law, Beer's law.</p>
	Physical Chemistry 2	<p>CO-1 To study statistical thermodynamics, Maxwell Boltzmann distribution law and the concept of negative temperature,</p> <p>CO - 2 To understand Nuclear Chemistry and Radioactivity, Nuclear fission and nuclear fusion, kinetic and types of nuclear reactions.</p> <p>Co-3 To learn about classification, methods and different polymerization techniques and the kinetic rates of polymers.</p> <p>CO – 4 To learn Physical properties and Molecular structure- optical activity, dipole moment and paramagnetism.</p>

	Organic Chemistry 1	<p>CO-1 To study the Principle of nuclear magnetic resonance and its applications.</p> <p>CO-2 To study the Introduction and instrumentation of Mass spectrometry, and Organosulphur Compounds.</p> <p>CO-3 To study the Classification and nomenclature of Carbohydrates and mechanism of mutarotation.</p> <p>CO-4 To study the Organ metallic Compound its formation and chemical reactions.</p>
	Organic Chemistry 2	<p>CO -1 To understand the nature of Heterocyclic Compounds – preparation, orientation and reactivity</p> <p>CO -2 To study organo phosphorous compounds and their biological role.</p> <p>CO- 3 To examine the synthesis, properties and their uses of various polymers.</p> <p>CO-4 To understand the synthesis organic substances via enolates and classification and uses of different dyes.</p> <p>CO-5 To learn the classification, stereochemistry and properties of Amino Acids, Peptides, Proteins and Nucleic Acids</p>
SEM 6	Inorganic Chemistry 1	<p>CO-1 To study the use of Organic Reagents in Inorganic Analysis</p> <p>CO-2 To study the classification of errors, precision, accuracy.</p> <p>CO-3 To learn about the Definition, classification of inorganic polymers.</p> <p>CO-4 To study the Characteristics, mechanism, techniques of ion exchange and solvent exchange chromatography.</p>
	Inorganic Chemistry 2	<p>CO-1 To learn about the water pollution and its effects.</p> <p>CO-2 To learn about the air pollution and its effects</p> <p>CO-3 To study the Industrial Wastes and treatment processes</p> <p>CO-4 To understand the nuclear structure, properties and reactions</p> <p>CO-5 To study the Activation analysis, isotopic dilution analysis and radiometric titrations and their applications</p> <p>CO-6 To learn the crystal structure of various ionic compounds zinc blende, wurtzite, NiAs, CsCl, CaF₂, rutile, □-Cristobalite, CdI₂, BiI₃, ReO₃, corundum and Mn₂O₃.</p>
	Physical Chemistry 1	<p>CO-1 To study the Vibrational Spectroscopy and Idea of vibrational frequencies of different functional group.</p> <p>CO-2 To study the Quantum theory of Raman effect Elementary idea of Nuclear magnetic resonance.</p> <p>CO-3 To study the Concepts of potential energy curves for bonding and antibonding molecular orbitals</p> <p>CO-4 To study the Schrodinger wave equation and its significance. Physical interpretation of the wave function. Postulates of quantum mechanics.</p>

	<p>Physical Chemistry 2</p>	<p>Co-1 To understand the Construction of molecular orbital by linear combination of atomic orbital ,-H₂ ion CO-2 To understand the concept of molecular orbital theory with the help of orbital diagrams. CO-3 To learn about catalysis, different theories, general characteristics CO-4 To understand the chromatography classification according to their phenomenon and the mobile phase used in it.</p>
	<p>Organic Chemistry 1</p>	<p>CO-1 To study the Intorduction, Characterstics and nomenclature of Enzyme. CO-2 To know about Fermentation, chemical composition and importance of Fats, Oils and Detergent. CO-3 To know about the Introduction, relation of chemical structure and physiological activity with suitable examples. CO-4 To study the General aspects, preparation and uses of the following drugs General aspects, preparation and uses of the following drugs.</p>
	<p>Organic Chemistry 2</p>	<p>CO-1 To study the introduction, classification and their isolation of terpenoids CO-2 To study the introduction, classification and their isolation of alkaloids, Hofman's exhaustive methylation CO-3 To learn about the pesticides: introduction, classification and their effect CO-4 To learn about the Vitamins and hormones : introduction, classification and their biological role in human beings</p>

**COURSE & PROGRAM OUTCOMES OF
PHYSICS HONOURS (B.SC.)**

Semester	Course Code	Course Outcomes
SEM-I	Chemistry-I	<p>CO-1: To learn about the basic concepts and types of chemical bonding, formation of chemical bonds, hybridization and dipole moment of molecules, Modern approaches of chemical bonding (Molecular Orbital Theory)</p> <p>CO-2: To learn the basics concepts of crystal structure of different ionic solids, Spinels.</p> <p>CO-3: To understand the basic concept of Born Haber Cycle and band Theories, semiconductors and insulators, weak chemical forces.</p> <p>CO-4: To learn the basics concepts of Crystal field theory, the Jahn-Teller Theorem.</p> <p>CO-5: To understand about the Trans Effect and kinetics of square planar and octahedral substitution reaction.</p>
SEM-2	Chemistry-II	<p>CO-1: To learn stereochemistry of chiral compounds ; concept of D-L, R-S and E-Z nomenclature, Conformational isomerism.</p> <p>CO-2: To understand about structure and bonding of organic compounds and concept of aromaticity, isomerism and its types.</p> <p>CO-3: To understand about mechanism of organic reactions, reactive intermediates.</p> <p>CO-4: To understand Organic reactions as synthetic tools: Claisen, Cannizzaro, Grignard, Michael, Mannich, Darzen, aldol, Diekmann, Perkin etc.</p>

COURSE & PROGRAM OUTCOMES OF CHEMISTRY B.Sc. PASS COURSE UNDER CBCS

The CBCS Course curriculum of the discipline of Chemistry is well designed and very promising. The core course would help to enrich the subject knowledge of the students and increase their confidence level in the field of both academia and industry. Generic electives make integration among various interdisciplinary courses to fulfill the vision and mission of designing the course. The introduction of Skill Enhancement Courses (SEC) would help to gain more powerful knowledge not only in their core Chemistry subject but also in interrelated multidisciplinary subjects both theoretically and practically. The inclusion of Discipline Specific Courses(DSE)has brought an opportunity in front of students to gain knowledge on various naturally and industrially important useful materials and also helps them to familiar and expert in handling different chemistry based software after proper training. In brief the student graduated with this type of curriculum would be able to disseminate subject knowledge along with necessary skills to suffice their capabilities for academia, entrepreneurship and industry.

After careful analysis of the course, the department of Chemistry has pointed out the following outcomes of the course.

CourseOutcomes

Semester	Course Code	CourseOutcomes
Sem-1	CH-101	<p>CO-1 To understand Atomic Structure Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, quantum numbers, wave functions and shapes of s, p, d orbitals.</p> <p>CO-2 To study Periodic Properties, General principles of periodic table. Electronic configurations of the elements, effective nuclear charge, Slater's rules.</p> <p>CO-3 To study about types of chemical bonds, Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions Valence shell electron pair repulsion, theory to. MO theory.</p> <p>CO-4 To study about Ionic Solids Ionic structures, radius ratio rule, lattice defects, semiconductors, lattice energy and Born-Haber cycle, solvation energy and its relation with solubility of ionic solids, polarizing power and polarisability of ions, Fajan's rule.</p>

SEM-I	CH-102	<p>CO-1 To understand Gaseous States- Maxwell's distribution of velocities and energies, Calculation of root mean square velocity, average velocity and most probable velocity. Deviation of Real gases from ideal behaviour. Derivation of Vander Waal's Equation of State, its application in the calculation of Boyle's temperature and Explanation of behaviour of real gases using Vander Waal's equation.</p> <p>CO-2 To study about Critical Phenomenons, PV isotherms of real gases, continuity of states. The Law of corresponding states and Liquification of gases.</p> <p>CO-3 To study about To Liquid States Structure of liquids. Properties of liquids – surface tension, viscosity vapour pressure and optical rotations and their determination. Applications of liquid crystals.</p> <p>CO-4 To study about Solid State Classification of solids, Laws of crystallography. Unit cell & space lattice. Bravais lattices, crystal system. X-ray diffraction by crystals. Derivation of Bragg equation. Determination of crystal structure of NaCl, KCl.</p>
	CH-103	<p>CO-1 To understand Structure and Bonding of organic compounds van der Waals interactions, resonance, hyperconjugation, inductive effect, Electromeric Concept of isomerism. optical activity, chiral and achiral molecules meso compounds, resolution of enantiomers, inversion, retention and racemization.</p> <p>CO-2 To study about Stereochemistry of Organic Compounds R & S systems of nomenclature E & Z system of nomenclature, Conformational isomerism, Newman projection and Sawhorse formulae</p> <p>CO-3 To understand Mechanism of Organic Reactions Types of reagents – electrophiles and nucleophiles. Types of organic reactions. Energy considerations. carbocations, carbanions, free radicals, carbenes, arynes and nitrenes</p> <p>CO-4 To study about IUPAC nomenclature, classification, Isomerism in alkanes, sources, methods of formation alkane and cyclo alkane, Baeyer's strain theory and its limitations.</p>
SEM-2	CH-201	<p>CO-1 To understand Hydrogen Bonding & Vander Waals Forces Hydrogen Bonding Metallic Bond and Semiconductors.</p> <p>CO-2 To study about s-Block Elements, Chemistry of Noble Gases</p> <p>CO-3 To understand p-Block Elements, Boron family (13th gp), Carbon Family (14th group).</p> <p>CO-4 To study about Nitrogen Family (15th group), Oxygen family (16th group). Halogen Family (17th group).</p>
	CH-202	<p>CO-1 To understand Rate of reaction, rate equation, factors influencing the rate of a reaction, Kinetics of different order reaction.</p> <p>CO-2 To study about Effect of temperature on the rate of reaction – Arrhenius equation. Theories of reaction rates.</p> <p>CO-3 To understand Electrolytic conduction, factors affecting electrolytic conduction. Arrhenius theory of ionization, Ostwald's Dilution Law. Debye-Huckel – Onsager's equation for strong electrolytes. Transport number concept.</p> <p>CO-4 To study about Kohlrausch's Law study about strong and weak electrolytes. conductometric titrations.</p>
	CH-203	<p>CO-1 To Study about Nomenclature of alkenes. Chemical reactions of alkenes mechanisms involved in it.</p> <p>CO-2. To understand concept of Arenes and Aromaticity, Nomenclature Aromatic electrophilic substitution general pattern of the mechanism. Energy profile diagrams. Activating, deactivating substituents and orientation.</p> <p>CO-3 To understand concept of Dienes and Alkynes Nomenclature and classification of dienes.</p> <p>CO-4 To understand concept of Alkyl and Aryl Halides Nomenclature</p>

		and classes of alkyl halides, methods of formation, chemical reactions. Mechanisms and stereochemistry of nucleophilic substitution reactions of alkyl halides.
SEM-3	CH-301	<p>CO-1 To study the Chemistry of Elements of 1st transition series: position in the periodic table, General characteristics & properties, Structures & properties of compounds of transition elements – TiO₂, VOCl₂, FeCl₃, CuCl₂ and Ni(CO)₄</p> <p>CO-2 To study the General characteristics and properties of the 2nd and 3rd transition elements, Comparison of properties of 3d elements with 4d & 5d elements</p> <p>CO-3 To study Coordination Compounds, Werner's coordination theory, effective atomic number concept, chelates, valence bond theory</p> <p>CO-4 Study and analysis of Non-aqueous Solvents, Physical properties, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH₃ and liquid SO₂</p>
	CH-302	<p>CO-1 To understand the thermodynamic terms: system, surrounding. To know intensive and extensive properties, heat and work. To understand the Zeroth Law, First law of thermodynamics & Joule's law.</p> <p>CO-2 To calculate of w.q. dU & dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process, Temperature, Kirchoff's equation. Bond energies.</p> <p>CO-3 To understand Equilibrium constant and free energy, concept of chemical potential. To understand Temperature dependence of equilibrium constant; To understand Applications of Le-Chatelier's principle and Clausius – Clapeyron equation.</p>

