

PROGRAM OUTCOMES

B.Com

Program Outcomes :

PO1 : After deep insight of fundamentals of commerce and other related disciplines like statistic, taxation, law, economics and finance.

PO2 : The curriculum offers a numbers of courses to equip the students to face modern day challenges in the field of business and profession.

PO3 : The learners will acquire skills like communication, decision making and leadership qualities in solving day to day business affairs.

PO4 : Students will have a comprehensive understanding of accounting skills, which can further be applied in their future careers and higher education.

PO5 : The learners will involve in various practical work as tax consultant, audit assistant and other financial supporting services.

BBA

PROGRAM OUTCOMES:

PO1 : the individual must demonstrate maturity, professionalism and team working skills.

PO2 : the students will have general idea of operations in business.

PO3 : the individual will have specialized skills to deal with area specific issues of concern.

PO4 : the individual will be able to apply technological knowhow for business advancements.

PO5 : the individual will be capable of analyzing, investigating and solving critical business issues.

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Bazakhana Road, Barnala

BCA

Programme Outcomes :

- PO1.** The program prepares the young professional for a range of computer applications, computer organization, techniques of ComputerNetworking, Software Engineering, Web development, Database Management and Java.
- PO2.** An ability to enhance not only comprehensive understanding of the theory but its application too in diverse fields.
- PO3.** To enhance programming skills of the young IT professionals, the program has introduced the concept of project development in language/technology learnt during semesters.

B.SC(NM)

Programme Outcomes:

- PO 1 :** This stream's students are capable of doing bioinformatics and computer-assisted research.
- PO 2 :** Students know about numerous bimolecular processes at cellular level that are involved in the development of various technologies in this course.

B.A.

Program Outcomes:

- PO1 :** the individual must demonstrate maturity, professionalism and team working skills.
- PO2 :** the students will have general idea of operations in business.
- PO3 :** the individual will have specialized skills to deal with area specific issues of concern.
- PO4 :** the individual will be able to apply technological knowhow for business advancements.
- PO5 :** the individual will be capable of analyzing, investigating and solving critical business issues.

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M.Com

Programme Outcomes:

PO1 : Equip the students with higher level knowledge and understanding of contemporary trends in commerce and business finance.

PO2 : Train the students to evaluate environmental factors that influence business operation with the conceptual requirements and skills on preparation and interpretation of financial statements.

PO3 : Prepare the students for an in depth analysis of investment, portfolio management, investment banking and liquidation of investments.

PO4 : Develop competency in the students about the laws and regulations, and roles of commercial, government and central banks in controlling money market and inflation.

PO5 : Sensitize the students to plan and undertake independent research in a chosen discipline.

PO6 : Prepare the students for teamwork, lifelong learning and continuous professional development.

PGDCA

Programme Outcomes:

PO1. It will equip the students with skills required for designing, developing applications in Information Technology.

PO2. Students will be able to learn the latest trends in various subjects of computers & information technology.

PO3. To provide a detailed coverage of the key concepts and challenges in data and resource protection and computer software security.

PO4. To give hands on to students while developing real life IT applications as part of the study.

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Bazarkhana Road, Barnala

Msc.IT/ Msc.IT (LE)

Programme Outcomes:

- PO1.** Build up programming, analytical and logical thinking abilities.
- PO2.** Get prepared for placement by inculcating technical and professional skills.
- PO3.** Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, Artificial Intelligence, Machine Learning.
- PO4.** Provides technology-oriented students with the knowledge and ability to develop creative solutions.

MSc. Mathematics

Programme Outcomes:

- PO 1 :** students will be able to find out or analysing scientific reasoning for various things.
- PO 2 :** Students will get knowledge about both pure and applied mathematics branches.
- PO 3 :** Students will get knowledge about both pure and applied mathematics branches.

M.A Economics

Programme Outcomes

- PO1:** Employment opportunities in teaching and research
- PO2:** Emerging opportunities in corporate sector/ Banking/Finance.
- PO3:** Placement in research institutions


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M.A English

Programme Outcomes

PO1: The students will learn about the different genres and forms of literary texts.

PO2: The students will develop a broader chronological understanding of the transitions in the history of English literature and the socio-cultural and political contexts that led to the emergence of different genres in literature.

PO3: The students will become familiar with literary masterpieces and will learn to appreciate the creative as well as critical insights of literary writers.

PO4: The students will be able to situate literary works in different social, political, economic, historical and national contexts.

PO5: The students will learn to appreciate modern Indian literature in English and its unique contribution to literature.

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Course Outcomes: B.COM

BC 101 Punjabi

- CO-1: ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਕੁਦਰਤਾਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ
- CO-2: ਰੂਪਕਾਰ ਕਹਾਣੀ ਰਾਹੀਂ ਜਿੰਦਗੀ ਦੀਆਂ ਤਲਖ ਹਕੀਕਤਾਂ ਸਮਝਣ ਦੇ ਯੋਗ ਹੋਵੇਗਾ
- CO-3: ਭਾਸ਼ਾ ਦੇ ਵਿਭਿੰਨ ਰੂਪਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਵਿੱਚ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਰੂਪ ਵਿੱਚ ਵਿਚਰਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੋਵੇਗੀ
- CO-4: ਭਾਸ਼ਾ ਦੀ ਸਮਰੱਥਾ ਪਛਾਣਕੇ ਅੰਦਰਲੀ ਯੋਗਤਾ ਦਾ ਸਹੀ ਪ੍ਰਯੋਗ ਕਰਨਾ ਸਿੱਖਣਗੇ
- CO-5: ਭਾਸ਼ਾਈ ਨੇਮਾਂ ਨੂੰ ਸਮਝਕੇ ਭਾਸ਼ਾਈ ਸੰਜਮਤਾ ਤੇ ਅਨੁਸ਼ਾਸਨ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਕਰਨਾ

BC 102 & 202 Communication Skills

After completion of this course the student will be able to:

- CO1: understand cultural diversity and values of life.
- CO2: become well versed in effective business communication.
- CO3: develop clear and lucid writing skills
- CO4: approach ideas with a creative bent of mind.
- CO5: draft business correspondence effectively with great brevity and clarity.
- CO6: relate with the nuances of business strategies and organisation with familiarity.
- CO7: enhance their employability by developing effective verbal communication skills

BC 103 & 203 FINANCIAL ACCOUNTING-I& II

After completion of this course the student will be able to:

- CO1: Acquire conceptual knowledge of basics of accounting, prepare ledger accounts and do journal entries accordingly. CO2: Equip with the knowledge of accounting process and prepare financial statements in accordance with appropriate standards.
- CO3: Prepare Bank Reconciliation Statement from incomplete statements of Cash book and Pass Book.
- CO4: Understand Partnership accounts for admission, retirement, death of partner and dissolution of Partnership Firm.
- CO5: Understand the meaning of Hire- Purchase, Branch, Department and Consignment and also the preparation of the related accounts.
- CO6: Apply previously acquired accounting and computer skills by using software Tally.ERP.9.0

BC 104 & 204 BUSINESS LAW-I & II

After completing this course the students will be able to:

- CO1: Appreciate the relevance of Law of Contract Act for an individual as well as for business houses along with the significance of forming,

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performing and discharging written and verbal contracts and agreements.

C02: Acquire knowledge about entering into special contracts like indemnity, guarantee, bailment, pledge and agency including the remedies available to the parties for the breach of contracts.

C03: Hold grip on basics of Sales of Goods Act including conditions, warranties, sale by auction and hire purchase agreements and Partnership Act that consists of nature, types, registration process, rights, duties, authorities and dissolution defined under the act.

C04: Gain knowledge about the contents like features, agreements and incorporation by registration covered under The Limited liability Partnership Act.

C05: Understand the significance of negotiable instruments like promissory note, bill of exchange and cheques in the day to day life and business under Negotiable Instrument Act.

C06: Understand the legal framework under the Consumer Protection Act and the procedure to seek justice under grievance redressal machinery and get deep insight into the Patent Act

C07: Acquire knowledge about the provisions of Factories Act regarding health, safety and welfare of workers with additional provisions regarding employment of women, young person and Children.

C08: Comprehend the purpose behind establishment of Right to Information Act and IT Act that describes objectives, penalties, powers, functions and the role of State, central and information commissions to handle appeals and grievances.

BC 105 COMPUTER APPLICATION FOR BUSINESS

After Completion of this Course the student will be able to:

CO1: Understand the Practical aspects of MS- Windows 7

CO2: Learn the MS-Office 2007 including Ms-Word, Ms-PowerPoint, Ms-Excel and their utility in writing document, creating spreadsheet, preparation PowerPoint presentation

CO3: Learn working of computer system & its parts

CO4: Learn Number system and technique to represent computer system architecture, every value that you are saving and getting into/from computer memory

BC 106 & 206 PRINCIPLES OF ECONOMICS I & II

After completion of this course the student will be able to:

CO1: Understand theories and principles in microeconomics including demand theory, elasticity of demand and consumer equilibrium with utility and indifference curve analysis.

CO2: Analyse the relationship between inputs used in production and the resulting output and cost, integrate the concepts of price and output decisions of firms and industry under various market structure.

CO3: Understand theories and principles in macroeconomics including national income, models of employment and output determination, consumption function and investment multiplier. **CO4:** Assess business fluctuations, expansions and recessions, long term macro- economic growth trends and concept of inflation.

CO5: Apply these principles to analyze economic issues.

CO6: Communicate effectively using written and oral arguments about specific economic issues.

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BC 201 Punjabi

- CO1: ਵਿਆਕਰਨਕ ਪੱਧਰ ਉੱਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਸੁੱਧ ਰੂਪ ਵਿੱਚ ਉਚਾਰਨ, ਲਿਖਣ ਅਤੇ ਪੜਨ ਦਾ ਹੁਨਰ
- CO2: ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸ਼ਬਦ ਨਿਰਮਾਣ ਪ੍ਰਬੰਧ ਦਾ ਗਿਆਨ
- CO3: ਵੱਖ-ਵੱਖ ਉਪਭਾਸ਼ਾਵਾਂ ਦੀ ਵੱਖਰਤਾ ਰਾਹੀਂ ਪੰਜਾਬ ਦੀ ਭਾਸ਼ਾਈ ਭਿੰਨਤਾ ਤੇ ਵਿਸ਼ਾਲਤਾ ਦਾ ਗਿਆਨ
- CO4: ਵਿਭਿੰਨ ਸਮਾਜਕ, ਰਾਜਨੀਤਕ, ਧਾਰਮਿਕ ਮੁੱਦਿਆਂ ਸਬੰਧੀ ਵਿਚਾਰਾਂ ਦੇ ਨਿਰਮਾਣ ਦੀ ਸਮਰੱਥਾ ਵਿਚ ਵਾਧਾ
- CO5: ਮੁਕਾਬਲੇ ਦੀਆਂ ਪ੍ਰੀਖਿਆਵਾਂ ਵਿਚ ਸਹਾਇਕ
- CO6: ਸਮਾਜਿਕ ਰਿਸ਼ਤਿਆਂ ਵਿੱਚ ਭਾਵਾਂ ਦੀ ਸਰਲ ਪੇਸ਼ਕਾਰੀ ਨਿਜੀ ਚਿੱਠੀ- ਪੱਤਰ ਰਾਹੀਂ ਕਰਨ ਦੀ ਯੋਗਤਾ

BC 205 Business Mathematics

- CO1: To analyse and demonstrate mathematical skills which is required in mathematical intensive areas in economics and business.
- CO2: Learn about mathematical applications in commerce, finance, economics etc.
- CO3: Apply the knowledge in mathematic in solving business problems.
- CO4: Use simple and compound interest to do business calculations such as value of money, present value and future value and will be able to differentiate which math method should be used for different problems.
- CO5: Use differential calculus to solve problems of finding maximum profits and minimum cost

BC 301 Punjabi

- CO1: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਗੌਰਵਮਈ ਟਿੱਤਿਹਾਸ ਦਾ ਗਿਆਨ ਹੋਵੇਗਾ
- CO2: ਸ਼ਾਹਿਤਕ ਰੂਪਕਾਰ ਨਾਵਲ ਰਾਹੀਂ ਜਿੰਦਗੀ ਦੀ ਵਿਸ਼ਾਲਤਾ ਨੂੰ ਸਮਝਣ ਦੀ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ
- CO3: ਵਾਕ ਬਣਤਰ ਦੇ ਗਿਆਨ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀ ਆਪਣੇ ਭਾਵਾਂ ਦਾ ਸੰਚਾਰ ਸੁੱਚੇ ਢੰਗ ਨਾਲ ਕਰ ਸਕਣਗੇ

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BC 302 & 402 Communication Skills

- CO1: develop overall linguistic competence and communicationskills.
- CO2: understand and be aware of cultural diversities andproblems of the world.
- CO3: make abstracts and summaries of business proposals.
- CO4: communicate in an ethical manner.
- CO5: demonstrate effective verbal and non-verbal skills throughpresentations.
- CO6: Participate in brainstorming sessions in a businessorganisation.
- CO7: gain proficiency in soft skills required for national andglobal placements.

BC 303 PRINCIPLES OF BUSINESS MANAGEMENT

After completion of this course the student will be able to:

- CO1: define the meaning, scope, significance, functions and process of management.
- CO2: list the characteristics, process and types of plans and understand the difference between delegation and decentralisation of authority and types of organisation structure.
- CO3: have an insight of the process of recruitment, selection and various types of training provided to the employee.
- CO4: learn various theories of motivation and leadership and types of leadership styles along with importance of communication and Co-ordination.

BC 304 & 404 CORPORATE ACCOUNTING-I & II

After completion of this course the student will be able to:

- CO1: Acquire knowledge of corporate accounts, accounting standards and to describe various practices and procedures related to Company Act, 2013.
- CO2: Understand the basic structure and redemption of share capital and debentures, ability to grasp knowledge of right issue and bonus share.
- CO3: Develop ability to understand underwriting of shares, preparation of income statement, position statement and consolidate balance sheet for holding company.
- CO4: Learn Accounting Standard-14 that helps them to know the process of Amalgamation and Internal reconstruction, interpretation and preparation of liquidation final accounts.
- CO5: Enlarge capability to understand the concept and preparation of accounts related to banking and insurance company, calculation of profit prior to incorporation.

BC 305 & 405 INCOME TAX LAW-I & II

After completing this course the students will be able to:

- CO1: Define the procedure of direct tax assessment.
- CO2: identify the five heads in which income can be categorised
- CO3: understand clubbing provisions, aggregation of income after set-off and carryforward of losses.
- CO4: compute total income and define tax complications andstructure.
- CO5: learn about appeal & revision, tax penalties, offences andprosecutions.

BC 306 BUSINESS STATISTICS

After completion of this course the student will be able to:

- CO1: understand basic concepts of Statistics such as collection of data, tabular and graphical representation of data.
- CO2: calculate Measures of Central Tendency, Dispersion, Correlation and Regression analysis.
- CO3: analyze time series and its trend including seasonal indices.

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CO4: solve the problems relating to Index number.

CO5: understand the concept relating to forecasting, and they would be able to forecast the demand and sales of companies or industries.

BC 401 Punjabi

CO1: ਕਵਿਤਾ ਨੂੰ ਪੜ੍ਹਦਿਆਂ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

CO-2: ਕਵਿਤਾ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਕਲਪਨਾ ਸ਼ਕਤੀ ਦਾ ਵਿਕਾਸ ਕਰੇਗੀ

CO-3: ਕਵਿਤਾ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀਆਂ ਸ਼ਬਦ ਦੀ ਸਮਝ ਅਤੇ ਸਮੱਰਥਾ ਬਾਰੇ ਪਰਤਾਂ ਬਾਰੇ ਸਹੀ ਅਰਥਾਂ ਬਾਰੇ ਜਾਨਣਗੇ

CO-4: ਗੁਰਮੁਖੀ ਲਿੱਪੀ ਦੀ ਵਿਕਾਸ ਪ੍ਰਕਿਰਿਆ ਨੂੰ ਪੜ੍ਹਦੇ ਹੋਏ ਵਿਦਿਆਰਥੀ ਭਾਸ਼ਾ ਅਤੇ ਲਿੱਪੀ ਦੇ ਆਪਸੀ ਸੰਬੰਧ ਬਾਰੇ ਸਮਝਣਗੇ

BC 403 COMPANY LAW

After completion of this course the student will be able to:

CO1: Understand the background of new companies Act, 2013 and kinds of companies.

CO2: Acknowledge and explicate the three important documents for incorporation and commencement of Business of Company: Memorandum of Association, Articles of Association and Prospectus.

CO3: Specify various types of shares and share capital and elucidate the alteration of MOA, AOA and consequences of misrepresentation in prospectus.

CO4: Recognize the powers and duties of directors and know various forms of winding up of company.

BC 406 OPERATIONS RESEARCH

After completing this course, the students will be able to:

CO1: Understand concepts, scope and techniques of operations research for business decision making.

CO2: Appropriately formulate linear programming models and application of OR techniques to solve these Linear programming problems.

CO3: Propose the strategy using decision making method under uncertainty and game theory.

CO4: Understand interpret variety of problems such as assignment, transportation and travelling salesman, etc.

CO5: Solve multilevel decision problems and simulate different real-life probabilistic situations using Monte Carlo simulation techniques.

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BC 501 Punjabi

CO-1: ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਵਿਭਿੰਨ ਸਾਹਿਤਕ ਰੂਪਕਾਰਾਂ ਵਿੱਚ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ

CO-2: ਵਿਦਿਆਰਥੀ ਤਕਨੀਕ ਦੇ ਦੌਰ ਵਿੱਚ ਹੁੰਦੇ ਹੋਏ ਲੋਕਧਾਰਾਈ ਬੋਧ ਬਾਰੇ ਗਿਆਨ ਹਾਸਲ ਕਰਨਗੇ

CO-3: ਵਿਦਿਆਰਥੀਆਂ ਆਪਣੀਆਂ ਪਰੰਪਰਾਵਾਂ ਦਾ ਸਮਕਾਲ ਨਾਲ ਮੇਰ ਕੇ ਮੁਲਾਂਕਣ ਕਰਨ ਦੇ ਸਮੱਰਥ ਹੋਣਗੇ

CO-4: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬ ਦੇ ਮੇਲਿਆਂ ਅਤੇ ਤਿਉਹਾਰਾਂ ਬਾਰੇ ਵਿਸਥਾਰ ਨਾਲ ਪਤਾ ਲੱਗੇਗਾ

CO-5: ਵਿਦਿਆਰਥੀ ਵਿਆਕਰਨ ਨੂੰ ਭਾਸ਼ਾ ਦੇ ਪ੍ਰਯੋਗ ਹਿੱਤ ਕੁਸ਼ਲਤਾ ਨਾਲ ਪ੍ਰਯੋਗ ਕਰਨਗੇ

BC 502 & 602 MANAGEMENT ACCOUNTING-I & II

After completing this course, the students will be able to:

CO1: Apply management accounting and its objectives in facilitating decisionmaking.

CO2: Give proper idea on financial statement analysis from practical point of view.

CO3: Prepare Cash Flow and Funds Flow statements this helps them in planning for intermediate and long-term finances.

CO4: Calculate various accounting ratios and analyse and interpret the liquidity, solvency, turnover and profitability by these ratios.

CO5: Develop the know-how and concept of marginal costing with practical problems and applications of Marginal costing.

CO6: Acquaint the meaning and types of Budgets and the concept of budgetary control.

BC 503 & 603 COST ACCOUNTING-I & II

After completion of this course the student will be able to:

CO1: acquire in depth indulgent of cost accounting principles for identification, analysis and interpretation of cost components and ascertainment using various costing methods and procedures.

CO2: understand the basic structure of cost accounting and cost related concepts, preparation of cost sheet along with elements of cost, analyse and evaluate information related to material, labour and overhead costs.

CO3: develop ability to understand and calculate the cost through FIFO, LIFO and Average Method, cost determination through apportionment and absorption of overheads, over valuation and under valuation of overheads.

CO4: learn reconciliation of cost and financial account that help them to find out any discrepancies and error arising from cost accounts and to understand the basic fundamentals of unit costing, identification of difference between job and contract costing.

CO5: enlarge capability to comprehend and calculate equivalent production, structure of process costing; identify the disparity between traditional costing and activity based costing.

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BC 504 INDIRECT TAXES

After completion of this course the student will be able to:

CO1: Understand the comprehensive structure of GST along with basic principles underlying the indirect system of taxation in India.

CO2: Determine taxable event, taxable person, time, place and value of supply for implementation of SGST, CGST and IGST.

CO3: Get a better understanding of the registration process for claiming input tax credit and requirement of filing various forms and documents like tax invoice, debit note, credit note and bill of supply etc.

CO4: Describe the powers and functions of GST Council and its role in the administration of GST.

CO5: Compare the previous tax system and the present GST regime to critically examine the strengths and weaknesses of both systems.

CO6: Familiarize with types of custom duty, the modes of evaluation, exemptions and procedures applicable for exports and imports under Indian Customs Act.

BC 505 AUDITING

After completion of this course the student will be able to:

CO1: Know the basic principles governing an Audit and importance of an error-free financial statement.

CO2: Get deeper insight in the role of Institute of Chartered Accountants of India for issuing auditing standards to conduct audit and other assurance engagements.

CO3: Understand auditors' qualifications, disqualification, rights, duties and liabilities and acquire knowledge of audit evidence and documentation.

CO4: Describe the procedure of vouching of cash and trading transactions, assets and liabilities in financial statements along with understanding of inherent risk involved in assessing and evaluating the financial statements.

CO5: Discuss the process of formulating the audit report and communicating the same to the client and the recent changes rising in the field of Auditing with special reference to Tax Audit and management Audit.

BC 506 CORPORATE FINANCE

After completing this course the students will be able to:

CO1: Study the different techniques and methods while calculating time value of money and the applicability of the concept of corporate finance to understand the managerial Decisions and Corporate Capital Structure

CO2: Understand the objectives and process of investment decisions, its evaluation criteria using different techniques and models.

CO3: Enlighten alternative sources of finance and investment opportunities and their suitability in particular conditions **CO4:** Measure the criteria of proportionate investment in different securities under the capital structure decision.

CO5: Apply different dividend theories while taking decisions concerning dividend pay-out ratio.

CO6: Analyse different issues which evaluate the requirements of working capital for the

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company's efficient performance.

BC 601 Punjabi

CO1: ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਵਿੱਚ ਅਨੁਵਾਦ ਕਰਦੇ ਹੋਏ ਭਾਸ਼ਾਈ ਸਾਂਝਾ ਅਤੇ ਵੱਖਰੇਵਿਆਂ ਬਾਰੇ ਜਾਨਣ ਦੇ ਸਮਰੱਥ ਹੋਣਗੇ

CO-2: ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸਾਹਿਤ ਦੇ ਰੂਪਕਾਰਾਂ ਵਿੱਚ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ

CO-3: ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਅਤੇ ਰਚਨਾਤਮਕ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

CO-4: ਰੋਜ਼ਾਨਾ ਜਿੰਦਗੀ ਵਿੱਚ ਭਾਸ਼ਾਈ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

CO-5: ਸਿਵਲ ਪ੍ਰੀਖਿਆਵਾਂ ਵਿੱਚ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨ ਉਹਨਾਂ ਨੂੰ ਮਜ਼ਬੂਤ ਆਧਾਰ ਪ੍ਰਦਾਨ ਕਰੇਗਾ

BC 604 BUSINESS ENVIRONMENT

After completion of this course the student will be able to:

CO1: Understand relationship between environment and business, significance and changing dimensions of business environment.

CO2: Analyse changing trends in micro and macro variables in India including the conceptual framework of BOP, employment, income, money supply, price level, saving and investment trends in the economy.

CO3: Grasp the importance of planning undertaken by the government of India and familiarize with Economic System & its types, growth and performance of public and private sector in India.

CO4: Understand importance of Fiscal, Monetary and New economic policy and their impact on Indian economy.

CO5: Interpret the current trends in India's foreign trade and the functioning of international economic groupings.

BC 605 ENTREPRENEURSHIP AND GOVERNANCE

After completing this course, the students will be able to:

CO1: Understand the needs and beginning of entrepreneurial class and communicate the applicability of different entrepreneurial theories.

CO2: Evaluate the different factors who affect the growth of entrepreneurs and developments of women entrepreneurship.

CO3: Analyse the role of EDP's and different financial or non-financial authorities for sustainability and encouraging entrepreneurship.

CO4: Understand the role of business ethics for sound business.

CO5: Apply different theories and principles of business ethics in a business organisation

CO6: Understand the conceptual framework of corporate governance by following the recommendations of clause 49 and Kumar Mangalam Birla committee.

CO7: Understand the concept of 'corporate social responsibility' and its different aspects related with business ethics & corporate governance.

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BC 606 FINANCIAL PLANNING

After completion of this course the student will be able to:

CO1: Understand and demonstrate the basics of financial planning like nature, advantages, process and legal aspects involved in developing financial plan.

CO2: Discuss various investment options available in capital and money market and will have clear understanding of objectives, rewards and constraints while investing funds.

CO3: Familiarize with the concept of risk, return, time value of money, portfolio and diversification needed to evaluate the performance of financial planning.

CO4: Synthesize information to develop a successful financial plan and evaluate tax saving instruments.

CO5: Analyse the need of life and health insurance and the role of investor's grievances and redressal system in India.

