S.L. Bawa D.A.V. College

Batala(143505), Punjab

Program Outcomes (POs)

&

Course Outcomes (COs)

[2021-2022]

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S.L. Bawa D.A.V. College

Batala(143505), Punjab

Faculty of Commerce & Management

Program Outcomes (POs)

&

Course Outcomes (COs)

Program Outcomes: Master of Commerce (M.Com.)

After completing M.Com, students will be able to

PO 1: Identify the problems and formulate research hypothesis and complete the research through modeling and data analysis to arrive at solutions for the problems in business, society and other fields.

PO 2: Apply the knowledge in contemporary issues in the fields of accounting, finance, human resource management, marketing, business environment, banking and insurance to solve complex business problems.

PO 3: Understand corporate tax laws and apply this knowledge to ensure proper tax planning, tax management and compliance with various policies and tax laws framed by the government.

PO 4: Evaluate the impact of the latest technological developments particularly in the field of e-commerce and adjust business policies and systems accordingly.

PO 5: Develop the entrepreneurial and employability skills in the fields of teaching, research, consultancy, data analyst in corporate sector.

Course Outcomes: Master of Commerce (M.Com.)

Semester- I

Paper: Managerial Economics: MC-101
Students will be able to:

- **CO 1:** Develop an understanding of the applications of managerial economics.
- **CO 2:** Discuss optimization and utility including consumer behavior.
- **CO 3:** Describe how changes in demand and supply affect markets.
- **CO 4:** Understand the choices made by a rational consumer and its impact on business and economy.
- **CO 5:** Use data for business decision making.

Paper: Statistical Analysis for Business: MC-102
Students will be able to:

- **CO 1:** Understand key terminology, tools and techniques used in statistical analysis
- **CO 2:** Apply various probability and non-probability sampling procedures in research.
- **CO 3:** Design questionnaire for data collection.
- **CO 4:** Formulate research hypothesis and use statistical tests to validate these hypothesis.

Paper: Management Principles and Organizational Behavior: MC-103
Students will be able to:

- **CO 1:** Acquire conceptual knowledge of management and organizational behavior.
- **CO 2:** Evaluate the different aspects related to Decision Making and Controlling Process
- **CO 3:** Analyze Group Behavioral influence in the Organization.
- **CO 4:** Evaluate the processes used in developing communication and resolving conflicts.
- **CO 5:** Understand perception and work towards improving perception.

Paper: Business Environment: MC- 104
Students will be able to:

- **CO 1:** Understand the concept of business environment and various factors affecting it and risks associated with it.
- **CO 2:** Evaluate economic, socio- cultural and technological environment of business.
- **CO 3:** Apply the environmental analysis techniques in practice.
- **CO 4:** Examine economic planning and contribution of five-year plans in India.
- **CO 5:** Understand the monetary and fiscal policy of India and evaluate their impact on business environment

Paper: Management Accounting and Control System: MC-105
Students will be able to

- **CO 1:** Understand the importance of management accounting and control.
- **CO 2:** Evaluate the models relating to reporting, decision making and accountability in the management control areas.
- **CO 3:** Understand relationship between strategy development and management accounting to design the control system.
- **CO 4:** Identify and analyze the business problems and provides the solutions in real-life situations.

Semester- II

Paper: Corporate Financial Accounting and Auditing: MC-201
Students will be able to:

- **CO 1:** Understand various components of corporate financial transactions.
- **CO 2:** Grasp relevant accounting standards and their applicability in financial transactions.
- **CO 3:** Prepare the financial statements in accordance with the statutory requirements.
- **CO 4:** Understand legal, regulatory and ethical framework for auditing
- **CO 5:** Demonstrate various steps of performing audit and identify the conceptual aspects of Auditing.

Paper: Financial Management: MC-202
The students would be able to:

- **CO 1:** Understand the theoretical & practical aspects of financial management in business corporations.
- **CO 2:** Analyze and mitigate risk within context of financial decision making.
- **CO 3:** Develop knowledge of various tools and techniques to be used in raising and investing the financial resources in business.
- **CO 4:** Understand and apply various principles and techniques in the Management of working capital requirements of business.

Paper: Research Methodology: MC-203
Students would be able to:

- **CO 1:** Understand basic concepts of research and its methods.
- **CO 2:** Identify appropriate research topics and parameters.
- **CO 3:** Develop advanced critical thinking skills in research.
- **CO 4:** Prepare a project proposal to undertake a research project.
- **CO 5:** Organize and conduct research and prepare reports with findings.

Paper: Marketing Management: MC-204
Students would be able to:

- **CO 1:** Acquire an understanding of fundamental concepts of Marketing.
- **CO 2:** Understand the need, importance and process of Marketing Planning and Control.
- **CO 3:** Demonstrate Marketing Mix as a framework for Marketing Decision making.
- **CO 4:** Identify and apply new ideas, methods and ways of thinking and design creative solutions to marketing problems.
- **CO 5:** Conduct market research to provide information needed to make marketing decisions.

Paper: Human Resource Management: MC-205
Students will be able to:

- **CO 1:** Identify the human resource needs of an organization and plan accordingly.
- **CO 2:** Utilize the knowledge to gain competitive advantage through human resources.
- **CO 3:** Develop necessary skill set for the solutions of various HR issues.
- **CO 4:** Analyze the strategies required to select and develop manpower resources.

Semester- III

Paper: Banking and Insurance Services: MC-301
The students will able to:

- **CO 1:** Understand Basics terms in banking and insurance and various functions of banks and insurance companies.
- **CO 2:** Acquire knowledge about the functioning of banking system and various reforms Initiated by the Govt. in banking system.
- **CO 3:** Understand the use of merchant banking and internet banking in improving business efficiency.
- **CO 4:** Compare and contrast the Insurance Business Environment in India after IRDA Act and opportunities available in this sector.