SEM-3		<p>CO-4: To understand Nernst distribution law, Modification of distribution law when solute undergoes dissociation, association and chemical combination. To understand applications of distribution law: (i) Determination of degree of hydrolysis and hydrolysis constant of aniline hydrochloride. (ii) Determination of equilibrium constant of potassium tri-iodide complex and process of extraction.</p>
	CH-303	<p>CO-1: To learn about nomenclature, methods of formation, chemical reactions of —Monohydric, dihydric, Trihydric alcohols. Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides</p> <p>CO-2: To learn about Nomenclature, structure and bonding. Preparation of phenols, physical properties and acidic character. Comparative acidic strengths of alcohols and phenols.</p> <p>CO-3: To know about Ultraviolet (UV) absorption spectroscopy Concept of chromophore and auxochrome. Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. Woodward-Fieser rules.</p> <p>CO-4: To Understand Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids and its derivatives.</p>
SEM-4	CH-401	<p>CO-1 Study of Chemistry of Lanthanides, Electronic structure, oxidation states and ionic radii and lanthanide contraction, complex formation, occurrence and isolation, lanthanide compounds.</p> <p>CO-2 Study of Chemistry of Actinides, General features and separation of Np, Pu and Am from U, Comparison of properties of Lanthanides and Actinides and with transition elements.</p> <p>CO-3 To analyze the various acidic radicals, identification of acid radicals in typical combinations, interference of acid radicals including their removal in the analyses is of basic radicals.</p> <p>CO-4 To analyses the various groups of basic radicals, Theory of precipitation, co- precipitation, Post- precipitation, purification of precipitates</p>
	CH-402	<p>CO-1 To understand Second law of thermodynamics, Carnot's cycles, entropy as a function of V & T & function of P & T. Entropy as a criteria of spontaneity and equilibrium.</p> <p>CO-2 To understand Third law of thermodynamics, Nernst heat theorem, residual entropy. To understand Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A & G as criteria for thermodynamic equilibrium and spontaneity.</p> <p>CO-3 To understand electrolytic and Galvanic cells – reversible & Irreversible cells, EMF and its measurement, Weston standard cell, Types of reversible electrodes. Nernst equations, Standard Hydrogen electrode, reference electrodes, electrochemical series and its applications.</p> <p>CO-4 To understand concentration cells with and without transference, liquid junction potential, application of EMF measurement, potentiometric titration. Determination of pH using Hydrogen electrode, Quinhydrone electrode and glass electrode by potentiometric methods.</p>

	CH-403	<p>CO-1: To learn in detail about Infrared (IR) absorption spectroscopy and Applications of IR spectroscopy in structure elucidation of organic compounds</p> <p>CO-2: To understand Structure, nomenclature, physical properties and Stereochemistry of amines.</p> <p>CO-3: To understand Mechanism of diazotization, structure of benzene diazonium chloride and Nitro Compounds</p> <p>CO-4: To learn about Nomenclature and structure of Aldehydes and Ketones, Wittig reaction, Mannich reaction, Baeyer–Villiger oxidation of ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner</p>
SEM-5	CH-501	<p>CO-1 To understand Metal-ligand Bonding in Transition Metal Complexes Limitations of valence bond theory.</p> <p>CO-2 To understand Thermodynamic and Kinetic Aspects of Metal Complexes. A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes of Pt(II).</p> <p>CO-3 To understand Magnetic Properties of Transition Metal Complexes. Types of magnetic behavior.</p> <p>CO-4 To understand Electron Spectra of Transition Metal Complexes. Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states.</p>
	CH-502	<p>CO-1 To understand about Quantum mechanics, Postulates of quantum mechanics, Role of operators in quantum mechanics, To show quantum mechanically that position and momentum cannot be predicated simultaneously, Determination of wave function & energy of a particle in one dimensional box, Pictorial representation and its significance.</p> <p>CO-2 To understand Thermodynamic and Kinetic Aspects of Metal Complexes A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes of Pt(II).</p> <p>CO-3 To understand Magnetic Properties of Transition Metal Complexes. Types of magnetic behavior.</p> <p>CO-4 To understand Electron Spectra of Transition Metal Complexes Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states.</p>
	CH-503	<p>CO-1To Study of Principle of NMR , the PMR signals, peak areas, equivalent and nonequivalent protons, positions and chemical shift, shielding and deshielding, proton counting, splitting of signals and coupling constants, magnetic equivalence of protons.</p> <p>CO-2To Study of PMR spectra of the molecules: ethyl bromide, n-propyl bromide, isopropyl bromide, 1,1-dibromoethane, 1,1,2-tribromoethane, ethanol, acetaldehyde, ethyl acetate, toluene, benzaldehyde and acetophenone. PMR spectroscopy for structure determination of organic compounds.</p> <p>CO-3To Study of Carbohydrates, Monosaccharides, mechanism of osazone formation, interconversion of glucose and fructose, Formation of glycosides, ethers and esters. Determination of ring size of glucose and fructose. Open chain and cyclic structure of D(+)-glucose & D(-) fructose. Mechanism of mutarotation. Structures of ribose and deoxyribose.</p> <p>CO-4 To Study of disaccharides (maltose, sucrose and lactose) and polysaccharides (starch and cellulose), the Grignard reagents, Organozinc compounds, Organolithium compounds.</p>

SEM-6	CH-601	<p>CO-1 To Study of Organometallic Chemistry Definition, nomenclature and classification of organometallic compounds.</p> <p>CO-2 To Study of Acids and Bases, HSAB Concept Arrhenius, Bronsted – Lowry, the Lux – Flood, Solvent system and Lewis concepts of acids & bases.</p> <p>CO-3To Study of Bioinorganic Chemistry, Essential and trace elements in biological processes.</p> <p>CO-4To Study of Silicones and Phosphazenes. Their preparation, properties, structure and uses.</p>
	CH-602	<p>CO-1 To Study of Electronic Spectrum Concept of potential energy curves for bonding, Franck- Condon principle.</p> <p>CO-2 To Study about Photochemistry. Laws of photochemistry, Jablonski diagram, photosensitized reactions-energy transfer processes.</p> <p>CO-3To Study about. Dilute Solutions and Colligative Properties, Osmosis law of osmotic pressure. Elevation of boiling point and depression of freezing point.</p> <p>CO-4 To Study about Phase Equilibrium, Gibbs phase rule, phase equilibria of one component system. Phase equilibria of two component systems solid-liquid equilibria, eutectic mixtures.</p>
	CH-603	<p>CO-1To Study of Heterocyclic Compounds- pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with mechanism of electrophilic substitution, nucleophilic substitution reactions, Comparison of basicity of pyridine, piperidine and pyrrole.</p> <p>CO-2To Study of Preparation and reactions of indole, quinoline and isoquinoline, Mechanism of electrophilic substitution reactions of, quinoline and isoquinoline, Organosulphur Compounds, Synthetic detergents alkyl and aryl sulphonates.</p> <p>CO-3 To Study of Organic Synthesis via Enolates, alkylation of diethyl malonate and ethyl acetoacetate. The Claisen condensation. Keto-enol tautomerism of ethyl acetoacetate, Synthetic polymers, Natural and synthetic rubbers.</p> <p>CO-4To Study of Amino Acids, Peptides & Proteins, end group analysis, selective hydrolysis of peptides, Classical peptide synthesis, solid-phase peptide synthesis. Structures of peptides and proteins: Primary & Secondary structure.</p>

ProgramOutcomes

PO-1: Disciplinary knowledge and skill: A graduate student is expected to be capable of demonstrating comprehensive knowledge and understanding both theoretical and practical knowledge in all disciplines of Chemistry. Students can solve their subjective problems very methodically, independently and finally draw a logical conclusion. Further, the student will be capable of applying modern technologies, handling advanced instruments and Chemistry related soft-wares for chemical analysis, characterization of materials and in separation technology.

PO-2: Skilled communicator: The course curriculum incorporates basics and advanced training in order to make a graduate student capable of expressing the subject through technical writing as well as through oral presentation.

PO-3: Critical thinker and problem solver: The course curriculum also includes components that can be helpful to graduate students to develop critical thinking and to design, carry out, record and analyze the results of chemical reactions. Students will be able to think and apply evidence based comparative chemistry approach to explain chemical synthesis and analysis.

PO-4: Sense of inquiry: It is expected that the course curriculum will develop an inquisitive characteristics among the students through appropriate questions, planning and reporting experimental investigation.

PO-5: Team player: The course curriculum has been designed to provide opportunity to act as team player by contributing in laboratory, field based situation and industry.

PO-6: Skilled project manager: The course curriculum has been designed in such a manner as to enabling a graduate student to become a skilled project manager by acquiring knowledge about chemistry project management, writing, planning, study of ethical standards and rules and regulations pertaining to scientific project operation.

PO-7: Digitally literate: The course curriculum has been so designed to impart a good working knowledge in understanding and carrying out data analysis, use of library search tools, use of chemical simulation software and related computational work.

PO-8: Ethical awareness: A graduate student requires understanding and developing ethical awareness or reasoning which is adequately provided through the course curriculum. Students can also create an awareness of the impact of chemistry on the environment, society, and also make development outside the scientific community.

PO-9: Environmental Awareness: As an inhabitant of this green planet a Chemistry graduate student should have many social responsibilities. The course curriculum is designed to teach a Chemistry graduate student to follow the green routes for the synthesis of chemical compounds and also find out new greener routes for sustainable development. The course also helps them to understand the causes of environmental pollution and thereby applying environmental friendly policies instead of environmentally hazard ones in every aspect.

PO-10: Lifelong learner: The course curriculum is designed to inculcate a habit of learning continuously through use of advanced ICT technique and other available e-techniques, e-book sand e-journals for personal academic growth.

PO-11: Analytical skill development and job opportunity: The course curriculum is designed in such a way that Chemistry graduate students can handle many Chemistry based software, decent instruments and advanced technologies to synthesize, characterize and analyze the chemical compounds very skillfully. Such a wonderful practice in the graduate level will bring a good opportunity to the students for getting job in industries besides academic and administrative works.

Programme Specific Outcomes

PSO-1: Co-recompetency: The chemistry graduates are expected to gain knowledge of the fundamental concepts of chemistry and applied chemistry through theory and practical. These fundamental concepts would be reflected in the latest understanding of the field to keep continues its progression.

PSO-2: Communication skills: Chemistry graduates are expected to possess minimum standards of communication skills to read and understand documents so that they can solve their problems very methodically, independently and with logical argument. Graduates are expected to build good communication skill so that they can easily share their idea/finding/concepts to others.

PSO-3: Critical thinking: Chemistry graduates are expected to achieve critical thinking ability to design, carry out, record and analyze the results of chemical reactions. They can have that much potential and confidence that they can overcome many difficulties with the help of their sharp scientific knowledge and logical approaches.

PSO-4: Psychological skills: Chemistry graduates are expected to possess basic psychological skills so that they can deal with individuals and students of various socio-cultural, economic and educational levels. Psychological skills are very important for proper mind setting during performing, observing and giving conclusion of a particular reaction. It is also important for self-compassion, self-reflection, inter personal relationships, and emotional management.

PSO-5: Problem-solving: Graduates are expected to be well trained with problem-solving philosophical approaches that are pertinent across the disciplines.

PSO-6: Analytical skill development and job opportunity: Chemistry graduates are expected to possess sufficient knowledge how to synthesize a chemical compound and perform necessary characterization and analysis in support of the formation of the product by using modern analytical tools and advanced technologies. Because of this course curriculum chemistry graduates have lot of opportunity to get job not only in academic and administrative field but also in industry.

PSO-7: Research motivation: Chemistry graduates are expected to be technically well trained with modern devices and Chemistry based software and has powerful knowledge in different disciplines of Chemistry so they can easily involve themselves in theory and laboratory-based research activities.

PSO-8: Teamwork: Graduates are expected to be team players, with productive co-operations involving members from diverse socio-cultural backgrounds.

PSO-9: Digital Literacy: Graduates are expected to be digitally literate for them to enroll and increase their core competency via e-learning resources has MOOC and other digital tools for lifelong learning.

PSO-10: Social Awareness: As an inhabitant of this green world it is our duty to make our planet clean and suitable for living to all. In this context Chemistry graduates are expected to be more aware about finding green chemical reaction routes for sustainable development. They are expected to maintain good laboratory practices and safety.

**COURSE & PROGRAM OUTCOMES OF
B.A. GEOGRAPHY (HONS)**

Semester	Subject Name and Code	Course Outcomes
SEM-1	Introduction to Geography	CO-1: It will help students to understand the nature of Geography CO-2: The students will be able to understand the history of geographical thought CO-3: The students will know dualisms and geographical scholars
	Fundamentals of Physical Geography	CO-1: It will provide students with an understanding of the conceptual and dynamic aspects of nature and the scope of Physical Geography CO-2: Students will learn the relevance of Geomorphology, Climatology and Oceanography in various fields
	General Cartography (Practical)	CO-1: It will provide students with an understanding of the Basic Concepts of Cartography CO-2: Students will learn the relevance of Map Scales, Latitude and Longitude; Global Time etc
SEM-2	Ecology and Environment	CO-1: It will help students to understand Ecology and Ecosystem CO-2: The students will be able to understand Environmental pollution CO-3: The students will know about the Conservation and management of the environment
	Fundamentals of Human Geography	CO-1: It will provide students with an understanding of nature and scope and branches of Human Geography CO-2: Students will learn the relevance of human adaptation to the environment
	Representation of Physical Features (Practical)	CO-1: It will provide students with an understanding of intervisibility and profiles CO-2: Students will learn the relevance of histograms etc.