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Course Outcomes: BBA

CO.1- BBA-101 Communication Skills in Punjabi

After completing this course, the students will be able to:

CO-1: ਭਾਸ਼ਾਈ ਸਰੰਚਨਾ ਦੇ ਨੇਮਾਂ ਨੂੰ ਸਮਝਕੇ ਉਸ ਦੀ ਵਰਤੋਂ ਰੋਜ਼ਾਨਾ ਜ਼ਿੰਦਗੀ ਵਿੱਚ ਕਰਨਾ

CO-2: ਭਾਸ਼ਾ ਦੇ ਜਰੀਏ ਮਨੁੱਖੀ ਭਾਵਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰਨ ਦੇ ਯੋਗ ਹੋਣਾ

CO-3: ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੇ ਭਾਸ਼ਾਈ ਵਿਕਾਸ ਦੇ ਵਿਭਿੰਨ ਪੜਾਵਾਂ ਨੂੰ ਸਮਝਣ ਦੀ ਚੇਤਨਾ

CO-4: ਮਨੁੱਖੀ ਹੋਂਦ ਦੇ ਸੰਕਟਾਂ ਦੀ ਨਿਸ਼ਾਨਦੇਹੀ ਅਤੇ ਉਹਨਾਂ ਦਾ ਯੋਗ ਹੱਲ ਲੱਭਣਾ

CO-5: ਸਾਹਿਤਕ ਰਚਨਾਵਾਂ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

2. CO.2. - BBA-102 Business Economics-I

After completing this course, the students will be able to:

- Explain the basic concepts of microeconomics and issues in business economics.
- Discussing the consumer equilibrium, utility analysis indifference curve and the demand and supply analysis.
- Examine the production and cost structure under different stages of production.
- Identify how and why equilibrium prices might change and their impact on resource allocation.
- Recommending the pricing and output decisions under various market structure.

CO.3.- BBA-103 Business Mathematics

After completing this course, the students will be able to:

- State the mathematical skills which are required in business.
- Discuss various mathematical applications in Finance and Marketing etc.

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- Solve problems of Resource allocation by applying tools of Linear Programming, Transportation and Assignment problems.
- Examine various business solutions by applications of Game theory problems.
- Students will be able to judge the

reasonableness of obtained solutions. **CO.4. -BBA-**

104 Business Organization and Management

Principles-I After completing this course, the

students will be able to:

- Describing the Nature and Scope of Business, Forms of Business Organizations and Formation of a Company.
- Comparing Sole Trading Concerns, Partnership, Joint Stock Company, Co-operative Societies, Government and Business, Public Enterprise, Small Business.
- Examine the Functions of Management, Business Ethics, and Social Responsibility of Business.
- Interpret the interactions between the environment, technology, human resources, and organizations in order to achieve high performance.
- Examine the effectiveness of applications of management concepts.
- Appraise different types, roles and styles of managers across organizations.

CO.5. - BBA-105: Workshop on Computer Applications in Business :

After completing this course, the students will be able to:

- Describing the Definition, Features and Classification of computers, Concept of OS, Introduction to Windows.
- Explaining Difference between Hardware and Software, Types of Software System. Software and Application Software, Interpreter.
- Assessing MS-Word, MS-Excel and MS-PowerPoint
- Outline the steps for creating Creating, Saving, Opening, Importing, Exporting and Inserting Files. Formatting Pages, Paragraphs and Sections.
- Use the various command for Auto Content Wizard, Creating Design Template on Blank Presentation, Slides Sorter View, Inserting Slides from Other Presentation, Inserting Pictures & Graphics, Slide Show, Printing Slides.

CO.6-BBA 106- Seminar

After completing this course, the students will be able to:

- List the important events of the year in area of General, Social, Economic and Business Awareness.

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- Describe the business concepts and theories to real-world decision-making
- Illustrate business skills in communication, technology, quantitative reasoning, and teamwork.

Compare and Contrast different business operations.

SUMMER INTERNSHIP: INDUSTRIAL TRAINING OF · 4 TO 6 WEEKS

Class: BBA-II, Semester- III

CO.13- BBA-301 Principles of Human Resource Management

After completing this course, the students will be able to:

- Describe the basic concepts, functions and processes of human resource management.
- Explain the role, functions and functioning of human resource department of the organizations.
- Solve various HR issues using necessary skill set studied in HRM.
- To Identify and formulate various HRM processes such as Recruitment, Selection, Training, Development, Performance appraisals and Compensation Plans.
- To recommend the knowledge of HR concepts to take correct business decisions.
- Construct various policies for effective use of human in the organisation.

CO.14-BBA-302 Business Accounting

After completing this course, the students will be able to:

- Listing conceptual knowledge of recording the business information in books of accounts.
- Report the results of business using financial statements.
- Interpret the results of business for business decision making.
- Comparing results of business using Inter-firm and Intra-firm analysis.
- Assess the result of various accounting policies on accounting profits.
- Design accounting information system for a small business unit.

CO.15- BBA-303 Principles of Marketing Management:

After completing this course, the students will be able to:

- Listing the foundation terms, concepts and principles of marketing.
- Classifying the marketing environment and learn how to cope with changing marketing forces.
- Use the various essential tools and techniques for effective marketing practice.
- Examine relationship between marketing and other management functions.
- Illustrate various marketing decision related to product, price, place and promotions.

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- Recommending the various marketing strategies for Service Marketing, Rural marketing, Marketing Research, Advertisement and Sales Management etc.

CO.16- BBA 304:- Business Laws :

After completing this course, the students will be able to:

- Describing the nature of Contract Act 1872, capacity of parties, performance, discharge and remedies for breach of contract.
- Compare the types of contract, rights and obligation of the parties to the contract, types of negotiable instruments and three forms of grievance redressed machinery.
- Identify the salient features of consumer protection Act 2019
- Categorize the different types of cheque, holder and holder in due course.
- Recommendation for Dishonour and discharge of negotiable instruments

CO.17- BBA-305 Workshop on Contemporary Business Issues:

After completing this course, the students will be able to:

- Describing the domestic and international dimensions of the business environment.
- Listing the corporate social responsibility, performance, socialization and moral development.
- Classification of values, congruence and conflicts related to values.
- Identifying the corporate ethics and ethical dimensions of public affairs.
- Assessing the crisis management, social performance of corporate.

CO.18- BBA-306 Seminar on Knowledge Management:

After completing this course, the students will be able to:

- Enhancing the knowledge related to economy, leveraging economy.
- Outline the transformation of a enterprise through knowledge management.
- Illustrate of creating, sharing and momentum of knowledge.
- Examine the organization culture for knowledge management, and challenges.

CO.19-BBA-307 COMMUNICATION SKILLS IN PUNJABI:

After completing this course, the students will be able to:

CO-1: ਭਾਸ਼ਾਈ ਸਰੰਚਨਾ ਦੇ ਨੇਮਾਂ ਨੂੰ ਸਮਝਕੇ ਉਸ ਦੀ ਵਰਤੋਂ ਰੋਜਾਨਾ ਜ਼ਿੰਦਗੀ ਵਿੱਚ ਕਰਨਾ

CO-2: ਭਾਸ਼ਾ ਦੇ ਜਰੀਏ ਮਹੱਤਵੀ ਭਾਵਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰਨ ਦੇ ਯੋਗ ਹੋਣਾ

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CO-3: ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੇ ਭਾਸ਼ਾਈ ਵਿਕਾਸ ਦੇ ਵਿਭਿੰਨ ਪੜਾਵਾਂ ਨੂੰ ਸਮਝਣ ਦੀ ਚੇਤਨਾ

CO-4: ਮਨੁੱਖੀ ਹੋਂਦ ਦੇ ਸੈਕਟਾਂ ਦੀ ਨਿਸ਼ਾਨਦੇਹੀ ਅਤੇ ਉਹਨਾਂ ਦਾ ਯੋਗ ਹੋਲ ਲੱਭਣਾ

CO-5: ਸਾਹਿਤਕ ਰਚਨਾਵਾਂ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

Class: BBA-III Semester- IV

CO.20- BBA-401 Financial Management

After completing this course, the students will be able to:

- Listing the aim, scope and significance of finance function, sources of company finance.
- Discussion of theories and valuation of capital structure, cost of capital and capital budgeting.
- Assessing the SEBI guidelines for raising company finance.
- Recommend the working capital requirement, steps in responsibility accounting.
- Illustrating the planning of capital expenditure and its evaluation including risk and uncertainty.

CO.21- BBA-402 Workshop on Creativity & Innovation:

After completing this course, the students will be able to:

- Discussing the creativity in management, theories of creativity, role of computers in creativity.
- Illustrate the brainstorming, lateral thinking, synaptic idea generating methods.
- Assessing the need of market research, sources of ideas, and financial sources.
- Examine the case-histories of renowned companies.

CO.22-BBA-403 Seminar on Entrepreneurship:

After completing this course, the students will be able to:

- Describing the nature, characteristics, theories of entrepreneurship, role of government in setting of enterprises.
- Compare the class of entrepreneurship including women entrepreneurship, along with the socio economic environment and entrepreneurial behaviour.
- Assess the contribution of commercial banks in promoting and servicing small business, government policies and formalities in setting up a unit.
- Identify the basic requirements regarding registration, excise, sales


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tax and factory Act and SSlexemptions.

CO.23-BBA-406 Advertisement & Sales Management:

After completing this course, the students will be able to:

- List the nature and scope of advertising research, campaign planning strategic, sales management.
- Outline the knowledge about consumer behaviour, recruitment and selection process, training and development of sales personnel.
- Compare media planning of print, T.V, Radio, Cable and satellites, direct mail marketing.
- Discussing the creation of copy-testing, advertising budget.
- Illustrating Event management , advertising agencies and assessing the advertising effectiveness, performance of sales personnel.
- Planning a Carving territories, routing and scheduling, sales quotas.
- Examine the selling theories and process sales ethics and distribution.

CO.24- BBA-407: Marketing Of Services

After completing this course, the students will be able to:

- Describe the concept of goods and services, services marketing concept, features.
- List the need, significance of behavioural services aspiration.
- Outline the marketing segmentation, marketing information system for various services.
- Restate the meaning of service quality, its components and measurement.
- Investigate the Seven 'P' of service marketing and its management.
- Assess the services marketing in Banking, hotel, tourism, transport, personal care, hospital, education and consultancy marketing.

CO. 25- BBA-409: Training & development

After completing this course, the students will be able to:

- The training and development outcomes typically include enhanced communication skills, critical thinking, problem-solving abilities, leadership qualities, and a solid understanding of business concepts.
- Graduates should be well-prepared for entry-level managerial roles, demonstrating adaptability in diverse business environment

CO.26- BBA-423 Communication Skills In Punjabi

After completing this course, the students will be able to:

CO-1: ਕੁਪਕਾਰ ਨਿਬੰਧ ਰਾਹੀਂ ਜ਼ਿੰਦਗੀ ਦੀਆਂ ਤਲਖ ਹਕੀਕਤਾਂ ਸਮਝਣ ਦੇ ਯੋਗ ਹੋਣਾ

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CO-2: ਵਪਾਰਕ ਪੱਤਰ ਵਿਹਾਰ ਰਾਹੀਂ ਵਪਾਰਕ ਪੱਧਰ ਤੇ ਸਮਰਥ ਹੋਣਾ

CO-3: ਭਾਸ਼ਾ ਦੇ ਵਿਭਿੰਨ ਰੂਪਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਵਿੱਚ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਰੂਪ ਵਿੱਚ ਵਿਚਰਣ ਦੀ ਯੋਗਤਾ

CO-4: ਭਾਸ਼ਾ ਦੀ ਸਮਰੱਥਾ ਪਛਾਣਕੇ ਅੰਦਰਲੀ ਯੋਗਤਾ ਦਾ ਸਹੀ ਪ੍ਰਯੋਗ ਕਰਨਾ

CO-5: ਸਾਹਿਤਕ ਰਚਨਾਵਾਂ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

Class: BBA-III, Semester- V

CO.27- BBA-500: Communication Skills in Punjabi

After completing this course, the students will be able to:

CO-1: ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

CO-2: ਰੂਪਕਾਰ ਕਹਾਣੀ ਰਾਹੀਂ ਜਿੰਦਗੀ ਦੀਆਂ ਤਲਖ ਹਕੀਕਤਾਂ ਸਮਝਣ ਦੇ ਯੋਗ ਹੋਵੇਗਾ

CO-3: ਭਾਸ਼ਾ ਦੇ ਵਿਭਿੰਨ ਰੂਪਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਵਿੱਚ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਰੂਪ ਵਿੱਚ ਵਿਚਰਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੋਵੇਗੀ

CO-4: ਭਾਸ਼ਾ ਦੀ ਸਮਰੱਥਾ ਪਛਾਣਕੇ ਅੰਦਰਲੀ ਯੋਗਤਾ ਦਾ ਸਹੀ ਪ੍ਰਯੋਗ ਕਰਨਾ ਸਿੱਖਣਗੇ

CO-5: ਭਾਸ਼ਾਈ ਨੇਮਾਂ ਨੂੰ ਸਮਝਕੇ ਭਾਸ਼ਾਈ ਸੰਜਮਤਾ ਤੇ ਅਨੁਸ਼ਾਸਨ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਕਰਨਾ

CO.28- BBA-501: Business Research Methods

After completing this course, the students will be able to:

- Describe the Meaning, Objectives and Process of Research, Research Methods in Social Sciences, Exploratory, Descriptive and Experimental Research.
- Outline the Applications and Limitations of Research Methods and Sampling Design
- Explain Techniques for Data Collection; Primary and Secondary Sources, Primary Sources-Consumers and Trade Survey, Including Consumer Panels and Retail Auditing.
- Recommend the Qualitative Techniques of Data-Collection and application including questionnaire Designing and protesting.
- Assess difficulties in Measurement and Concepts of Validity and Reliability; Attitude Measurement General Methods; Scaling Techniques: Thurston, Likert, and Semantic Differentials.
- Construct Report Writing and Presentation.

CO.29- Bba-502: Workshop on Time and Workload Management

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After completing this course, the students will be able to:

- Relates with the Psychology of Time; Time as Finite Capital.
- Discuss the Developing the Right Attitude of Mind; Your Current Use of Mind; You and Your Tasks; You and Yourself
- Identifying Self Objectives and Their Methodologies for Completion; Your and Others. Task Management.
- Recommend Workload Management Systems; Managing Interruptions; Delegation; Managing Meetings; Working with a Secretary; Managing Stress; and Balancing Work and Home.
- Recommend Workload Management Systems; Managing Interruptions; Delegation; Managing Meetings; Working with a Secretary; Managing Stress; and Balancing Work and Home.

CO.30 - Bba-503: Seminar on Summer Internship

After completing this course, the students will be able to:

- Demonstrate confidence in their activities
- Develop effective communication skills.
- Demonstrate strong abilities of working in teams
- Identify strategies to adapt to different situations.
- Design and deliver effective presentations.

CO.31- Bba-505: Rural Marketing

After completing this course, the students will be able to:

- List the Nature and Scope of Rural Marketing with Special Reference to India
- Compare Buying Behaviour in Rural Markets.
- Classify Rural Marketing Information system
- Categorize the Rural Markets, Communication and Large Format Retail Stores.
- Prioritize the Study of Rural Markets Strategy in relation to Product, Pricing, Promotion and Distribution Strategy.
- Design the information technology for Rural Markets and Rural Market Research.

CO.32- Bba-506: Brand & product management

After completing this course, the students will be able to:

- The objective of this course is to learn fundamentals of Product and Brand Management. The aim of Product Management Part is to make participants understand competition at product level as well as brand level.
- Two broadly important aspects namely Product Management from competition point of view and Product Management from New Product Development and Innovation point of view are to be covered.

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- The objective of Brand Management is to make students understand principles of Branding, role of brands, elements and components of brands, brand equity etc.
- The main aim for Brand Management is to make sure that students understand implications of planning, implementing and evaluating Branding Strategies

CO. 33- Bba-506: Interpersonal skills in management

Students will be able to:

- Exhibit effective interpersonal communication in a variety of settings and effectively apply active listening skills.
- Perceive the listeners interpersonal need and Gain information about other individuals through communication.
- Build a context of understanding through communication And demonstrate respect for others' viewpoints.
- Maintain proper eye contact while communicating interpersonally.
- Exhibit de-escalatory behaviours in situations of conflict and Mediate between other conflicting parties.
- Demonstrate acknowledgment and validation of the feelings, opinions, and contributions of others.

CO.34- BBA-512: Investment Management

After completing this course, the students will be able to:

- To understand the investment objective and investment management.
- To learn to invest in securities and earn higher return.
- To learn to study the risk involved in security market its nature and return.
- To know the various insurance products, its business, brokers and end consumers.

Class: BBA-III.

Semester- VI

CO.35- BBA-601: Industrial Training Project

- Exposure to current work practices as opposed to possibly theoretical knowledge being taught at college.
- Predict the professional skills in a hands-on environment.
- Evaluate the skills students have developed in their time with the company.
- Inspect a practical perspective on the world of work.
- This interaction gave the students.
- Illustrate the skills interaction, working methods and employment practices

CO.36- BBA-602 Project Report

Describe the practical exposure got during the training.

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- List the learning during the industrial training.
- Describe the company in which students have attended the training.
- Uses the theatrical knowledge in solving the problems face by the training organisation.
- Illustrate the research tools like sampling techniques, statistic test etc.

CO.37- BBA-603 Seminar on the Project Report

- Demonstrate confidence in their activities.
- Develop effective communication skills.
- Demonstrate strong abilities of working in teams.
- Identify strategies to adapt to different situations.
- Design and deliver effective presentations.

CO.38- BBA-604 : Viva-Voce


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Course Outcomes: BCA

BCA-111: General English – I

After completion of this course, students will be able to:

CO-1: Generate their competence of both active and passive elements of the English language i.e., writing and speaking and listening and reading.

CO-2: Deepen their understanding of accurate usage of English grammar in writing and speaking.

CO-3: Enlarge their vocabulary by keeping a vocabulary lexicon.

CO-4: Learn to transform their native language into the target language.

CO-5: Learn to write accurate English essays and letters.

CO-6: Enhance their confidence by having translation drills and through speaking English practice sections.

BCA-112: Punjabi (Compulsory)

After completion of this course, students will be able to:

CO-1: ਭਾਸ਼ਾਈ ਸਰੰਚਨਾ ਦੇ ਨੇਮਾਂ ਨੂੰ ਸਮਝਕੇ ਉਸ ਦੀ ਵਰਤੋਂ ਰੋਜ਼ਾਨਾ ਜ਼ਿੰਦਗੀ ਵਿੱਚ ਕਰਨਾ

CO-2: ਭਾਸ਼ਾ ਦੇ ਜਰੀਏ ਮਨੁੱਖੀ ਭਾਵਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰਨ ਦੇ ਯੋਗ ਹੋਣਾ

CO-3: ਗੁਰਮੁਖੀ ਲਿੱਪੀ ਦੇ ਭਾਸ਼ਾਈ ਵਿਕਾਸ ਦੇ ਵਿਭਿੰਨ ਪੜਾਵਾਂ ਨੂੰ ਸਮਝਣ ਦੀ ਚੇਤਨਾ

CO-4: ਮਨੁੱਖੀ ਹੋਂਦ ਦੇ ਸੰਕਟਾਂ ਦੀ ਨਿਸ਼ਾਨਦੇਹੀ ਅਤੇ ਉਹਨਾਂ ਦਾ ਯੋਗ ਹੱਲ ਲੱਭਣਾ

CO-5: ਸਾਹਿਤਕ ਰਚਨਾਵਾਂ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ


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BCA-113: Fundamentals of Information Technology


Upon the completion of the course the learner will be able to

- CO-1: Familiarization with the types of computer, peripheral devices, memory management, multimedia and number system.
- CO-2: Learn about working of various input and output devices.
- CO-3: Learnt about binary number representation along with its operations.
- CO-4: Understand theoretical framework of internet and associated application of the internet.
- CO-5: Acquire the knowledge about the binary number representation along with its operations.
- CO-6: Understand of the role of computers in business, education and society.

BCA-114: Programming Fundamentals Using C

After completion of this course, students will be able to:

- CO-1: Understand of various concepts of programming language.
- CO-2: Develop logics and analytical ability solve problem.
- CO-3: Learn about procedural programming using functions.
- CO-4: Acquired various flow control statements.
- CO-5: Learn about various storage classes along with user defined data types.
- CO-6: Acquire knowledge of file handling
- CO-7: Work with arrays of complex structure data types.
- CO-8: Understanding a concept of functional hierarchical code organization.


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BCA-115: Software Lab-I

After completion of this course, students will be able to:

- CO-1:** Have basic knowledge of computer Hardware and Software.
- CO-2:** Understand business areas to which computers may be applied.
- CO-3:** Installation of Operating System (Windows), application software and to use Windows OS.
- CO-4:** Provide practical knowledge to Office tools (MS Word, Excel and Power Point).
- CO-5:** Use of MS-Word to type documents with various formatting.
- CO-6:** Creating and manipulating Datasheets for different applications.
- CO-7:** Designing effective presentations using Power Point software.

BCA-116: Software Lab-II

COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1:** Design algorithms and flowchart to solve programming problems.
- CO-2:** Write, compile and debug programs in C language. Use different data types, operators and console I/O function in a computer program.
- CO-3:** Design programs involving decision control statements, loop control statements and case control structures.
- CO-4:** Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
- CO-5:** Comprehend the concepts of structures and union: declaration, initialization and implementation.
- CO-6:** Use the file operations, character I/O, string I/O, file pointers, and create/update basic data files.

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BCA-121: General English-II

COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1: Enhance their competence in writing and speaking skills to the next level.
- CO-2: Make use of new lexical terms after going through verbs, adjectives and idioms.
- CO-3: Learn to write with the accurate use of Active and Passive voices after completing the taught exercises by the teacher.
- CO-4: Start writing in the reported speech that usually confuses the learner. The conversion of Direct Speech to Indirect Speech will create a crystal clarity to the learners.
- CO-5: Learn different type of sentences e.g. Affirmative, Negative, Interrogative, Assertive, Exclamatory and so on.
- CO-6: The next level drills of the translation will help the students to create new complex sentences from their mother tongue to the target language.

BCA-122: Punjabi (Compulsory)

COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1: ਰੂਪਕਾਰ ਨਿਬੰਧ ਰਾਹੀਂ ਜਿੰਦਗੀ ਦੀਆਂ ਤਲਖ ਹਕੀਕਤਾਂ ਸਮਝਣ ਦੇ ਯੋਗ ਹੋਣਾ
- CO-2: ਵਪਾਰਕ ਪੱਤਰ ਵਿਹਾਰ ਰਾਹੀਂ ਵਪਾਰਕ ਪੱਧਰ ਤੇ ਸਮਰੱਥ ਹੋਣਾ
- CO-3: ਭਾਸ਼ਾ ਦੇ ਵਿਭਿੰਨ ਰੂਪਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਵਿੱਚ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਰੂਪ ਵਿੱਚ ਵਿਚਰਣ ਦੀ ਯੋਗਤਾ
- CO-4: ਭਾਸ਼ਾ ਦੀ ਸਮਰੱਥਾ ਪਛਾਣਕੇ ਅੰਦਰਲੀ ਯੋਗਤਾ ਦਾ ਸਹੀ ਪ੍ਰਯੋਗ ਕਰਨਾ
- CO-5: ਸਾਹਿਤਕ ਰਚਨਾਵਾਂ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ


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BCA-123: Digital Electronics

COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1:** Acquire knowledge about Analog and Digital Systems and various digital logic gates.
- CO-2:** Distinguish between various number systems and their conversions and computer arithmetic.
- CO-3:** Develop K-Maps representation and simplification logic functions up to 4 variables.
- CO-4:** Understand, analyze and design various combinational and sequential circuits such as encoders, decoders and counters using multiplexers, and flip-flops.
- CO-5:** Describe analog to digital and digital to analog conversion circuits.

BCA-125: Basic Mathematics

COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1:** Understand the concept and solve complex numbers and quadratic equations.
- CO-2:** Understand and use of co-ordinate geometry in modern scientific computing.
- CO-3:** Apply Matrices and Determinants for solving problems appropriate problems.
- CO-4:** Familiar with representation of floating point number system, arithmetic operation and errors in normalized floating point numbers.
- CO-5:** Solve transcendental and simultaneous algebraic equations using different methods under different parameters.

BCA-124: Data and File Structures & BCA-126: Software Lab-III (based on BCA- 124)

After completion of this course, students will be able to:

- CO-1:** Be familiar with basic data structure and algorithms.
- CO-2:** Design and analyze programming problem statements
- CO-3:** Choose appropriate data structures and algorithms and use it to design algorithms for a specific problem.
- CO-4:** Handle operations like searching, insertion, deletion and traversing mechanism
- CO-5:** Come up with analysis of efficiency and proofs of correctness


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BCA-127: Drug Abuse: Problem, Management and Prevention***

COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1:** Understand the extent of the problem of Drug Abuse and its prevalence.
- CO-2:** Differentiate Drug Abuse from Drug Dependence and Drug Addiction.
- CO-3:** Gain conceptual understanding about Drug tolerance and examine the difference between Physical and Psychological dependence on drugs.
- CO-4:** Identify short and long term effects and withdrawal symptoms of drugs like stimulants, depressants: Alcohol, Barbiturates, Narcotics, hallucinogens, steroids and Inhalants.
- CO-5:** Analyze the nature of the problem of Drug abuse by learning about vulnerable age groups, Physical, academic, behavioral and Psychological indicators.
- CO-6:** Evaluate the Physiological, Psychological and Sociological causes of drug abuse along with its consequences for individuals, families, society and the nation.
- CO-7:** Understand the overview of Management and Prevention of Drug Abuse by visiting a Drug De-addiction Centre. The students will also be able to assess the role of Family, School, Media, Legislation and De-addiction Centers in combating the menace of Drug Abuse

BCA-211: English Communications Skills - I COURSE OUTCOMES

After completion of this course, students will be able to: **CO-1:** Write with competency with a critical and creative insight.