Paper: Security Analysis and Portfolio Management: MC-311
Students will be able to:

- **CO 1:** Familiarize with the theoretical and practical background in the field of investments.
- **CO 2:** Designing and managing the bond as well as equity portfolios in the real word.
- **CO 3:** Measuring the portfolio performances.
- **CO 4:** Apply the knowledge to develop portfolio of our clients with portfolio risk return trade off.
- **CO 5:** Analyze market expectations and build strategic asset allocation.

Paper: Contemporary Accounting: MC-312
Students would be able to:

- **CO 1:** Understand various contemporary issues in accounting.
- **CO 2:** Demonstrate the role of accounting standards in the preparation of financial statements of the business.
- **CO 3:** Evaluate the conventional as well as contemporary areas in the discipline of accounting.

Paper: Strategic Management: MC-321
Students will be able to:

- **CO 1:** Understand the basic concepts and principles of strategic management.
- **CO 2:** Analyze the internal and external environment of business.
- **CO 3:** Develop and prepare organizational strategies that will be effective for the current business environment.
- **CO 4:** Devise strategic approaches to managing a business successfully in a global context.

Paper: Security Market Operations: MC-322
Students will be able to:

- **CO 1:** Know to concept of security market and its function.
- **CO 2:** Analyze different market operations, instruments and analyze risk management practices.
- **CO 3:** Demonstrate the contribution of the financial market in the economic stability and development of a country.
- **CO 4:** Analyze various trends and models applicable in financial markets
- **CO 5:** Understand the methodology adopted by the credit rating agencies.

Semester- IV

Paper: International Accounting: MC-401

Students will be able to:

- **CO 1:** To develop professional knowledge and skills in International Accounting.
- **CO 2:** Compare the different ways in which countries can adopt IFRS for various purposes.
- **CO 3:** Understand financial reporting in the US, China, UK, India, Japan etc.
- **CO 4:** Know how users of financial statements cope with international differences in accounting.
- **CO 5:** Outline the main players in International harmonization of accounting, and how successful they have been implemented it.

Paper: E-Commerce: MC-402

Students will be able to:

- **CO 1:** Understand the fundamentals and importance of E-commerce.
- **CO 2:** Learn about E-commerce models like, C2C, B2B, B2C, C2B, G2C
- **CO 3:** Know the legal issues and privacy issues in E-Commerce.
- **CO 4:** Be familiar with E- marketing, E-procurement and supply chain Management.

Paper: International Financial Management: MC-411

Students will be able to:

- **CO 1:** Identify the investment opportunities in the international environment.
- **CO 2:** Identify risk relating to exchange rate fluctuations and develop strategies to deal with them.
- **CO 3:** Identify and evaluate foreign direct investment and international acquisition opportunities.
- **CO 4:** Develop strategies to deal with other types of country risks associated with foreign operations.
- **CO 5:** Express well considered opinion on issues relating to international financial management.

Paper: Financial Market and Financial Services: MC-412

Students will be able to:

- **CO 1:** Determine the need of financial system and describe why and how financial system works.
- **CO 2:** Have a practical understanding of various financial institutions and their functioning.
- **CO 3:** Have a practical understanding of function of central bank and its role in monetary planning of the country.
- **CO 4:** Acquire analytical skills in money and capital market in the context of raising medium and long term funds

Paper: Corporate Tax Law and Planning: MC-413

Students will be able to

- **CO 1:** Describe different types of incomes and their taxability.
- **CO 2:** Do tax planning to minimize tax liabilities of the company taking advantage of deductions, exemptions, rebates and concession provided under Income Tax Act.
- **CO 3:** Evaluate various management decisions from tax point of view.

Program Outcomes: Bachelor of Commerce (B.Com)

The students after pursuing 3 year B.Com course will be able to

PO 1: Acquire in-depth knowledge about accounting concepts in the fields of financial and cost accounting.

PO 2: Apply the knowledge in the field of accounting for preparation of Final Accounts of proprietorship, partnership and company.

PO 3: Understand and enhance the analytical skills and apply techniques for interpretation of final accounts, decision making and problem solving.

PO 4: Develop comprehensive understanding of Marketing techniques, Human Resource Management, Business and Corporate Laws, Business Economics, Financial Management, GST, Income Tax and other branches of Commerce including Auditing, Financial Services, Portfolio Management.

PO 5: Learn techniques and manners of business Communication, making power point presentations to meet the requirements of corporate sector.

Course Outcomes: Bachelor of Commerce (B.Com.)

Semester- I

Paper: Financial Accounting: BCG-103

Students will be able to

- **CO 1:** Familiarize with the relevance of accounting in the modern business world.
- **CO 2:** Understand the accounting concepts and conceptual framework for preparation and presentation of financial statements.
- **CO 3:** Develop skills for preparing financial statements of a sole trader; business unit with multi branches and departments.
- **CO 4:** Apply the knowledge of accounting in maintaining records in business of Joint Ventures and consignments and solve the problems faced.

Paper: Business Organization: BCG-104

Students will be able to

- **CO 1:** Understand the scope of Business, and its importance
- **CO 2:** Describe the social responsibility of business towards society and various measures to be taken.
- **CO 3:** Understand about the functioning of stock exchanges.
- **CO 4:** Identify the different forms of organizations and decide their suitability based on various factors.
- **CO 5:** Explain business ethics as an integral part of every business organization and incorporate the same in business policies.

Paper: Business Communication: BCG-105

Students will be able to

- **CO 1:** Understand the Concept Process, Importance and Objectives of Business Communication
- **CO 2:** Develop awareness regarding New Trends in Business Communication
- **CO 3:** Know the Principles of Effective Communication & acquire Communication Skills.
- **CO 4:** Develop Skills to Draft Letters and notices for internal and external business communication with stakeholders.
- **CO 5:** Apply skills for effective interpersonal communication in business world.