SEM-3	Geomorphology	<p>CO-1: It will provide students with an understanding of the conceptual and dynamic aspects of Landform development</p> <p>CO-2: Students will learn the relevance of applied aspects of Geomorphology in various fields</p>
	Regional Development	<p>CO-1: The student will get familiarised with the theoretical foundations and conceptual grounding of this branch</p> <p>CO-2: The students will understand and evaluate the concept of region in geography and its role and relevance in regional planning</p> <p>CO-3: The students would be able to comprehend the regional development and planning process in India</p>
	Geography of India	<p>CO-1: The students will appreciate the relevance of geographical knowledge of India to understand the contemporary issues</p> <p>CO-2: To describe various geographical aspects of land, people and economy of Indian sub-continent</p>
	Thematic Cartography (Practical)	<p>CO-1: It will help students to understand Techniques in thematic mapping</p> <p>CO-2: The students will be able to understand Cartographic overlays</p>
SEM-4	Climatology	<p>CO-1: It will help students to understand the mean global atmospheric circulations and disturbance</p> <p>CO-2: The students will be able to understand World climate systems</p> <p>CO-3: The students will know climatic variability and change</p>
	Population Geography	<p>CO-1: Students would be able to understand the distribution and dynamics of population distribution and its problems and management</p> <p>CO-2: The students are introduced to the spatial distribution of the population with causative factors</p> <p>CO-3: It also deals with various theories and concepts related to population</p>
	Statistical Techniques in Geography	<p>CO-1: Students will learn the significance of statistical techniques in geography</p> <p>CO-2: Students should be able to understand measures of central tendency the relationship and juxtaposition of features therein.</p>

	Basic Principles of Land Surveying	<p>CO-1: Students will be able to apply techniques in the Chain and Tape Survey</p> <p>CO-2: They will be able to conduct a Plane Table Survey</p>
SEM 5	Modern Geographical Thought	<p>CO-1: This should enable the student to critically look at the contents of other courses at the undergraduate level as logically integrated with the broad currents of thought the subject has witnessed in the distant and recent past</p> <p>CO-2: Students will be acquainted with the philosophy, methodology and historical development of geography as a professional field</p> <p>CO-3: Students should develop critical thinking and analytical approaches</p>
	World Regional Geography	<p>CO-1: This should enable the student to critically look at Geographic realms and regions</p> <p>CO-2: Students will be acquainted with the natural and economic regions of the world</p>
	Agricultural Geography	<p>CO-1: Students will become sensitized to the concept of nature and the scope of Agricultural Geography</p> <p>CO-2: Students will know about World farming systems</p> <p>CO-3: Students will understand Agricultural planning and policies in India</p>
	Map Projections, Prismatic Compass Survey and Field Report	<p>CO-1: Students will be able to apply Survey techniques</p> <p>CO-2: They will be able to describe and explain various geographical patterns and relationships in the field study</p> <p>CO-3: Students would be able to make a rational choice amongst listed Map projections</p>
SEM 6	Oceanography	<p>CO-1: The student will be able to understand the dynamics of ocean physiography and water movement</p> <p>CO-2: It will help them to have an understanding of the relevance of oceans as a resource in times of coom</p> <p>CO-3: It will also provide an understanding of the ocean-human interface including weather, climate, navigation, security and resource utilisation</p>
	Economic Geography	<p>CO-1: Students would be able to understand how in an increasingly globalized world, economic activities occur unevenly over geographical space</p> <p>CO-2: Students would be able to understand how local places and the global economy are intertwined</p> <p>CO-3: Students would understand Agricultural regions of the world</p>

	and trade and transport
Political Geography	<p>CO-1: The student will get familiarised with the nature and scope of Political Geography</p> <p>CO-2: The students will understand and evaluate the concept of nation, state and nation-state</p> <p>CO-3: The students would be able to comprehend Global geo-strategic views</p>
Fundamentals of Remote sensing	<p>CO-1: Students will be able to apply interpretation techniques through aerial photographs and stereoscope</p> <p>CO-2: They will be able to describe and explain various stages, regions and processes of remote sensing</p>

COURSE & PROGRAM OUTCOMES OF

B.A Hindi Hons

Semester	Subject Name and Code	Course Outcomes
मह.1	हिन्दी नाटक	<p>पहला प्रश्न पत्र हिन्दी नाटक सेमेस्टर एक के अन्तर्गत हिन्दी ऑनर्स में विद्यार्थियों को दो नाटक पढ़ाए जाते हैं। मिस्टर अभिमन्यू और भाम्बूक। बच्चों नाटकों को पढ़कर खुद को ज्ञानवर्धक पाते हैं इन्हीं नाटकों में राष्ट्रीयता की भावना का परिचय मिलता है। बच्चों में राष्ट्रीयता की भावना को उजागर किया जाता है।</p> <p>सेमेस्टर एक के दौरान ही विद्यार्थियों को दूसरा प्रश्न- पत्र भाषा विज्ञान और हिन्दी भी पाठ्यक्रम पढ़ाया जाता है। जहाँ भाषा अध्ययन की दिशाएँ , हिन्दी की बोलियाँ, स्वर ,व्यंजन और नागरी लिपि की विशेषताएँ, मानकीकरण आदि प्रश्न पाठ्यक्रम में शामिल हैं। यहाँ विद्यार्थियों को भाषा विज्ञान से सम्बंधित समस्त जानकारी उपलब्ध कराई जाती है। जो आगे चलकर उनको एम0ए0 हिन्दी में भी पढ़नी होती हैं। एम0ए0 हिन्दी करने से पहले वो भाषा विज्ञान के बारे में काफी ज्यादा जानकारी यहाँ से ही प्राप्त कर लेते हैं।</p>
मह.2	हिन्दी उपन्यास	<p>तीसरा प्रश्न पत्र ..हिन्दी उपन्यास चौथा प्रश्न पत्र साहित्य लोचन</p> <p>सेमेस्टर द्वितीय के दौरान इन्हीं विद्यार्थियों को पाठ्यक्रम में तीसरा प्रश्न पत्र हिन्दी उपन्यास पढ़ाया जाएगा। पाठ्यक्रम में निर्धारित उपन्यास है।</p> <ol style="list-style-type: none"> 1 .त्याग पत्र.....जैनेन्द्र कुमार 2 महाभोज ... मन्नु भण्डारी <p>विद्यार्थी हिन्दी के उपन्यास साहित्य का विविष्ट ज्ञान प्राप्त करते हैं। इन्हीं उपन्यासों के माध्यम के अन्य उपन्यास लेखक और उनकी रचनाओं का विविष्ट ज्ञान प्राप्त करते हैं। इसी सेमेस्टर में चौथा प्रश्न पत्र साहित्यलोचन भी पढ़ाया जाता है। यहाँ भारतीय एवं पाश्चात्य काव्य-शास्त्र के सिद्धांतों को पढ़ाया जाता है। विद्यार्थियों में भारतीय एवं पाश्चात्य काव्य-शास्त्र की समझ विकसित होगी। कृतियों के विश्लेषण हेतु भारतीय एवं पाश्चात्य चिन्तन का पक्ष स्पष्ट होगा।</p> <p>पाठ्यक्रम इस प्रकार है :-</p> <ol style="list-style-type: none"> 1 काव्य का स्वरूप,तत्व,प्रयोजन । 2. रस सिद्धांत,अलंकार,रीति,ध्वनि ,वक्रोक्ति,औचित्य सिद्धांत 3 प्लेटो,अरस्तु,लोजाइनस, कॉलरिज के सिद्धांत 4.अभिजात्यवाद,स्वच्छन्दतावाद,मार्क्सवाद,मनोविश्लेषणवाद शामिल है।
मह.3	मध्यकालीन हिन्दी कविता	<p>पांचवा प्रश्न-पत्र - मध्यकालीन हिन्दी कविता छठा प्रश्न-पत्र-आधुनिक हिन्दी कविता सातवां प्रश्न-पत्र-कहानी साहित्य</p> <p>सेमेस्टर-3 मध्यकालीन हिन्दी कविता पेपर-5</p> <p>हिन्दी साहित्य के इतिहास का विश्लेषणात्मक ज्ञान देना विभिन्न कवियों एवं उनकी कविताओं का विशिष्ट ज्ञान देना। विद्यार्थियों में हिन्दी के प्रमुख कवि एवं उनकी कविताओं की समझ विकसित होगी। पाठ्यक्रम में शामिल कवि -कबीरदास,सूरदास,तुलसीदास ,रैदास के पद एवं दोहे।</p> <p>पेपर -6 (आधुनिक हिन्दी -कविता)</p> <p>हिन्दी साहित्य के इतिहास में शामिल आधुनिक कवियों एवं उनकी कविताओं का विशिष्ट ज्ञान देना।</p> <p>छायावादी हिन्दी कवि</p>

		<p>1 जंयोंकर प्रसाद 2 सूर्यकान्त त्रिपाठी निराला 3 सुमित्रानन्दन पन्त 4 महादेवी वर्मा</p> <p>1 छायावादोत्तर हिन्दी कवि - 1 स0 ही0 वा0 अज्ञेय 2 धर्मबीर भारती 3 नागार्जुन 4 दुश्यन्त कुमार 5 कुंवर नारायण भामिल है। (कहानी साहित्य, पेपर-7)</p> <p>हिन्दी कथा -साहित्य का वि'लेशणात्मक ज्ञान देना कहानी एवं उनके लेखकों का वि'ीष्ट ज्ञान देना। कहानियों को पढकर विधार्थी खुद को ज्ञानवर्धक पाते है। उनको जीवन की समझ विकसित होगी। कहानियों में विधार्थी -प्रेमचन्द की भातरंज के खिलाडी। जैनेन्द्र कुमार -जाहनवी निर्मल वर्मा-परिन्दे कमले'वर-कस्बे का आदमी राजेन्द्र यादव-खेल -खिलौने भीश्म साहनी-अमृतसर आ गया। मन्जू भण्डारी -त्रि'ोकू फणी'वरनाथ- लाल पान की बेगम ओमप्रका'ी वाल्मीकि-प्रमो'ेन ममता कालिया -आपकी छोटी लडकी।</p>
मड.4	निबंध साहित्य	<p>आठवा प्र'ेन पत्र -निबंध साहित्य नौवा प्र'ेन पत्र-संस्मरण और आत्मकथा दसवां प्र'ेन पत्र- हिन्दी साहित्य का इतिहास(आदिकाल,भक्तिकाल, रीतिकाल) हिन्दी साहित्य में गद्य विधाओं के अर्न्तगत (निबंध साहित्य)इतिहास का वि'लेशण विभिन्न लेखकों एवं उनके निबंधों की समस्त जानकारी प्राप्त करके खुद को ज्ञानवर्धक पाते है। निर्धारित निबंधों में - बालकृष्ण भट्ट,महावीर प्रसाद द्विवेदी, अध्यापक पूर्ण सिंह, रामधारी दिनकर,अज्ञेय,डा0नगेन्द्र, रामबिलास भार्मा, हजारी प्रसाद द्विवेदी, जैसे निबंधकार भामिल हैं। प्र'ेन-पत्र-9 में संस्मरण और आत्मकथा 1 पथ के साथी- महादेवी वर्मा 2 क्या भूलूँ क्या याद करू- हरिवं'ेराय बच्चन । दसवाँ प्र'ेन-पत्र (हिन्दी साहित्य का इतिहास) विधार्थियों को हिन्दी साहित्य के इतिहास का वि'लेशणात्मक ज्ञान देना इतिहास लेखक, प्रमुख इतिहास ग्रन्थों की जानकारी विधार्थियों को मिलेगी। हिन्दी साहित्य इतिहास की लेखन परम्परा , आदिकालीन, भक्तिकालीन एवं समस्त रीतिकालीन साहित्य से विधार्थी परिचित होंगे।</p>
मड.5	हिन्दी साहित्य का इतिहास (आधुनिक काल)	<p>पेपर-11 हिन्दी साहित्य का इतिहास (आधुनिक काल) पेपर-12 पत्रकारिता और अनुवाद पेपर -13 काव्यांग परिचय पेपर-11 के अन्तर्गत आधुनिक काल (काव्य का इतिहास)जिसमें -भारतेन्दु युग, छायावाद ,प्रगतिवाद,नयी कविता सम्बधित वि'ीष्ट ज्ञान विधार्थियों को प्राप्त होता है। इनकी समझ विकसित होती है। खण्ड(ख)के अर्न्तगत गद्य का इतिहास हिन्दी नाटक,एकांकी ,कहानी, निबंध ,उपन्यास,आलोचना ,आत्मकथा ,जीवनी आदि के अर्न्तगत</p>