CO-2: The taught prescribed literature book Prose Parable will be an insightful source for the students that will help them in understanding social and moral philosophy.

CO-3: Start forming new dialogues with the given paragraphs that will give them new dimensions to their foresight and creativity.

CO-4: Write and speak with accuracy and precision after going through the exercises of error in the sentences.

CO-5: The topic 'Curriculum Vitae' taught by the teacher will make the learner conscious about their earned credentials and the potentials to be generated.

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BCA-212: Punjabi (Compulsory) COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1: ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ
- CO-2: ਰੂਪਕਾਰ ਕਹਾਣੀ ਰਾਹੀਂ ਜੀਵਨ ਦੀਆਂ ਤਲਖ ਹਕੀਕਤਾਂ ਸਮਝਣ ਦੇ ਯੋਗ ਹੋਵੇਗਾ
- CO-3: ਭਾਸ਼ਾ ਦੇ ਵਿਭਿੰਨ ਰੂਪਾਂ ਨੂੰ ਸਮਝਕੇ ਸਮਾਜ ਵਿੱਚ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਰੂਪ ਵਿੱਚ ਵਿਚਰਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੋਵੇਗੀ
- CO-4: ਭਾਸ਼ਾ ਦੀ ਸਮਰੱਥਾ ਪਛਾਣਕੇ ਅੰਦਰਲੀ ਯੋਗਤਾ ਦਾ ਸਹੀ ਪ੍ਰਯੋਗ ਕਰਨਾ ਸਿੱਖਣਗੇ
- CO-5: ਭਾਸ਼ਾਈ ਨੇਮਾਂ ਨੂੰ ਸਮਝਕੇ ਭਾਸ਼ਾਈ ਸੰਜਮਤਾ ਤੇ ਅਨੁਸ਼ਾਸਨ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਕਰਨਾ

BCA-213: Discrete Mathematics COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1: Learn the mathematical reasoning and important problem solving skills.
- CO-2: Understand the basic concepts of Set theory and foundation for imbedding logical reasoning in computer science.
- CO-3: Understand and create mathematical arguments.
- CO-4: Apply the concept of Graph and tree in practical applications.

BCA-214: Computer System Organization and Architecture COURSE OUTCOMES

After completion of this course, students will be able to:

- CO-1: Understand computer organization and its working, processing of an instruction by the CPU.
- CO-2: Understand the various other important component of a computer system like Memory, Registers, Arithmetic Logic unit, Control unit, Peripheral devices.
- CO-3 Learn the concepts related with execution of instructions, working of addressing modes, interface and its use in the working of peripheral devices, interrupt signals, direct memory access.
- CO-4: Learn the concepts related with digital electronics to understand the working of components like logic gates, flip flops, counters, and multiplexers etc., which are used to build computer.

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BCA-215: Object Oriented Programming using C++

After the completion of the course the learner will be able to CO-1: Understand the benefits of Object-Oriented Programming (OOP) as compare to Traditional Programming approach and resolve problem in domain of object- oriented programming.

CO-2: Familiarization with a widely range of features of object-oriented programming using C++

CO-3: Understand Object oriented approach for finding solutions to various problems with the help of C++ language.

CO-4: Understand the concept of polymorphism with the help function overloading and virtual functions.

CO-5: Acquire various types of various types and forms of inheritance.

CO-6: Understand basic of generic functions and classes.

BCA-216: Fundamentals of Database Management System Upon the completion of the course the learner will be able to

CO-1: Familiarization with various features and applications of Database Management system.

CO-2: Acquire knowledge about database languages (DDL, DML, DCL)

CO-3: Learn how to design a database by using different data models.

CO-4: Understand the database handling during execution of the transactions along with concurrent access.

CO-5: Ability to perform various types of SQL queries.

CO-6: Able to design a good database using normalization, decomposition and functional dependency

BCA-217: Software Lab – IV (Object Oriented Programming using C++ Lab) COURSE

OUTCOMES

After completion of this course, students will be able to:

CO-1: Understand the intricacies of Object Oriented Programming including the features and peculiarities of the C++ programming language.

CO-2: Illustrate the concept of Inheritance, operator overloading, and polymorphism.

CO-3: Implement various objects oriented concepts to solve practical problems.

CO-4: Apply the concepts of OOPs using C++ in programming.

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BCA-218: Software Lab – V (DBMS using MS-Access Lab) COURSE OUTCOMES

After completion of this course, students will be able to:

CO-1: Understand database concepts and importance of database design.

CO-2: Understanding the concepts of DBMS architecture.

CO-3: Understand the objectives of normalization and what role it plays in the database design process.

CO-4: Become proficient in creating and using tables, queries, reports and forms in MS-Access.

BCA-221: English Communications Skills - II COURSE OUTCOMES

After completion of this course, students will be able to:

CO-1: Increase their reading rate and cognition of fiction via the novel *The Old Man and The Sea*.

CO-2: Improve their reading fluency skills through extensive reading.

CO-3: Enlarge their vocabulary by keeping a vocabulary lexicon while dealing with literature.

CO-4: Enhance their level of understanding of sentences after having the revisions of Narration & Active and Passive voices

CO-5: Generate accuracy in writing and speaking skills.

BCA-222: Punjabi (Compulsory) COURSE OUTCOMES

After completion of this course, students will be able to:

CO-1: ਕਵਿਤਾ ਨੂੰ ਪੜ੍ਹਦਿਆਂ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ

CO-2: ਕਵਿਤਾ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਕਲਪਨਾ ਸ਼ਕਤੀ ਦਾ ਵਿਕਾਸ ਕਰੇਗੀ

CO-3: ਕਵਿਤਾ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀਆਂ ਸ਼ਬਦ ਦੀ ਸਮਝ ਅਤੇ ਸਮੱਰਥਾ ਬਾਰੇ ਪਰਤਾਂ ਬਾਰੇ ਸਹੀ ਅਰਥਾਂ ਬਾਰੇ ਜਾਨਣਗੇ

CO-4: ਗੁਰਮੁਖੀ ਲਿੱਪੀ ਦੀ ਵਿਕਾਸ ਪ੍ਰਕਿਰਿਆ ਨੂੰ ਪੜ੍ਹਦੇ ਹੋਏ ਵਿਦਿਆਰਥੀ ਭਾਸ਼ਾ ਅਤੇ ਲਿੱਪੀ ਦੇ ਆਪਸੀ ਸੰਬੰਧ ਬਾਰੇ ਸਮਝਣਗੇ

CO-5: ਲਿੱਪੀ ਨੂੰ ਸਮਝਣ ਤੋਂ ਬਾਅਦ ਭਾਸ਼ਾ ਦੀ ਸਮੱਰਥਾ ਪਛਾਨਣ ਦੇ ਵਿਕਾਸ ਪ੍ਰਕਿਰਿਆ ਨੂੰ ਪੜ੍ਹਦੇ ਹੋਏ ਵਿਦਿਆਰਥੀ ਭਾਸ਼ਾ ਅਤੇ ਲਿੱਪੀ ਦੇ ਆਪਸੀ ਸੰਬੰਧ ਬਾਰੇ ਸਮਝਣਗੇ

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BCA-223: Computer Networks COURSE OUTCOMES

After completion of this course, students will be able to:

CO-1: Understand the functions of different layers of TCP/IP and OSI reference models.

CO-2: Classify of networks-LAN, MAN and WAN.

CO-3: Identify and understand various techniques and modes of transmission media with real time applications.

CO-4: Understand the fundamentals of Network security.

BCA-224: Management Information System COURSE OUTCOMES

After completion of this course, students will be able to:

CO-1: Understand the concept of information, system, value of information, elements of a system and role of information system.

CO-2: Understand the classification of MIS.

CO-3: Experience various stages in the development of MIS and applications of Information Systems in functional areas of MIS.

CO-4: Have a clear idea about DSS and its difference from MIS.

BCA-225: Computer Oriented Numerical and Statistical Methods & BCA-227: Software Lab –

VI (Computer Oriented Numerical and Statistical Methods)

After completion of this course, students will be able to:

CO-1: Solve algebraic equations using different methods under different parameters.

CO-2: Be familiar with numerical integration and differentiation

CO-3: Analyze statistical data using measures of central tendency and dispersion.

CO-4: Calculate and interpret the methods of correlation and regression analysis.

CO-5: Implement numerical and statistical methods in C/C++.

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BCA-226: Relational Database Management System with Oracle & BCA-228: Software Lab – VII (Oracle Lab)

After completion of this course, students will be able to:

CO-1: Understand the core terminology of Relational Database Management System.

CO-2: Understand and apply the concept of Transaction Processing, Concurrency Control Mechanism, and Recovery system in database.

CO-3: Comprehend Relational Query Languages.

CO-4: Use SQL syntax for Data Administration, Manipulation and to query a database to retrieve information.

BCA-229: Environmental and Road Safety Awareness COURSE OUTCOMES

After completion of this course, students will be able to:

CO-1: Understand the structure and function of an ecosystem and ecosystem links between environmental components and their role.

CO-2: Recognize the importance of environment and the sustainable of natural resources.

CO-3: Use scientific reasoning to recognize and comprehend environment issues and evaluate potential solutions.

CO-4: Well versed with environmental protection laws in India. **CO-5:** Understand the concept and significance of Road safety.

BCA -311: English Literary Skills – I COURSE OUTCOMES

After completion of this course, students will be able to:

CO-1: Attain the intrinsic knowledge of human behaviour by reading Popular Short Stories book.

CO-2: By learning new words pertaining to places, trades, church, marriage, arts and science, the learners will have more knowledge of physical and social entities.

CO-3: The grammar book will create accuracy and precision in students' writings and conversation.

CO-4: Bring the students to a new advanced level of learning the English language.

CO-5: The prescribed lists of synonyms and antonyms will make the students more Director
selecting appropriate words for usage.

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BCA-312: System Analysis and Design COURSE OUTCOMES

After completion of this course, students will be able to: CO-1: Understand the term System in the real world.

CO-2: Understand all terms and concepts related with the various systems existing.

CO-3: Learn Computer functioning as a System.

CO-4: Understand all steps related with the creation of a System, starting from its analysis to its design to its implementation including the hardware software selection for the same.

BCA-313: System Software COURSE OUTCOMES

After completion of this course, students will be able to:

CO-1: Learn and understand the System at the level of the operating system that is System software.

CO-2: Understand System in terms of the processors, loaders and linkers.

CO-3: Learn the working of Compilers as well as their construction and use.

CO-4: Knowledge of various software tools like program developers, editors, debuggers and user interfaces.

BCA-314: Java Programming & BCA-316: Software Lab-IX After completion of this course, students will be able to:

CO-1: Design programs involving decision control statements, loop control statements and case control structures.

CO-2: Understand the implementation of arrays, and functions and apply the dynamics of memory by the use of memory management schemes.

CO-3: Comprehend the concepts of classes and objects: declaration, initialization and implementation.

CO-4: Apply basics of object oriented programming, polymorphism and inheritance, Exception Handling, Multithreading.

CO-5: Use the file operations, character I/O, string I/O, and create/update basic data files.

CO-6: Understand and learn the concepts of Applets.


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BCA-315: Web Designing using HTML and DHTML & BCA – 317: Software Lab- X

After completion of this course, students will be able to:

CO-1: Write and debug webpage using HTML and DHTML languages.

CO-2: Knowledge and Use of web publishing and phases related with the website development.

CO-3: Make use of knowledge related to links, addresses, images, and tables.

CO-4: Knowledge of various formatting options on HTML page and web site.

CO-5: Knowledge of Server Side programming.

BCA-318: Punjabi Compulsory or Punjabi Compulsory After completion of this course, students will be able to:

CO-1: ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਵਿਭਿੰਨ ਸਾਹਿਤਕ ਰੂਪਕਾਰਾਂ ਵਿੱਚ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ

CO-2: ਵਿਦਿਆਰਥੀ ਤਕਨੀਕ ਦੇ ਦੌਰ ਵਿੱਚ ਹੁੰਦੇ ਹੋਏ ਲੋਕਧਾਰਾਈ ਬੋਧ ਬਾਰੇ ਗਿਆਨ ਹਾਸਲ ਕਰਨਗੇ

CO-3: ਵਿਦਿਆਰਥੀਆਂ ਆਪਣੀਆਂ ਪਰੰਪਰਾਵਾਂ ਦਾ ਸਮਕਾਲ ਨਾਲ ਮੇਰ ਕੇ ਮੁਲਾਂਕਣ ਕਰਨ ਦੇ ਸਮਰਥ ਹੋਣਗੇ

CO-4: ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬ ਦੇ ਮੇਲਿਆਂ ਅਤੇ ਤਿਉਹਾਰਾਂ ਬਾਰੇ ਵਿਸਥਾਰ ਨਾਲ ਪਤਾ ਲੱਗੇਗਾ

CO-5: ਵਿਦਿਆਰਥੀ ਵਿਆਕਰਨ ਨੂੰ ਭਾਸ਼ਾ ਦੇ ਪ੍ਰਯੋਗ ਹਿੱਤ ਕੁਸ਼ਲਤਾ ਨਾਲ ਪ੍ਰਯੋਗ ਕਰਨਗੇ

BCA-321: English Literary Skills-II

After completion of this course, students will be able to:

CO-1: Gain not only innate insight of human behaviour but also the terms of drama by reading Short Plays book.

CO-2: By learning new words referring to death, war, science and nature, the students will have supplementary knowledge of material and nature elements.

CO-3: The grammar book will create accuracy and precision in students' writings and conversation.

CO-4: Bring the students to a new advanced level of learning the English language.

CO-5: The prescribed figure of speech i.e. verbs, adjectives and adverbs will make the students more polished in determining proper words for usage.


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BCA-322: E-Commerce

After completion of this course, students will be able to: CO-1: Understand E-commerce as a process.

CO-2: Learn the difference that exist between traditional and latest e-commerce procedures and outcomes.

CO-3: Understand the concepts and technologies like internet for implementation of e-commerce.

CO-4: Learn various consumer oriented e-commerce concepts in the form of models et oetera.

CO-5: Knowledge of advertisement and marketing using internet technology.

BCA-323: Operating Systems

After completion of this course, students will be able to:

CO-1: Learn the mechanisms of OS to handle processes and threads and their communication.

CO-2: Use different data types, operators and console I/O function in a computer program.

CO-3: Learn the mechanisms involved in memory management in contemporary OS.

CO-4: Gain knowledge on distributed operating system concepts that includes architecture, deadlock detection algorithms and agreement protocols.

CO-5: Understand different approaches to memory management.

CO-6: Understand the structure and organization of the file system

BCA-324: Software Engineering

On completion of this course, the students will be able to:

CO-1: Understand the basic concepts, models, life cycle of software development. CO-2: Learn higher level concepts like Re-engineering, Reverse Engineering, Forward Engineering, and CASE tools.

CO-3: Knowledge of all the steps of software engineering and their use and implementation in real problems

CO-4: Understanding of programming language and using it to develop software using Director of software development.

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BCA-326: Software Lab-XI

After completion of this course, students will be able to:

- CO-1: Understand the basic concepts related with the development of software.
- CO-2: Ability to develop software both at simple level as well as complex level.
- CO-3: Understand various models for software development.
- CO-4: Understand the life cycle of a software.
- CO-5: Learn higher level concepts like Re-engineering, Reverse Engineering, Forward Engineering, CASE tools.
- CO-6: Knowledge of all the steps of software engineering and their use and implementation in real problems
- CO-7: Understanding of programming language and using it to develop software using all stages of software development.

BCA-325: Web Designing using ASP.NET & BCA-327: Software Lab-XII After completion of this course, students will be able to:

- CO-1: Write, compile and debug programs using ASP.NET language.
- CO-2: Knowledge and Use of different data types, operators, loops and other control structures in web programming.
- CO-3: Design programs accepting user inputs and various other standard controls.
- CO-4: Understand the implementation of arrays, and events.
- CO-5: Comprehend the concepts of classes and objects: declaration, initialization and implementation.
- CO-6: Apply the various rich web features like file uploads, debugging, caching and deploying ASP.NET pages et cetera.
- CO-7: Understand and learn the concepts related with ASP.NET security, localizing ASP.NET applications.
- CO-8: Ability to develop programs to implement and use all the above specified concepts and features in programming.

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BCA-328: Punjabi (Compulsory) or Punjabi

After completion of this course, students will be able to:

- CO-1: ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸਾਹਿਤ ਦੇ ਰੂਪਕਾਰਾਂ ਵਿੱਚ ਕੁਝ ਪੈਦਾ ਹੋਵੇਗੀ
- CO-2: ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਅਤੇ ਰਚਨਾਤਮਕ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ
- CO-3: ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਵਿੱਚ ਅਨੁਵਾਦ ਕਰਦੇ ਹੋਏ ਭਾਸ਼ਾਈ ਸਾਂਝਾ ਅਤੇ ਵਖਰੇਵਿਆਂ ਬਾਰੇ ਜਾਨਣ ਦੇ ਸਮਰੱਥ ਹੋਣਗੇ
- CO-4: ਰੋਜਾਨਾ ਜ਼ਿੰਦਗੀ ਵਿੱਚ ਭਾਸ਼ਾਈ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ
- CO-5: ਸਿਵਲ ਪ੍ਰੀਖਿਆਵਾਂ ਵਿੱਚ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨ ਉਹਨਾਂ ਨੂੰ ਮਜ਼ਬੂਤ ਆਧਾਰ ਪ੍ਰਦਾਨ ਕਰੇਗਾ


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Course Outcomes: B.SC Non Medical

ਪਰਚਾ: ਨਾਜ਼ਮੀ ਪੰਜਾਬੀ

ਕੋਰਸ ਦਾ ਨਾਂ: ਬੀ.ਏ / ਬੀਐੱਸ.ਸੀ / ਬੀਐੱਸ.ਸੀ (ਬੀ.ਟੀ.) / ਬੀ.ਐਮ / ਬੀ.ਸੀ.ਏ / ਬੀ.ਏਐ / ਬੀ.ਐਨਐਮ

ਸੈਮਿਸਟਰ: ਪਹਿਲਾ

ਕੋਰਸ ਦੇ ਉਦੇਸ਼ :

ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਪੈਦਾ ਕੀਤੀ ਜਾਵੇਗੀ। ਬੌਧਿਕ ਪੱਧਰ ਤੇ ਵਿਕਾਸ ਕੀਤਾ ਜਾਵੇਗਾ। ਅਲੱਗ-ਨਾਅਲੱਗ ਰੁਚੀਆਂ ਪੈਦਾ ਕੀਤੀਆਂ ਜਾਣਗੀਆਂ। ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਆਪਣੀ ਮਾਂ ਬੋਲੀ ਵਿਚ ਸੰਚਾਰ ਕਰਨ ਲਈ ਉਤਸ਼ਾਹਿਤ ਕੀਤਾ ਜਾਵੇਗਾ। ਵਿਦਿਆਰਥੀਆਂ ਦੀਆਂ ਵਿਦਿਅਕ, ਬੌਧਿਕ ਅਤੇ ਸਰਬਪੱਖੀ ਪ੍ਰਤਿਭਾਵਾਂ ਨੂੰ ਉਤਸ਼ਾਹਿਤ ਕਰਨ ਵਿਸ਼ੇਸ਼ ਧਿਆਨ ਦੇਣਾ।

ਕੋਰਸ ਨਾਲ ਹੋਣ ਵਾਲੀਆਂ ਪ੍ਰਾਪਤੀਆਂ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ :

1. ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪੈਦਾ ਹੋਣਗੀਆਂ।
2. ਸਾਹਿਤ ਸਿਰਜਣ ਦੀ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ।
3. ਭਾਸ਼ਾ ਦੀ ਅੰਦਰੂਨੀ ਬਣਤਰ ਸੰਬੰਧੀ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੋਵੇਗਾ।

ਬੌਧਿਕ ਹੁਨਰ:

1. ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੋਚਣ ਸ਼ਕਤੀ ਵਿਚ ਵਾਧਾ ਹੋਵੇਗਾ।
2. ਅਲੱਗ-ਨਾਅਲੱਗ ਰੁਚੀਆਂ ਪੈਦਾ ਹੋਣਗੀਆਂ।
3. ਵਿਦਿਆਰਥੀ ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਦਾ ਗਹਿਨ ਅਧਿਐਨ ਕਰਨ ਦੇ ਕਾਬਿਲ ਹੋਣਗੇ।
4. ਕੋਈ ਵੀ ਸਾਹਿਤਕ ਰਚਨਾ ਦੇ ਕੇ ਉਸ ਵਿਚਲੇ ਵਿਸ਼ੇ ਨਾਲ ਸੰਬੰਧਿਤ ਪਦਾਰਥ ਉਜਾਗਰ ਕਰਨ ਦਾ ਹੁਨਰ ਵਿਕਸਿਤ ਕੀਤਾ ਜਾਵੇਗਾ।

ਅਮਲੀ ਹੁਨਰ:

1. ਇਸ ਪ੍ਰੋਗਰਾਮ ਦੇ ਜ਼ਰੀਏ ਪ੍ਰਾਪਤ ਕੀਤੇ ਗਿਆਨ ਨੂੰ ਵਿਦਿਆਰਥੀ ਵੱਖ-ਵੱਖ ਖੇਤਰਾਂ ਵਿਚ ਲਾਗੂ ਕਰ ਸਕਦੇ ਹਨ।
2. ਸਾਹਿਤ ਸਿਰਜਣ ਦੀ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ।
3. ਆਪਣੀ ਮਾਂ ਭਾਸ਼ਾ (ਪੰਜਾਬੀ) ਦੇ ਵਿਕਾਸ ਵਿਚ ਅਹਿਮ ਯੋਗਦਾਨ ਪਾਉਣਗੇ।

ਵਿਸ਼ੇ ਨੂੰ ਵਿਹਾਰਿਕ ਪੱਧਰ ਤੇ ਵਰਤਣ ਦਾ ਹੁਨਰ:

ਸਾਹੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕ ਵਿਚਲੇ ਲੇਖਾਂ ਦਾ ਗਹਿਨ ਅਧਿਐਨ ਕਰਕੇ ਵਿਦਿਆਰਥੀ ਉਸਾਰੂ ਸੋਚ ਅਤੇ ਪਾਰਦਰਸ਼ੀ ਨਜ਼ਰੀਏ ਨਾਲ ਸਮਾਜ ਵਿਚ ਵਿਚਰਣ ਦੇ ਯੋਗ ਹੋਣਗੇ। ਨਾਟ ਭਾਸ਼ਾ ਦੇ ਜ਼ਰੀਏ ਵਿਦਿਆਰਥੀ ਨਿਜੀ ਅਤੇ ਸਮਾਜਿਕ ਮਸ਼ਲਿਆਂ ਪ੍ਰਤੀ ਸੁਚੇਤ ਹੋਣਗੇ ਅਤੇ ਸਮਾਜ ਨੂੰ ਵੀ ਜਾਗਰੂਕ ਕਰਨ ਦੇ ਕਾਬਿਲ ਹੋਣਗੇ।

Course Name –English Compulsory

BA/B.com/B.Sc. SEMESTER I

Objective of the Course: Educate students in both the artistry and utility of the English language through the study of literature and other contemporary forms of culture. Develop their intellectual, personal and professional abilities.

GRAMMAR

- Simple present tense ☐ Be in the present tense ☐ Singular/plural forms of regular nouns ☐

Part of speech

LITERATURE

Understand a basic paragraph ☐ Scan for specific words in a text ☐ Know most sound-to-letter correspondences ☐ Write sentences using a limited vocabulary ☐ Write a paragraph using a limited vocabulary ☐ Copy a paragraph correctly

Course Outcomes:

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Knowledge and Understanding:

Knowledge of major literary works, genres and critical traditions

Understand and empathize with other cultures and people through exploring their literary traditions

- ☐ Knowledge of linguistic, literary, cultural contexts in which literature is written and read
- ☐ Understanding:
- ☐ Written and oral communication skills - ability to define audience, construct an argument, present an idea, and provide background information on a variety of issues
- ☐ Write and speak with clarity and precision, and learn the best methods to persuade an audience
- ☐ Detailed, balanced and rigorous examination of texts or spoken language and the ability to articulate interpretations to others
- ☐ Sensitivity to how communication is shaped by circumstances, authorship and intended audience
- ☐ Sensitivity to the power of language and its role in creating meaning
- ☐ A broad vocabulary and ability to use critical terminology appropriately
- ☐ Skills in a variety of research methods and the ability to accurately and appropriately present research

Intellectual, Cognitive / Analytical Skills :

- Write and speak with clarity and precision, and learn the best methods to persuade an audience
- Detailed, balanced and rigorous examination of texts or spoken language and the ability to articulate interpretations to others
- Sensitivity to how communication is shaped by circumstances, authorship and intended audience
- Sensitivity to the power of language and its role in creating meaning
- A broad vocabulary and ability to use critical terminology appropriately
- Skills in a variety of research methods and the ability to accurately and appropriately present research
- Awareness of how different social and cultural contexts affect the nature of language and meaning.