Paper: Business Statistics: BCG-106

Students will be able to

- **CO 1:** Understand the meaning, concepts and uses of statistics in business.
- **CO 2:** Learn, compute and interpret descriptive statistics like measures of central tendency, correlation, regression and others.
- **CO 3:** Demonstrate skill in computing different types of probability and probability distributions for use and problem solving in business.

Paper: Computer Fundamentals: BCG-107

Students will be able to

- **CO 1:** Familiarize and understand the terms like operating systems, peripheral devices, etc.

CO 2: Develop the skills to use various components of computer for storage, retrieval, printing and transfer of business data.
CO 3: Know about uses of internet and sending emails as medium of communication.
CO 4: Work with command line interface (DOS)

Semester- II

Paper: Advanced Financial Accounting: BCG-203

The students will be able to:

CO 1: Understand the importance and methods of providing depreciation as per Accounting Standards issued by Institute of Chartered Accountants of India..
CO 2: Explain the concepts of Hire purchase and Installment systems and solve the accounting issues arising from these transactions in the books of buyer and vendor.
CO 3: Develop skills in valuing the firm at the time of retirement, and death of a partner and distribute the assets at the time of closing down of business of firm.
CO 4: Apply the advanced knowledge of accounting in solving the problems faced by the partners.

Paper: Commercial Laws: BCG-204

The student will be able to:

CO 1: Learn the different types of Agreements and Contracts, and important elements to be taken care of while drafting business contracts.
CO 2: Understand various modes of discharge of Contracts, Breach of contracts and remedies available for the aggrieved parties.
CO 3: Apply the knowledge regarding the Contracts of Sale and agreements to sell in solving various issues between buyer and seller.
CO 4: Acquire and apply knowledge about Consumer Protection Act for solving disputes between seller and consumer.

Paper: Functional Management: BCG-206

The student will be able to:

CO 1: Understand the concept of management, its functions and principles
CO 2: Recognize the concept of social responsiveness and its benefits to modern business.
CO 3: Get knowledge regarding the importance of role of CEO in modern business.
CO 4: Develop basic knowledge in various fields of managements like marketing management, strategic management, production planning and control and apply the same for benefit of business organization.

Semester- III

Paper: Corporate Accounting: BCG-303

The student will be able to:

CO 1: Develop an understanding of rising of corporate finance through various long term sources and their legal provisions as per Companies Act.
CO 2: Apply working knowledge of accounting principles and procedures for recording of transactions related to corporate entities, and for preparing the corporate accounts and statements in accordance with the statutory requirements.
CO 3: Understand the process of preparing the final accounts of banking and insurance companies and various legal provisions with reference to legal provisions.

Paper: Company Law: BCG-304

The students will be able to:

- **CO 1:** Acquire basic knowledge of the provision of the company act, 2013 in relation to features, types of companies, memorandum of association, article of association, and administration of company law.
- **CO 2:** Understand the roles, duties & liabilities of promoters and directors,
- **CO 3:** Understand pre & post – incorporation stages in the formation of company and lifting of corporate veil.
- **CO 4:** Know the legal rules related to issue of prospectus and shares.
- **CO 5:** Understand the concept and modes of winding up of a Company.

Paper: Financial Management: BCG-305

The students would be able to

- **CO 1:** Understand both the theoretical & practical role of financial management in business corporations.
- **CO 2:** Analyze risk within context of financial decision making, and develop financial analytical skills.
- **CO 3:** Develop knowledge of various tools and techniques to be used in raising and investing the financial resources of business.
- **CO 4:** Understand and apply various principles and techniques in the Management of working capital requirements of business.

Paper: International Business: BCG-306

Students will be able to

- **CO 1:** Understand the aspects of globalization and its impact on domestic markets
- **CO 2:** Acquire knowledge of various tariff and non-tariff measures used by government to stabilize its balance of payment accounts and their impact on business environment of the country.
- **CO 3:** Demonstrate the foreign exchange markets, foreign exchange risks and its management.
- **CO 4:** Understand the importance of flow of foreign investment and foreign trade promotion measures taken by the Govt.

Paper: Business Environment: BCG-307

The students will be able to:

- **CO 1:** Understand the concept of business environment and various factors affecting it and risks associated with it.
- **CO 2:** Understand economic, socio- cultural and technological environment.
- **CO 3:** Apply the environmental analysis techniques in practice.
- **CO 4:** Examine economic planning and contribution of five-year plans in India.
- **CO 5:** Understand the monetary and fiscal policy of India and evaluate their impact on business environment.

Semester- IV

Paper: Principles and Practices of Banking and Insurance: BCG-405

The students will able to:

- **CO 1:** Understand Basics terms in banking and insurance and various functions of banks and insurance companies.
- **CO 2:** Acquire knowledge about the functioning of banking system and various reforms Initiated by the Govt. in banking system.
- **CO 3:** Understand the use of merchant banking and internet banking in improving business efficiency.
- **CO 4:** Compare and contrast the Insurance Business Environment in India after IRDA Act and opportunities available in this sector.

Paper: Goods and Service Tax: BCG-403

The students will able to:

- **CO 1:** Outline the concepts of Indirect tax and GST from the pre-GST period to post GST period.
- **CO 2:** Understand the importance of Indirect Taxes (GST) in the Indian and global economy and its contribution to the economic development
- **CO 3:** Acquire knowledge on various provisions and their application including registration and filing returns.

Paper: Industrial Laws: BCG-404

The students will able to:

- **CO 1:** Comprehend the Industrial Dispute Act 1947, Trade Union Act 1926 and various terms like Awards, Settlement, Strikes, Lockdowns, Lay -off and Retrenchment
- **CO 2:** Understand the provisions of Payment of Wages Act 1948, Payment of Bonus Act 1965 and Payment of Gratuity Act 1972 and how to comply with these provisions.
- **CO 3:** Acquire the knowledge about Factory Act 1948 and Workmen Compensation Act 1923 to ensure better working conditions and compensation for workers.
- **CO 4:** Understand the provisions of Employee State Insurance Act 1948 enacted by Govt. for the benefit of workers.