		<p>आने वाली इतिहास की संपूर्ण जानकारी से बच्चों को अवगत कराया जाता है। यही पाठ्यक्रम आगे उनको एम0 ए0 हिन्दी में अवगत कराया जाता है। उनको आगे किसी भी प्रकार की कठिनाई नहीं होती है।</p> <p>पेपर -12 पत्रकारिता और अनुवाद</p> <p>हिन्दी पत्रकारिता का वि'लेशणात्मक ज्ञान को बच्चों को प्राप्त होता है। पत्रकारिता में बेहतर भविष्य के लिए नींव यही से तैयार की जाती है। पत्रकारिता के विभिन्न प्रकार, संवाददाता, संपादकीय ,साक्षात्कार, प्रेस ,आचार संहिता आदि प्रमुख विशयों की जानकारी उनको मिलती है।</p> <p>अनुवाद की प्रक्रिया एवं विधि, अनुवाद के गुण, सफल अनुवाद, अनुवाद का महत्व काव्यानुवाद आदि का वि'लेशणात्मक ज्ञान विधार्थी प्राप्त करते है। अनुवाद की सैद्धान्तिक समझ और माध्यमों का ज्ञान एवं अनुवाद के क्षेत्रों की समझ विकसित होती है।</p> <p>पेपर -13 काव्यांग परिचय</p> <p>महाकाव्य,खण्ड काव्य ,गीतिकाव्य, हिन्दी साहित्य की अन्य गद्य विधाएं उपन्यास, नाटक , कहानी, निबंध संपूर्ण अलंकार ,छन्द ,काव्य गुण, भाव्य भक्तिचाँ आदि का वि'ीष्ट ज्ञान एवं समझ विकसित की जाती है। उनके बेहतर भविष्य के लिए एम0 ए0 हिन्दी में यही पाठ्यक्रम भागमिल किया जाता है।</p>
<p>म्ह.6</p>	<p>निबंध लेखन</p>	<p>पेपर-14 निबंध लेखन</p> <p>पेपर-15 वि'ीष्ट कवि- कबीरदास</p> <p>पेपर-16 वि'ीष्ट कवि- सूरदास</p> <p>पेपर-17 वि'ीष्ट कवि -निराला</p> <p>पेपर-18 वि'ीष्ट कवि -अज्ञेय</p> <p>पेपर-19 वि'ीष्ट लेखक- उपन्यासकार (प्रेमचन्द)</p> <p>पेपर-20 वि'ीष्ट लेखक-नाटककार (जय'ंकर प्रसाद)</p> <p>पेपर-21 वि'ीष्ट लेखक-निबंधकार (आचार्य रामचन्द्र भुक्ल)</p> <p>निबंध लेखन पेपर-14 में साहित्यिक , सामान्य एवं सूक्तिपरक निबंधों का वि'ीष्ट एवं वि'लेशणात्मक ज्ञान दिया जाता है। विधार्थी बेहतर भविष्य के लिए एवं मानवीय समझ विकसित करने के लिए इन निबंधों का गहन अध्ययन करते है।</p> <p>अहिंसा परमोःधर्म ,नर न हो निरा'ं करो मन को , परहित सरस धर्म नहीं भाई ,महजब नहीं सिखाता आपस में वैर रखना, जीओ और जीने दो, मनुष्य वही जो मनुष्य के लिए मरे, भद्राचार कारण और निवारण,पर्यावरण और हम मानवधिकार आदि निबंधों को पढकर विद्यार्थी खुद को ज्ञानवर्धक पाते है और दे'ं एवं अपने प्रति जागृत और सचेत होते है।</p> <p>पेपर -15,16,17,18 से विधार्थी किसी एक प्र'न का चयन करते है। जो वो खु'ी से अपनी इच्छा से लेते है।</p> <p>कबीर दास, सूरदास, निराला,अज्ञेय एक का चयन करके खुद के ज्ञान को विकसित करते है। कबीर के पद, सूरदास का भ्रमरगीत, निराला का राग विराग, अज्ञेय : संपादक विधानिवास मिश्र।</p> <p>पेपर -19,20 एवं 21 से विधार्थी किसी एक प्र'नपत्र का चयन करते है।</p> <p>प्रेमचन्द के उपन्यास</p> <p>1 सेवासदन</p> <p>2 रंगभूमि</p> <p>नाटककार प्रसाद 1 ध्रुवस्वामिनी</p> <p>2 अजात'ोत्रु</p> <p>आचार्य भुक्ल - 1 चिन्तामणि भाग एक</p> <p>हिन्दी साहित्य की गद्य विधाएं उपन्यास, नाटक,निबंधों का वि'लेशणात्मक ज्ञान विधार्थी प्राप्त करते है।</p> <p>विभिन्न विधाओं में से एक विधा का चयन करके अपने स्वतन्त्र अस्तित्व का परिचय देते है।</p>

		भविष्य को ध्यान में रखते हुए अपनी इच्छानुसार एक विशय का चयन करके अपनी समझ को विकसित करते है।
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ProgramOutcomes

PO-1: fdlh भी सभ्यता एवं संस्कृति से जुडाव का माध्यम मातृभाशा ही होती हैं।

क.2रू वर्तमान भौतिकवादी युग में संवेदन"ून्य हो रहे युवाओं में मातृभाशा में रचित साहित्य मानवीय मूल्यों की स्थापना करता हैं।

क.3रू वर्तमान परिपेक्ष्य में हिन्दी में रोजगार की अपार सम्भावनाएँ परिलक्षित होंगी (अनुवाद,पत्रकारिता,बैंक ,हिन्दी ऑफिसर ,केन्द्रीय िक्षण संस्थाओ में हिन्दी विशय-वि"ैशज्ञ आदि) ।

क.4रू सूचना प्रौद्योगिकी युग में हिंदी सरलीकरण व जानकारी ।

क.5रू वै"िवक परिदृ"्य में छात्र -छात्राओं में भोध के प्रति रुचि जागृत करना

क.6रू वाक्पटुता आती है व बौद्धिक क्षमता का विकास होता है।

क.7रू महाकाव्यो जैसे -रामचरितमानस,साकेत ,प्रियप्रवास ,कामायनी आदि से प्रेरणादायक व िक्षापद जानकारी प्राप्त करने में सक्षम होंगे एवम संत महात्माओ जैसे - कबीरदास ,तुलसीदास ,जायसी आदि की दिव्य वाणी से आध्यात्मिक ज्ञान एवं संपूर्ण विकास ।

क.8रू सामाजिक ,साहित्यिक व व्यावसायिक गतिविधियों से प्रभाव"ाली संचार व प्रभाव"ाली रिपोर्ट लेखन व प्रस्तुतीकरण ।

क.9रू जटिल साहित्यिक एवं व्याकरणिक कार्यों के लिए उचित तकनीकियों स्त्रोतो और आधुनिक सूचना तकनीकी का उचित चुनाव व प्रयोग ।

क.10 सामाजिक,सांस्कृतिक एवं साहित्यिक दृष्टिकोण से जिम्मेदार नागरिस बनेंगे ।

ProgrammeSpecific Outcomes

कै.1रू बी0 ए0 हिन्दी आनर्स का पाठ्यक्रम जिसका उद्दे"्य विद्यार्थियों के ज्ञान को विकसित करते हुए उनमें गहन अध्ययन, एम0ए0 हिन्दी एवं भोध की उत्कंठ को विकसित करना ठें

कै.2रू यही विद्यार्थी हिन्दी साहित्य को पढकर समाज की नकारात्मक भाक्तियों के विरुद्ध समानता और बंधुत्व स्थापित कर सकते है। मानवता की भावना का विस्तार कर सकते है।

कै.3रू सीखना एक सत्त , व्यापक एवं जीवन पर्यत चलने वाली प्रकिया हैं।यदि सीखने का माध्यम मातृभाशा हो तो यह सीखना सरल, सहज, प्रभाव"ाली एवं रोचक बन जाता है। िक्षक,समाज व भौक्षणिक प्र"ासक सभी मिलकर इसके लिए प्रयास करते है। इन प्रयासों का उद्दे"्य िक्षा स्तर पर हिन्दी सीखने पर विद्यार्थियों का सर्वांगीण विकास करना है। उच्चतर िक्षा स्तर पर हिन्दी सीखने पर विद्यार्थियों से आ"ा की जाती है।

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**COURSE & PROGRAM OUTCOMES OF
B.Sc. Math Hons**

Semester	Subject Name and Code	Course Outcomes
SEM-1	ALGEBRA	<p>CO-1: Recognize Symmetric, Skew-symmetric, Hermitian and skew Hermitian matrices</p> <p>CO-2: Recognize consistent and inconsistent systems of linear equations by the row echelon form of the augmented matrix.</p> <p>CO-3: Perform Elementary Operations on matrices and find Rank of a matrices</p> <p>CO-4: Compute the characteristic polynomial, eigenvalues, eigenvectors, and eigenspaces, as well as the geometric and the algebraic multiplicities of an eigenvalue and apply the basic diagonalization result.</p> <p>CO-5: Find Eigen values and corresponding eigenvectors for a square matrix</p>
	CALCULUS	<p>CO-1: Sketch the curves in Cartesian and polar coordinates as well as learn techniques of sketching the conics.</p> <p>CO-2: Visualize three dimensional figures and calculate their volumes and surface areas.</p> <p>CO-3: Understand limits, continuity and derivatives of functions of single variable.</p> <p>CO-4: Compute area of surfaces of revolution and the volume of solids by integrating over cross-sectional areas.</p> <p>CO-5: Compute successive differentials.</p> <p>CO-6: Understand asymptotes, reduction formula, rectification</p>
	Solid Geometry	<p>CO-1: Learn concepts in two-dimensional geometry.</p> <p>CO-2: Identify and sketch conics namely, ellipse, parabola and hyperbola.</p> <p>CO-3: Learn about three-dimensional objects such as spheres, conicoids, straight lines and planes</p>
	Discrete Math-I	<p>CO-1: Understand the notion of ordered sets and maps between ordered sets.</p> <p>CO-2: Learn about lattices, modular and distributive lattices, sublattices and homomorphisms between lattices.</p> <p>CO-3: Become familiar with Boolean algebra, Boolean homomorphism, Karnaugh diagrams, switching circuits and their applications.</p> <p>CO-4: Learn about basics of graph theory, including Eulerian graphs, Hamiltonian graphs.</p> <p>CO-5: Learn about the applications of graph theory in the study of shortest path algorithms.</p>

	Descriptive Statistics	<p>CO-1: Determine basic knowledge of various data.</p> <p>CO-2: Determine measures of central tendencies.</p> <p>CO-3: Determine Moments, Skewness and Kurtosis.</p> <p>CO-4: Understand the theory of Attributes.</p> <p>CO-5: Determine Correlation for Bivariate Data</p>
SEM-2	Ordinary Differential Equations	<p>CO-1: Learn basics of differential equations and mathematical modeling.</p> <p>CO-2: Formulate differential equations for various mathematical models.</p> <p>CO-3: Solve first order non-linear differential equations and linear differential equations of higher order using various techniques</p> <p>CO-4: Apply these techniques to solve and analyze various mathematical models</p>
	Number Theory and Trigonometry	<p>CO-1: Learn about some fascinating discoveries related to the properties of prime numbers.</p> <p>CO-2: Know about number theoretic functions and modular arithmetic.</p> <p>CO-3: Learn about equivalent classes and cardinality of a set.</p> <p>CO-4: Use modular arithmetic and basic properties of congruences.</p> <p>CO-5: Solve linear, quadratic and system of linear congruence equations.</p> <p>CO-6: Employ De Moivre's theorem in a number of applications to solve numerical problems</p>
	Vector Calculus	<p>CO-1: Compute Scalar and vector product of three vectors and four vectors and Reciprocal vectors.</p> <p>CO-2: Compute and apply gradient, divergence and curl of functions.</p> <p>CO-3: Transform curvilinear coordinates to Cartesian coordinates and vice versa. Apply Gauss, Green and Stocks Theorem</p>
	Discrete Mathematics-II	<p>CO-1: Determine the properties of lattices and lattice as algebraic system</p> <p>CO-2: Understand the problems related to Boolean algebra</p> <p>CO-3: Know the applications of Boolean algebra to digital network.</p> <p>CO-4: Appreciate the definition and basics of graphs along with types and their examples</p> <p>CO-5: Understand the definition of a tree and learn its applications to fundamental circuits. Relate the graph theory to the real-world problems</p>
	Regression analysis and probability	<p>CO-1: Understand the concept of regression and principle of least squares.</p> <p>CO-2: Know the basics and applications of Curvilinear Regression.</p> <p>CO-3: Concepts in Probability</p> <p>CO-4: Definition and properties of Random Variable and Probability Functions</p> <p>CO-5: Concepts of bivariate random variable.</p>
SEM-3	Advanced Calculus	<p>CO-1: Have a rigorous understanding of the concept of limit of a function.</p> <p>CO-2: Learn about continuity and uniform continuity of functions defined on intervals.</p> <p>CO-3: Understand geometrical properties of continuous functions on closed and bounded intervals.</p> <p>CO-4: Learn extensively about the concept of differentiability using limits, leading to a better understanding for applications.</p> <p>CO-5: Know about applications of mean value theorems and Taylor's</p>

		theorem. CO-6: Learn basics of differential geometry
	Partial Differential Equations	CO-1: Formulate, classify and transform first order PDEs into canonical form. CO-2: Learn about method of characteristics and separation of variables to solve first orders PDE's. CO-3: Classify and solve second order linear PDEs. CO-4: Learn about Cauchy problem for second order PDE and homogeneous and non homogeneous wave equations. CO-5: Apply the method of separation of variables for solving many well-known second order PDEs
	Statics	CO-1: Understand Composition and resolution of forces, Parallel forces, Moments and Couples.. CO-2: • Derive Analytical conditions of equilibrium of coplanar forces. • CO-3: Understand the concept of Friction and Centre of Gravity. • CO-4: Understand the concept of Virtual work, Wrenches, Stable and unstable equilibrium
	Differential Geometry	CO-1: Understand one parameter family of surfaces CO-2: Understand developable associated with a curve. CO-3: Understand Two- parameter family of surfaces CO-4: Understand Principal directions and curvatures CO-5: Understand Geodesics and Geodesic parallels and curves in relation to Geodesics
	Probability Distribution	CO-1: Understand the mathematical basis of probability and its applications in various fields of life. CO-2: Use and apply the concepts of probability mass/density functions for the problems involving single/bivariate random variables. CO-3: Have competence in practically applying the discrete and continuous probability distributions along with their properties CO-4: Decide as to which test of significance is to be applied for any given large sample problem.
	Sequence and series	CO-1: Understand the real numbers and their basic properties CO-2: Be familiar with convergent and Cauchy sequences. CO-3: Test the convergence and divergence of infinite series of real numbers. CO-4: Test the behavior of sequences. CO-5: Learn about power series expansion of some elementary functions