Practical Skills :

- ☐ Digital copywriter
- ☐ Editorial assistant
- ☐ English as a foreign language teacher
- ☐ Lexicographer
- ☐ Magazine journalist
- ☐ Newspaper journalist
- ☐ Publishing copy-editor/proofreader
- ☐ Secondary school teacher
- ☐ Web content manager
- ☐ Writer

Transferable Skills :

- ☐ **Setting schedules and working under deadline** - The bread and butter of an English major is meeting deadlines. That might mean reading 400 pages of Virginia Woolf and feminist literary criticism over five days, or conducting a research paper over a five-page term

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paper. Sometimes, it might mean cranking out a lengthy writing assignment on short notice. English majors routinely take on large projects that require them to manage their time efficiently, meet self-imposed deadlines, and work under time pressure to complete long- and short-term projects. Those skills are valuable in any workplace.

- ❑ **Communicating clearly and grasping tone** - Today, written communication reigns: email, instant messaging, texting, Twitter, Facebook, LinkedIn. That means writing skills are incredibly important. English majors know how to write crisply and concisely, and also have a strong grasp of tone. In business communications, for example, English majors will understand how to tailor their language to fit the company. English majors will also likely pick up the tone of an email from the boss or a client, and better understand what note to strike in the reply.
- ❑ **Thinking critically and arguing a point** - English majors are taught to rethink and question everything they read. Rarely is there one "right answer;" rather, there are many possible answers that can be interpreted and argued in different ways. "I think being able to take a work, a piece of literature, or anything in the written word and being able to analyze it and think about it and take it not necessarily at face value is something that can be used in many work settings," Goldman says. In learning to make an argument about a book, English majors are taught to pick a manageable topic, frame an argument, and present it effectively - skills that will serve them well for any workplace presentation or project.
- ❑ **Taking constructive criticism or "agreeing to disagree"** - Even though there's rarely one "right answer" in English, that doesn't mean everything is a right answer. Sometimes a professor will disagree with your point, or your argument will be discarded in favor of a classmate's. Goldman calls it the "ability to have healthy debate" and "understand how others argue their points." English majors learn to take constructive criticism.
- ❑ **Grammar and spelling** - Yes, this seems obvious, but far too few people these days have a solid knowledge of English grammar and a broad vocabulary. English majors love words. They know the difference between they're/their/there and why "less" is different from "fewer." Everyone makes typos once in a while, but you can be sure most English majors are producing clean copy.

Paper Name: Electricity and Magnetism

Class: B.Sc. (Non Med and C.Sc.) Semester: 1st

Objectives of the Courses:

1. Provide the student with a broad spectrum of physics courses.
2. Emphasize the role of physics in life and other discipline (Chemistry, Mathematics and Biology).
3. To cultivate skills at formulating and solving physics problems.
4. To develop familiarity with physical concepts and mathematical relations of electromagnetism.
5. Provide the student with different practical, intellectual and transferable skills.

Course Outcomes:

A. Knowledge and Understanding:

Students will:

- Know how to define a various branches of Electricity and Magnetism.
- Understand and explain the basic concepts associated with the electric and magnetic field (e.g. Biot Savart Law, Implications of Maxwell equations).

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other important laws of Electricity and Magnetism)

- Students will be able to understand basis of electricity and how does the things change in different situations.

B. Intellectual (Cognitive/ Analytical) Skills:

Students will be able to:

- Think critically about the theories of physics.
- Think critically about the contribution of various scientists in the particle world.
- Identify the different relations of momentum, energy, velocities etc.
- Think critically about the Maxwell relations.
- Think critically about the use of physics in our daily life.

C. Practical Skills:

Students will learn to:

- To practically demonstrate about applications of Faraday's law.
- To learn about Electricity and Magnetism and their applications.

D. Transferable skills:

Students will be able to:

- Use concepts of physics more effectively.
- Learn to think more creative as well as comparatively.
- Project Planning.
- Problem solving

Paper Name: Mechanics

Class: B.Sc. (Non Med and C.Sc.) Semester: 1st

Objectives of the Courses:

1. Provide the student with a broad spectrum of physics courses.
2. Emphasize the role of physics in life and other discipline (Chemistry, Mathematics and Biology).
3. To cultivate skills at formulating and solving physics problems.
4. To develop familiarity with physical concepts and mathematical relations of electromagnetism.
5. Provide the student with different practical, intellectual and transferable skills.

Course Outcomes:

Knowledge and Understanding:

Students will

- Understand basics formalism of Mechanics and its implications.
- Understand Foucault's Pendulum and motion of rigid bodies.
- Students will be able to understand motion of centre of mass.

Intellectual (Cognitive/ Analytical) Skills:

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Students will be able to:

- Think critically about the theories of physics.
- Think critically about the contribution of various scientists in the particle world.
- Identify the different relations of momentum, energy, velocities etc.
- Think critically about the use of physics in our daily life.

Practical Skills: Students will learn to:

- Study the characterizations of various applications of Ampere's Law
- To study the rigid body motions.
- To Understand behavior of Coupled Oscillator.

Transferable skills: Students will be able to:

- Use concepts of physics more effectively.
- Learn to think more creative as well as comparatively.
- project planning
- Problem solving

Course Name **CHEMISTRY (INORGANIC CHEMISTRY-I)**

Class: **B.Sc (Medical & Non-Medical)**

Semester: I

Objective of the course:

- This course is intended to provide the students an in-depth understanding of the basic concepts of Inorganic Chemistry.
- To know the atomic structure, arrangement of elements in the periodic table and the periodic properties.
- To identify the nature of chemical bond as well as the existence of special types of compounds through weak chemical forces.

Course Outcomes:

- Acquire knowledge and understanding of essential facts, concepts, principles and theories relating to the Inorganic Chemistry.
- To develop skills to evaluate, analyze and solve problems competently.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Course Name **CHEMISTRY (ORGANIC CHEMISTRY-I)**

Class: **B.Sc (Medical & Non-Medical)**

Semester I

Objective of the course:

1. This course is intended to provide the students an in-depth understanding of the basic

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- concepts of Organic Chemistry.
2. To understand the structure and bonding of organic compounds.
 3. To know the method of naming and preparation of organic compounds, stereochemistry and the mechanism of organic reactions.
 4. To understand the stereochemistry of aliphatic and aromatic hydrocarbons.

Course Outcomes:

- This course will equip the students with the necessary chemical knowledge concerning the fundamentals in the basic areas of Organic chemistry.
- To develop skills to evaluate, analyze and solve problems competently.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Class: B.Sc(Non Medical/Computer Science/Economics)/B.A

Course: Algebra Semester: I

Course Objectives:

The course on Algebra deals with advance topics on matrices viz. rank, eigen values, eigen vectors and homogeneous and non homogeneous systems, solution of cubic and bi-quadratic equations.

Course Outcomes:

A. Knowledge and Understanding:

- Understand all basic fundamentals of Matrices and vectors
- Learn to find rank of a matrix.
- Learn to solve linear system of equations (homogeneous and non homogeneous)
- Increasing Knowledge of the basic concepts of equations.
- Aware of a variety learning aids that can be used in the teaching of solving equations.
- Know how to transform the equation.
- Understand to solve cubic and bi-quadratic equations using Cardan, Descartes and Ferrari's method.

B. Intellectual(cognitive/Analytical) skills:

- Use the basic concepts of matrix algebra and vector, including linear dependence/independence, rank and nullity, for analysis of matrices and systems of linear equations.
- Use the characteristic polynomial to compute the eigen values and eigen vectors of a square matrix and use them to diagonalise matrices when this is possible; discriminate between diagonalizable and non-diagonalizable matrices.
- Orthogonally diagonalise symmetric matrices and quadratic forms.

C. General skills:

- Use questioning and explanation strategies to help students learn new concepts and to support students in their problem solving activities.
- Apply mathematical methods involving arithmetic, algebra to solve problems.
- Represent mathematical information and communicate mathematical reasoning symbolically and verbally.


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ਕੋਰਸ ਦਾ ਨਾਮ : ਮੁੱਢਲੀ ਪੰਜਾਬੀ

ਕੋਰਸ ਦਾ ਨਾਂ: ਬੀ.ਏ / ਬੀਐੱਸ.ਸੀ / ਬੀਐੱਸ.ਸੀ (ਬੀ.ਟੀ.) / ਬੀ.ਕਾਮ/ ਬੀ.ਸੀ.ਏ/ ਬੀ.ਵਾਕ/ ਬੀ.ਐਮਐਮ

ਸਮੇਸਟਰ - ਦੂਜਾ

- 1) ਕੋਰਸ ਦਾ ਉਦੇਸ਼ :- ਇਸ ਕੋਰਸ ਦਾ ਉਦੇਸ਼ ਵਿਦਿਆਰਥੀ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਮੁੱਢਲਾ ਗਿਆਨ ਦੇਣਾ ਜਿਸ ਨਾਲ ਉਹ ਭਾਸ਼ਾ ਦਾ ਸਹੀ ਰੂਪ ਵਿਚ ਉਚਾਰਨ ਤੇ ਵਿਆਕਰਣ ਬਾਰੇ ਮੁੱਢਲੇ ਤੌਰ ਤੇ ਚੰਗੀ ਜਾਣਕਾਰੀ ਪ੍ਰਾਪਤ ਕਰ ਸਕੇ। ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਬਣਤਰ ਬਾਰੇ ਦੱਸਦੇ ਹੋਏ, ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਦੀ ਪਹਿਚਾਣ ਅਤੇ ਵਰਤੋਂ, ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ ਦੀ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ ਬਾਰੇ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਗਿਆਨ ਦੇਣਾ ਹੈ।

ਇਸ ਪ੍ਰੋਗਰਾਮ ਨਾਲ ਹੇਠ ਵਾਲੀਆਂ ਪ੍ਰਾਪਤੀਆਂ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ

- 1) ਇਸ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਦੇ ਗਿਆਨ ਵਿਚ ਵਾਧਾ ਹੋਵੇਗਾ।
- 2) ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਤੇ ਪੰਜਾਬੀ ਵਾਕ ਬਣਤਰ ਬਾਰੇ ਜਾਣਕਾਰੀ।
- 3) ਆਪਣੀ ਮਾਤ ਭਾਸ਼ਾ ਪੰਜਾਬੀ ਚੰਗੀ ਤਰ੍ਹਾਂ ਜਾਣਕਾਰੀ ਤੇ ਸੁਧ ਉਚਾਰਨ ਕਰਨ ਵਿਚ ਕਾਮਯਾਬ ਹੋਣਗੇ ਅਤੇ ਉਨ੍ਹਾਂ ਦੇ ਅੰਦਰ ਹੋਰ ਭਾਸ਼ਾਵਾਂ ਸਿਖਣ ਤੇ ਸਮਝਣ ਦਾ ਹੌਸਲਾ ਹੋਰ ਵਧੇਗਾ।
- 4) ਬੱਚੇ ਆਪਣੀ ਮਾਂ-ਬੋਲੀ ਬਾਰੇ ਚੰਗੀ ਤਰ੍ਹਾਂ ਜਾਣਨਗੇ ਅਤੇ ਉਨ੍ਹਾਂ ਦੀ ਸ਼ਬਦਾਵਲੀ ਵਿਚ ਵਾਧਾ ਹੋਵੇਗਾ।

ਬੋਧਿਕ ਹੁਨਰ :

- 1) ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਸਹੀ ਰੂਪ ਵਿਚ ਸਮਝ ਸਕਣਗੇ ਅਤੇ ਉਸ ਬਾਰੇ ਖੁਦ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰਨ ਦੇ ਸਮਰੱਥ ਹੋਣਗੇ।
- 2) ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਵਿਆਕਰਣ ਰਾਹੀਂ ਸ਼ਬਦ ਜੋੜ, ਵਾਕ ਨੂੰ ਸਹੀ ਰੂਪ ਵਿਚ ਬਣਾ ਸਕਣਗੇ।
- 3) ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਤੇ ਸੱਭਿਆਚਾਰ ਨਾਲ ਜੁੜਣਗੇ।

ਅਮਲੀ ਹੁਨਰ (Practical skill)

Director
Aryabhatta College
Vill. Ghadema-Jodhpur
Bazakhana Road, Barnala

1) ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਸ਼ਬਦ ਜੋੜ, ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ, ਵਾਕ ਬਣਤਰ, ਨਾਵ-ਪੜਨਾਂਵ ਨੂੰ ਚਾਟ ਦੀ ਸਹਾਇਤਾ ਨਾਲ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰਨਾ ਸਿਖਾਇਆ ਜਾਵੇਗਾ।

2) ਵਿਦਿਆਰਥੀ ਨੂੰ ਪੰਜਾਬੀ ਵਿਆਕਰਣ ਦੀ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ ਲਈ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨਾਲ ਜੁੜੀਆਂ ਵੈਬਸਾਈਟ ਨਾਲ ਸਾਂਝ ਪਵਾਈ ਜਾਵੇਗੀ।

3) ਬਲੈਕ ਬੋਰਡ ਜਾਂ ਚਾਰਟ, ਨੋਟ ਬੁੱਕ ਉਪਰ ਨਾਂਵ, ਪੜਨਾਂਵ, ਕਿਰਿਆ, ਸਬੰਧ, ਯੋਜਕ ਵਾਕ ਬਣਤਰ ਦੀ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ ਆਦਿ ਦਾ ਵਰਗੀਕਰਨ ਕਰਨਾ ਸਿਖਾਇਆ ਜਾਵੇਗਾ।

ਵਿਦਿਆਰਥੀ ਦੀ ਪਰਖ ਲਈ ਉਹਨਾਂ ਨੂੰ ਸਮੇਂ ਸਮੇਂ ਉਪਰ ਸਵਾਲ ਜਵਾਬ ਕੀਤੇ ਜਾਣਗੇ। ਉਹਨਾਂ ਤੋਂ ਲਿਖਤ ਕਾਰਜ ਕਰਵਾਇਆ ਜਾਵੇਗਾ। ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਉਪਰ ਬੋਲਣ ਜਾਂ ਚਾਰਟ ਤੇ ਬਲੈਕ ਬੋਰਡ ਦੀ ਸਹਾਇਤਾ ਰਾਹੀਂ ਉਹਨਾਂ ਦੇ ਹੁਨਰ ਨੂੰ ਪਰਖਿਆ ਜਾਵੇਗਾ।

ਭਾਸ਼ਾ ਦੇ ਵਿਵਹਾਰਕ ਪੱਧਰ ਤੇ ਵਰਤਣ ਦਾ ਹੁਨਰ

1) ਭਾਸ਼ਾ ਨੂੰ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਢੰਗ ਨਾਲ ਵਰਤਣ ਦੇ ਯੋਗ ਹੋਣਗੇ।

2) ਪੰਜਾਬੀ ਦੇ ਨਵੇਂ ਸ਼ਬਦਾਂ ਤੇ ਵਾਕਾਂ ਨੂੰ ਬਣਾਉਣ ਵਿਚ ਸਮਰਥ ਹੋਣਗੇ।

3) ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਨੂੰ ਅਧਿਐਨ ਕਰਨ ਦੇ ਕਾਬਲ ਹੋਣਗੇ।

4) ਵਿਦਿਆਰਥੀ ਵਿਚ ਸੰਚਾਰ ਕਰਨ ਦਾ ਹੁਨਰ ਪਰਿਪੱਕ ਹੋਵੇਗਾ।

Director
Aryabhatta College
VIII, Ghuma-Jodhpur
Bazakhana Road, Barnala

ਪਰਚਾ: ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ

ਪ੍ਰੋਗਰਾਮ: ਬੀ.ਏ / ਬੀਐੱਸ.ਸੀ / ਬੀਐੱਸ.ਸੀ (ਬੀ.ਟੀ.) / ਬੀ.ਕਾਮ/ ਬੀ.ਸੀ.ਏ/ ਬੀ.ਵਾਕ/
ਬੀ.ਐਮਐਮ

ਸਮੇਸਟਰ - ਦੂਜਾ

ਕੋਰਸ ਦੇ ਉਦੇਸ਼ : ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਪੈਦਾ ਕੀਤੀ ਜਾਵੇਗੀ। ਬੌਧਿਕ ਪੱਧਰ ਤੇ ਵਿਕਾਸ ਕੀਤਾ ਜਾਵੇਗਾ। ਅਲੋਚਨਾਤਮਕ ਰੁਚੀਆਂ ਪੈਦਾ ਕੀਤੀਆਂ ਜਾਣਗੀਆਂ। ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਆਪਣੀ ਮਾਂ ਖੋਲੀ ਵਿਚ ਸੰਚਾਰ ਕਰਨ ਲਈ ਉਤਸ਼ਾਹਿਤ ਕੀਤਾ ਜਾਵੇਗਾ। ਵਿਦਿਆਰਥੀਆਂ ਦੀਆਂ ਵਿਦਿਅਕ ਬੌਧਿਕ ਅਤੇ ਸਰਬ-ਪੱਖੀ ਪ੍ਰਤਿਭਾਵਾਂ ਨੂੰ ਉਤਾਰਨ ਵੱਲ ਵਿਸ਼ੇਸ਼ ਧਿਆਨ ਦੇਣਾ।

ਇਸ ਪ੍ਰੋਗਰਾਮ ਨਾਲ ਹੋਣ ਵਾਲੀਆਂ ਪ੍ਰਾਪਤੀਆਂ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ :

- ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪੈਦਾ ਹੋਣਗੀਆਂ।
- ਸਾਹਿਤ ਸਿਰਜਣ ਦੀ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ।
- ਭਾਸ਼ਾ ਦੀ ਅੰਦਰੂਨੀ ਬਣਤਰ ਸੰਬੰਧੀ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੋਵੇਗਾ।

ਬੌਧਿਕ ਹੁਨਰ:

1. ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੋਚਣ ਸ਼ਕਤੀ ਵਿਚ ਵਾਧਾ ਹੋਵੇਗਾ।
2. ਅਲੋਚਨਾਤਮਕ ਰੁਚੀਆਂ ਪੈਦਾ ਹੋਣਗੀਆਂ।
3. ਵਿਦਿਆਰਥੀ ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਦਾ ਗਹਿਨ ਅਧਿਐਨ ਕਰਨ ਦੇ ਕਾਮਿਲ ਹੋਣਗੇ।
4. ਕੋਈ ਵੀ ਸਾਹਿਤਕ ਰਚਨਾ ਦੇ ਕੇ ਉਸ ਵਿਚਲੇ ਵਿਸ਼ੇ ਨਾਲ ਸੰਬੰਧਿਤ ਪਰਤਾਂ ਉਜਾਗਰ ਕਰਨ ਦਾ ਦੁਨਰ ਵਿਕਸਿਤ ਕੀਤਾ ਜਾਵੇਗਾ।

ਅਮਲੀ ਹੁਨਰ (Practical skill) :

1. ਸਾਹਿਤ ਸਿਰਜਣ ਦੀ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ।
2. ਆਪਣੀ ਮਾਂ ਭਾਸ਼ਾ (ਪੰਜਾਬੀ) ਦੇ ਵਿਕਾਸ ਵਿਚ ਅਹਿਮ ਯੋਗਦਾਨ ਪਾਉਣਗੇ।
3. ਵੱਖ ਵੱਖ ਨਾਇਕਾਂ ਦੀਆਂ ਜੀਵਨੀਆਂ ਪੜ੍ਹ ਕੇ ਵਿਦਿਆਰਥੀ ਪ੍ਰੇਰਿਤ ਹੋਣਗੇ।

Director
Aryabhatta College
Vijay Cheema-Jodhpur
Bazakhana Road, Barnala

Paper Name: Vibrations and Waves

Class: B.Sc. (Non Med and C.Sc.) Semester: 2nd

Objectives of the Courses:

1. Provide the student with a broad spectrum of physics courses.
2. Emphasize the role of physics in life and other discipline (Chemistry, Mathematics and Biology).
3. To cultivate skills at formulating and solving physics problems.
4. To develop familiarity with physical concepts and mathematical relations of vibration and waves.
5. Provide the student with different practical, intellectual and transferable skills.

Course Outcomes:

A. Knowledge and Understanding:

Students will:

- Know how to define various branches of Vibration and Waves.
- Understand and explain the basic concepts associated with Oscillation, simple harmonic oscillation, damped oscillations energy of oscillator (Mechanical and electrical), Waves.
- Students will understand and able to describe Oscillations and simple harmonic motion, and waves and standing waves.

B. Intellectual (Cognitive/ Analytical) Skills: Students will be able to:

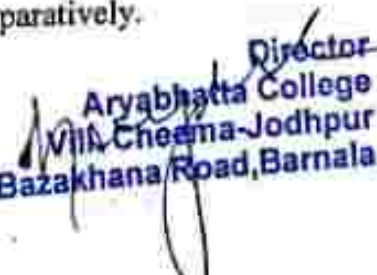
- Think critically about the theories of physics.
- Think critically about the contribution of various scientists in the particle world.
- Identify the different relations of displacement, velocities, acceleration and energy etc.
- Think critically about the basic motion of every particle in the Universe i.e vibration
- Think critically about the use of physics in our daily life.

C. Practical Skills: Students will learn to:

- To find the damping coefficient of a simple pendulum.
- To study Melde's experiment.
- To study Electrical oscillator.

D. Transferable skills: Students will be able to:

- Use concepts of physics more effectively.
- Learn to think more creative as well as comparatively.
- Project planning.
- Develop Problem solving attitude.


Director
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Vill. Cheema-Jodhpur
Bazakhana Road, Barnala

Paper Name: Relativity and Electromagnetism

Class: B.Sc. (Non Med and C.Sc.) Semester: 2nd

Objectives of the Courses:

1. Provide the student with a broad spectrum of physics courses.
2. Emphasize the role of physics in life and other discipline (Chemistry, Mathematics and Biology).
3. To cultivate skills at formulating and solving physics problems.
4. To develop familiarity with physical concepts and mathematical relations of electromagnetism.
5. Provide the student with different practical, intellectual and transferable skills.

Course Outcomes:

A. Knowledge and Understanding: Students will:

- Know how to define a various branches of Relativity And Electromagnetism.
- Understand and explain the basic concepts associated with the electric and magnetic field (eg. Boit Savart Law and Ampere's Law and their applications)
- Students will understand and able to describe the difference between the particles travelling with speed c light and with velocity very smaller than the speed of light.

B. Intellectual (Cognitive/ Analytical) Skills: Students will be able to:

- Think critically about the theories of physics.
- Think critically about the contribution of various scientists in the particle world.
- Identify the different relations of momentum, energy ,velocities etc.
- Think critically about the Maxwell relations.
- Think critically about the use of physics in our daily life.

C. Practical Skills: Students will learn to:

- Study the characterizations of various applications of Ampere's Law
- To study the variation of self and mutual inductance.

D. Transferable skills: Students will be able to:

- Use concepts of physics more effectively.
- Learn to think more creative as well as comparatively.
- project planning.
- Problem solving

Course Name CHEMISTRY (INORGANIC CHEMISTRY-II)

Class: B.Sc (Medical & Non-Medical)

Semester :II

Objective of the course:

- This course is intended to provide the students an in-depth understanding of the groups of elements in Inorganic Chemistry.
- To know the periodic properties of s, p and d block elements.
- To understand the physical and chemical properties of elements and their compounds.

Course Outcomes:

- Acquire knowledge and understanding of essential facts, concepts, principles and theories relating to the Inorganic Chemistry.
- To develop skills to evaluate, analyze and solve problems competently.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

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VIII. Chaitanya Jodhpur
Bazakhana Road, Barnala

Objective of the course:

1. This course is intended to provide the students an in-depth understanding of the basic concepts of Physical Chemistry.
2. To understand the physical aspects of chemical reactions.
3. To know the methods of evaluating the physical parameters .
4. To understand the numerical concepts.

Course Outcomes:

- This course will equip the students with the necessary chemical knowledge concerning the fundamentals in the basic areas of Physical chemistry.
- To develop skills to evaluate, analyze and solve problems competently.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Class: **B.Sc. (Non Medical/Computer Science/Economics)/B.A**

Course: **Calculus II**

Semester: **II**

Course Objectives:

This course introduces the student to integral calculus with the techniques of integration and application of integration to physical problem.

Course Outcomes:

A. Knowledge and Understanding:

- Extend the concept of integrals to a variety of applications, establishing several integration
- Use a variety of mathematical techniques to evaluate integrals
- Develop problem solving skills through diverse applications of the integral
- Analyze the parameterization of curves and the polar coordinate system

B. Intellectual(cognitive/Analytical) skills:

- Examine various techniques of integration and apply them to definite and improper integrals,
- Approximate definite integrals using numerical integration techniques and solve related problems,
- Model physical phenomena using partial differential equations,-
- Compute limits of, differentiate, integrate and solve related problems involving functions represented parametrically or in polar coordinates,
- Differentiate, and integrate functions represented using power series expansions, including Taylor series, and solve related problems.

C. Practical skills:

Students will be able to:

- Evaluate iterated integrals and switch the order of integration.
- Find volumes of solids by calculating appropriate double integrals in rectangular and polar coordinates.
- Find surface area using a double integral.

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- Evaluate triple integrals and use them to find volumes in rectangular, cylindrical and spherical coordinates.
- Use a Jacobian to make a change of variables in a double integral.

Department: Mathematics

Class: B.Sc (Non Medical/Computer Science/Economics)/B.A

Course: Calculus and Differential equations II Semester: II

Course Objectives:

This course provides an introduction to topics involving calculus and ordinary differential equations. Both Calculus and Differential equations have applications in all areas of applied Sciences and engineering. Upon completion, students will be able to understand the applications of differential and integral calculus and also demonstrate understanding of the theoretical concepts and select and use appropriate techniques for finding solutions to differential equations.