Paper: Cost Accounting: BCG: 406

The students will able to:

- **CO 1:** Understand various concepts and elements of cost and relationships between cost and financial accounting.
- **CO 2:** Apply the knowledge of various methods of costing in the process of ascertainment of cost in various industries including, manufacturing, service, operations, and process.
- **CO 3:** Solve various practical problems and take managerial decisions like, deciding most profitable sales mix, make or buy decisions, operate or shut down decisions etc.
- **CO 4:** Understand the techniques of cost control and apply them to keep costs under control.

Semester-V

Paper: Management Accounting: BCG-503

The students will able to:

- **CO 1:** Learn the use of various tools including comparative statements and ratio analysis to draw inferences from financial statements.
- **CO 2:** Explore the meaning of capital budgeting and techniques used to make capital budgeting decisions.
- **CO 3:** Demonstrate the report writing skill to provide regular timely reports to management at the right time for decision making.
- **CO 4:** Analyze effectively about financial planning to maintain sufficient liquidity and solvency in the business.

Paper: Direct Tax Law: BCG-504

The students will able to:

- **CO 1:** Acquire the complete knowledge of sources of income and basic concepts of income tax.
- **CO 2:** Understand the concept of exempted incomes and provisions of agricultural income.
- **CO 3:** Apply knowledge of tax laws to compute taxable income and tax liability of individuals and businesses.
- **CO 4:** Understand the provisions of income tax to be complied with while deducting tax at source or making advance payment of Tax.

Paper: Auditing: BCG-505

The students will able to:

- **CO 1:** Familiarize with basic auditing principles & procedures.
- **CO 2:** Understand the process of auditing and the steps performed in every business unit (especially company's)
- **CO 3:** Demonstrate the knowledge and skills to conduct various types of audit.
- **CO 4:** Prepare auditor's report at the end of auditing process.
- **CO 5:** Solve real life practical problems while conducting audit.

Paper: Contemporary Accounting: BCG-511

Students will have the knowledge and skills to:

- **CO 1:** Understand various contemporary issues in accounting.
- **CO 2:** Explain the role of accounting standards in the preparation of financial statements of the business.
- **CO 3:** Demonstrate the conventional as well as contemporary areas in the discipline of accounting.
- **CO 4:** Identify contemporary accounting issues and find the well-reasoned arguments or solutions to solve these issues.

Paper: Financial Market Operations: BCG-512

Students will be able to-

- **CO 1:** Identify recent developments in the financial markets.
- **CO 2:** Understand the use of instruments that are operational in the money market.
- **CO 3:** Demonstrate the contribution of the financial market in the economic stability and development of a country.
- **CO 4:** Analyze the role of various players in the capital market including the regulator of capital market.

Semester- VI

Paper: Operations Research: BCG-603

Students will be able to-

- **CO 1:** Understand the concept and techniques of operations research.
- **CO 2:** Identify the problems and develop the mathematical models for these problems.
- **CO 3:** Use various techniques of operations research to provide solutions to the business problems.

Paper: Corporate Governance: BCG-604

Students will be able to-

- **CO 1:** Understand the influence of corporate governance system on the performance of an organization.
- **CO 2:** Demonstrate the concept of whistleblowing, credit rating and insider trading in the conceptual framework of corporate governance.
- **CO 3:** Evaluate various corporate scandals across the world.

Paper: Portfolio Management: BCG-611

Students will be able to-

- **CO 1:** Understand theoretical concept of portfolio management.
- **CO 2:** Apply the knowledge to develop portfolio of our clients with portfolio risk return trade off.
- **CO 3:** Evaluate the changes in the market and revise the portfolio.
- **CO 4:** Analyze market expectations and build strategic asset allocation.

Paper: Financial Services: BCG-612

Students will be able to-

- **CO 1:** Understand the concept of the Indian financial system, markets, institution and financial services.
- **CO 2:** Evaluate the operations and functioning of various financial institutions.
- **CO 3:** Compare various financial products and services offered by financial institutions and select the best for one’s business.

Program Outcomes: Bachelor of Business Administration (B.B.A.)

Students after completing BBA program will be able to

PO 1: Acquire in-depth understanding of different areas of management such as Human Resource management, Marketing Management, Production and Operations Management and Financial Management.

PO 2: Understand and enhance the analytical and decision making skills and apply them to realistic problem solving and decision making in various areas in a dynamic business environment.

PO 3: Apply knowledge and understanding of the major theories in evaluating various policies, laws and legislations passed by the Government and suggest necessary changes in the business policies and procedure to comply with these laws.

PO 4: Learn techniques and manners of business Communication, making power point presentations to meet the requirements of corporate sector.

PO 5: Exercise their professional skills, team spirit, and leadership to meet the challenges of life and business.

PO 6: Develop and strengthen theoretical and applied aspects of various fields of business management and prepare for higher education and research.

Course Outcomes: Bachelor of Business Administration (B.B.A.)

Semester- I

Paper: Basic Accounting: BBA-103

The students will be able to -

- **CO 1:** Understand the Conceptual framework of Accounting
- **CO 2:** Demonstrate the applicability of the concept and process of accounting to prepare financial statements.
- **CO 3:** Apply the knowledge to identify the errors in final accounts and rectify those errors.