SEM-4	Special Functions and Integral Transforms	<p>CO-1: Derive Series solution of differential equations.</p> <p>CO-2: • Explore Legendre and Hermite differentials equations and their solutions. •</p> <p>CO-3: Understand and use Laplace and Fourier transforms and their Properties. • Approximate transcendental functions in terms of power series as well as, differentiation and integration of power series</p> <p>CO-4: Approximate transcendental functions in terms of power series as well as, differentiation and integration of power series</p>
	Programming in C and Numerical Methods	<p>CO-1: Learn basics of Programming of C.</p> <p>CO-2: Learn 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.</p> <p>CO-3: Know about methods to solve system of linear equations, such as Gauss–Jacobi, Gauss–Seidel and SOR methods.</p>
	HYDROSTATICS	<p>CO-1: Know about Pressure equation, Condition of equilibrium, Lines of force, Homogeneous and heterogeneous fluids and Surface of equal pressure.</p> <p>CO-2: Understand Fluid pressure on plane surfaces</p> <p>CO-3: Understand Stability of equilibrium of floating bodies, Work done in producing a displacement, and Vessels containing liquid</p> <p>CO-4: Understand Gas laws, Internal energy and Work done in compressing a gas.</p>
	Elementary Inference	<p>CO-1: Parameter and statistic, sampling distribution and standard error of estimate</p> <p>CO-2: Method of maximum likelihood estimation</p> <p>CO-3: Testing and interval estimation of a single mean, single proportion, difference between two means and two proportions</p> <p>CO-4: Definition of Chi-square statistic, Chi-square tests for goodness of fit and independence of attributes and Student’s ‘t’ and Snedcor’s F-statistics</p> <p>CO-5: Testing for the mean and variance of univariate normal distributions, Testing of equality of two means and two variances of two univariate normal distributions</p>
	GROUP AND RINGS	<p>CO-1: Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc. •</p> <p>CO-2: Link the fundamental concepts of groups and symmetrical figures. •</p> <p>CO-3: Analyze the subgroups of cyclic groups and classify subgroups of cyclic groups. •</p> <p>CO-4: Explain the significance of the notion of cosets, normal subgroups and factor groups. ...</p> <p>CO-5: • Know about group homomorphism and group isomorphism. •</p> <p>CO-6: Learn about the fundamental concept of rings, integral domains and fields. •</p> <p>CO-7: Know about ring homomorphism’s and isomorphism’s theorems of rings. • Appreciate the significance of unique factorization in rings and</p>

Sem 5		<p>integral domains</p> <p>...</p>
	REAL ANALYSIS	<p>CO-1: Learn about some of the classes and properties of Riemann integral functions, and the applications of the Fundamental theorems of integration. •</p> <p>CO-2: Know about improper integrals including, beta and gamma functions.</p> <p>CO-3: • Learn about Cauchy criterion for uniform convergence and Weierstrass M-test for uniform convergence. •</p> <p>CO-4: Learn various natural and abstract formulations of distance on the sets of usual or unusual entities. Become aware one such formulations leading to metric spaces. •</p> <p>CO-5: Learn about the two important topological properties, namely connectedness and compactness of metric spaces</p>
	LINEAR ALGEBRA	<p>CO-1: Learn about the concept of linear independence of vectors over a field, and the dimension of a vector space.</p> <p>CO-2: • Basic concepts of linear transformations, dimension theorem, matrix representation of a linear transformation, and the change of coordinate matrix..</p> <p>CO-3: • Compute inner products and determine orthogonality on vector spaces, including Gram–Schmidt orthogonalization to obtain orthonormal basis. •</p> <p>CO-4: Find the adjoint, normal, unitary and orthogonal operator</p>
	Integral Equations	<p>CO-1: Model various problems from different physical fields as integral equations.</p> <p>CO-2: Reduce initial value problems associated with linear differential equations to Volterra integral equations.</p> <p>CO-3: Learn the basic methods and techniques for solving various Volterra integral equations.</p> <p>CO-4: To reduce various boundary value problems associated with linear differential equations to Fredholm integral equations</p> <p>CO-5: Describe exact, approximate, and numerical methods of solving Fredholm integral equations.</p> <p>Use Green's function in reduction of boundary value problems to Fredholm integral equations</p>
	Methods of Applied Mathematics	<p>CO-1: Demonstrate knowledge of partial differential equations, their classification and various modeling situations.</p> <p>CO-2: Find the solution of heat, Laplace and wave equations with different initial and boundary conditions along with understanding of motion of a vibrating string</p> <p>CO-3: Find the solution of Hankel transform of elementary functions</p> <p>CO-4: Determine the Moments and products of inertia</p>

	Operations Research-I	<p>CO-1: Identify and develop operations research model describing a real life problem.</p> <p>CO-2: Understand the mathematical tools that are needed to solve various optimization problems</p> <p>CO-3: Solve various linear programming, transportation, assignment, queuing, inventory and game problems related to real life</p>
SEM 6	NUMERICAL ANALYSIS	<p>CO-1: Understand Finite Differences operators and their relations. •</p> <p>CO-2: Use Gauss forward and Gauss's backward interpolation formulae, Sterling, Bessel Formula. •</p> <p>CO-3: Use Interpolation techniques to compute the values for a tabulated function at points not in the table. •</p> <p>CO-4: Applications of numerical differentiation and integration to convert differential equations into difference equations for numerical solutions</p>
	REAL AND COMPLEX ANALYSIS	<p>CO-1: Use Jacobins, Beta and Gama functions, Double and Triple integrals, Drichlet's integrals, change of order of integration in double integrals. •</p> <p>CO-2: Understand Fourier expansion of piecewise monotonic functions, Properties of Fourier Coefficient, Stereographic projection of complex numbers. •</p> <p>CO-3: Explore Analytic functions and their properties. • Use different type of transformations.</p>
	DYNAMICS	<p>CO-1: Understand the concept of Velocity and acceleration along radial, transverse, tangential and normal directions as well as Relative velocity and acceleration. •</p> <p>CO-2: Understand the terminology of Mass, Momentum and Force. •</p> <p>CO-3: State and apply Newton's laws of motion. • Understand General motion of a rigid body. •</p> <p>CO-4: Study Central Orbits, Kepler laws of motion</p>
	Elementary Topology	<p>CO-1: Get familiar with the concepts of topological space and continuous functions.</p> <p>CO-2: Generate new topologies from a given set with bases.</p> <p>CO-3: Describe the concept of homeomorphism and topological invariants.</p> <p>CO-4: Establish connectedness and compactness of topological spaces and proofs of related theorems</p> <p>CO-5: Have in-depth knowledge of separation axioms and their properties.</p>
	Fluid Dynamics	<p>CO-1: Be familiar with continuum model of fluid flow and classify fluid/flows based on physical properties of a fluid/flow along with Eulerian and Lagrangian descriptions of fluid motion.</p> <p>CO-2: Find the equations of flow lines for a moving ideal fluid</p> <p>CO-3: Derive and solve equation of continuity, equations of motion, vorticity equation, equation of moving boundary surface, pressure equation and equation of impulsive action for a moving inviscid fluid</p> <p>CO-4: Calculate velocity fields and forces on bodies for simple steady and unsteady flow including those derived from potentials</p>

		<p>CO-5: Understand the concepts of velocity potential, stream function and complex potential, and their use in solving two-dimensional flow problems applying complex-variable techniques</p> <p>CO-6: Represent mathematically the potentials of source, sink and doublets in two-dimensions as well as three-dimensions, and study their images in impermeable surfaces</p>
	<p>Operations Research-II</p>	<p>CO-1: Introduction of inventory, factors affecting inventory, Inventory models</p> <p>CO-2: Deterministic models. Basic characteristics of queuing system and find Birth-death equations</p> <p>CO-3: Find the Solution of Markovian queuing models</p> <p>CO-4: PERT and CPM: Introduction of PERT and CPM, Earliest and latest times</p> <p>CO-5: Determination of critical path and various types of floats</p> <p>CO-6: Probabilistic and cost considerations in project scheduling</p>

PHYSICS
B.Sc Non-Medical Hons

Semester - 1

Mechanics

After successful completion of the course, students will be able to understand:

- Mechanics of single And system of particles.
- Conservation of Linear and angular momentum, their use in real life problems.
- Lagrangian equation of motion and using this equation. We can get complete information of particle i.e. position, velocity and acceleration.
- Rotation of rigid body and parameter associated with it. Understanding of rotational motion of rigid body.

Electricity, Magnetism and Electromagnetic Theory

After successful completion of the course, students will be able to understand:

- Basics of electromagnetics.
- Electrostatic field and Gauss Law , its application to find out the electric field for different configuration of charge
- Magneto-statics and different laws, domain theory, cycle of magnetization, Hysteresis loop of different materials, classification of magnetic materials.
- Electromagnetic theory, Maxwell equation, and electromagnetic waves , their application in ICT.

Semester - 2

Properties of Matter, Kinetic Theory and Relativity

After successful completion of the course, students will be able to understand:

- Elasticity Hooke's law and application of these laws to find out the strength of material used for different application
- Kinetic theory of gases. Its application in our daily life. "We can understand the whole thermodynamics in a kitchen"
- Theory of relativity, Galilean and Lorentz transformation, their application to justify space contraction, time dilation, velocity addition theorem, mass dilation etc.

Electromagnetic Induction and Electronic Devices

After successful completion of the course, students will be able to understand:

- DC transient (voltage and current equation of RL, RC and RLC ckt)
- AC transient (voltage and current equation of RL, RC and RLC ckt)
- Basics of semiconductor and semiconductor devices i.e. solar cell photo diode LED
- Application of Diodes : rectifier, Zener Diode, I-V characteristics and application in voltage regulation
- Basics of transistors and cathode ray oscilloscope
- Application of transistor as an amplifier And application positive feedback to generate sinusoidal signal (Oscillator)

Semester - 3

Computer Programming and Thermodynamics

After successful completion of the course, students will be able to understand:

- Understand the basic concepts of Thermodynamics and Thermodynamical Variable.
- Different Laws and its application (Carnot Cycle).
- Draw and understand the flow Chart and its Interpretation.
- Understand conversion :Binary to digital conversion. IF ,DO Loop .
- Applications of Claperyon Equation, Maxwell Function (F,H,G,U)and Relation.

Waves and Optics

After successful completion of the course, students will be able to understand:

- CO-4. The concept of Transverse and Longitudenal Waves.
- CO-5. Concept of Fourier series and transforms.
- CO-6. Aberrations in lenses and their removal.
- CO-7. Interference by division of wavefront.

Semester - 4

Statistical Mechanics

After successful completion of the course, students will be able to understand:

- CO-6. Understand the basic concepts of Thermodynamics and Probability
- CO-7. Different aspects of Statistics to understand Thermodynamical System.
- CO-8. Understand the different Quantum mechanics on particles and its Interpretation.
- CO-9. Understand Fermi gas, Photon gas, Boson gas and zero point energy.
- CO-10. Applications of STASTICS to develop Radiation Law and Specific Heat (metal)Relation.

Waves and Optics

After successful completion of the course, students will be able to understand:

- Interference by Division of Amplitude: Colour of thin, films, wedge shaped film, Newton's rings.
- Interferometers: Michelson's interferometer and its application to (I) Standardisation of a meter (II) determination of wave length.
- Fresnel's Diffraction: Fresnel's half period zones, zone plate, diffraction at a straight edge, rectangular slit and circular aperture.
- Fraunhofer diffraction : One slit diffraction, Two slit diffraction N-slit diffraction, Plane transmission grating spectrum, Dispersive power of a grating , Limit of resolution, Rayleigh's criterion, resolving power of telescope and a grating.
- Polarization: Polarisation and Double Refraction : Polarisation by reflection, Polarisation by scattering, Malus law, Phenomenon of double refraction,
- Huygen's wave theory of double refraction (Normal and oblique incidence),

- Analysis of Polarised light : Nicol prism, Quarter wave plate and half wave plate, production and detection of (i) Plane polarized light (ii) Circularly polarized light and (iii) Elliptically polarized light,
- Optical activity, Fresnel's theory of rotation, Specific rotation, Polarimeters (half shade and Biquartz).

Semester - 5

Solid State Physics

After successful completion of the course, students will be able to understand:

- CO-5. Understand different types of lattices.
- CO-6. Crystal structures of different materials
- CO-7. Understand the x ray diffraction and different experimental methods of it
- CO-8. Understand Reciprocal lattice of different lattices.
- CO-9.** Know about Specific heat of solids

Quantum Mechanics

After successful completion of the course, students will be able to understand:

- Understand Photoelectric effect, Compton effect.
- Understand about concept of wave duality.
- Understand about wave function and its significance.
- Understand particle potential energy at different positions in Lattice.