Course Outcomes:

A. Knowledge and Understanding:

- Write the definition of indefinite and definite integrals.
- Define the integral of the inverse trigonometric and hyperbolic functions.
- State the Fundamental theorem of calculus
- Find general solutions to first order, second order and higher order homogeneous and non-homogenous differential equations with constant and variable coefficients.
- find the series solution of differential equation

B. Intellectual(cognitive/Analytical) skills:

- Evaluate Indefinite integral involving hyperbolic functions and Definite integral of all the functions.
- Sketch the graph of curves (Cartesian and parametric co-ordinates)
- Calculate areas of plane regions and arc length.
- Select and apply appropriate methods to solve differential equations.
- Apply power series method to find solution of Differential equations involving Bessel and Legendre equations.
- Use fundamental theorem of calculus to evaluate integral involving algebraic and transcendental functions.

C. Practical skills:

- Present mathematics to others, both in oral and written form clearly and in a well organized manner.
- Have the ability to carry out complex calculations orally and mentally.

Director
Aryabhata College
Vill. Chedma-Jodhpur
Bazakhana Road, Barnala

ਪਰਚਾ: ਨਾਮੀ ਪੰਜਾਬੀ

ਕੋਰਸ ਦਾ ਨਾਂ: ਭੀ.ਏ / ਭੀਐੱਸ.ਸੀ / ਭੀ.ਭਾਮ ਸਮੇਸਟਰ: ਤੀਜਾ

ਕੋਰਸ ਦੇ ਉਦੇਸ਼ :

ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸਾਹਿਤ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਪੈਦਾ ਕੀਤੀ ਜਾਵੇਗੀ। ਬੋਧਿਕ ਪੱਧਰ ਤੇ ਵਿਕਾਸ ਕੀਤਾ ਜਾਵੇਗਾ। ਅਲਿੰਬਨਾਤਮਕ ਰੁਚੀਆਂ ਪੈਦਾ ਕੀਤੀਆਂ ਜਾਣਗੀਆਂ। ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਆਪਣੀ ਮਾਂ ਬੋਲੀ ਵਿਚ ਸੰਚਾਰ ਕਰਨ ਲਈ ਉਤਸ਼ਾਹਿਤ ਕੀਤਾ ਜਾਵੇਗਾ। ਵਿਦਿਆਰਥੀਆਂ ਦੀਆਂ ਵਿਦਿਅਕ, ਬੋਧਿਕ ਅਤੇ ਸਰਬਪੱਖੀ ਪ੍ਰਤਿਭਾਵਾਂ ਨੂੰ ਉਜਾਗਰ ਵੱਲ ਵਿਸ਼ੇਸ਼ ਧਿਆਨ ਦੇਣਾ।

Course Outcomes:

ਕੋਰਸ ਨਾਲ ਹੋਣ ਵਾਲੀਆਂ ਪ੍ਰਾਪਤੀਆਂ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ :

4. ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਪੈਦਾ ਹੋਣਗੀਆਂ।
5. ਸਾਹਿਤ ਸਿਰਜਣ ਦੀ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ।
6. ਭਾਸ਼ਾ ਦੀ ਅੰਦਰੂਨੀ ਬਣਤਰ ਸੰਬੰਧੀ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੋਵੇਗਾ।

ਬੋਧਿਕ ਹੁਨਰ:

5. ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੋਚਣ ਸ਼ਕਤੀ ਵਿਚ ਵਾਧਾ ਹੋਵੇਗਾ।
6. ਅਲਿੰਬਨਾਤਮਕ ਰੁਚੀਆਂ ਪੈਦਾ ਹੋਣਗੀਆਂ।
7. ਵਿਦਿਆਰਥੀ ਇਸੇ ਦੀ ਵਿਸ਼ੇ ਦਾ ਭਹਿਨ ਅਧਿਐਨ ਕਰਨ ਦੇ ਕਾਬਿਲ ਹੋਣਗੇ।
8. ਕੋਈ ਵੀ ਸਾਹਿਤਕ ਰਚਨਾ ਦੇ ਕੇ ਉਸ ਵਿਚਲੇ ਵਿਸ਼ੇ ਨਾਲ ਸੰਬੰਧਿਤ ਪਰਤੋਂ ਉਜਾਗਰ ਕਰਨ ਦਾ ਹੁਨਰ ਵਿਕਸਿਤ ਕੀਤਾ ਜਾਵੇਗਾ।

ਅਮਲੀ ਹੁਨਰ:

4. ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਨਾਟ ਕਲਾ ਅਤੇ ਫੀਕ ਮੰਚ ਪ੍ਰਤੀ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ।
5. ਸਾਹਿਤ ਸਿਰਜਣ ਦੀ ਰੁਚੀ ਪੈਦਾ ਹੋਵੇਗੀ।
6. ਆਪਣੀ ਮਾਂ ਭਾਸ਼ਾ (ਪੰਜਾਬੀ) ਦੇ ਵਿਕਾਸ ਵਿਚ ਅਹਿਮ ਯੋਗਦਾਨ ਪਾਉਣਗੇ।

ਦਿਸ਼ੇ ਨੂੰ ਵਿਹਾਰਿਕ ਪੱਧਰ ਤੇ ਵਰਤਣ ਦਾ ਹੁਨਰ:

ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕ ਵਿਚਲੇ ਲੇਖਾਂ ਦਾ ਭਹਿਨ ਅਧਿਐਨ ਕਰਕੇ ਵਿਦਿਆਰਥੀ ਉਸਾਰੂ ਸੋਚ ਅਤੇ ਪਾਰਦਰਸ਼ੀ ਨਜ਼ਰੀਏ ਨਾਲ ਸਮਾਜ ਵਿਚ ਵਿਚਰਣ ਦੇ ਯੋਗ ਹੋਣਗੇ। ਨਾਟ ਕਲਾ ਦੇ ਜ਼ਰੀਏ ਵਿਦਿਆਰਥੀ ਨਿੱਜੀ ਅਤੇ ਸਮਾਜਿਕ ਮਸਲਿਆਂ ਪ੍ਰਤੀ ਸੁਚੇਤ ਹੋਣਗੇ ਅਤੇ ਸਮਾਜ ਨੂੰ ਵੀ ਜਾਗਰੂਕ ਕਰਨ ਦੇ ਕਾਬਿਲ ਹੋਣਗੇ।

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ਕੋਰਸ ਦਾ ਨਾਂ - ਮੁੱਢਲੀ ਪੰਜਾਬੀ

ਕਲਾਸ - ਬੀ.ਏ / ਬੀਐੱਸ.ਸੀ / ਬੀਐੱਸ.ਸੀ (ਬੀ.ਟੀ.) / ਬੀ.ਕਾਮ / ਬੀ.ਸੀ.ਏ / ਬੀ.ਵਾਕ / ਬੀ.ਐਮਐਮ

ਸਮੇਸਟਰ - ਤੀਜਾ

ਕੋਰਸ ਦੇ ਉਦੇਸ਼: ਇਸ ਕੋਰਸ ਦਾ ਉਦੇਸ਼ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਬਾਰੇ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਕਰਨਾ ਹੈ ਤਾਂ ਜੋ ਉਹ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਪੜ੍ਹਨ ਤੇ ਲਿਖਣ ਦੇ ਯੋਗ ਹੋ ਸਕਣ। ਵਿਦਿਆਰਥੀਆਂ ਦੀਆਂ ਵਿੱਦਿਅਕ, ਬੋਧਿਕ ਅਤੇ ਸਰਵਪੱਖੀ ਪ੍ਰਤਿਭਾਵਾਂ ਨੂੰ ਉਤਾਰਨ ਅਤੇ ਉਘਾਤਨ ਵੱਲ ਵਿਸ਼ੇਸ਼ ਧਿਆਨ ਦੇਣਾ। ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਵਿਆਕਰਨਿਕ ਨੇਮਾਂ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਣਾ ਤਾਂ ਜੋ ਉਹ ਭਾਸ਼ਾ ਦਾ ਸਹੀ ਸੰਚਾਰ ਕਰ ਸਕਣ।

(ੳ) ਕੋਰਸ ਨਾਲ ਹੋਣ ਵਾਲੀਆਂ ਪ੍ਰਾਪਤੀਆਂ ਦੀਆਂ ਸੰਭਾਵਨਾਵਾਂ:-

- ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਲਿਖਣ ਤੇ ਪੜ੍ਹਨ ਦੇ ਯੋਗ ਬਣਨਗੇ।
- ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਵਿਆਕਰਨਿਕ ਨੇਮ ਵਿਧਾਨ ਤੋਂ ਜਾਣੂ ਹੋਣਗੇ ਤੇ ਸਹੀ ਤਰ੍ਹਾਂ ਇਹਨਾਂ ਦੀ ਵਰਤੋਂ ਦੇ ਯੋਗ ਹੋ ਸਕਣਗੇ।
- ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਪੜ੍ਹਨ ਤੇ ਲਿਖਣ ਵੱਲ ਆਕਰਸ਼ਿਤ ਹੋਣਗੇ।

(ਅ) ਬੋਧਿਕ ਹੁਨਰ:-

- ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸਾਹਿਤ ਨੂੰ ਪੜ੍ਹਨ ਦੇ ਯੋਗ ਹੋ ਸਕਣਗੇ ਤੇ ਉਹਨਾਂ ਦਾ ਸਮਾਜ ਪ੍ਰਤੀ ਚੰਗਾ ਨਜ਼ਰੀਆ ਬਣੇਗਾ।
- ਵੱਖ-ਵੱਖ ਪ੍ਰਦੇਸ਼ਾਂ ਤੋਂ ਆਏ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਪੜ੍ਹਨ ਦੇ ਨਾਲ-ਨਾਲ ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ ਨੂੰ ਵੀ ਸਮਝਣ ਦੇ ਯੋਗ ਹੋਣਗੇ।

(ੲ) ਅਮਲੀ ਹੁਨਰ:-

- ਹਫ਼ਤੇ ਦੇ ਛੇ ਦਿਨ ਲੈਕਚਰ।
- ਸਮੇਂ-ਸਮੇਂ ਵਿਦਿਆਰਥੀਆਂ ਤੋਂ ਮੌਖਿਕ ਅਤੇ ਲਿਖਤੀ ਟੈਸਟ ਲੇਏ।

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- ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਆਤਮ ਵਿਸ਼ਵਾਸ ਪੈਦਾ ਕਰਨ ਲਈ ਹਫ਼ਤੇ ਵਿਚ ਇਕ ਦਿਨ ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਉੱਪਰ ਵਿਚਾਰ ਵਟਾਂਦਰਾ ਕਰਨ ਲਈ ਕਹਿਣਾ।
- ਸਮੇਂ-ਸਮੇਂ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਲਾਇਬ੍ਰੇਰੀ ਲਿਜਾਣਾ ਤਾਂ ਜੋ ਉਹਨਾਂ ਅੰਦਰ ਪੁਸਤਕਾਂ ਪੜ੍ਹਣ ਦੀ ਜ਼ਕੀਅਤ ਪੈਦਾ ਹੋਵੇ।

(ਸ) ਵਿਸ਼ੇ ਨੂੰ ਵਿਹਾਰਕ ਪੱਧਰ ਤੇ ਵਰਤਣ ਦਾ ਹੁਨਰ:-

- ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਸੰਚਾਰ ਕਰਨ ਦਾ ਹੁਨਰ ਪਰਿਪੱਕ ਹੋਵੇਗਾ।
- ਭਾਸ਼ਾ ਨੂੰ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਢੰਗ ਨਾਲ ਵਰਤਣ ਦੇ ਯੋਗ ਹੋਣਗੇ।
- ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਸਹੀ ਤਰ੍ਹਾਂ ਲਿਖਣ ਦੇ ਯੋਗ ਹੋਣਗੇ।

Paper Name: Statistical Physics and Thermodynamics

Class: B.Sc. (Non Med and C.Sc.) Semester: 3rd

Objectives of the Courses:

This course introduces students to the fundamental concepts of building up complexity from elementary constituents in the framework of thermodynamics and statistical physics. Starting with an overview of the kinetic theory of gases, this course develops concepts in classical laws of thermodynamics and their application, postulates of statistical mechanics, statistical interpretation of thermodynamics. Various methods of statistical mechanics are used to develop the statistics for Bose-Einstein, Fermi-Dirac and photon gases; selected topics from low temperature physics and electrical and thermal properties of matter are discussed.

Learning Outcomes:

1. Explain statistical physics and thermodynamics as logical consequences of the postulates of statistical mechanics.
2. Apply the principles of statistical mechanics to selected problems.
3. Apply techniques from statistical mechanics to a range of situations.
4. Use the tools, methodologies, language and conventions of physics to test and communicate ideas and explanations
5. Use the tools, methodologies, language and conventions of physics to test and communicate ideas and explanation.
6. The major objective of the course is to impart knowledge about basic statistical physics properties and their relation with thermodynamics for understanding of various particle distributions in ensembles.
7. To cultivate skills at formulating and solving physics problems.
8. Provide the student with different practical, intellectual and transferable skills.

Course Outcomes:

Knowledge and Understanding:

The Students :

- ☐ Achieved the ability to explain the various statistical physics and their properties.
- ☐ Explain the various laws of thermodynamics and all the thermodynamical processes.

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along with their essential variables.

- ☐ Acquires knowledge of properties of carnot heat engine.
- ☐ Acquires knowledge of all quantum states and phase space..
- ☐ Describe the role of Bose Einstein Condensation and their all concepts in brief.
- ☐ read, understand and explain scholarly journal articles in statistical physics

A. Intellectual (Cognitive/ Analytical) Skills:

Students will be able to:

- ☐ Describe and analyses quantitatively processes, relationships and techniques related to the areas covered in the statistical physics course;
- ☐ Develop a clear understanding of the basic concepts in statistical mechanics physics.
- ☐ Use the physical knowledge to analyze a suitable technique to solve problems.
- ☐ Be able to outline the importance of statistical physics and its various applications in the modern society.

B. Practical Skills:

Students will learn to

- Apply appropriate mathematical techniques to solve statistical physics problems.
- Apply appropriate laboratory techniques to study particle distribution in phase space.
- Discuss applications of the topics included in the statistical physics course, and appreciate their relation to other topics in course components taken.
- Develop the ability of the students to conduct, observe, analyzes and report an experiment

C. Transferable skills:

Students will be able to:

- ☐ Use concepts of statistical mechanics physics more effectively.
- ☐ Learn to think more creative as well as comparatively.
- ☐ Apply logical analysis to problem solving;
- ☐ Contribute to the management of a group engaged in project work
- ☐ Develop the ability of the students to deal with various particle distributions classically as well as using quantum mechanics and formulas mathematically.
- ☐ Prepare and deliver a presentation and report of group work.
- ☐ Apply team-working skills to address a complex physics problem and contribute significantly to the work of a group tackling such a problem

Paper Name: Optics

Class: B.Sc. (Non Med and C.Sc.) Semester: 3rd

Objectives of the Courses:

This course introduces students to the fundamental concepts of optics. Optics is concerned with the genesis and propagation of light, the changes that it undergoes and produces, and other phenomena closely associated with it. There are two major branches of optics, physical and geometrical. Physical optics deals primarily with the nature and properties of light itself. Geometrical optics has to do with the principles that govern the image-forming properties of lenses, mirrors, and other devices that make use of light. It also includes optical data processing.

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which involves the manipulation of the information content of an image formed by coherent optical systems.

Learning Outcomes:

- ☐ The students will learn about superposition and interference, Diffraction, Reflection and Rarefaction.
- ☐ The students will learn about Polarization. They will learn about the difference between Linearly, Circularly and Elliptically polarized light.
- ☐ The students will learn about Scattering, Half Period Zones.

Knowledge and Understanding:

The Students

- ☐ Achieved the ability to explain the various optical phenomenon.
- ☐ Explain the various laws of Optics and all processes along with their essential variables.
- ☐ Read, understand and explain scholarly journal articles in Optics

Intellectual (Cognitive/ Analytical) Skills:

Students will be able to:

- ☐ Describe and analyses quantitatively processes, relationships and techniques related to the areas covered in the course
- ☐ Develop a clear understanding of the basic concepts in Optical Physics.
- ☐ Use the physical knowledge to analyze a suitable technique to solve problems.
- ☐ Be able to outline the importance of statistical physics and its various applications in the modern society.

Practical Skills:

Students will learn to

- Apply appropriate mathematical techniques to solve Optical Problems.
- Apply appropriate laboratory techniques to study Bright and Dark fringes.
- Develop the ability of the students to conduct, observe, analyzes and report an experiment

Transferable skills:

Students will be able to:

- ☐ Use concepts of Optical Physics more effectively.
- ☐ Learn to think more creative as well as comparatively.
- ☐ Apply logical analysis to problem solving;
- ☐ Contribute to the management of a group engaged in project work
- ☐ Prepare and deliver a presentation and report of group work.
- Apply team-working skills to address a complex physics problem and contribute significantly to the work of a group tackling such a problem.

Course Name **CHEMISTRY (ORGANIC CHEMISTRY-II)**

Class: **B.Sc (Medical & Non-Medical)**

Semester **III**

Objective of the course:

- This course is intended to provide the students an in-depth understanding of the stereochemistry of organic compounds.
- To provide a complete knowledge of nomenclature, structure and methods of

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preparation and chemical reactions of the compounds related to functional groups like alcohols, phenols, aldehydes and ketones.

Course Outcomes:

- This course will equip the students with the necessary chemical knowledge concerning the organic chemistry of functional groups.
- To develop skills to interpret and explain the mechanism of organic reactions involving different functional groups.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Course Name **CHEMISTRY (PHYSICAL CHEMISTRY-II)**

Class: **B.Sc (Medical & Non -Medical)**

Semester **III**

Objective of the course:

This course is intended:

- To provide the students an in-depth understanding of the basic concepts of thermodynamics discussing the fundamental laws.
- To provide a complete knowledge related to phase as well as chemical equilibrium while discussing various examples.

Course Outcomes:

- This course will help the students to acquire knowledge and understanding of basic concepts of thermodynamics as well as equilibrium in a detailed manner.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Class: **B.Sc. (Non Medical/Computer Science/Economics)/B.A**

Course: **Analysis Semester: III**

Course Objectives:

The aims of this course are to develop an understanding of convergence in its simplest setting to explain the difference between the sequence and series in the mathematical context to lay foundations for further investigation of infinite processes, in particular differential and integral calculus.

Learning outcomes:

A. Knowledge and Understanding:

- Students will have
 - An ability to work within an axiomatic framework.
 - Knowledge of some simple technique for testing the convergence of sequences and series and confidence in applying them.
 - An understanding of how the elementary functions can be defined by power series with

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an ability to deduce some of their easier properties.

B. Intellectual(cognitive/Analytical) skills:

- Express correctly the definitions of basic concepts from the course unit, for example the definition of the limit of a sequence.
- Decide on the correctness or otherwise of statements involving the basic concepts from the course unit, providing justifications or counter examples as appropriate.

C. Practical skills:

- Decide on convergence or divergence a wide class of series of real numbers or power series with real coefficient.
- A detailed understanding of how Cauchy's criterion for the convergence of real sequences and series follows from the completeness for \mathbb{R} and the ability to explain the steps in standard mathematical notation.

Class: B.Sc. (Non Medical/Computer Science/Economics)/B.A
Course: Analytical Geometry Semester: III

Course Objectives:

The aim of this course is to introduce the geometry of lines and conics in the Euclidean plane. Students can develop geometry with a degree of confidence and will gain fluency in the basics of Euclidean geometry. In this course, foundational mathematical training is also pursued. Curves studied include straight lines, ellipse, parabolas, hyperbolas and sphere. The course assumes a sound background in algebra, geometry and trigonometry.

Course Outcomes:

☐ **Knowledge and Understanding:**

Students will be able to:

- Parameterize curves.
- Evaluate the distance and angle.
- Sketch conic sections.
- Identify conic sections.
- Classify quadratic equations.

☐ **Intellectual(cognitive/Analytical) skills:**

On completion of this module, students should be able to:

- Establish rectangular coordinate system in the plane and in the space, express concept of vector both geometrically and analytically, understand operations on vectors and the properties of these operations.
- Estimate polar equations of conics and their graphs.
- Study of conics like ellipse, parabola and hyperbola.
- Express condition of parallel or perpendicular of the two lines.

Practical skills:

- Define conics and draw the graphs of conics such as ellipse, hyperbola, parabola and ellipse.
- Use the polar coordinate system, relate it to the rectangular coordinate system and graph equations using polar coordinates.
- Model real world situations with equations of conics.
- Determine equation of curves when given information that determines the curves.

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Paper Name: Quantum Mechanics

Class: B.Sc. (Non Med and C.Sc.) Semester: 4th

Objectives of the Courses:

1. Provide the student with a broad spectrum of physics courses.
2. Emphasize the role of physics in life and other discipline (chemistry, mathematics and biology).
3. To cultivate skills at formulating and solving physics problems.
4. To develop familiarity with the physical concepts and mathematical methods of quantum mechanics.
5. Provide the student with different practical, intellectual and transferable skills.

Course Outcomes:

A. Knowledge and Understanding:

Students will:

- ☐ Know how to define a various branches of Quantum Physics (eg. high energy physics, high particle physics, Molecular Physics).
- ☐ Understand and explain the basic concepts associated with the quantum physics (eg. Uncertainty principle, Normalization, Operators)
- ☐ Students will understand and able to describe the difference between classical (old) and quantum (new) physics.

B. Intellectual (Cognitive/ Analytical) Skills:

Students will be able to:

- ☐ Think critically about the theories of physics.
- ☐ Think critically about the contribution of various scientists in the particle world.
- ☐ Identify the different process of how individual atoms interact with one another.
- ☐ Think critically about the wave particle duality nature.
- ☐ Learn about degenerate states of same energy level.
- ☐ Think critically about the use of physics in our daily life.

C. Practical Skills:

Students will learn to:

- Study the characterizations of Photovoltaic cell.
- Determine the value of planck's constant.
- To study the absorption and rotational spectra.
- To study the variation of light intensity with distance.

D. Transferable skills:

Students will be able to:

- ☐ Use concepts of physics more effectively.
- ☐ Learn to think more creative as well as comparatively.
- ☐ Project planning.
- ☐ Problem solving

Paper Name: Atomic Spectra & Lasers

Class: B.Sc. (Non Med and C.Sc.) Semester: 4th

Objectives of the Courses:

This course introduces students to the fundamental concepts of Atomic Spectra & Lasers. When atoms are excited they emit light of certain wavelengths which correspond to different colors. The emitted light can be observed as a series of colored lines with dark spaces in between; this series of colored lines is called a line or atomic spectra. Each element produces a unique set of

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spectral lines. Since no two elements emit the same spectral lines, elements can be identified by their line spectrum. Laser is a device that stimulates atoms or molecules to emit light at particular wavelengths and amplifies that light, typically producing a very narrow beam of radiation. The emission generally covers an extremely limited range of visible, infrared, or ultraviolet wavelengths. Many different types of lasers have been developed, with highly varied characteristics. Laser is an acronym for "light amplification by the stimulated emission of radiation."

Learning Outcomes:

- ☐ The students will learn about Hydrogen atom spectra.
- ☐ The students will also learn about many electron spectra, LS coupling selection rules.
- ☐ The students will learn about Laser fundamentals and Laser systems.

Knowledge and Understanding:

The Students

- ☐ Achieved the ability to explain the various atomic spectra phenomena.
- ☐ Explain the various laws of Lasers and all processes along with their essential variables.
- ☐ Read, understand and explain scholarly journal articles in Laser Spectra

Intellectual (Cognitive/ Analytical) Skills:

Students will be able to:

- ☐ Describe and analyses quantitatively processes, relationships and techniques related to the areas covered in the course
- ☐ Develop a clear understanding of the basic concepts in Atomic Spectra and Lasers.
- ☐ Use the physical knowledge to analyze a suitable technique to solve problems.
- ☐ Be able to outline the importance of statistical physics and its various applications in the modern society.

Practical Skills:

Students will learn to

- Apply appropriate mathematical techniques to solve Laser Problems.
- Apply appropriate laboratory techniques to study Laser Spectra.
- Develop the ability of the students to conduct, observe, analyzes and report an experiment

Transferable skills:

Students will be able to:

- ☐ Use concepts of Atomic Spectra and Laser Physics more effectively.
 - ☐ Learn to think more creative as well as comparatively.
 - ☐ Apply logical analysis to problem solving;
 - ☐ Contribute to the management of a group engaged in project work
 - ☐ Prepare and deliver a presentation and report of group work.
- Apply team-working skills to address a complex physics problem and contribute significantly to the work of a group tackling such a problem.

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Course Name CHEMISTRY (ORGANIC CHEMISTRY-III)

Class: B.Sc (Medical & Non-Medical)

Semester IV

Objective of the course:

- This course is intended to provide the students an in-depth understanding of the stereochemistry of organic compounds.
- To provide a complete knowledge of nomenclature, structure and bonding, methods of preparation and chemical reactions of the compounds related to functional groups like carboxylic acids, ethers and epoxides, organic compounds of nitrogen.

Course Outcomes:

- This course will equip the students with the necessary chemical knowledge concerning the organic chemistry of functional groups.
- To develop skills to interpret and explain the mechanism of organic reactions involving different functional groups.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Course Name CHEMISTRY (INORGANIC CHEMISTRY-III)

Class: B.Sc (Medical & Non -Medical)

Semester IV

Objective of the course:

- This course is intended to provide the students an in-depth understanding of the coordination chemistry of inorganic compounds.
- To provide a complete knowledge of non aqueous solvents, oxidation and reaction behaviour, chemistry of lanthanoids and actinoids etc.