Paper: Business Organization and system: BBA-104

The students will be able to -

- **CO 1:** Understand the scope of Business, and its importance
- **CO 2:** Describe the social responsibility of business towards society
- **CO 3:** Understand about the functioning of stock exchanges
- **CO 4:** Identify the different forms of organizations viz: Sole proprietorship, Partnership, HUF etc.
- **CO 5:** Explain business ethics as an integral part of every business organization

Paper: Business Communication: BBA-107

The students will be able to -

- **CO 1:** Understand the Conceptual Process and Importance of Business Communication
- **CO 2:** Develop awareness regarding New Trends in Business Communication
- **CO 3:** Know the Principles of Effective Communication & acquire Communication Skills.
- **CO 4:** Develop Skills to Draft Letters and notices for internal and external business communication with stakeholders.
- **CO 5:** Apply skills for effective interpersonal communication in business world.

Semester- II

Paper: Business Laws: BBA-203

The students will be able to -

- **CO 1:** Learn the different types of Agreements and Contracts, and important elements to be taken care of while drafting business contracts.
- **CO 2:** Understand various modes of discharge of Contracts, Breach of contracts and remedies available for the aggrieved parties.
- **CO 3:** Apply the knowledge regarding the Contracts of Sale and agreements to sell in solving various issues between buyer and seller.
- **CO 4:** Acquire and apply knowledge about Consumer Protection Act for solving disputes between seller and consumer.

Paper: Principles of Management: BBA-204

The students will be able to -

- **CO 1:** Make use of different management principles in the course of decision making in business organization.
- **CO 2:** Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities

CO 3: Analyze effective applications of Principles of Management to diagnose and solve organizational problems.

Paper: Computer Based Accounting System: BBA-206

The students will be able to -

CO 1: Demonstrate basic knowledge of computers and computerized accounting software.
CO 2: Demonstrate basic skills in storing accounting information in a computerized accounting system.
CO 3: Apply accounting procedures using specialized computer accounting software.
CO 4: Use Tally ERP 9 in maintenance of Accounts of the firms.

Paper: Fundamentals of Banking: BBA-207

The students will be able to -

CO 1: Understand the various services offered and various risks faced by banks
CO 2: Know various banking innovations after nationalization.
CO 3: Integrate procedures according to the functioning of RBI and Commercial Banks in the Indian Banking System, and
CO 4: Examine the various characteristics of banker- client relationships.
CO 5: Familiarize various provisions related to The Negotiable Instrument Act, 1881 with Amendment Act, 2015.

Semester- III

Paper: Fundamentals of HRM: BBA-304

The students will be able to -

CO 1: Identify the human resource needs of an organization and plan accordingly.
CO 2: Utilize the knowledge to gain competitive advantage through people
CO 3: Develop necessary skill set for the solutions of various HR issues.
CO 4: Analyze the issues and strategies required to select and develop manpower resources.

Paper: Fundamentals of Marketing Management: BBA-305

The students will be able to -

CO 1: Demonstrate the core concept of marketing and its utility for business and society.
CO 2: Understand the strategic implication of segmentation, targeting and positioning of goods and services.
CO 3: Know the consumer behavior and their decision making process.
CO 4: Grasp the complexities in marketing function and work on solutions to achieve goals of business.

Paper: Indian Financial System: BBA-306

The students will be able to -

CO 1: Know the functioning of Capital Market and Money Market in the development of IFS.
CO 2: Evaluate the functioning of Non- Banking Financial Companies.
CO 3: Understand and analyze the mechanics and regulation of financial instruments.

Paper: Management Accounting: BBA-307

The students will be able to -

CO 1: Learn the use of various tools including comparative statements and ratio analysis to draw inferences from financial statements.

CO 2: Explore the meaning of capital budgeting and techniques used to make capital budgeting decisions.

CO 3: Demonstrate the report writing skill to provide regular timely reports to management for decision making.

CO 4: Analyze effectively about financial planning to maintain sufficient liquidity and solvency in the business.

Semester- IV

Paper: Financial Management: BBA-403

The students will be able to -

CO 1: Understand both the theoretical & practical role of financial management in business corporations.

CO 2: Analyze risk within context of financial decision making, and develop financial analytical skills.

CO 3: Develop knowledge of various tools and techniques to be used in raising and investing the financial resources of business.

CO 4: Understand and apply various principles and techniques in the Management of working capital requirements of business.

Paper: Production and Operations Management: BBA-404

The students will be able to -

CO 1: Identify the issues in Production and Operations Management and resolve them.

CO 2: Apply operations management techniques for better decision making.

CO 3: Better understand the role of quality management in success of business enterprise.

Paper: Business Environment: BBA- 405

The students will be able to:

CO 1: Understand the concept of business environment and various factors affecting it and risks associated with it.

CO 2: Understand economic, socio- cultural and technological environment and its impact on business.

CO 3: Apply the environmental analysis techniques in practice.

CO 4: Examine economic planning and contribution of five-year plans in India.

CO 5: Understand the monetary and fiscal policy of India and evaluate their impact on business.

Paper: Operations Research: BBA-406

The students will be able to -

CO 1: Understand the concept and techniques of operations research.

CO 2: Identify the problems in different areas of business and develop mathematical models for these problems.

CO 3: Use various techniques of operations research to provide solutions to the business problems.

Paper: Fundamentals of Insurance: BBA-407

The students will be able to:

CO 1: Understand the importance and regulation insurance sector.

CO 2: Have a thorough understanding of the structure of insurance sector in India.

CO 3: Evaluate various insurance products available for business and suggest the best product for enterprise.

Semester- V

Paper: Company Law: BBA-503

The students will be able to:

- **CO 1:** Acquire basic knowledge of the provision of the Companies Act, 2013.
- **CO 2:** Understand the role, duties & liabilities of promoters and directors,
- **CO 3:** Understand pre & post – incorporation stages in the formation of company and lifting of corporate veil.
- **CO 4:** Know the legal rules related to issue of prospectus and shares.
- **CO 5:** Understand the concept and modes of winding up of a Company.