Semester- 6

Atomic , Molecular and Laser Physics

After successful completion of the course, students will be able to understand:

- CO-5. Understand atomic model and different atomic spectra.
- CO-6. Understand effects of Magnetic and Electric field on spectra.
- CO-7. Understand molecular spectra.
- CO-8. Understand basics of LASER ,its construction and working.
- CO-9. Know about application of LASER.

Nuclear Physics

After successful completion of the course, students will be able to understand:

- CO-6. Understand basic properties of Nucleus.
- CO-7. Know about construction of mass spectrograph and its working.
- CO-8. Understand alpha decay, beta decay, gamma particle.
- CO-9. Understand nuclear reactions and conservation laws.
- CO-10. Know about Nuclear reactors.

B.Sc Physics(H)

Semester - 1

Mathematical Physics

After successful completion of the course, students will be able to understand:

- Vector Algebra and Analysis Review of vector algebra- addition, subtraction and product of two vectors.
- Polar and axial vectors and their examples from physics. Triple and quadruple product (without frenet-Serret formulae).
- Scalar and vector fields, differentiation of a vector w.r.t. a scalar . Unit tangent vector and unit normal vector (without Frenet- Serret formulae).
- Directional derivatives, gradient, divergence, curl and Laplacian operations and their meaning.
- Idea of line, surface and volume integrals. Gauss, Stokes and Green's theorems.
- Orthogonal Curvilinear Coordinates and Multiple integrals Orthogonal curvilinear coordinates,
- Derivation of gradient, divergence, curl and Laplacian in Cartesian, spherical and cylindrical coordinate systems.
- Change of variables and Jacobian. Evaluation of line surface and volume integrals.
- Calculus of Variations Constrained maxima and minima. Method of Lagrange undetermined multipliers and its application to simple problems in physics.
- Variational principle Euler-Lagrange equation and its application to simple problems

Mechanics I

After successful completion of the course, students will be able to understand:

- Fundamentals of Dynamics: Motion of charged particle in electric and magnetic fields.
- Dynamics of a system of particles. Centre of mass Conservation of momentum.
- Idea of conservation of momentum from Newton's third law impulse.
- Momentum of variables mass system: motion of rocket, Work-energy theorem. Potential energy. Energy diagram.
- Stable and unstable equilibrium. Conservative and non-conservative forces. Force as gradient of potential energy.
- Particle collisions. Centre of mass frame and laboratory frame.
- Rotational Dynamics: Angular momentum of a particle and system of particles. Torque,
- Conservation of angular momentum, Rotation about a fixed axis Moment of inertia; its calculation for rectangular and cylindrical bodies;
- idea of calculation for spherical bodies. Kinetic energy of rotation. Motion involving both translation and rotation.
- Oscillatory Motion: Motion of simple and compound pendulum. Loaded spring, Energy considerations.
- Time average of energy. Damped harmonic oscillator Resonance in a lightly damped system.

Electricity

After successful completion of the course, students will be able to understand:

- Electric Circuits: Kirchhoff's laws for A.C. circuits, Series and parallel resonant circuits, A.C. bridges.
- Thevenin's theorem and Norton's theorem and their applications to D.C. circuits.
- Electric Field: Electric charge: conservation and quantisation.
- Coulomb's law and superposition principle. Electric field and electric lines.

- Gauss's law. Field of spherical, linear and plane charge distributions. Line integral of electric field.
- Electric potential. Potential and electric field of a dipole, a charged wire and a charged disc.
- Multipole expansion of potential due to arbitrary charge distribution.
- Force and torque on a dipole. Laplace's equation: uniqueness theorem.
- Conductors in an electrostatic field. Description of a system of charged conductors. An isolated conductor and capacitance.
- Methods of images and its application to simple electrostatic problems, plane infinite sheet and sphere.
- Electrostatic Energy System of point charges, a uniform sphere a condenser, an ionic crystal, nuclear electric field, point charge.
- Dielectric Properties of Matter: Dielectric polarization and polarization charges, Gauss's law in dielectrics.
- Field vectors D and E and their boundary conditions. Capacitors filled with dielectrics.

Linear and Digital Integrated Circuits and Instrumentation-I

After successful completion of the course, students will be able to understand:

- Understand the basic integrated circuits and its trends.
- Explain the different characteristics of ideal and practical operational amplifier.
- Learnt the applications of op-amp.
- Understand the basics of different categories of oscillator.
- Learnt the basic logic gates, its implementation and realization using electronic devices.
- Explain the combinational logics circuits as mux, de-mux, decoder, encoder and arithmetic logic circuits.

Semester- 2

Mathematical Physics-II

After successful completion of the course, students will be able to understand:

- Differential Equations: Classification of differential equations: linear and nonlinear, homogeneous and non-homogeneous equations.
- Linear ordinary Differential Equations: First order: Separable and exact equations. Integrating factor.
- Second Order: Homogeneous equations with constant coefficient's. Wronskian and general solution
- Statement of Existence and Uniqueness theorem for initial value problems. Solution of non-homogeneous equations by operator (D) method.
- Particular integral. Method of undetermined coefficients and variation of parameters Equations reducible to those with constant coefficient.
- Fourier Series Fourier series, Dirichlet conditions (Statement only).
- Orthogonality of sine and cosine functions. Sine and cosine series.
- Distinctive features of Fourier expansions. Half-range expansions.
- Applications Square wave triangular wave, output of full wave rectifier and other simple functions Summary of infinite series
- Theory of Errors: Systematic and random errors. Propagation of errors.
- Standard and probable error. Least square fitting of data (linear case).

Mechanics –II

After successful completion of the course, students will be able to understand:

- Gravitation and Central Force Motion: Law of gravitation. Inertial and gravitational mass.
- Potential energy and field due to spherical shell and solid sphere.
- Self-energy. Motion of a particle under central force field
- Angular momentum conservation one body problem two body problem and its reduction to one body problem and its solution
- The energy equation and energy diagram. Kepler's laws. Satellites.
- Non-Inertial Systems: Inertial frame and Galilean transformation, Non-inertial frame and fictitious forces.
- Uniformly accelerating system. Physics in rotating coordinate systems, centrifugal and Coriolis forces.
- Michelson-Morley experiment and its outcome. Postulates of special theory of relativity.
- Lorentz transformations. Simultaneity and order of events.
- Lorentz contraction and time dilation.
- Relativistic transformation of velocity, frequency and wave number.
- Velocity dependence of mass and equivalence of mass and energy.
- Relativistic Doppler effect, Relativistic Kinematics,
- Transformation of energy and momentum

Magnetism

After successful completion of the course, students will be able to understand:

- Magnetic Field: Magnetic force between current elements and definition of B. Properties of B
- Ampere's Circuital Law, Curl and divergence of B, Vector potential.
- Magnetic flux. Calculation of B for circular and solenoid currents.
- Torque on a current loop in a uniform magnetic field. Magnetic dipole.
- Forces on an isolated moving charge.
- Magnetic Properties of Matter: B, H and their relation. Magnetic susceptibility.
- Stored magnetic energy in matter,
- Magnetic circuit B-H curve and energy loss in hysteresis.
- Electromagnetic Induction: A conducting rod moving through a uniform magnetic field.
- A loop through on- uniform magnetic field.. A stationary loop with field source moving.
- Faraday's law of induction. Curl E-D B/dt. Mutual induction – reciprocity theorem ($M_{12} = M_{21}$)
- Self-induction, energy stored in magnetic field.

Linear and Digital Integrated Circuits and Instrumentation-II

After successful completion of the course, students will be able to understand:

- Understand the basic concepts of sequential circuits as flip-flops.
- Different shift registers SISO, SIPO, PISO, PIPO.
- Draw and understand the counter asynchronous and synchronous.
- Understand the Analog to digital conversion and inverse.
- Applications of timer 555.
- Power supply and its different aspects.

Semester -3

Mathematical Physics-III

After successful completion of the course, students will be able to understand:

- Represent complex numbers algebraically and geometrically, find roots of complex numbers and De-Moivre's Theorem.
- Analyse limit, continuity and differentiation of functions of complex variables.
- Understand Cauchy-Riemann equations, analytic functions and various properties of analytic functions.
- Understand Cauchy theorem and Cauchy integral formula with its consequences and apply these to evaluate complex contour integrals.
- Represent functions as Taylor and Laurent series; classify singularities and poles; find residues and evaluate complex integrals using the residue theorem.
- Use contour integration to evaluate definite integrals involving sines and cosines.
- Provide some standard methods (Power series & Frobenius' Method) for solving 2nd order linear differential equations with variable coefficients
- Write down the series solution for Legendre, Bessel, Hermite and Laguerre's differential equations.

Thermal Physics

After successful completion of the course, students will be able to understand:

- Analyze heat, mass, and momentum transport in a process.
- Understand the Kinetic Molecular Theory of gases and the assumptions made in the kinetic-molecular theory and use of theory to explain the nature of gas pressure and temperature.
- To analyse how the distribution of speeds and the average speed of gas molecules change with temperature.
- Understand the general conditions of P and T under which real gases most closely approximate ideal-gas behavior.
- Use the ideal gas equation ($PV = nRT$) to Calculate P, V, n, or T given the other three variables and to describe how a gas responds to changes in P, V, n, or T

Vibration and Wave Optics

After successful completion of the course, students will be able to understand:

- Basics of SHM, Principle of Superposition, beats.
- Understand the superposition of n harmonic oscillator, superposition of two perpendicular harmonic oscillator.
- To analyse waves, travelling waves, standing waves.
- Understand the normal modes of string, plucked and stuck string

Quantum Mechanics

After successful completion of the course, students will be able to:

- Develop concepts in quantum mechanics such that the behaviour of the physical universe can be understood from a fundamental point of view.
- Has gained knowledge about basic non-relativistic quantum mechanics.
- Describe the structure of the hydrogen atom and show an understanding of quantisation of angular momentum
- Use mathematical tools to construct approximate quantum mechanical models

- Apply principles of quantum mechanics to calculate observables on known wave functions
- Combine spin, angular momentum states, angular momentum addition rules, and identical particles.

Computer Fundamentals and Programming-I

After successful completion of the course, students will be able to:

- When understanding of *Fortran* programming language
- *Fortran* is a computer programming language that is extensively used in numerical, scientific computing.
- How to write *Fortran* program.
- To learn and differentiate about microprocessor 8085 and 8086.
- How to use *Fortran* in numerical problem solving.

Semester- 4

Mathematical Physics-IV

After successful completion of the course, students will be able to:

- Understand the concept of Special functions like Legendre, Hermite, Laguerre and Bessel's function
- Understand their various properties like generating function, recurrence relations, orthogonality condition and Rodrigue's formula
- Know about Gamma and Beta functions, Relation between them and their use to evaluate different types of integrals
- Find the solution of PDEs with separation of variables technique
- use knowledge of partial differential equations to formulate physical problems as PDEs using conservation laws
- Study the transverse vibrations of a string, general solution of a wave equation in 1-D, 2-D and 3-D; vibrations of circular and rectangular membranes
- Study the Heat flow in one-, two- and three-dimensional system with finite boundaries and their complete solution
- Write the Laplace equation in cartesian, cylindrical and spherical polar coordinate system with their respective general solutions.

Thermal Physics-II

After successful completion of the course, students will be able to:

- To be able to state various Law of Thermodynamics and the difference between various forms of energy.
- Understand the definition of system, surrounding, closed and open system, extensive and intensive properties.
- Identify the relationship and correct usage of work, energy, heat capacity, specific heat, latent heat, and enthalpy.
- Calculate thermal efficiency and coefficient of performance for heat engine, refrigerators and heat pumps.
- Explain how entropy is related to randomness/disorder/dispersal of energy and predict whether the sign of ΔS is positive, negative, or near zero for a chemical or physical change.
- Describe how and why the entropy of a substance changes with temperature or when a phase change occurs.
- State the third law of thermodynamics and explain absolute molar entropies.

Vibrations and Waves Optics-II

After successful completion of the course, students will be able to:

- Develop concepts of Diffraction, Fraunhofer diffraction due to single slit, rectangular, circular aperture
- Has gained knowledge grating and its resolving power, dispersive power.
- Describe Fresnel diffraction, Fresnel integrals, Cornu's spirals
- Understand the concept of Holography, its principle and theory
- Application of diffraction problems
- Knowledge of Kirchoff's integral theorem

Atomic and Nuclear Physics

After successful completion of the course, students will be able to:

- Understand the Concepts of Nuclear physics and Nuclear energies and importance of their use for mankind.
- Understand the relationship between particles & atom, as well as their creation & decay, (nuclear fission and fusion). Relate the structure of atoms & subatomic particles.
- Understand nuclear composition and elementary particles, charge symmetry and independence, spin dependency and nuclear force.
- Distinguish between types of nuclear models.
- State law of radioactivity decay and its application.
- Describe theories explaining the structure of atoms and the origin of the observed spectra.
- Study of hydrogen atom with fine structure correction makes the comprehensive knowledge very strong.
- The concept of fine structure and the hyperfine structure provides the understanding of spectral lines in detail.
- Identify atomic effect such as Zeeman effect and Stark effect.