Course Outcomes:

- This course will equip the students with the necessary chemical knowledge concerning the biological properties of inorganic compounds.
- To develop skills to devise uses of inorganic compounds in medicine and industry.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Course: Solid Geometry Semester: IV

Class: B.Sc.(Non Medical/Computer Science/Economics)/B.A

Course Objectives:

This course provides an introduction of solid geometry that studies the size, shape, and position of 2-dimensional shapes and 3-dimensional figures.

Students will be able to identify geometric shapes in objects they use in their daily lives. Studying solid geometry provides many foundational skills and helps to build the thinking skills of logic, deductive reasoning, analytical reasoning, and problem-solving.

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Course outcomes:

A. Knowledge and Understanding:

- The method of using virtual reality in desktop application that is intended to be used for solid geometry
- Geometry covers a whole range of concepts which will be encountered in everyday life
- Show them examples of 2-D and 3-D shapes, such as a circle and a sphere
- Geometry has many practical applications like architects and interior designers need to use their geometry knowledge to guide their designs

B. Intellectual(cognitive/Analytical) skills:

- Allowing the systematic use of linear equations and matrix algebra, which are important for higher dimensions

C. Practical skills:

- 3-D Computer graphics revolutionized animation, Video games, graphics etc.
- Architectural designing is another area in which applications of solid geometry play a major role

Class: B.Sc. (Non Medical/Computer Science/Economics)/B.A

Course: Statics and Vector Calculus **Semester:** IV

Course Objectives:

This Course introduces the student to review vector arithmetic, distinguish point and vectors, relate geometric concepts to their algebraic representation, describe point, line, and planes, use the dot product and cross product and their applications in Graphics. In Statics, we deal with equilibrium of bodies under action of forces (bodies may be either at rest or move with a constant velocity)

Course Outcomes:

A. Knowledge and Understanding:

Students will be able to:

- Identify conservative vector fields.
- Find the divergence and curl of a vector field.
- Evaluate line integrals of curves and vector fields.
- Use Green's theorem to evaluate line integrals.
- Gradient vector fields and constructing potentials

B. Intellectual(cognitive/Analytical) skills:

On completion of this module, students should be able to:

- a) calculate vector and scalar derivatives of vector and scalar fields using the grad, div and curl operators in Cartesian and in cylindrical and spherical polar coordinates;
 - b) Use suffix notation to manipulate Cartesian vectors and their derivatives;
 - c) calculate multiple integrals in two and three dimensions including changing variables using Jacobians.
 - d) Calculate line and surface integrals and use the various integral theorems.
- Undertake the analysis of symmetric beams under vertical loads and torsion of cylindrical shafts

C. Practical skills:

- The integral ideas of the functions defined including line, surface and volume integrals - both derivation and calculation in rectangular, cylindrical and spherical coordinate systems and understand the proofs of each instance of the fundamental theorem of calculus.
- Examples of the fundamental theorem of calculus and see their relation to the fundamental theorems of calculus in calculus leading to the more generalised version of Stokes' theorem in the setting of differential forms.

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- The differential ideas of divergence, curl, and the Laplacian along with their physical interpretations, using differential forms or tensors to represent derivative operations.

Paper Name: Condensed Matter Physics

Class: B.Sc. (Non-Med. & C.Sc.) Semester: 5 th

Objective of the Course:

This course aims to establish fundamental concepts of crystal structures, diffraction, lattice vibrations and free electron theory of metals. It also aims to explore the students with principle, theory and mathematical calculations involved in crystal structure studies in detail.

Course content:

Crystal structure, Symmetry operations for a two and three dimensional crystal, Two dimensional Bravais lattices, Three dimensional Bravais lattices, Basic primitive cells, Crystal planes and Miller indices, Diamond and NaCl structure. Crystal Diffraction: Bragg's law, Experimental methods for crystal structure studies, Laue equations, Reciprocal lattices of SC, BCC and FCC, Bragg's law in reciprocal lattice, Brillouin zones and its construction in two and three dimensions, Lattice vibrations, Concepts of phonons, Free electron model of metals, Free electron, Band Theory: Kronnig- Penney model.

Course Outcomes :

A. Knowledge and understanding: Students will

- Have a basic knowledge of crystal structure and symmetry operations.
- Understand the concept of reciprocal lattice and be able to use it as a tool .
- Know the significance of grain boundaries .
- Know the fundamental principles of Fermi levels and band gap in semiconductors.

B. Intellectual (Cognitive/Analytical) skills: Students will

- be able to outline the importance of Brillouin zones.
- be able to perform structure determination of simple structures.
- Industrial applications.

C. Practical skills: Students will learn to:

- Apply appropriate mathematical techniques to solve different theories of lattice specific heat.
- Think in graphical terms and approximate terms when appropriate.
- Apply appropriate laboratory techniques to measure semiconductor properties.
- Understand the operation and characteristics of various semiconductors.

D. Transferrable skills:

- Communication skills.
- Thinking skills.
- Problem solving.

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Paper Name: Electronics

Class: B.Sc. (Non-Med. & C.Sc.) Semester: 5 th

Objective of the Course:

This course aims to establish fundamental concepts of basic electronics, concepts of current and voltage source, Diode and Transistor Characteristics. It also aims to explore the students with principle, theory and mathematical calculations involved in electronics aspect studies in detail.

Course content:

Concepts of current and voltage sources, p-n junction, Biasing of diode, V-I characteristics, Rectification: half wave, full wave rectifiers and bridge rectifiers, Efficiency, Ripple factor. Junction transistor : Structure and working relation between different currents in transistors, Sign conventions, Amplifying action, Different configurations of a transistor and their comparison, CB and CE characteristics, Working of CE amplifier, Amplifier analysis using h-parameters, Equivalent circuits, Determination of current gain, Power gain, Input impedance, FET amplifier and its voltage gain, Feed back in amplifiers Barkhausen criterion of sustained oscillations, LC oscillator (tuned collector, tuned base Hartley), RC oscillators, phase shift and Wein bridge.

What will be the teaching methods:

- Lectures: Three per week.
- Interactive classroom discussions.
- Assignments & Seminars.
- Power point presentations.

Program Learning Outcomes:

Knowledge and understanding:

Students will

- have a basic knowledge of how semi conductor electronics works..
- know the significance of Amplitude gain .
- know the fundamental principles of oscillators.

Practical skills:

Students will learn to:

- Apply appropriate mathematical techniques to solve diode equation and its implications.
- Think in graphical terms and approximate terms when appropriate.
- Apply appropriate laboratory techniques to measure semiconductor properties.
- Understand the operation and characteristics of various types of transistors.

Transferrable skills:

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- Communication skills.
- Thinking skills.
- Problem solving.

Course Name **CHEMISTRY (INORGANIC CHEMISTRY-IV)**

Class: **B.Sc (Medical & Non-Medical)**

Semester **V**

Objective of the course:

This course is intended:

- To provide the students an in-depth understanding of bonding and magnetic properties of transition metal complexes.
- To discuss various factors affecting the kinetic as well as thermodynamic stability, electronic spectra.
- To give brief introduction to organometallic compounds.

Course Outcomes:

- This course will equip the students with the necessary chemical knowledge concerning the inorganic chemistry of transition metal complexes.
- To develop skills to interpret and explain the bonding, magnetic as well as spectral properties of transition metal complexes.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Course Name **CHEMISTRY (PHYSICAL CHEMISTRY-III)**

Class: **B.Sc (Medical & Non-Medical)**

Semester **V**

Objective of the course: This course is intended:

- To provide the students an in-depth understanding of basic as well as advanced concepts of electrochemistry.
- To discuss the nuclear chemistry in detail including various laws governing the nuclear processes and various factors affecting them.
- To give brief introduction to spectroscopy discussing rotational and vibrational spectroscopy and electronic spectrum.

Course Outcomes:

- To understand the inter conversion of chemical and electrical energy and to link thermodynamics with electrochemistry.
- To apply the concepts of electrochemistry, spectroscopy to different chemical processes as well as in practicals.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

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Class: B.Sc.(Non Medical/Computer Science/Economics)/B.A

Course: Dynamics Semester: V

Course Objectives:

This course aims to equip the student with fundamental knowledge of dynamics of machines so that student can appreciate problems of dynamic force balance, transmissibility of forces, isolation of systems and vibrations. The overall objective of this course is to learn how to analyze the motions of mechanisms, design mechanisms to have given motions and analyze forces in machines.

Learning outcomes:

A. Knowledge and Understanding:

Students will be able to

- Understand the set of physical laws, describing the motion of bodies, under the influence of system of forces.
- Understand and use basic terms for the description of the motion of particles, vector functions and the fundamental laws of Newtonian mechanics.
- Solve mechanics problems in one dimension that involve one or more of the forces of gravity, friction and air resistance.
- understand the concept of terminal speed, and use it in solving mechanics problems in one dimension

B. Intellectual(cognitive/Analytical) skills:

- Analyze the applications of mathematics to the problems in physics & develop suitable mathematical method for such application.
- Solve problems relating to the motion of a projectile in the absence of air resistance

C. Practical skills:

- Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
- Solve mechanics problems in one dimension that involve one or more of the forces of gravity, friction and air resistance.

Class: B.Sc. (Non Medical/Computer Science/Economics)/B.A

Course: Number theory Semester: V

Course Objectives:

The objective of this course is the study of basic structure and properties of integers. Learning number theory helps improving one's ability of mathematical thinking. The objectives for this course are to expose students to this beautiful theory, to understand what inspired this quote from Gauss and to allow students to experience mathematics as a creative, empirical science.

Learning Outcomes:

A. Knowledge and Understanding:

Students will be able to

- Explore the use of arithmetical functions, the Mobius function and the Euler totient function.
- Solve systems of linear congruences with different moduli using the Chinese Remainder Theorem.
- Prove results involving divisibility and greatest common divisors.

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B. Intellectual(cognitive/Analytical) skills:

- Enhance and reinforce the student's understanding of concepts through the use of technology when appropriate.
- Apply Euler-Fermat's Theorem to prove relations involving prime numbers.

C. General skills:

- Analyze the structure of real-world problems and plan solution strategies.
- Communicate quantitative data verbally, graphically, symbolically and numerically.
- Use mathematical concepts in problem-solving through integration of new material and modeling.

Paper Name: Nuclear Physics

Class: B.Sc. (Non-Med. & C.Sc.) Semester: 6 th

Objective of the Course:

This course aims to establish fundamental concepts of nucleus and its properties. The course will also emphasize upon various nuclear models. The Nuclear Physics is the study of protons and neutrons at the centre of an atom and the interactions that hold atom together in a space just a few femtometers (10-15 meters) across.

Course content:

The students will learn about nuclear properties, radioactive decays, nuclear reactions and various nuclear models. The students will learn about shell model, nuclear radius, radioactive decays. The students will learn about parity violation, beta alpha and decay. Nuclear forces, Yukawa theory and quadruple moment and other nuclear feature will be part of the discussion in the course.

What will be the teaching methods:

- Lectures: Three per week.
- Interactive classroom discussions.
- Assignments & Seminars.
- Power point presentations.

Course Outcomes:

Knowledge and understanding:

Students will

- have a basic knowledge of how nuclear forces work..
- know the significance of radioactive decay.
- know the fundamental principles of Nuclear Reactions.

Practical skills: Students will learn to:

- Apply appropriate mathematical techniques to solve nuclear equation and its implications.
- Think in graphical terms and approximate terms when appropriate.
- Apply appropriate laboratory techniques to measure nuclear properties.
- Understand the operation and characteristics of radioactive decays.

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Transferrable skills:

- Communication skills.
- Thinking skills.
- Problem solving.

Paper Name: Radiation and Particle Physics

Class: B.Sc. (Non-Med. & C.Sc.) Semester: 6 th

Objective of the Course:

This course aims to establish fundamental concepts of radiation and particle physics. Radiation, flow of atomic and subatomic particles and of waves, such as those that characterize heat rays, light rays, and X rays. All matter is constantly bombarded with radiation of both types from cosmic and terrestrial sources. This article delineates the properties and behavior of radiation and the matter with which it interacts and describes how energy is transferred from radiation to its surroundings. The course will cover a range of detectors to be used for detecting various types of radiations. The course will also cover high energy physics because many elementary particles do not occur under normal circumstances in nature, but can be created and detected during energetic collisions of other particles, as is done in particle accelerators. These include atomic constituents such as electrons, protons, and neutrons (protons and neutrons are actually composite particles, made up of quarks), particles produced by radiative and scattering processes, such as photons, neutrinos, and muons, as well as a wide range of exotic particles.

Course content:

The students will learn about interaction of radiation and charged particles with matter. It will cover nuclear radiation detection and accelerators. The course will also cover elementary particles and their interactions. The students will learn about Quark model and quantum numbers related to various conservation laws.

What will be the teaching methods:

- Lectures: Three per week.
- Interactive classroom discussions.
- Assignments & Seminars.
- Power point presentations.

Course Outcomes:

Knowledge and understanding:

Students will

- have a basic knowledge of nuclear radiation and its properties.
- know the significance of accelerators.
- know the fundamental properties of elementary particles.

Practical skills:

Students will learn to:

- Apply appropriate mathematical techniques to solve radiation equations.
- Think in graphical terms and approximate terms when appropriate.
- Apply appropriate laboratory techniques to measure elementary particle properties.
- Understand the operation and characteristics of radiation detectors.

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Transferrable skills:

- Communication skills.
- Thinking skills.
- Problem solving.

Course Name **CHEMISTRY (PHYSICAL CHEMISTRY-IV)**

Class: **B.Sc (Medical & Non -Medical)**

Semester **VI**

Objective of the course: This course is intended:

- To provide the students an in-depth understanding of the basic concepts of quantum mechanics.
- To provide a complete knowledge related to solid state and photochemistry.

Course Outcomes:

- This course will help the students to acquire knowledge and understanding of basic concepts of quantum chemistry in a detailed manner.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Course Name **CHEMISTRY (ORGANIC CHEMISTRY-IV)**

Class: **B.Sc (Medical & Non-Medical)**

Semester **VI**

Objective of the course: This course is intended:

- To provide the students an in-depth understanding of spectroscopy of organic compounds.
 - To discuss various spectroscopic techniques and spectral analysis.
 - To give complete knowledge of amino acids, peptides and nucleic acids.
- Course Outcomes:**


- This course will equip the students with the necessary knowledge concerning uses of spectroscopic techniques.
- To develop skills to interpret and explain the spectra.
- The students will be able to pursue their career objectives in higher education, scientific research and teaching.

Class: **B.Sc. (Non Medical/Computer Science/Economics)/B.A**

Course: **Numerical Analysis Semester: VIth**

Course Objectives:

This course aims to provide a first approach to the subject of algebra, which is one of the basic pillars of modern mathematics. The focus of the course will be the study of certain structures called groups, rings, fields and some related structures. Abstract algebra gives to student a good mathematical maturity and enables to build mathematical thinking and skill.


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Course Outcomes:

A. Knowledge and Understanding:

Students will know how

- Solve an algebraic or transcendental equation using an appropriate numerical method.
- Approximate a function using an appropriate numerical method.
- solve a differential equation using an appropriate numerical method
- evaluate a derivative at a value using an appropriate numerical method
- code a numerical method in a modern computer language

B. Intellectual/cognitive/Analytical skills:

- Derive numerical methods for approximating the solution of problems of continuous mathematics,
- Analyze the error incumbent in any such numerical approximation,
- Implement a variety of numerical algorithms using appropriate technology.
- Compare the viability of different approaches to the numerical solution of problems arising in roots of solution of non-linear equations, interpolation.
- And approximation, numerical differentiation and integration, solution of linear systems.

C. Transferable skills:

- solve a linear system of equations using an appropriate numerical method
- Problem solving and Analytical skills
- Be able to develop numerical literacy
- Social responsibility and global citizenship skills

Class: B.Sc. (Non Medical/Computer Science/Economics)/B.A

Course: Linear Algebra Semester: VI

Course Objectives:

Algebraic structures -- such as groups, rings, and fields -- are pervasive in mathematics. This course focuses on (commutative) rings, which are sets equipped with two (commutative) operations (called addition and multiplication), and that contain an additive identity and an additive inverse for each element of the set. A fundamental example of a ring is \mathbb{Z} , the set of integers; other important examples include \mathbb{Q} , \mathbb{Z} modulo n , and $\mathbb{Q}[X]$, which is the set of polynomials in X with rational Coefficients.

Course Outcomes:

A. Knowledge and Understanding: Students will be able to

- Develop an understanding of linear algebra in mathematics, natural and social sciences.
- Use matrix algebra to analyze and solve equations arising in many applications that require a background in linear algebra.
- Utilize vector space terminology and describe how closely other vector spaces resemble \mathbb{R}^n .

B. Intellectual/cognitive/Analytical skills:

- Demonstrate factual knowledge of the fundamental concepts of spanning, linear independence, and linear transformations.
- Acquire communication and organizational skills, including effective written communication in their weekly assignments.
- Use visualization, spatial reasoning as well as geometric properties and strategies to

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mode, solve problems and view solutions especially in R^2 and R^3 .

C. General skills:

- Apply mathematical methods involving arithmetic, algebra, geometry and graphs to solve problems.
- Represent mathematical information and communicate mathematical reasoning symbolically and verbally.
- Interpret and analyze numerical data, mathematical concepts and identify patterns to formulate and validate reasoning.

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Course Outcomes: M.A Economics

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: MICRO ECONOMICS ANALYSIS	Course Code ECOM21101T
Course Outcomes: It provides knowledge about the theories of micro economics	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: MACRO ECONOMICS ANALYSIS	Course Code ECOM21102T
Course Outcomes: It provides knowledge about the theories of macro economics	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Basic Quantitative Method	Course Code ECOM21103T
Course Outcomes: It provides knowledge about the theories of basic quantitative method	
Program Name: Master of Economics	Program Code ECOM2PUP
Course Name Economics of Growth And Development	Course Code ECOM21104T
Course Outcomes: It provides knowledge about the theories of growth and development.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name Economics of Agriculture	Course Code ECOM21105T
Course Outcomes: It provides the knowledge about the theory and current status of agriculture in India.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economics of Industry	Course Code ECOM21106T
Course Outcomes: It acquaints the students in the theories of Industrial Economics.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economics of Labour	Course Code ECOM21107T
Course Outcomes: It provides the knowledge about theories in labour market.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: History of Economic Thought	Course Code ECOM21108T
Course Outcomes: It provides the knowledge about the historical changes and development of economic theory.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economics of Demography	Course Code ECOM21109T

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Course Outcomes: It provides the knowledge about the structure of demography and its impact on economic development.

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economics of Gender and Development	Course Code ECOM21110T
Course Outcomes: It provides the knowledge about the relationship between gender and development.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economic History of India and U.S.S.R.	Course Code ECOM21111T
Course Outcomes: It provides the knowledge about the historical changes in India and U.S.S.R.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: : MICRO ECONOMICS ANALYSIS	Course Code ECOM21201T
Course Outcomes: It provides further knowledge about the theories of micro economics	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: MACRO ECONOMICS ANALYSIS	Course Code ECOM21202T
Course Outcomes: It provides knowledge about the theories of macro economics	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Basic Quantitative Method	Course Code ECOM21203T
Course Outcomes: It provides advance knowledge about the theories of Basic Quantitative Method	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name Economics of Growth and Development	Course Code ECOM21204T
Course Outcomes: it provides knowledge about the advanced theories of growth and development	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economics of Agriculture	Course Code ECOM21205T
It provides the knowledge about the theory and current status of agricultural economics.	

Program Name: Master of Economics	Program Code ECOM2PUP
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Course Name: Economics of Industry	Course Code ECOM21206T
Course Outcomes: It provides further knowledge in the theories of Industrial Economics	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economics of Labour	Course Code ECOM21207T
Course Outcomes: It provides further knowledge about theories in labour market.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: History of Economic Thought	Course Code ECOM21208T
Course Outcomes: It provides further knowledge about the historical changes and development of economic theory.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economics of Demography	Course Code ECOM21209T
Course Outcomes: it provides further knowledge about the structure of demography and its impact on economic development.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economics of Gender and Development	Course Code ECOM21210T
Course Outcomes: It provides further knowledge about the relationship between gender and development.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Economic History of India and U.S.S.R.	Course Code ECOM21211T
Course Outcomes: It provides further knowledge about the historical changes in India and U.S.S.R.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Political Economy of Development	Course Code ECOM22301T
Course Outcomes: It provides further knowledge in the theories of political economy	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Evolution And Structure of Indian Economy	Course Code ECOM22302T

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Course Outcomes: It provides the knowledge about the structure of Indian economy.
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Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Public Economics	Course Code: ECOM22303T
Course Outcomes: It provides knowledge in the theories of Public Economics.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: International Economics	Course Code ECOM22304T
Course Outcomes: It provides the knowledge about the international markets and theories.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Regional Economics and Punjab Economy	Course Code ECOM22305T
Course Outcomes: It provides the knowledge about the theories of regional economics and Punjab recent development	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Money & Banking	Course Code ECOM22306T
Course Outcomes: It provides the knowledge about how the money and financial markets work.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Comparative Economic Systems	Course Code ECOM22307T
Course Outcomes: It provides the knowledge about how various economic systems functions.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Theory of Statistics	Course Code ECOM22308T
Course Outcomes It provides the intermediate knowledge about the Statistical methods	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Mathematical Economics	Course Code ECOM22309T
Course Outcomes: It trains the students in using the Mathematical tools in economic analysis	

Program Name: Master of Economics	Program Code ECOM2PUP
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Course Name: Computer Applications for Economists -II	Course Code ECOM22310T
Course Outcomes: It trains the students in using the Computers in economic analysis	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Econometrics	Course Code ECOM22311T
Course Outcomes: It acquaints the students with basic econometric techniques.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Political Economy of Development	Course Code ECOM22401T
Course Outcomes: It provides advanced knowledge in the theories of political economy	


Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Evolution And Structure of Indian Economy	Course Code ECOM22402T
Course Outcomes: it provides advanced knowledge about the Structure of Indian Economy.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Public Economics	Course Code ECOM22403T
Course Outcomes: it provides further knowledge in the theories of Public Economics	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: International Economics	Course Code ECOM22404T
Course Outcomes: It provides further knowledge about the international markets and theories..	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Regional Economics and Punjab Economy	Course Code ECOM22405T
Course Outcomes: it provides further knowledge about the theories of regional economics and Punjab recent development	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Money & Banking	Course Code ECOM22406T
Course Outcomes: It provides further knowledge about how the money and financial markets work.	


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Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Comparative Economic Systems	Course Code ECOM22407T
Course Outcomes: It provides further knowledge about how various economic systems functions.	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Theory of Statistics	Course Code ECOM22408T
Course Outcomes: It provides the advanced knowledge about the statistical methods	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Mathematical Economics	Course Code ECOM22409T
Course Outcomes: It trains the students in using advance Mathematical tools in economic analysis	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Computer Applications for Economists -II	Course Code ECOM22410T
Course Outcomes: It further trains the students in using the Computers in economic analysis	

Program Name: Master of Economics	Program Code ECOM2PUP
Course Name: Econometrics	Course Code ECOM22411T
It acquaints the students with advanced econometric techniques.	

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Course Outcomes: M.COM

MC 101: MANAGEMENT CONCEPT & ORGANIZATIONAL BEHAVIOR

After completing this course, the students will be able to: **CO1:** Acquire theoretical and practical acquaintance of management behaviour, procedures and practices; understand the process of planning, organising, controlling, staffing and decision making, behaviour of the individuals and members of the group.

CO2: Develop ability to know the basic structure of management functions, policies and procedures, to know about how to manage individuals at place of work.

CO3: Acknowledge leadership and motivational theories which help students to develop insights and to manage work relations.

CO4: Understand different types of group dynamics, team development and to know the significance of organizational culture and how to deal with organisational change and work stress.

CO5: Analyse and Interpret different types of organisation structures, understand two way communication process and enlarge capability to overcome or remove barriers to effective communication.

MC 102: ACCOUNTING FOR MANAGERIAL DECISIONS

After completing this course, the students will be able to: **CO1:** Acquire theoretical and practical knowledge of financial statements, their analysis techniques and recent trends of the corporate houses, analyse and interpret various accounting ratios to know the profitability position and financial position of the corporations.

CO2: Enlarge capability to understand the basic structure of cash flow and funds flow statements, this will further help them in planning for intermediate and long-term finances.

CO3: Understand the concept and applications of marginal costing and philosophy behind the strategic cost management, its key element and cost drivers.

CO4: Develop ability to understand the role and limitations of budgets in organisations, interpret the difference between performance and zero based budgeting.

CO5: Analyse and Interpret common business management decisions such as pricing and outsourcing from a financial perspective, grasp knowledge of responsibility accounting, group work and communication skills.

CO6: Interpret financial statements of an enterprise and make appropriate suggestions.

MC 103: BUSINESS ECONOMICS

After completing this course, the students will be able to:

CO-1: Understand the nature and scope of business economics, various objectives of firm and fundamental economic concepts.

CO-2: Analyse demand functions, elasticity of demand and consumer equilibrium with utility and indifference curve analysis including revealed preference theory and theory of consumer choice under risk.

CO-3: Use the techniques of demand forecasting, production function and cost analysis.