Paper: Entrepreneurship and Small Business: BBA-504

The students will be able to -

- **CO 1:** Demonstrate competence in identifying opportunities and challenges faced by small business owners, manager face.
- **CO 2:** Develop basic decision making skills that related to startup enterprises.
- **CO 3:** Identify industry entry barriers and prepare a feasible business plan.
- **CO 4:** Grasp new attitudes, knowledge and skills as entrepreneurs.

Paper: Cost Accounting: BBA-505

The students will be able to -

- **CO 1:** Understand various concepts and elements of cost and relationships between cost and financial accounting.
- **CO 2:** Apply the knowledge of various methods of costing in the process of ascertainment of cost in various industries including, manufacturing, service, operations, and process.
- **CO 3:** Solve various problems and take managerial decisions like, deciding most profitable sales mix, make or buy decisions, operate or shut down decisions etc.
- **CO 4:** Understand the techniques of cost control and apply them to keep costs under control.

Paper: Consumer Behavior: BBA-511

The students will be able to -

- **CO 1:** Demonstrate the application of knowledge of consumer behavior to marketing.
- **CO 2:** Recognize the various factors influencing consumer behavior.
- **CO 3:** Use appropriate research approaches for collecting and analyzing data.

Paper: Advertising and Sales Management: BBA-512

The students will be able to -

CO1**:** Understand various components of Advertising.

CO2**:** Demonstrate requirements of a good advertising campaign.

CO2**:** Develop skills for a successful Salesman by understanding various features required for it.

CO3**:** Experiments with e-commerce trends to find the most cost effective option.

Semester- VI

Paper: Income Tax: BBA-603

The students will able to:

- **CO 1:** Acquire the complete knowledge of sources of income and basic concepts of income tax.
- **CO 2:** Understand the concept of exempted incomes and provisions of agricultural income.
- **CO 3:** Apply knowledge of tax laws to compute taxable income and tax liability of individuals and businesses.
- **CO 4:** Understand the provisions of income tax to be complied with while deducting tax at source

or making advance payment of Tax.

Paper: Fundamentals of Capital Market: BBA- 604

The students will be able to -

- **CO 1:** Understand the functioning of primary and secondary markets.
- **CO 2:** Develop an understanding of financial derivatives and institutional structure of the market.
- **CO 3:** Experiment the knowledge in trading at stock exchange.

Paper: Service Marketing: BBA- 611

The students will be able to -

- **CO 1:** Understand the conceptual framework of services marketing.
- **CO 2:** Do research about consumer behavior for effective advertising.
- **CO 3:** Apply the knowledge about services marketing principles to identify and solve marketing problems.
- **CO 4:** Develop effective customer relationship management system.

Paper: E- Marketing: BBA- 612

The students will be able to -

- **CO 1:** Gain a thorough understanding of E-Marketing and its varied strategies.
- **CO 2:** Analyze E-Marketing issues and challenges
- **CO 3:** Identify the role of various social media platforms.

S.L. Bawa D.A.V. College

Batala(143505), Punjab

Faculty of Arts

Program Outcomes (POs)

&

Course Outcomes (COs)

Program Outcomes: Bachelor of Arts (B.A.)

PO 1: The programme gives an exposure to students towards the intricacies and use of language in both formal and casual situation.

PO 2: To gain knowledge in the field of social sciences, literature and philosophical aspects.

PO 3: Get to learn various social, political, economic, historical and psychological facets.

PO 4: Ability to develop logical and ethical way of life.

Course Outcomes: Political Science

Semester-I: Principles of Political Science

The students will be able to:

- **CO 1:** Describe what politics is and analyzing the classic and current perspectives on normative and pragmatic approaches to study political science.
- **CO 2:** Explain the links between political science with other social-sciences such as economics, history, psychology, and sociology
- **CO 3:** Explain Hobbes', Locke's, and Rousseau's social contract theories, as well as Marx's perspective of the state.
- **CO 4:** Analyze various state ideologies such as iberal, Gandhian, and Marxist.

Semester-II: Modern Political Theory

The students will be able to:

- **CO 1:** Understand the term such as political system, political culture and the concept of political socialization was also added to the field of political science.
- **CO 2:** Analyze the various sorts of rights and responsibilities to enable students to identify their role in nation building.
- **CO 3:** Get awareness about the concepts such as Liberty, Equality, and Justice among the students in order to understand current social problems.
- **CO 4:** Explain the different ideologies like liberalism, Marxism, and Elitist theory which help the students to grasp the fundamental perspectives and distinctions between these theories.

Semester-III: Indian Constitution

This course will help the student in:

- **CO 1:** Evaluating a brief history and significance of the constitution of India.
- **CO 2:** Describing the importance of the preamble of the Indian Constitution.
- **CO 3:** Explaining the composition and functioning of Parliament, the President, the Prime Minister and the office of Governor.
- **CO 4:** Analyzing the importance of fundamental rights, fundamental duties and directive principles of state policy.

Semester-IV: Indian Political System

This course expertise the students in:

- **CO 1:** Describing the nature and structure of political parties in In India and various issues related with these political parties. It enables the students to make critical thinking about the ideologies of national and political parties as well as their electoral performance.
- **CO 2:** Providing knowledge to the students regarding the various elements that can influence an individual at the time of voting.
- **CO 3:** Explaining how the politics at national and state level is dominated by caste and religion which further help the students to get understanding about various issues like use of caste and religion at the time of election.
- **CO 4:** Analyzing the meaning, objectives and determination of India’s Foreign Policy and to provide awareness to the students why India wishes to preserve its distance from two major blocs.

Semester-V: Comparative Political Systems (UK & USA)

This course will expertise the student in:

- **CO 1:** Explaining the importance, nature, and breadth of Comparative Politics and Comparative Government which help the students to know the difference between comparative politics and comparative government.
- **CO 2:** Enabling the students to get knowledge about the input output models developed by Political scientists such as David Easton and Almond Powell for the better understanding of each country's political system.
- **CO 3:** Helping the students to learn about the political systems of United States of America and United Kingdom which enhance the students understanding of politics, state and Government from a comparative perspective.
- **CO 4:** Analyzing the historical background of political parties and their shifting roles in the United Kingdom and the United States of America which create awareness among the students regarding the transition from absolute monarchy to constitutional monarchy in the United Kingdom.