Computer Fundamentals and Programming-II

After successful completion of the course, students will be able to:

- Understand the Iterative Method is a mathematical way of solving a problem. This method is applicable for both linear and nonlinear problems with large number of variables.
- In this book we covered many types of iterative methods.
- Study the Trial and error method is a problem solving method in which multiple attempts are made to reach a solution.

- To understand the numerical methods for solving problems that arise in other areas of mathematics, such as linear algebra, differential equations and integration.

Semester- 5

Mathematical Physics-V

After successful completion of the course, students will be able to understand:

- Understand about Matrices and Linear Vector Spaces.
- Various types of transformation and Digitalization solution.
- Understand about Similarity transformations and bilinear and quadratic forms.

Electromagnetic Theory-I

After successful completion of the course, students will be able to understand:

- Understand about Maxwell equation and boundary conditions.
- Understand about some optical concept.
- Wave propagation in various medium.

Statistical Physics-I

After successful completion of the course, students will be able to:

- The students are able explain fundamentals of statistical physics and thermodynamics as logical consequences of the postulates.
- Identify and describe the statistical nature of concepts and laws in thermodynamics, in particular: entropy, temperature, chemical potential, Free energies, partition functions.
- They can easily distinguish between different types of particles and statistics and can easily distribute bosons, fermions and classical particles among energy levels.
- Student gets idea about Phase space, probability distribution, and thermodynamic probability, Principle of a priori probability, Boltzmann's entropy relation, different states, Maxwell Boltzmann distribution law, and its application.
- Understands the Properties of thermal radiation, Kirchhoff's law, Stefan-Boltzmann law and Wien's displacement law.
- Understand the characteristics of Laser which will help them to distinguish it from the ordinary light. The other part is based on radiation & matter which in turn is the significant topic of this course. They are able to explain absorption, Spontaneous & Stimulated emission of radiation.

Physics of Materials-I

After successful completion of the course, students will be able to understand:

- Understand about Various types of solids.
- Understand about Lattice vibration.

Electronics Devices: Physics and Applications-I

After successful completion of the course, students will be able to understand:

- Understand about Basic Semiconductor Physics with applications.
- Understand about various types of diodes.
- Understand about various types of transistors.

Nano Technology-I

After successful completion of the course, students will be able to understand:

- Understand about band gap with metals, insulators and semiconductors with idea of Nano science.
- Understand with practical and theoretical knowledge of quantum applications.
- Understand about density of states.

Semester -6

Mathematical Physics-VI

After successful completion of the course, students will be able to understand:

- Understand about tensor analysis.
- Understand about Fourier Transformation.
- Understand about Laplace Transformation.

Electromagnetic Theory-II

After successful completion of the course, students will be able to understand:

- Understand about application of EM wave.
- Understand about role of Wave Guide in communication.
- Understand about Polarization of EM waves.

Statistical Physics-II

After successful completion of the course, students will be able to understand:

- Connection between statistical mechanics and thermodynamics applications to simple systems.
- Quantum statistics, indistinguishable particles; Fermi-Dirac and Bose-Einstein distributions.
- Define the Fermi-Dirac and Bose-Einstein distributions; state where they are applicable.
- Understand how they differ and when they reduce to the Boltzmann distribution.
- To Apply the Fermi-Dirac distribution to the calculation of thermal properties of electrons in metals
- To Apply the Bose-Einstein distribution to the calculation of properties of black body radiation, Bose Einstein condensation.

Physics of Materials-II

After successful completion of the course, students will be able to understand:

- Understand about Polarization and various terms.
- Understand about free electron theory and Hall effects.
- Understand about band gaps and various types of materials on the basis of their electrical properties.

Electronics Devices: Physics and Applications-II

After successful completion of the course, students will be able to understand:

- Understand about various types of amplifiers.
- Understand about various type of oscillator.
- Understand about feedback in amplifiers.

Nano Technology –II

After successful completion of the course, students will be able to understand:

- Understand about XRD, photoluminescence and Raman Spectra of Nano particles.
- Understand about synthesization of Nano particles.
- Understand about Characterization of Nano particles.

M.Sc Physics

Semester-1

Mathematical Physics

After successful completion of the course, students will be able to understand:

- Get sufficient exposure /understanding of the linear vector space and applications of matrices to physical problem.s
- Provide some standard methods (Power series & Frobenius' Method) for solving 2nd order linear differential equations with variable coefficients.
- Identify the difference between ordinary and singular point and their respective solution approach; understand the linear dependence and independence of the solutions.
- Obtain the series solution for Legendre, Bessel, Hermite and Laguerre's differential equations.
- Understand their various properties like generating function, recurrence relations, orthogonality condition and Rodrigue's formula.
- Know about Gamma and Dirac-Delta functions and their use to evaluate different types of integrals.
- Realize the idea behind the integral transform; study of Laplace and Fourier Transform with their properties for derivatives and integrals and applications of integral transform to solve ODEs and PDEs.
- Understand the concept of series expansion of function in terms of sines and cosines.

Classical Mechanics

After successful completion of the course, students will be able to understand:

- Describe Lagrangian and Hamiltonian formulations.
- Solve problems on motion under central force, rigid body dynamics, and periodic motions.
- Apply the theory of small oscillations in different areas of physics e.g., molecular spectra, acoustics, vibrations of atoms in solids, coupled mechanical oscillators.

Quantum Mechanics - I

After successful completion of the course, students will be able to understand:

- The mathematical formalism of Hilbert space, hermitian operators, eigen values, eigen states and unitary operators, which form the fundamental basis of quantum theory.
- Application to simple harmonic oscillators, hydrogen-like atoms and angular momentum operators and how to obtain eigen values and eigen states for such systems elegantly.
- How to use perturbation theory to obtain corrections to energy eigen-states and eigen-values when an external electric or magnetic field is applied to a system

Physics of Electronic Devices

After successful completion of the course, students will be able to understand:

- Nature of charge carriers in semiconductors.
- Energy band theory
- Hall Effect to know the type of semiconductors and concentration of charge carriers.
- Carrier transportation for optical devices.
- Hayens Shockley Experiment.
- Diode laser basic concepts
- Types of IC devices
- Differences between Analog and Digital Electronic devise.
- Sequence of VLSI fabrication steps for realization of integrated circuits.

Semester-2

Statistical Mechanics

After successful completion of the course, students will be able to understand:

- Understand a probabilistic description of nature at the microscopic level gives rise to deterministic laws at the macroscopic level.
- Relate the concepts of entropy and temperature as defined in statistical mechanics to their more familiar versions in thermodynamics.
- Solve for the thermal properties of classical and quantum gases and other condensed systems from a knowledge of their microscopic Hamiltonians.
- Appreciate that interactions between particles can explain the various phases of matter observed in nature, as well as the universality of critical exponents characterizing phase transitions.

Quantum Mechanics-II

After successful completion of the course, students will be able to understand:

- How to use approximation methods to obtain corrections to energy eigen-states and eigen-values when an external electric or magnetic field is applied to a system.
- Semi-classical theory of radiation and its applications on absorption and emission spectra.
- Scattering theory which will teach them how to obtain scattering cross-section in quantum system.
- Principle of indistinguishability and symmetry requirements and its applications.

Nuclear and Particle Physics

After successful completion of the course, students will be able to understand:

- Explain the deuteron behaviour at ground and excited states, Nucleon-Nucleon scattering for explaining the nature of nuclear forces.
- Understand the structure of nucleus with the help of Nuclear Models like Liquid Drop Model, Shell Model and Collective Model.
- Predict various nuclear properties like spin momentum, parity, magnetic moments, rotational and vibrational spectra etc. of different nuclei.

- Understand different nuclear decays, their theories and selection rules; compound and direct nuclear reaction with reaction cross section.
- Gain a basic knowledge about Elementary Particles and their interactions, associated conservation laws, Quark model and various symmetries.

Solid State Physics

After successful completion of the course, students will be able to understand:

- Differentiate between different Lattice types and explain the concepts of reciprocal lattice and crystal diffraction.
- Predict electrical and thermal properties of solids and explain their origin.
- Explain the concept of energy bands and effect of the same on electrical properties.
- Explain and understand various types of magnetic phenomenon, physics behind them, their properties and applications.
- Explain superconductivity, its properties, important parameters related to possible applications in era of superconducting physics

Semester-3

Atomic and Molecular Physics

After successful completion of the course, students will be able to understand:

- Energy Eigen values of Hydrogen Spectrum, Pauli Exclusion Principle, concept of equivalent and non-equivalent orbitals, Spectra of alkali spectra
- Effect of magnetic and electric field on energy levels of atomic spectra i.e. Normal and Anomalous Zeeman effects and stark effect etc. , Concepts of LS and JJ –Coupling
- Concept of Rotational spectra in detail, energy levels of diatomic molecules as a rigid rotator and non-rigid rotator
- Concept of Vibrational spectra in detail, energy levels of diatomic molecules as a harmonic oscillator and anharmonic Oscillator, Basic concept of PQR branches in vibrational spectra

Electrodynamics and Wave Propagation

After successful completion of the course, students will be able to understand:

- Four Vectors and their representations
- Representation of Maxwell's Equations in form of Electromagnetic Field Tensor
- Transformation of Electric and Magnetic Field Vectors
- To calculate power radiated by oscillating electric dipole
- To calculate the electric and magnetic fields` strength emitted by uniformly and accelerated charges
- The concept of Radiative Reaction Force and its application to understand about Thompson Scattering and Rayleigh Scattering
- The concept of Dispersion and its types as Normal and Anomalous Dispersion
- The propagation of electromagnetic waves through Ionosphere

- To derive equations of motions of charged particles through electric and magnetic fields
- Waveguides and their types along with the attenuation during propagation of electromagnetic waves through waveguides
- Transmission Lines and their circuit representations

Electronics-I

After successful completion of the course, students will be able to understand:

- Firstly students will learn an introduction about semiconductors, and then a brief account of transistors would be discussed. Students would be able to differentiate BJT and MOSFET transistors and their characteristics.
- Then a brief idea transistor models and Hybrid model will be understood in detail.
- Some negative resistance devices will also be studied.
- The next part of the course deals mainly with Operational amplifiers and their characteristics and Applications include summing, differentiate, integrate, filters, multivibrators, oscillators.

Computational Physics

After successful completion of the course, students will be able to understand:

- The student will learn a selection of computational methods and how these can be used to solve problems within different fields of physics.
- The student will be able to formulate a strategy to solve a given problem using one or more computational methods, make it concrete through programming and running the program and then critically analyse the obtained result, communicate the result in writing in a format close to the standard used in international physics journals.

Semester -4

Physics of laser and laser Applications

After successful completion of the course, students will be able to understand:

- Basic properties of Laser i.e. Directionality, Monochromaticity, Superfluorescence phenomenon, Non-radiative decay
- Types of Pumping used i.e. Optical and electrical Pumping, Optical Resonators, Rate equations for three and four level laser, Techniques of Q-switching
- Applications and working of Solid and Liquid Lasers
- Basic concept of multiphoton effect, Stimulated Raman Effect, Holography and Applications of Lasers in daily life.

Physics of Nano materials

After successful completion of the course, students will be able to understand:

- Starting from basic theory of solids, students will be able to understand nano materials and can relate to bulk materials.
- Students would know how quantum and surface effects results in the variety and tunability of physical properties, such as band gap of semiconductors.
- Students next learn a few synthesis and fabrication of zero, one and two dimensional nanostructures.

- In the last four main characterization techniques viz : XRD, TEM, Photoluminescence and Raman spectroscopy are discussed in detail.

Electronics-II

After successful completion of the course, students will be able to understand:

- Basic binary numbers, its arithmetics, different binary codes, logic gates, SOP and POS forms, and logic minimization techniques.
- Combinational and sequential circuits.
- Basic MOSFET transistor and its implementation for different logic gates, shift registers and RAM.

Computational Physics

After successful completion of the course, students will be able to understand:

- The student will learn a selection of computational methods and how these can be used to solve problems within different fields of physics.
- The student will be able to formulate a strategy to solve a given problem using one or more computational methods, make it concrete through programming and running the program and then critically analyse the obtained result, communicate the result in writing in a format close to the standard used in international physics journals.