CO-4: Comprehend the market forms and apply the pricing techniques to determine the prices of products.

CO-5: Understand classical theory of employment and Keynesian objection to the classical theory, meaning of consumption function and investment.

CO-6: Assess business fluctuations, expansions and recessions, theories of business cycle and concept of Inflation.

MC 104: RESEARCH METHODOLOGY & STATISTICAL TECHNIQUE

After completing this course, the students will be able to:

CO1: Develop the understanding of research and its types, objectives of doing research, research process, sampling methods, data collection methods and computer assisted information acquisition.

CO2: Understand the various probability distributions.

CO3: Develop awareness of data analysis and hypothesis testing procedure.

CO4: Use of various parametric and non-parametric test, chi square test, t test, f test and z test.

CO5: Familiarize with mechanics of report writing.

MC 105(ii): FINANCIAL MANAGEMENT

After completing this course, the students will be able to:

CO1: Acquire basic knowledge of finance function in a corporate enterprise.

CO2: Demonstrate the applicability of the concept of Financial Management to understand the managerial Decisions and Corporate Capital Structure

CO3: This course also highlights the emerging issues of corporate restructuring, mergers and acquisition decisions.

CO4: Explain alternative sources of finance and investment opportunities and their suitability in particular circumstances

CO5: Analyse a company's performance and make appropriate recommendations.

MC 201: ADVANCED ACCOUNTING

After completing this course, the students will be able to:

CO-1: Expound and interpret various contemporary issues in Accounting along with their usage in strategy formulation by business.

CO-2: Enlist the steps involved in process of development of accounting standards and their convergence with IFRS and list Indian Accounting Standards (IND AS) 1,2,10,17,19,34 and IFRS-1,3,4,10 and understand their scope, significance and disclosure.

CO-3: Have an insight of accounting for price level changes, Accounting for human resources and measurement corporate social performance and utilize this knowledge for practical exposure.

CO-4: understand Corporate reporting practices in India and concept of creative and environment accounting in order to go for higher education or advanced research in the field of Commerce and management.

MC 202: BUSINESS ENVIRONMENT

After completing this course, the students will be able to:

CO1: Chalk out business policies and understand the impact of environment on business, changing dimensions of business environment and use different demand forecasting techniques.

CO2: Learn objectives and targets of five years plans and understand importance of economic policies including Fiscal, Monetary, Industrial and EXIM policy

CO3: Analyze positive and negative impact of economic reforms on Indian economy.

CO4: Familiarize with provisions of Consumer Protection Act, Right to Information Act, Environment Protection Act and Competition Act

CO5: Understand the current trends in global economy and the functioning of international economic institutions including IMF, World Bank, IFC, IDA, and ADB.

CO6: Analyse Indian Economy in light of changing government regulatory policies.

MC 203: E-COMMERCE

After completing this course, the students will be able to:

CO1: To develop and understanding the foundations & importance of E-commerce.

CO2: To develop & understanding of retailing in E-commerce by:-Analyzing branding & pricing strategies, Using & determine the effectiveness of market research, the effect of disintermediation.

CO3: Analyse the impact of e-commerce on business modes and strategy

CO4: Describe internet trading relationship including B2B, B2C, intra-organizational

CO5: Discuss legal issues & privacy of E-commerce

CO6: Assess Electronic payment system

CO7: Recognize & discuss global e-commerce issues

CO8: To make aware the ethical, social & security issues of E-commerce

MC 204: SEMINAR

After completing this course, the students will be able to:

CO1: think and scrutinize real world issue, explore creative avenues of expression, decipher problems, and make substantial decisions.

CO2: learn ethical principles, develop presentation and discussion skills, integrate thoughts and bring out new ideas through creative work.

CO3: Integrate collaborative learning and self-determining study, examine, explore, achieve, and develop knowledge in the field of commerce and social sciences.

CO4: identify and utilize resources, develop critical thinking and time management strategies & skills.

CO5: demonstrate their questioning skills which will spark further discussion, develop voice modulation and speak persuasively with or without notes.

MC 205(ii): FINANCIAL INSTITUTIONS AND MARKETS

After completing this course, the students will be able to:

CO1: Have a good understanding of financial institutions and markets as applicable in real life Business Management.

CO2: Understand the banking system and describe the role of regulatory bodies in

regulating how banks manage their capital.

CO3: Develop a set of skills among the students to use the financial planning at the workplace to solve business finance related and general decision for financial problems.

CO4: Analyze the financial problems and learn about markets are inter-linked, structured and regulated.

CO5: The role of regulation and monetary policy to ensure the stability and longevity of any financial system and minimize the impact of possible adverse outcomes and contagion effects implicit in any financial crisis, particularly when the financial systems are globally interconnected.

MC 301: CONTEMPORARY AUDITING

After completing this course, the students will be able to:

CO1: get deeper insights into basic principles governing an Audit and importance of an error-free financial statement.

CO2: understand the role of Institute of Chartered Accountants of India for issuing auditing standards to conduct audit and other assurance engagements.

CO3: understand auditors' qualifications, disqualification, rights, duties and liabilities and will acquire knowledge and understanding of audit evidence and documentation.

CO4: demonstrate and critically examine various contemporary audit issues and challenges involved in the electronic data processing environment.

CO5: understand the inherent risk involved in assessing and evaluating the financial statements, process of formulating the audit report and communicating the same to the client.

CO6: This course will help students to prepare for CA, CS and auditing specific competitive exams like audit inspectors.

MC 302: CORPORATE LEGAL FRAMEWORK

After completing this course, the students will be able to:

CO-1: Acknowledge the concept of incorporation of Company, its separate legal entity and documents required for registration of company: Memorandum of Association and Articles of Association and their alteration with a special reference to Doctrine of Ultra vires and Doctrine of indoor management.

CO-2: Enlist the steps involved in framing of prospectus and explicate the significance of prospectus and consequences of misrepresentation in prospectus.

CO-3: Analyse the powers and duties of directors considering meetings of directors and shareholders and learn various forms of winding up of company.

CO-4: Interpret in detail the Negotiable Instruments Act, 1881 and Competition Act, 2002 and demonstrate the relevance of foundational and theoretical knowledge of their academic major in order to gain practical exposure.

MC 303: DIRECT TAX LAWS

After completing this course, the students will be able to:

CO1: Develop knowledge of laws pertaining to levy of direct tax in India and to enable students to apply the same practically.

CO2: Understand the basic concepts in the law of Income Tax and determine the residential status of different persons.

CO3: Identify the five heads in which income can be categorised and to compute income under different heads.

CO4: Analyse and Examine clubbing provisions, aggregate income after set-off and carry forward of losses.

CO5: Identify deductions out of gross total income and computation of total income in regard to different assesses.

MC 304: MARKETING MANAGEMENT

After completing this course, the students will be able to:

CO1: Develop ability to define and analyze the marketing problems through the formulation of marketing objectives, policies, programmes and strategies.

CO2: Understand the Marketing Environment to capture the market share and size for their organization.

CO3: Understanding the concept of marketing, marketing information system and consumer behavior

CO4: Interpret complex marketing issues and problems using relevant theories, concepts and methods with regard to ethical conduct.

CO5: Apply contemporary marketing theories to the demands of business and management practice.

CO6: The concepts of Promotional Mix will help the learners to develop and deal with the different promotional strategies in corporate successfully.

MC 305(II): MANAGEMENT OF FINANCIAL SERVICES

After completing this course, the students will be able to:

CO1: Have in-depth understanding of financial services and their application in business concerns.

CO2: The Identification of services of Merchant Banking system and role played by regulatory bodies in the smooth and profitable functioning of business activities.

CO3: Develop a set of skills to use the hire purchase and leasing to solve the problems related to optimum utilisation of scarce resources.

CO4: Identify role played by Venture Capital and the evaluation of various strategies so that the students can develop information based solutions.

CO5: Develop appropriate information about Mutual Funds which will further help students to create their own portfolio.

CO6: Analyse factoring and forfeiting to ensure the smooth functioning of business and minimization of adverse outcomes of plastic money.

MC 101: HUMAN RESOURCE MANAGEMENT

After completing this course, the students will be able to:

CO1: Acquaint the students with the concept of HRM, its relevance, objectives, functions and role in organisation.

CO2: Familiarize with planning, procurement and development of human resource and their retention plans.

CO3: understand the various compensational and reward system of human resource.

CO4: Implementation and Evaluation of welfare, safety and health policies and practices.
CO5: Integrate the knowledge of HR concepts of job rotation, work redesigning, job enlargement etc to take correct business decisions.

MC 402: FUNDAMENTALS OF INVESTMENT

After completing this course, the students will be able to:

- CO1:** Develop ability to know the basic structure of investment and speculation, analyse the concept of risk and risk return framework.
- CO2:** Critically analyse the various investment alternatives available to individuals, examine diverse innovations in derivative market.
- CO3:** Construct, analyse, examine and evaluate portfolios along with a deep understanding of efficient market theory and associated models.
- CO4:** Understand the structure of fundamental and technical analysis along with technical indicators; evaluate bonds in terms yield and risks.
- CO5:** Acquire and develop knowledge of theoretical and practical aspects of portfolio management and investment analysis for security selection and manage portfolio.

MC 403: BANKING & INSURANCE SERVICES

After completing this course, the students will be able to:

- CO1:** accumulate knowledge regarding functions, operations and instruments of a commercial bank.
- CO2:** get deeper insight into the various schemes and services offered by banks along with changing trends and volume of deposits in the banking and insurance sector of India.
- CO3:** understand and expertise in various matters relating to principles of lending, credit appraisal techniques, priority sector lending, credit monitoring and management of funds.
- CO4:** acquire knowledge of rising trends and changing scenarios at national level in banking and financial services like e-banking, retail banking and recent banking technologies etc.
- CO5:** discover about emerging trends in insurance sector, legislative framework and the major life and non-life players in India.
- CO6:** know about risk management practices in banking and insurance sector.
- CO7:** This course will help students to get wide range of employment opportunities in field of banking and financial sector

MC 404: CORPORATE TAX PLANNING

After completing this course, the students will be able to:

- CO1:** examine the instances of tax evasion and tax avoidance, which should not be followed in tax planning.
- CO2:** Consider tax implications while taking business decisions regards to its nature and location.
- CO3:** assess the impact of taxation on trade off of financial decisions.
- CO4:** Identify managerial decisions like tax planning in regards to make or buy decision, shut down or continue decision and own or lease.
- CO5:** comprehend the tax issues relating to amalgamation, which influence the policy outcomes of amalgamating and amalgamated companies.

MC 406 (ii): INTERNATIONAL FINANCE

After completing this course, the students will be able to:

CO1: Acquire and Develop theoretical and practical knowledge of international financial system.

CO2: Develop ability to know the basic structure of international finance, policies and procedures, to know about the recent trends and globalisation of world economy.

CO3: Understand the evolution of international monetary system and connotation of regional and global imbalances.

CO4: Critically analyse the consequence of foreign exchange exposure and market on management practices and how to manage international receivable management, significance of global crisis in both developing and developed economies.

CO5: Understand the concept of balance of payment which will further engage the students to know the deficit/surplus of trade of home country with the world economy.

CO6: Analyse and Interpret regional economic integration along with multinational working capital management, understand the concept and role of FDI and FII and their implications in global market.

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Course Outcomes: M.A English

ENGM1101T: Introduction to Poetry: Medieval and Renaissance

Course Outcomes:

1. The students will develop an understanding of the complex character of medieval society and culture.
2. The students will also learn about the modes of representation used by medieval writers.

ENGM1102T: Classical and Elizabethan Drama

Course Outcomes:

1. The students will develop an understanding of the differences between Classical, Renaissance and Jacobean dramatic traditions.
2. The students will learn about the historico-cultural factors for the popularity of the genre of drama in Elizabethan England.

ENGM1103T: Beginnings of the Novel

Course Outcomes:

1. The students will learn about the literary and cultural context that contributed to the rise of the novel.
2. The students will develop an appreciation of the centrality of the novel to modern cultural and political life.
3. The student will become familiar with the challenges of reading a novel.

ENGM1104T: English Phonetics and Phonology

Course Outcomes:

1. The students will become familiar with phonemic/phonetic differences of English words.
- The students will develop an understanding of the mechanics of pronunciation.

ENGM1105T: William Shakespeare: From Stage to Screen

1. The students will be able to appreciate Shakespeare's departure as a dramatist from Aristotelian theory of drama.
2. The students will develop an understanding of the philosophical depth Shakespearean tragedy.
3. The students will be develop an understanding of the transition from the English tradition of morality/mystery plays to Shakespearean drama.

ENGM1206T: Literary Criticism

Course Outcomes:

1. The students will be able to appreciate the changing function of literary criticism.
2. The students will learn to read a literary text critically.
3. The students will also use Indian literary concepts to interpret texts.

ENGM1207T : Poetry from Neoclassical to Victorian Age

Course Outcomes:

1. The students will develop a period-specific understanding of poetry.
2. The students will be able to appreciate poetry by situating it in the socio-cultural and historical context.
3. The students will develop an understanding of the changing contours poetic sensibility.

ENGM1208T: Nineteenth Century Fiction

Course Outcomes:

1. The students will be able to appreciate the centrality of the novel in nineteenth century.

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2. The students will develop an understanding of the flourishing of the genre of novel across America, France, England and Russia during the nineteenth century.

ENGM1209T: Contemporary Essay

1. The students will be able to appreciate the growth of essay writing from the classical to the modern.
2. The students will develop an understanding of how essay writing is different from other forms of writing (both fiction and non-fiction).

ENGM1210T: Creative Writing

1. The students will be able to appreciate the construction of clear, precise and beautiful sentences.
2. The students will develop an understanding of the organization of information into a narrative.

ENGM1211T: Modern English Grammar and Usage

1. The students will develop an understanding of the rudiments of grammar and its usage.

ENGM2112T: Literature and Modernity

1. The students will be able to appreciate the complexity of modernism and the kind of literature it produced.
2. The students will develop an understanding of the complex relationship between modernity and modern literary forms such as the novel.

ENGM2113T: Twentieth Century Poetry and Fiction

1. The students will develop an appreciation of the literary techniques used by modern writers.
2. The students will have a better grasp of how different kinds of experimentation that was happening in literature with reference to select texts.

ENGM2114T: Literature and Gender

Course Outcomes:

1. The students will be able to appreciate the contribution of women as agents in the making of modern literature.
2. The students will develop an understanding of how women writers interrogated the existing literary landscape.

ENGM2115T: Literature and Postcoloniality

Course Outcomes:

1. The students will be able to appreciate how writers started interrogating the complex layers of colonial imagination.
2. The students will develop an understanding of the politics of representation.

ENGM2116T: Modern Drama

Course Outcomes:

1. The students will be able to appreciate how and where modern theatre departs from Aristotelian principles of dramatic representation.
2. The students learn to appreciate the significance of theatre in the modern cultural context.

ENGM2117T: Indian Writing in English

Course Outcomes:

1. The students will be able to appreciate how writers from India have appropriated and engaged with tradition of writing in English.
2. The students will develop an understanding of how regional, cultural and linguistic diversity of India is represented in Indian writing in English.


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ENGM2218T: Literary and Cultural Theory

Course Outcomes:

1. The students will develop an understanding of the changing trajectory of cultural studies as a discipline.
2. The students will be able to appreciate the complexity which underpins cultural praxis and processes.

ENGM2219T: Modern Indian Literature in Translation

Course Outcomes:

1. The students will be able to appreciate the significance and necessity of literary translation.
2. The students will develop an understanding of the different kinds of writing taking place in the regional languages of India

ENGM2220T: Literature and Politics

Course Outcomes:

1. The students will be able to appreciate how literature engages and responds to major political events that have shaped modern history.
2. The students will develop an understanding of how the act of writing can influence political participation and processes.

ENGM2221T: American Literature

Course Outcomes:

1. The students will develop an understanding of how the experience of race and class shape our relationship to the American dream.
2. The students will develop an insight into how American social and cultural history has shaped American literary landscape.

ENGM2222T: Language and Linguistics

Course Outcomes:

1. The students will develop an understanding of the semantics of language with special reference to word formation, grammar and morphology.
2. The students will also be able to appreciate the relationship between language and the construction of discourse.

ENGM2223T: European Drama

Course Outcomes:

1. The students will be exposed to the traditions of Greek and Modern European drama.
2. The students will develop an understanding of the thematic changes that occurred in European drama.

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Course Outcomes: PGDCA

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS: (PGDCA)

This program will equip students with the skills necessary for designing and developing applications in Information Technology. They will have the opportunity to stay updated with the latest trends in various subjects within the fields of computers and information technology. The PG Diploma is designed for graduates with a computing background and offers comprehensive coverage of key concepts and challenges in data and resource protection, as well as computer software security. Through hands-on experiences, students will develop real-life IT applications as part of their studies. The program's objectives include training graduate students in fundamental computer technology concepts and information technology applications, as well as enabling them to design and develop applications to analyze and solve a wide range of computer science-related problems.

General Education

No.	Name of Course	Description of Course outcome
CO-1	Introduction to Information Technology & E Commerce	After completing the course, students will be able to comprehend basic computer hardware architecture and design fundamental logic circuits, convert between different number systems, and explain various encoding methods. They will also grasp the essential hardware components that constitute a computer's hardware and understand the functions of each of these components, including the role of the CPU and its constituent parts. Additionally, students will develop essential IT support skills, including installing, configuring, securing, and troubleshooting operating systems and hardware. They will gain practical experience in using Microsoft products such as MS Word, MS Excel, and MS PowerPoint. Furthermore, they will explore and integrate diverse communication technologies with IT applications for business purposes.
CO-2	Computer programming using C and its programming Lab- I	After completing the course, students will gain the ability to develop logic for creating programs in C and acquire a solid foundation in basic programming constructs. This knowledge will empower them to seamlessly transition to other programming languages in the future. The learning outcomes of this course encompass developing applications and grasping essential computer programming terminology, encompassing writing, compiling, debugging, and understanding decision structures, loops, functions, arrays, strings, pointers, unions, and file handling.

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CO-3	Window Operating System and Office Automation and its Programming Lab-II	After completing the course, students will have acquired a comprehensive skill set. They will be adept at understanding the fundamental structure and organization of the file system, proficient in using the internet for information retrieval and email communication, skilled in creating presentations and conducting calculations with Excel spreadsheets, and capable of managing both Windows and Linux operating systems for various applications and networking tasks. Additionally, they will possess the know-how to perform various office-related activities on a computer, including software installation, printer and scanner management, internet setup, and system troubleshooting. Furthermore, they will have developed a solid grasp of the terminology associated with operating systems, enhancing their overall proficiency in the IT field.
CO-4	Database Management System	After completing the course, students will have the capability to provide a comprehensive introduction to Database Management Systems (DBMS), understand the design and implementation of efficient database, and gain practical experience in the practical aspects of database management. They will be proficient in data modeling, query optimization, transaction management, and data security within the realm of DBMS. Additionally, students will recognize the vital role that DBMS plays in addressing real-world data management challenges stay updated with the latest trends and advancements in database technology, explore future possibilities and constraints within the field, and embrace the enduring value of continuous learning and skill enhancement in the ever-evolving domain of database management.
CO-5	Programming using Python and its programming Lab-III	After completing the course, students will possess a solid foundation in Programming with Python, equipping them with the knowledge and skills to develop software solutions using this versatile and widely-used programming language. They will gain practical experience in coding, problem-solving, and algorithmic thinking with Python, and they will understand how to leverage Python libraries and frameworks for various applications, such as web development, data analysis, machine learning, and automation. Students will also learn good coding practices and software development methodologies, ensuring the production of clean, maintainable code. Additionally, they will grasp the practical relevance of Python in addressing real-world challenges across diverse industries and stay current with the latest developments in Python programming. This course emphasizes the value of continuous learning and adaptability in the dynamic field of programming with

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		Python.
CO-6	Web Technology and its Programming Lab-IV	<p>After completion of the web technology and programming lab, students will have gained a diverse range of skills. They will be well-versed in the intricacies of web technology, including web development principles and programming languages commonly used in web applications. Students will become proficient in creating dynamic and interactive web applications, utilizing HTML, CSS, JavaScript, and various web development frameworks. They will also acquire essential skills in database management and server-side scripting, allowing them to develop full-fledged web applications. Furthermore, students will gain practical experience in debugging and troubleshooting web-related issues. This comprehensive knowledge and hands-on experience will prepare them to excel in the field of web technology and programming.</p>

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Course Outcomes: M.Sc Mathematics

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Algebra-I		Course Code: MATM1101T
Course Outcomes:		
CO1	To understand the notion of group action and able to apply this to get some interesting results of Group actions like Class Equation etc	
CO2	Able to learn Lagrange's Theorem, structure theory of groups, solvability and nilpotency of groups	
CO3	To understand the Symmetric groups, Alternating Groups and their simplicity	
CO4	To know how to apply Sylow Theory to determine structure of groups of finite order	
CO5	To understand the basic properties of Rings and Ideals	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Mathematical Analysis		Course Code: MATM1102T
Course Outcomes:		
CO1	Solve problems based on functional of several variables including Inverse function theorem, Implicit function theorem	
CO2	Understand Measure spaces and Lebesgue measure	
CO3	Identify measurable function, Riemann and lebesgue integrals.	
CO4	Understand differentiation, functions of bounded variation, differentiation of an integral, absolute continuity, convex functions and Jensen's inequality.	
CO5	Describe the applications in probability theory, real analysis, and many other fields in mathematics as functional analysis, approximation theory and PDE.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Topology-I		Course Code: MATM1103T
Course Outcomes:		
CO1	Can differentiate between finite, countable, uncountable sets and understand the concept of open-sets, closed set, interior and exterior points.	
CO2	Can understand the topological properties like compactness, connectedness and the countability axioms and find their numerous uses in the course.	
CO3	The concepts of basis and sub-basis of a space, of interior and closure set the stage for the most general study of continuity.	
CO4	Enables the student to understand the special characters of the metric spaces as an important special case of a topological space.	
CO5	Enables the student to use these concepts in other areas of their studies whenever needed and establishing the importance of rigorous proof in mathematics.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Differential Geometry		Course Code: MATM1104T
Course Outcomes:		
CO1	To calculate the curvature and torsion of curves and surfaces in the three-	

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	dimensional space
CO2	To study the geometry of curves and surfaces in three-dimensional space using calculus techniques
CO3	Use of the first and the second fundamental forms for computing the length of the curves on a surface and to determine the deviation of the surface from its tangent plane
CO4	To have an idea about the surfaces of the constant mean and Gaussian curvature which have interesting physical interpretations.
CO5	To have a thorough knowledge about the effect of the Gauss's remarkable theorem on the bending of the surface without stretching.
CO6	To apply the theory of geodesics to study geodesic curvature, geodesic equations and the surfaces of revolution

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Software Laboratory-I (C Programming)	Course Code: MATM1105L
Course Outcomes:	
CO1	Can use the fundamentals of C programming in trivial problem solving.
CO2	Enhances skill on problem solving by constructing algorithms and flowchart.
CO3	Can apply skill of identifying appropriate programming constructs for problem solving.
CO4	Write, compile and debug programs in C language using different data types, operators and console I/O function.
CO5	Use the file operations, character I/O, string I/O, file pointers, and create/update basic data files.

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Mathematical Statistics	Course Code: MATM1106T
Course Outcomes:	
CO1	Knowledge of the theory of statistics through mathematical techniques
CO2	To understand the axiomatic approach to probability with reference to the conceptual details of the set theory
CO3	Demonstration of the uses of specific parametric families of univariate density functions in day to day life
CO4	To obtain various generating functions for different discrete and continuous distributions and derive their properties
CO5	To understand the concept of sampling and some important sampling distributions to make inferences about the population
CO6	To apply the knowledge of two important aspects of statistical inference- estimation and test of hypothesis in various feasible statistical and mathematical spheres

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Linear Programming	Course Code: MATM1107T
Course Outcomes:	
CO1	Able to model a real world problem as a and to find its solution using different variants of Simplex methods
CO2	To understand the dual nature of the linear programming problem and their

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	solution
CO3	To analyze the effect of parametric changes on Optimal solution.
CO4	To understand important concept of job sequencing problems and a variety of models.
CO5	Replacement of goods which degenerates with time with/without considering any change in value of money

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Algebra-II (Rings and Modules)		Course Code: MATM1201T
Course Outcomes:		
CO1	To understand the connection between PID, ED and UFD	
CO2	To understand the division algorithm in Polynomial Rings	
CO3	Able to understand the concepts of modules, submodules and their properties	
CO4	To understand the difference of Modules and Vector Spaces and can see modules as generalization of vector spaces	
CO5	To know the concepts of Simple modules, Artinian Modules, Noetherian Modules and their simple characterizations	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Topology-II		Course Code: MATM1202T
Course Outcomes:		
CO1	Knowledge of convergence in mathematics through filters, regularity, complete regularity and normality of topological spaces.	
CO2	Able to understand the modern language of Categories and Functors through the study of Homotopy	
CO3	Introduce the idea of universal properties through the study of Stone Cech Compactification of Tichonov spaces.	
CO4	The standard material of Identification spaces and their applications are established.	
CO5	Enable the student to see the link between Algebra and Topology by proving the fundamental theorem of Algebra through Topological ideas.	
	Prepares the student for their future study of Algebraic Topology and the study of Natural Transformations in Mathematics.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Differential Equations-I		Course Code: MATM1203T
Course Outcomes:		
CO1	Know the concepts of existence, uniqueness and continuity of the solutions of first order ordinary differential equations.	
CO2	Identify the properties of the zeros of solutions of linear nth order ordinary differential equations.	
CO3	Analyze the dependence of solutions on initial conditions and parameters.	
CO4	Demonstrate the knowledge of eigen values and eigen functions of Sturmliouville systems.	