Semester-VI: International Politics: Theory and Practice

This course will expertise the student in:

- **CO 1:** Studying the definition of national power, the balance of power system, and the concept of collective security.
- **CO 2:** Analyzing those factors that contributed to the rise of the cold war, Soviet complaints against Western nations, the waning of the cold war, and the resurgence of the cold war from 1979 to 1987, as well as their impact on international politics.
- **CO 3:** Assessing the shift in global order and help the students to get awareness regarding the rise of American hegemony, the formation of the World Trade Organization, globalization, and liberalization.
- **CO 4:** Explaining how Terrorism is a major threat that the entire globe. Also describing the factors that contribute to the demand for a New International economic order.

Course Outcomes: Physical Education

Semester-I: Physical education

The students will be able to:

- **CO 1:** Acquire knowledge of physical education and the relationship between education and physical education.
- **CO 2:** Understand biological principles and the effects of heredity and environment on growth and development.
- **CO 3:** Get enhanced the knowledge of students about foundation of physical education in India
- **CO 4:** Develop the ability to perform fundamental skills of Shot–put, Volleyball and Cricket.

Semester-II: Physical education

The students will be able to:

- **CO 1:** Understand and acquire knowledge about anatomy and physiology of human body.
- **CO 2:** Acquire knowledge and importance of balance diet and Nutrition.
- **CO 3:** Identify the principles of Health education and first aid.
- **CO 4:** Get comprehensive knowledge of Communicable Diseases and their preventions.
- **CO 5:** Inculcate the practical understanding of fundamental Rules and Skills in 100m, Long Jump, Handball and Kho–Kho.

Semester-III: Physical education

The students will be able to:

- **CO 1:** Acquire knowledge about theories of learning and its effect.
- **CO 2:** Understand about factors effecting sports performance and to identify causes of poor performance.
- **CO 3:** Get comprehensive knowledge of sports sociology and its role in the field of physical education.
- **CO 4:** Inculcate the practical understanding of fundamental Rules and Skills in 200m, Discuss Throw, Football and Yoga.

Semester-IV: Physical education

The students will be able to:

- **CO 1:** Acquire knowledge about yoga and its effects.
- **CO 2:** Gain knowledge about anatomy and physiology of human body.
- **CO 3:** Get enhanced knowledge of student about sports injuries and their remedial measures.
- **CO 4:** Inculcate the practical understanding of fundamental Rules and Skills in 200m, High Jump, Hockey and Wrestling.

Semester-V: Physical education

The students will be able to:

- **CO 1:** Get knowledge about recreation and its importance in daily life.
- **CO 2:** Acquire knowledge about various concepts of Biomechanics.
- **CO 3:** Get enhanced knowledge about sports training and its role in enhancing sports performance.
- **CO 4:** Inculcate the practical knowledge of fundamental rules and skills of 800m, Triple Jump, Basketball and Judo.

Semester-VI: Physical education

The students will be able to:

- **CO 1:** Understand and acquire knowledge about effects of exercise on various systems of human body.
- **CO 2:** Learn how to organize a sports tournament and camps.
- **CO 3:** Get enhanced knowledge about Kinesiology and Therapeutic exercises.
- **CO 4:** Comprehensive knowledge of various sports training.
- **CO 5:** Inculcate the practical understanding of fundamental Rules and Skills of 1500m, Javelin Throw, Kabbadi and Badminton.

Course Outcomes: History

Semester –I: History of India Upto C. 1000

The students will be able to:

- **CO 1:** Understand the evolution of an Empire.
- **CO 2:** Get knowledge about the main characteristics of Hinduism and also the birth and teachings of Buddhism and Jainism.
- **CO 3:** Know about the great Muaryan Empire and its art and architecture.
- **CO 4:** Examine that how the Gupta established Golden Age of Ancient India.
- **CO 5:** Understand the Administration of Greats Indian rulers.
- **CO 6:** Acquire knowledge related to the great centres of education and knowledge at Taxila, Nalanda and Vakrimasila universities.

Semester –II: History of India 1000-1707 A.D.

The students will be able to:

- **CO 1:** Describe the evolution of the political structures of Medieval India.
- **CO 2:** Understand political rise of Islam and Turkish Rule of India
- **CO 3:** Explain how the establishment, expansion and consolidation of the Delhi Sultanate, Mughals and Marathas were laid.
- **CO 4:** Learn about the political, social, economic and religious life of people under the Delhi Sultanate and the Mughals.
- **CO 5:** Understand the legacy of Chhatrapati Shivaji under his Maratha Empire.

Semester –III: History of India 1707-1947 A.D.

The students will be able to:

- **CO 1:** Explain how the Company's Rule in India was established after the battle of Plessey and Legitimized the regulating Act, Socio-religious reform Movements, Judiciary and Educational Reforms.
- **CO 2:** Describe the land revenue systems under the company's rule in India.
- **CO 3:** Explain Indian Nationalism and the freedom struggle.
- **CO 4:** Know why the Mutiny of 1857 is called the India's First War of Independence and what were its causes and impacts.
- **CO 5:** Understand the Economic Drain from the India by the Britishers.
- **CO 6:** Develop the political consciousness in Indian and development of India's Independence Movement and how we got freedom.