**COURSE & PROGRAM OUTCOMES OF
M.A. (GEOGRAPHY)**

Semester	Subject Name and Code	Course Outcomes
SEM-1	Geomorphology	CO-1: It will provide students with an understanding of the conceptual and dynamic aspects of Landform development CO-2: Students will learn the relevance of applied aspects of Geomorphology in various fields
	Climatology	CO-1: It will help students to understand the mean global atmospheric circulations and disturbances CO-2: The students will be able to understand World climate systems CO-3: The students will know climatic variability and change
	Resource Geography	CO-1: Students will become sensitized to the concept and classification of resources CO-2: Students will know about models of natural resource processes CO-3: Students will understand about use and misuse of resources CO-4: Students will learn about conservation methods and techniques
	Statistical Methods in Geography	CO-1: Students will be able to apply statistical techniques to make precise and unambiguous statements CO-2: They will be able to describe and explain various geographical patterns and relationships CO-3: Students would be able to make a rational choice amongst listed various statistical methods keeping in view the nature of data and purpose of the study
	Topographical Maps and Interpretation (Practical)	CO-1: Students will develop skills in map interpretation through the identification of physical and cultural features using conventional signs CO-2: Students should be able to understand the importance and uses of maps and the relationship and juxtaposition of features therein
	Computer-Aided Statistical Diagrams and Graphs (Practical)	CO-1: Students will be able to use computers in geography for statistical method applications CO-2: It will provide students ability to analyze, classify and prepare data for statistical diagrams through computer
	Geography of World Economy	CO-1: Students would be able to understand how in an increasingly globalized world, economic activities occur unevenly over geographical space CO-2: Students would understand how the regime of neoliberal policies is generating uneven geography of capitalist development

SEM-2	Regional Development and Planning	<p>CO-1: The student will get familiarised with the theoretical foundations and conceptual grounding of this branch</p> <p>CO-2: Students would be able to understand how local places and the global economy are intertwined</p> <p>CO-3: The students will understand and evaluate the concept of region in geography and its role and relevance in regional planning</p> <p>CO-4: The students would be able to comprehend the regional development and planning process in India</p>
	Geography of India	<p>CO-1: The students will appreciate the relevance of geographical knowledge of India to understand the contemporary issues</p> <p>CO-2: To describe various geographical aspects of land, people and economy of Indian sub-continent</p>
	Environmental Geography	<p>CO-1: The students will learn about our environment, to understand its interrelationship with man and his linkages with other organisms, which vary in different biomes</p> <p>CO-2: It will sensitise the students about the Environmental problems and degradation</p> <p>CO-3: The students will learn the importance of conserving biodiversity to maintain an ecological balance as well as national and international concerns on various environmental issues</p>
	Practical: Digital Cartography	<p>CO-1: Students will be able to understand and prepare maps</p> <p>CO-2: Students will have adequate professional knowledge and computer skills to enable the students to take up careers in the field of Geospatial Technology</p>
	Practical: Morphometric Analysis	<p>CO-1: The students will learn morphometric techniques in general and in the case of a drainage basin in particular</p> <p>CO-2: Students would be able to understand the usefulness of morphometric techniques in the case of a drainage basin</p>
SEM-3	Remote Sensing and GIS	<p>CO-1: Students will be familiarized and enhance their knowledge about the Remote Sensing and GIS technology</p> <p>CO-2: They will understand the technology along with application value as well as its importance in the Earth observation</p>
	Geography of Transport	<p>CO-1: The course will enable students to understand:</p> <p>CO-2: Students shall learn about the significance of transport in multifaceted development</p> <p>CO-3: Students shall learn about accessibility and connectivity and policy interventions</p> <p>CO-4: Students shall learn about various models and theories related to transport network</p>

	Oceanography	<p>CO-1: Students will be able to understand the dynamics of ocean physiography and water movement</p> <p>CO-2: It will help them to have an understanding of the relevance of oceans as a resource in times to come</p> <p>CO-3: It will also provide an understanding of the ocean-human interface including weather, climate, navigation, security and resource utilisation</p>
	Practical: Field Work	<p>CO-1: The students will get an understanding of the ground reality of a specific chosen Geographical area by observation, and learn field survey techniques</p> <p>CO-2: Students would be able to understand the basic socio-economic characteristics of the chosen area through the field methods/ techniques and build the capability of writing a report</p>
	Practical-GIS	<p>CO-1: Students will be able to understand the representation of the earth's surface features with the help of maps by GIS techniques</p> <p>CO-2: It will give students an exposure to how to use geographic information systems through the creation and dation of maps which is an essential part of any geographic study</p>
SEM-4	Geographical Thought	<p>CO-1: This should enable the student to critically look at the contents of other courses at the Postgraduate level as logically integrated with the broad currents of thought the subject has witnessed in the distant and recent past</p> <p>CO-2: Students will be acquainted with the philosophy, methodology and historical development of geography as a professional field</p> <p>CO-3: Students should develop critical thinking and analytical approaches</p>
	Research Methodology	<p>CO-1: Students would be able to formulate research questions</p> <p>CO-2: Students would understand the advantages and disadvantages of quantitative and qualitative approaches</p> <p>CO-3: Students will explore various steps for doing research</p> <p>CO-4: Students would be able to write a research proposal</p>

	Geography of Tourism	<p>CO-1: Knowledge of the basic concepts of tourism and regional dimensions of tourism in India shall be the main learning outcomes</p> <p>CO-2: Through the syllabus, the students can have a closer insight into tourism in our own country</p>
	Population Geography	<p>CO-1: Students would be able to understand the distribution and dynamics of population distribution and its problems and management</p> <p>CO-2: The students are introduced to the spatial distribution of the population with causative factors</p> <p>CO-3: It also deals with various theories and concepts related to population</p>
	Practical: Aerial Photographs and its Interpretation	<p>CO-1: Students would be able to understand the usefulness of air photo interpretation techniques in geography</p> <p>CO-2: The students should be able to learn air photo interpretation techniques and their application aspects for the study of various fields of geography</p>
	Practical- Satellite Images and its Interpretation	<p>CO-1: Students will get exposure to how to interpret a satellite image with hands on experience</p> <p>CO-2: Students will understand the basics of satellite image interpretation</p>

**COURSE & PROGRAM OUTCOMES OF
M.Sc. PHYSICS**

Semester	Subject Name and Code	Course Outcomes
SEM-1	<i>Mathematical Physics</i>	<ul style="list-style-type: none"> • Get sufficient exposure /understanding of the linear vector space and applications of matrices to physical problem.s • Provide some standard methods (Power series & Frobenius' Method) for solving 2nd order linear differential equations with variable coefficients. • Identify the difference between ordinary and singular point and their respective solution approach; understand the linear dependence and independence of the solutions. • Obtain the series solution for Legendre, Bessel, Hermite and Laguerre's differential equations. • Understand their various properties like generating function, recurrence relations, orthogonality condition and Rodrigue's formula. • Know about Gamma and Dirac-Delta functions and their use to evaluate different types of integrals. • Realize the idea behind the integral transform; study of Laplace and Fourier Transform with their properties for derivatives and integrals and applications of integral transform to solve ODEs and PDEs. • Understand the concept of series expansion of function in terms of sines and cosines.
	<i>Classical Mechanics</i>	<ul style="list-style-type: none"> • Describe Lagrangian and Hamiltonian formulations. • Solve problems on motion under central force, rigid body dynamics, and periodic motions. • Apply the theory of small oscillations in different areas of physics e.g., molecular spectra, acoustics, vibrations of atoms in solids, coupled mechanical oscillators.
	<i>Quantum Mechanics - I</i>	<ul style="list-style-type: none"> ▪ The mathematical formalism of Hilbert space, hermitian operators, eigen values, eigen states and unitary operators, which form the fundamental basis of quantum theory. • Application to simple harmonic oscillators, hydrogen-like atoms and angular momentum operators and how to obtain eigen values and eigen states for such systems elegantly. • How to use perturbation theory to obtain corrections to energy eigen-states and eigen-values when an external electric or magnetic field is applied to a system

	<i>Physics of Electronic Devices</i>	<ul style="list-style-type: none"> • Nature of charge carriers in semiconductors. • Energy band theory • Hall Effect to know the type of semiconductors and concentration of charge carriers. • Carrier transportation for optical devices. • Hayens Shockley Experiment. • Diode laser basic concepts • Types of IC devices • Differences between Analog and Digital Electronic devise. • Sequence of VLSI fabrication steps for realization of integrated circuits.
SEM-2	<i>Statistical Mechanics</i>	<ul style="list-style-type: none"> ▪ Understand a probabilistic description of nature at the microscopic level gives rise to deterministic laws at the macroscopic level. • Relate the concepts of entropy and temperature as defined in statistical mechanics to their more familiar versions in thermodynamics. • Solve for the thermal properties of classical and quantum gases and other condensed systems from a knowledge of their microscopic Hamiltonians. • Appreciate that interactions between particles can explain the various phases of matter observed in nature, as well as the universality of critical exponents characterizing phase transitions.
	<i>Quantum Mechanics-II</i>	<ul style="list-style-type: none"> • How to use approximation methods to obtain corrections to energy eigen-states and eigen-values when an external electric or magnetic field is applied to a system. • Semi-classical theory of radiation and its applications on absorption and emission spectra. • Scattering theory which will teach them how to obtain scattering cross-section in quantum system. • Principle of indistinguishability and symmetry requirements and its applications.
	<i>Nuclear and Particle Physics</i>	<ul style="list-style-type: none"> • Explain the deuteron behaviour at ground and excited states, Nucleon-Nucleon scattering for explaining the nature of nuclear forces. • Understand the structure of nucleus with the help of Nuclear Models like Liquid Drop Model, Shell Model and Collective Model.

		<ul style="list-style-type: none"> • Predict various nuclear properties like spin momentum, parity, magnetic moments, rotational and vibrational spectra etc. of different nuclei. • Understand different nuclear decays, their theories and selection rules; compound and direct nuclear reaction with reaction cross section. Gain a basic knowledge about Elementary Particles and their interactions, associated conservation laws, Quark model and various symmetries
	<i>Solid State Physics</i>	<ul style="list-style-type: none"> • Differentiate between different Lattice types and explain the concepts of reciprocal lattice and crystal diffraction. • Predict electrical and thermal properties of solids and explain their origin. • Explain the concept of energy bands and effect of the same on electrical properties. • Explain and understand various types of magnetic phenomenon, physics behind them, their properties and applications. • Explain superconductivity, its properties, important parameters related to possible applications in era of superconducting physics
SEM-3	<i>Atomic and Molecular Physics</i>	<ul style="list-style-type: none"> • Energy Eigen values of Hydrogen Spectrum, Pauli Exclusion Principle, concept of equivalent and non-equivalent orbitals, Spectra of alkali spectra • Effect of magnetic and electric field on energy levels of atomic spectra i.e. Normal and Anomalous Zeeman effects and stark effect etc. , Concepts of LS and JJ –Coupling • Concept of Rotational spectra in detail, energy levels of diatomic molecules as a rigid rotator and non-rigid rotator • Concept of Vibrational spectra in detail, energy levels of diatomic molecules as a harmonic oscillator and anharmonic Oscillator, Basic concept of PQR branches in vibrational spectra
	<i>Electrodynamics and Wave Propagation</i>	<ul style="list-style-type: none"> • Four Vectors and their representations • Representation of Maxwell`s Equations in form of Electromagnetic Field Tensor • Transformation of Electric and Magnetic Field Vectors • To calculate power radiated by oscillating electric dipole • To calculate the electric and magnetic fields` strength emitted by uniformly and accelerated charges • The concept of Radiative Reaction Force and its application to understand about Thompson Scattering and Rayleigh Scattering • The concept of Dispersion and its types as Normal and Anomalous Dispersion • The propagation of electromagnetic waves through Ionosphere

		<ul style="list-style-type: none"> To derive equations of motions of charged particles through electric and magnetic fields
	<i>Electronics-I</i>	<ul style="list-style-type: none"> Firstly students will learn an introduction about semiconductors, and then a brief account of transistors would be discussed. Students would be able to differentiate BJT and MOSFET transistors and their characteristics. Then a brief idea transistor models and Hybrid model will be understood in detail. Some negative resistance devices will also be studied. The next part of the course deals mainly with Operational amplifiers and their characteristics and Applications include summing, differentiate, integrate, filters, multivibrators, oscillators
	<i>Computational Physics</i>	<ul style="list-style-type: none"> The student will learn a selection of computational methods and how these can be used to solve problems within different fields of physics. The student will be able to formulate a strategy to solve a given problem using one or more computational methods, make it concrete through programming and running the program and then critically analyse the obtained result, communicate the result in writing in a format close to the standard used in international physics journals
SEM-4	<i>Physics of laser and laser Applications</i>	<ul style="list-style-type: none"> Basic properties of Laser i.e. Directionality, Monochromaticity, Superfluorescence phenomenon, Non-radiative decay Types of Pumping used i.e. Optical and electrical Pumping, Optical Resonators, Rate equations for three and four level laser, Techniques of Q-switching Applications and working of Solid and Liquid Lasers Basic concept of multiphoton effect, Stimulated Raman Effect, Holography and Applications of Lasers in daily life.
	<i>Physics of Nano materials</i>	<ul style="list-style-type: none"> Starting from basic theory of solids, students will be able to understand nano materials and can relate to bulk materials. Students would know how quantum and surface effects results in the variety and tunability of physical properties, such as band gap of semiconductors. Students next learn a few synthesis and fabrication of zero, one and two dimensional nanostructures. In the last four main characterization techniques viz : XRD, TEM, Photoluminescence and Raman spectroscopy are discussed in detail.

	<i>Electronics-II</i>	<ul style="list-style-type: none"> • Basic binary numbers, its arithmetics, different binary codes, logic gates, SOP and POS forms, and logic minimization techniques. • Combinational and sequential circuits. • Basic MOSFET transistor and its implementation for different logic gates, shift registers and RAM.
	<i>Computational Physics</i>	<ul style="list-style-type: none"> • The student will learn a selection of computational methods and how these can be used to solve problems within different fields of physics. • The student will be able to formulate a strategy to solve a given problem using one or more computational methods, make it concrete through programming and running the program and then critically analyse the obtained result, communicate the result in writing in a format close to the standard used in international physics journals.