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Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Complex Analysis-I		Course Code: MATM1204T
Course Outcomes:		
CO1	Study the theory of complex variable with reference to theory real variables	
CO2	Analyse the behaviour of derivative of a function of a complex variable	
CO3	To deal effectively with the numerical concepts related to analytic functions and harmonic functions	
CO4	Construction of various methods to deal with complex integration	
CO5	To investigate the behaviour of a function at the singularities through various series expansions	
CO6	To deal with the concept of analytic continuation by extending the domain of analyticity	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Object Oriented Programming Using C++		Course Code: MATM1205T
Course Outcomes:		
CO1	Write, compile and debug programs in C++ language	
CO2	Understand the implementation of arrays, pointers and functions	
CO3	Describe the procedural and object-oriented paradigm with concepts of classes and objects	
CO4	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism	
CO5	Classify inheritance with the understanding of early and late binding, usage of exception handling	
CO6	Demonstrate the use of various OOPs concepts with the help of programs	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Functional Analysis-I		Course Code: MATM1206T
Course Outcomes:		
CO1	Understand and apply fundamental theorems Hahn-Banach theorem in Normed linear spaces and its applications, uniform boundedness principle, open mapping theorem, closed graph theorem.	
CO2	Understand Hilbert spaces including orthogonality, orthonormal sets, Bessel's inequality, Parseval's theorem.	
CO3	Use and derive basic definitions and theorems of functional analysis	
CO4	Differentiate between Banach Space and Hilbert Space	
CO5	Apply contraction and approximation theory in differential equations and integral equations.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Classical Mechanics		Course Code: MATM1207T
Course Outcomes:		
CO1	Determine the Lagrangian and Hamiltonian functions for a physical systems	
CO2	Derive and solve the equations of motion from these functions	
CO3	Determine the moments of inertia of a rigid body.	

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CO4	Identify symmetries and to derive the corresponding conservation laws
CO5	Perform calculations using relativistic kinematics and conservation laws

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Differentiable Manifolds		Course Code: MATM2101T
Course Outcomes:		
CO1	To study complicated structures in terms of relatively well understood properties of simpler spaces	
CO2	To acquire the thorough knowledge of the concept of Riemannian manifolds having wide applications in various fields of mathematics	
CO3	Understanding the theory of various differential geometric structures on manifolds and arrange the results on submanifolds of Riemannian manifolds with certain structures	
CO4	To deal with the theory of tensors and to construct differentiable mappings on the tensor product spaces	
CO5	To define various differentiable mappings and connections on the structure of manifolds leading to formation of some important differential geometric tools.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Field Theory		Course Code: MATM2102T
Course Outcomes:		
CO1	Ability to test whether a given polynomial is irreducible or not	
CO2	Understanding of the basic notions of Field theory like Normal Extensions, Separable Extensions etc	
CO3	Ability to find splitting field of a given polynomial	
CO4	To calculate Galois group of certain polynomials	
CO5	To apply the Galois correspondence to solve problems of Field theory	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Differential Equations-II		Course Code: MATM2103T
Course Outcomes:		
CO1	Analyse the existence of solutions of first order differential equations for complex system.	
CO2	Derive the family of Equipotential surface and prove Kelvin inversion theorem.	
CO3	Understand the uniqueness and continuation of solutions of first order differential equations for complex system.	
CO4	Understand the Maximum and minimum solution of first order differential equations for complex system.	
CO5	Formulate and solve initial and boundary value problems for the Laplace equations in polar, spherical and cylindrical coordinates	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Category Theory-I		Course Code: MATM2104T
Course Outcomes:		
CO1	The central concepts of Functors, Natural Transformations and its numerous	

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	applications enable the student to see the link between seemingly different concepts.
CO2	Can establish the importance of universal properties and the study of various mathematical structures through their universal mapping properties via commutative diagrams.
CO3	Study of categorical limits and co-limits and its use to bring concepts like pullbacks, products and equalizers under a common structure.
CO4	Prepares the groundwork for a deeper study of adjunctions and monads.

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP	
Course Name: Numerical Analysis using MATLAB		Course Code: MATM2105T	
Course Outcomes:			
CO1	Understand the concept of single step and multistep methods for solving Initial and Boundary Value problems		
CO2	Analyze the convergence , truncation error and stability of the single and multistep methods		
CO3	Develop an efficient numerical scheme for solving boundary value problems based finite difference approach(explicit and implicit method) arising in science and engineering		
CO4	Carry out stability analysis and truncation error in various finite difference schemes		

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Complex Analysis-II		Course Code: MATM2106T
Course Outcomes:		
CO1	Introduce the analyticity of complex functions and study their applications.	
CO2	Evaluate complex integrals using Cauchy residue and Cauchy integral theorems.	
CO3	Determine and classify the zeros and singularities of the complex functions	
CO4	Learn the uniqueness of conformal transformation	
CO5	Establish the capacity for mathematical reasoning through analysing, proving and explaining concepts from complex analysis	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP	
Course Name: Classical Mechanics		Course Code: MATM2107T	
Course Outcomes:			
CO1	Determine the Lagrangian and Hamiltonian functions for a physical systems		
CO2	Derive and solve the equations of motion from these functions		
CO3	Determine the moments of inertia of a rigid body.		
CO4	Identify symmetries and to derive the corresponding conservation laws		
CO5	Perform calculations using relativistic kinematics and conservation laws		

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Algebraic Topology	Course Code: MATM2108T
Course Outcomes:	

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CO1	Abel to find algebraic invariants that classify topological spaces up to homeomorphism.
CO2	Enables in the construction and use of functors from some category of topological spaces into an algebraic category.
CO3	Can have the idea of attaching an algebraic structure with a given topological space and to prove that if the topological spaces are homeomorphic then their associated algebraic structure must be isomorphic.
CO4	Able to solve associated algebraic problem than the original topological one.
CO5	Through the concepts like homotopy, the fundamental group and the covering spaces can establishes a close link between topology and algebra.

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP	
Course Name: Optimization Techniques-I		Course Code: MATM2109T	
Course Outcomes:			
CO1	Model a problem as a linear programming problem and to apply the appropriate method in order to find an optimal solution		
CO2	Formulate a given simplified description of a suitable real-world problem as a linear programming model in general, standard and canonical forms		
CO3	Sketch a graphical representation of a two-dimensional linear programming model given in general, standard or canonical form		
CO4	Use the Simplex method to solve small linear programming models by hand		
CO5	Find optimal solutions of many other problems like assignment, transportation, travelling salesman etc.		
CO6	Understand dynamic programming algorithms and its applications in problem solving.		
CO7	Solve various problems in game theory		

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP	
Course Name: Fuzzy Sets and Applications		Course Code: MATM2110T	
Course Outcomes:			
CO1	To be able to distinguish between the crisp set and fuzzy set concepts through the learned differences between the crisp set characteristic function and the fuzzy set membership function.		
CO2	To be able to draw a parallelism between crisp set operations and fuzzy set operations through the use of characteristic and membership functions respectively.		
CO3	Become aware of the use of fuzzy inference systems in the design of intelligent or humanistic systems.		

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP	
Course Name: Solid Mechanics		Course Code: MATM2111T	
Course Outcomes:			
CO1	Understand tensor and its basic properties		
CO2	Find gradient, divergence and curl of a vector tensor field		
CO3	Determine the Stresses and Strain developed in a body due to loading and find the different types of Stresses/strains in the body		
CO4	Develop governing equations for isotropic or anisotropic elastic solids		

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CO5	Find the solution for the two dimensional problems
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Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Functional Analysis-II		Course Code: MATM2112T
Course Outcomes:		
CO1	Understand and apply fundamental theorems Hahn-Banach theorem in Normed linear spaces and its applications, uniform boundedness principle, open mapping theorem, closed graph theorem.	
CO2	Understand Hilbert spaces including orthogonality, orthonormal sets, Bessel's inequality, Parseval's theorem.	
CO3	Use and derive basic definitions and theorems of functional analysis	
CO4	Differentiate between Banach Space and Hilbert Space	
CO5	Apply contraction and approximation theory in differential equations and integral equations.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Homology Theory		Course Code: MATM2201T
Course Outcomes:		
CO1	Deep knowledge of algebraic structures associated with a topological space.	
CO2	Homology groups lead to the singular and simplicial homology	
CO3	Enables the student to compute some homology groups.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Theory of Linear Operators		Course Code: MATM2202T
Course Outcomes:		
CO1	Understand spectral theory in Normed linear spaces, bounded linear operator, spectral mapping theorem for polynomials, elementary theory of banach algebras..	
CO2	Undersatand spectral properties of compact linear operators on normed space bounded self-adjoint linear operators on a complex Hilbert space.	
CO3	Differentiate between Banach Space and Hilbert Space	
CO4	Apply spectral techniques for the study of the theory of linear operators.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Lie Groups and Complex Manifolds		Course Code: MATM2203T
Course Outcomes:		
CO1	To acquire the knowledge of the theory of Lie groups which is based on the study of differential geometry and differential topology	
CO2	To define connections on the structure of complex manifolds leading to the development of new spaces	
CO3	To implement the metric induced on the submanifolds for the construction of structural equations	
CO4	To understand the concept of complex manifolds and complex differential forms based on unitary space which is instrumental in further research in this field	
CO5	To apply the theory of differentiable manifolds and Lie groups, which is one of the	


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	cornerstones of the edifice of modern mathematics, in various spheres of study
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Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Category Theory-II	Course Code: MATM2204T
Course Outcomes:	
CO1	Knowledge of the fundamental concepts of categorical adjunctions and monads.
CO2	Can establish the unity of all mathematical concepts as different instances of adjoints
CO3	Development of the machinery of Eilenberg Moore Category and Kliegli construction for the study of relationship between adjoints and monads.
CO4	Yoneda lemma also finds many applications in the course.

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Optimization Techniques-II	Course Code: MATM2205T
Course Outcomes:	
CO1	Formulate a given simplified description of a suitable real-world problem as a linear programming model in general, standard and canonical forms
CO2	Use the Simplex method to solve small linear programming models by hand
CO3	Find optimal solutions of many other problems like assignment, transportation, travelling salesman etc.
CO4	Understand dynamic programming algorithms and its applications in problem solving.

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Homology Algebra	Course Code: MATM2206T
Course Outcomes:	
CO1	Knowledge of homology functors in the more general algebraic setting.
CO2	The categorical concepts having natural applications in the study of homology and algebraic topology
CO3	Proficiency in setting up the homology functors, derived functors and the special ext and tor functor
CO4	Can apply knowledge of functors in algebraic topology.

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Finite Element Methods	Course Code: MATM2207T
Course Outcomes:	
CO1	Understand the concept of finite element methods and their effectiveness as compared to finite difference methods
CO2	Formulate the boundary value problem
CO3	Solve simple ordinary differential equations using FEM
CO4	Determine stresses and strains in a body using FEM
CO5	Solve two dimensional partial differential equations under different geometric conditions

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Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Fluid Mechanics		Course Code: MATM2208T
Course Outcomes:		
CO1	Understand the basic principles of fluid mechanics, such as Lagrangian and Eulerian approach, conservation of mass.	
CO2	Understand the application of Euler and Bernoulli's equations and the conservation of mass to determine velocity and acceleration for incompressible and inviscid fluid.	
CO3	Analyse the concept of rotational and irrotational flow, stream functions, velocity potential, sink, source, vortex etc.	
CO4	Understand the simple fluid flow problems (flow between parallel plates, flow through pipe etc.) with Navier - Stoke's equation of motion.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Algebraic Coding Theory		Course Code: MATM2209T
Course Outcomes:		
CO1	To do arithmetic in Finite fields, Linear Algebra over Finite Fields	
CO2	To find Minimal polynomials with the help of Cyclotomic cosets.	
CO3	Understanding of Linear codes, their basis and distance	
CO4	Encoding and Decoding of Linear Codes;	
CO5	The Main Coding Theory Problem and certain bounds	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Commutative Algebra		Course Code: MATM2210T
Course Outcomes:		
CO1	Understanding of basic terminology used to understand commutative algebra	
CO2	To know exact sequences, construction of Tensor product and exactness of Hom and Tor Functor	
CO3	Understanding of Localization of rings, modules and will be able to see the correspondence between ideals of rings and localized rings	
CO4	To know Primary ideals and two theorems regarding decomposition of ideals as product of Primary Ideals	
CO5	To understand Integral Dependence of rings, Going up and Going down theorems.	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Operation Research		Course Code: MATM2211T
Course Outcomes:		
CO1	To understand basic characteristic features of a queuing system and acquire skills in analyzing queuing models	
CO2	Understand different queuing situations and find the optimal solutions using models for different situations	
CO3	Comprehend the dynamics of inventory management's principles, concepts, and techniques as they relate to the entire supply chain (customer demand, distribution, and product transformation processes)	

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CO4	Replacement of goods which degenerates with time with/without considering any change in value of money
CO5	To understand operations research situations that can be conveniently modeled and solved as network problems through a variety of network optimization algorithms

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Wavelets	Course Code: MATM2212T
Course Outcomes:	
CO1	Expand a function in Haar wavelets
CO2	Construct Meyer wavelets to a given function
CO3	Find Daubechies wavelet series to a given function
CO4	Analyse two or more dimensional problems using wavelets

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Non-Linear Programming	Course Code: MATM2213T
Course Outcomes:	
CO1	Understand the concept of non linear optimization problems and its formulation
CO2	Formulate unconstrained problems, constrained problems with equality and inequality constraints
CO3	Solve one dimensional unconstrained non linear optimization problems
CO4	Solve multidimensional non linear optimization problems

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Computational Techniques	Course Code: MATM2214T
Course Outcomes:	
CO1	Compute piecewise cubic and Hermite polynomials
CO2	Understand the Hermite-Birkhoff interpolation problem
CO3	Use of different types of Spline functions and their properties
CO4	Find the solution of various problems using Green's function and Tchebycheffian spline functions

Program Name: M.Sc. (Mathematics)	Program Code: MATM2PUP
Course Name: Mathematics of Finance	Course Code: MATM2215T
Course Outcomes:	
CO1	The students will study different market models using basic notions and assumptions.
CO2	Students will learn to manage risk with options.
CO3	Students will learn about periodic compounding, continuous compounding and will be able to compare the various compounding methods.
CO4	In this subject techniques will be learnt to apply the different models to the dynamics of stock prices.
CO5	Some particular models like Binomial tree model, Trinomial tree model and continuous time limit will be taught to the students so that they can manage the risks.

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Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Mathematical Methods		Course Code: MATM2216T
Course Outcomes:		
CO1	Understand the relation between linear differential equation and Volterra's equation and convert one type into another.	
CO2	Apply to analyze the safety and stability of the dam during an earthquake.	
CO3	Understand the difference between Volterra and Fredholm integral equations, first kind and second kind.	
CO4	Understand the fundamental concepts of the space of admissible variations for fixed points.	
CO5	Give the Solution to the brachistochrone and isoperimetric problem	

Program Name: M.Sc. (Mathematics)		Program Code: MATM2PUP
Course Name: Analytic Number Theory		Course Code: MATM2217T
Course Outcomes:		
CO1	Can handle multiplicative functions.	
CO2	Can deal with Dirichlet series as functions of a complex variable,	
CO3	To prove the Prime Number Theorem and simple variants.	
CO4	To study number theory by using analytic tools (inequalities, limits, calculus, etc) .	
CO5	To solve problems about the integers and the distribution of prime numbers by using analysis.	

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Course Outcomes: M.Sc IT & Lateral Entry

M. Sc. IT – (Information Technology) Regular & Lateral Entry

This course, comprising Information Technology, C and C++ programming languages, computer graphics, database management, algorithm design, and Python programming, equips students with invaluable knowledge, skills, and practical experience spanning a variety of vital domains. From mastering the intricacies of C and C++ to comprehending the nuances of Information Technology, students emerge well-prepared to tackle real-world challenges. They not only acquire the fundamental concepts but also gain an appreciation for the significance of these subjects in addressing intricate problems. Moreover, the emphasis on staying updated with evolving technologies and nurturing a commitment to continuous learning underscores the lasting importance of adaptability and skill refinement in our ever-evolving technological landscape. This course collectively establishes a robust foundation for students to excel in their respective fields, enabling them to contribute meaningfully to the realms of technology and innovation.

General Education

No.	Name of Course	Description of Course outcome
CO-1	Introduction to Information Technology and E-Commerce	After completing the course, students will gain a comprehensive understanding of computer hardware architecture, enabling them to design fundamental logic circuits. They will also develop proficiency in converting between different number systems and describing various codes. Moreover, they will acquire knowledge about the fundamental hardware components that constitute a computer's hardware and the specific roles of each of these components. In addition, students will grasp the significance of the CPU and its constituent parts. Furthermore, they will cultivate essential IT support skills encompassing the installation, configuration, security, and troubleshooting of operating systems and hardware. Finally, the course will provide students with hands-on experience in using Microsoft products such as MS Word, MS Excel, and MS PowerPoint.
CO-2	Computer Programming using C and its Programming Lab – I	After completing the course, students will gain the ability to develop logic for creating programs in C and acquire a solid foundation in basic programming constructs. This knowledge will empower them to seamlessly transition to other programming languages in the future. The learning outcomes of this course encompass developing applications and grasping essential computer programming terminology, encompassing writing, compiling, debugging, and understanding decision structures, loops, functions, arrays, strings, pointers, unions, and file handling.
CO-3	Web Technology and its Programming Lab - II	After completion of the web technology and programming lab, students will have gained a diverse range of skills. They will be well-versed in the intricacies of web technology, including

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		web development principles and programming languages commonly used in web applications. Students will become proficient in creating dynamic and interactive web applications, utilizing HTML, CSS, JavaScript, and various web development frameworks. They will also acquire essential skills in database management and server-side scripting, allowing them to develop full-fledged web applications. Furthermore, students will gain practical experience in debugging and troubleshooting web-related issues. This comprehensive knowledge and hands-on experience will prepare them to excel in the field of web technology and programming.
CO-4	Database Management System and its Programming Lab-III	After completing the course, students will have the capability to provide a comprehensive introduction to Database Management Systems (DBMS), understand the design and implementation of efficient database, and gain practical experience in the practical aspects of database management. They will be proficient in data modeling, query optimization, transaction management, and data security within the realm of DBMS. Additionally, students will recognize the vital role that DBMS plays in addressing real-world data management challenges stay updated with the latest trends and advancements in database technology, explore future possibilities and constraints within the field, and embrace the enduring value of continuous learning and skill enhancement in the ever-evolving domain of database management.
CO-5	Programming with Python and its Programming Lab-IV	After completing the course, students will possess a solid foundation in Programming with Python, equipping them with the knowledge and skills to develop software solutions using this versatile and widely-used programming language. They will gain practical experience in coding, problem-solving, and algorithmic thinking with Python, and they will understand how to leverage Python libraries and frameworks for various applications, such as web development, data analysis, machine learning, and automation. Students will also learn good coding practices and software development methodologies, ensuring the production of clean, maintainable code. Additionally, they will grasp the practical relevance of Python in addressing real-world challenges across diverse industries and stay current with the latest developments in Python programming. This course emphasizes the value of continuous learning and adaptability in the dynamic field of programming with Python.
CO-6	Operating Systems	After completing the course, students will possess a comprehensive understanding of operating systems, including their principles and modules. They will be well-versed in key design mechanisms for operating system modules and will have a strong grasp of process management, concurrent processes, threads, memory management, virtual memory concepts, and handling deadlocks. Furthermore, students will be proficient in evaluating and comparing processor scheduling algorithms, along with the ability to devise algorithmic solutions for process synchronization problems. They will also gain practical experience in utilizing any operating system.

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		calls, such as Linux processes, and apply their knowledge to various operating system concepts, including process management, synchronization, networked processes, and file systems.
CO-7	Computer Organization and Architecture	After completing the course, students will be able to understand computer organization and architecture, including instruction formats and construction, addressing modes, memory hierarchy (cache, main memory, and secondary memory) operation and performance, simple pipelines, basic performance analysis, simple OS functions, particularly as they relate to hardware, virtual memory, computer I/O concepts, including interrupt and DMA mechanisms, and intercomputer communication concepts.
CO-8	Java and its Programming Lab-V	Upon successful completion of the Java programming and its associated lab course, students will have acquired a wide spectrum of invaluable skills. They will have developed a deep understanding of the Java programming language, covering both its core concepts and advanced features. Students will become adept at designing and building Java applications, including desktop, web, and mobile applications, utilizing the Java Standard Library and frameworks. They will gain proficiency in object-oriented programming, multithreading, and database connectivity with Java. Additionally, students will enhance their problem-solving abilities through hands-on coding exercises and real-world Java programming projects. This comprehensive knowledge and practical experience will empower them to excel in the dynamic field of Java development and software engineering.
CO-9	Software Engineering	After the successful completion of the software engineering course, students will have cultivated a versatile skill set essential for a prosperous career in the field. They will possess a deep understanding of software engineering principles and practices, covering the entire software development lifecycle. Students will become proficient in various methodologies, including agile and waterfall, and gain expertise in tasks such as requirements gathering, system design, coding, testing, and maintenance. They will excel in the art of designing scalable and maintainable software systems, utilizing industry-standard tools and technologies. Additionally, students will develop strong project management skills, enabling them to lead and collaborate effectively within software development teams. The practical experience acquired through hands-on projects will enhance their problem-solving capabilities, preparing them to address real-world software engineering challenges. With this comprehensive knowledge and practical proficiency, they will be well-prepared to thrive in the continually evolving field of software engineering.
CO-10	Computer Networks	After the successful completion of the computer networks, students will possess a comprehensive grasp of the intricate realm of computer networking. They will have gained profound insights into the underlying networking principles, protocols, and technologies that constitute the foundation of modern communication systems. Through hands-on projects and practical exercises, they have honed

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		<p>their abilities in designing, configuring, and managing computer networks, encompassing local area networks (LANs), wide area networks (WANs), and the internet. They will have developed the expertise necessary to diagnose and resolve network issues, ensuring peak network performance. Moreover, students will delve into advanced subjects, including network security, wireless networking, and cloud-based networking solutions. Through hands-on labs and real-world network design projects, they will refine their practical networking skills, equipping themselves to tackle the ever-evolving challenges of the interconnected world of computer networks. Armed with this knowledge and expertise, they will be well-prepared to embark on successful careers in fields related to network administration, cybersecurity, and network engineering.</p>
CO-11	Computer Graphics & its Programming Lab - VI	<p>After completing the course, students will possess the capability to deliver a comprehensive introduction to computer graphics systems and formulate algorithms for two-dimensional transformations. They will also acquire a deep understanding of techniques related to clipping, three-dimensional graphics, and three-dimensional transformations. Additionally, students will gain practical experience in implementing various graphics drawing algorithms, 2D-3D transformations, and clipping techniques. They will develop proficiency in depth calculations, line and surface algorithms, and the implementation of surface rendering and illumination models.</p>
CO-12	Linux Administration its Programming Lab - VII	<p>Upon successful completion of the Linux administration, students will have acquired a robust skill set in managing and maintaining Linux-based systems. They will have gained in-depth knowledge of Linux operating system fundamentals, including file systems, user management, and command-line utilities. Students will become proficient in system installation, configuration, and performance optimization. They will also develop expertise in security measures, including user access controls and network security, to safeguard Linux servers and networks. Moreover, students will explore advanced topics such as shell scripting, virtualization, and containerization, enabling them to automate routine tasks and deploy scalable applications efficiently. Through hands-on labs and real-world system administration projects, they will refine their practical Linux administration skills and be well-prepared for roles as Linux administrators, system engineers, and DevOps professionals in the ever-growing Linux-based computing environments. This comprehensive knowledge and hands-on experience will empower them to excel in the dynamic world of Linux administration.</p>
CO-13	Research Methodology	<p>After completing the course in research methodology, students will emerge with a solid foundation in the art and science of research. They will have honed their skills in various research paradigms, methodologies, and approaches, enabling them to formulate incisive research questions, design methodologically sound studies, and proficiently analyze and synthesize data.</p>

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		<p>Proficiency in both qualitative and quantitative research methods will equip them to adapt to diverse research challenges. Ethical considerations in research will be ingrained in their approach, and they will be adept at critically evaluating existing research literature. Practical experience gained through hands-on research projects will refine their data collection, analysis, and interpretation skills. Armed with this comprehensive knowledge and practical expertise, students will be well-prepared to make meaningful contributions to the advancement of knowledge in their chosen fields and embark on successful careers in research, academia, or various industries that require adept research and analytical skills.</p>
CO-14	Artificial Intelligence	<p>After successfully completing the artificial intelligence (AI) course, students will have delved into the dynamic and transformative realm of AI. They will have gained a profound understanding of the foundational principles, algorithms, and techniques that underpin AI, machine learning, and deep learning. Proficiency in designing and implementing AI systems across diverse applications, from natural language processing and computer vision to autonomous agents and recommendation systems, will be a hallmark of their skill set. These students will also explore the ethical and societal dimensions of AI, gaining a holistic perspective on its impact. Hands-on projects will provide valuable experience in training and fine-tuning machine learning models, equipping them to address real-world challenges in fields like healthcare, finance, and autonomous technology. With this comprehensive knowledge and practical expertise, they will be poised to embark on careers as AI researchers, data scientists, AI engineers, and other pioneering roles shaping the future of artificial intelligence.</p>


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