Semester –IV: History of Punjab 1469-1799

The students will be able:

- **CO 1:** To know about the physical features of Punjab which was known as the 'Gateway of India'
- **CO 2:** To understand the foundation of Sikhism, the youngest religion of the world
- **CO 3:** To know about founder and the first Sikh guru Guru Nanak Dev Ji and his universal teachings.
- **CO 4:** To understand the importance of Sangat, Pangat, Gurudwara and Langar, which have great importance in Sikhism.
- **CO 5:** To know about the works of Sikhs Gurus and compilation Adi Granth Sahib.
- **CO 6:** To know about the Mughal- Sikhs relations and martyrdoms of Sikh Gurus and the

followers.

CO 7: To know the transformation of Sikhism under tenth guru Gobind Singh by creation of Khalsha.

CO 8: To know about and struggle and hardships of Punjab's people in the 18th century.

Semester –V: History of the World (C 1500 - 1956 AD)

The students will be able to:

CO 1: Explains the rise of dictatorship in Europe, Constitutional Monarchy, Liberation and Unification Movement in Italy and Germany, the impact of French Revolution and its ideals, and the World wars.

CO 2: Understand Post-war developments of Social, Political and Economic scenarios of the World, Decolonization and the emergence of the Third world.

CO 3: Understand the artistic, social and cultural changes and developments in world after Renaissance

CO 4: Know the rise of Fascism in Italy and Nazism in Germany, causes of two disastrous World Wars.

CO 5: Describe the origin of the Cold War and Changing World Political Scenarios and emerging trends in Culture, Media and Revolution among the World countries.

Semester –VI: History of Punjab (1799- 1966)

The students will be able to:

CO 1: Get knowledge about the establishment of the Sikh Empire under the Sher –E-Punjab Maharaja Ranjit Singh.

CO 2: Know about military and civil administration of the Maharaja.

CO 3: Develop understanding about society and religious structure under the Maharaja's Rule.

CO 4: Understand the annexation of Punjab into British rule after the two Anglo-Sikhs Wars.

CO 5: Identify changes and development of Punjab under British Rule.

CO 6: Examine Social and Religious Movement of the 19th century Punjab.

Course Outcomes: Punjab History & Culture

Class: B.A/ B.Sc./B.Com/ B.B.A/ BCA/ BSc.(IT)

Semester I: Punjab History & Culture (From earliest Times to C 320)

The students will be able to:

- **CO 1:** Get detailed information about the early history of Punjab.
- **CO 2:** Know about the Greeks and the impacts of Alexander's Invasion to Punjab were.
- **CO 3:** Understand the society, religion, and political structure of ancient Punjab.
- **CO 4:** Get knowledge from Indus valley to Gupta Era's Punjab.

Semester II: Punjab History & Culture (C. 320 to 1000 AD)

The students will be able to:

- **CO 1:** Know about the Gupta Period which is called the Golden Age of ancient India.
- **CO 2:** Understand the change of life style from ancient to medieval Punjab.
- **CO 3:** Get knowledge about the Turks' invasion in Punjab and the causes of their success.
- **CO 4:** Get information about the circumstances responsible for the establishment of Islam into Punjab.
- **CO 5:** Examine the social, cultural and religious changes in the Punjab during early medieval Years.

Semester III: Punjab History & Culture (From 1000- 1605 AD)

The students will be able to:

- **CO 1:** Know about the Medieval Punjab.
- **CO 2:** Know about the Punjab under the Delhi Sultanate.
- **CO 3:** Understand the political establishment of Mughals.
- **CO 4:** Develop understanding about the society, religion and economy of Medieval Punjab.

Semester IV: Punjab History & Culture (From 1605 - 1849 AD)

The students will be able to:

- **CO 1:** Understand the Afghan Mughals struggle.
- **CO 2:** Know about the foundation and the development of Sikhism.
- **CO 3:** Develop understanding about the establishment of Sikh Empire by Maharaja Ranjit Singh.
- **CO 4:** Introduced to the annexation of Punjab by the Britishers.

Semester V: Punjab History & Culture (From 1849 – 1947 AD)

The students will be able to:

- **CO 1:** Understand about the development and changes under British Crown.
- **CO 2:** Know about the social- religious movement in Punjab during the 19th century.
- **CO 3:** Get understand the role of Punjabis in the National Movement.
- **CO 4:** Understand the causes and consequences of the partition of Punjab in 1947.

Semester VI: Punjab History & Culture (From 1947- 2000 A.D)

The students will be able to:

- **CO 1:** Learn about the post-Independence Punjab.
- **CO 2:** Know about the Punjabi Suba Movement and partition of Punjab in 1966 on language basis.
- **CO 3:** Understand the militancy in the 1980-90s Punjab.

Course Outcomes: Sociology

Semester I: Fundamentals of Sociology I

CO 1: Students will gain in-depth knowledge of the origins of sociology and its fundamental concepts.

CO 2: Students will gain knowledge of the diverse components of society, community, and social institutions, as well as their significance in human existence.

CO 3: Students will be able to analyze the socialization process and recognize the role of socialization agencies.

Semester II: Fundamentals of Sociology II

CO 1: Students will be able to explain the social structure of civilized society and the function of norms and values.

CO 2: Students will comprehend their function and standing in society, as well as the significance of culture.

CO 3: Students will gain the ability to comprehend individual and group socioeconomic backgrounds.

CO 4: Students will be able to differentiate between formal and informal social control agencies.

Semester III: India's Society

CO 1: Students would be able to understand Indian society and its different pattern of languages, culture, and regional uniqueness, among other things.

CO 2: Students will learn about the origins of the caste system and the various caste systems.

CO 3: Students will be educated on current national and worldwide social concerns such as communalism, gender and human rights.

CO 4: Students will be able to recognize the social institutions and types of societies, as well as the distinctions between them.

Semester IV: Social change in India

CO 1: Students will get an understanding of the notion of social change and the various viewpoints on it.

CO 2: Students will be educated on the various aspects of social change and their significance.

CO 3: Students will learn about many social development processes such as westernization, sanskritization, modernization, urbanization, and industrialization.

CO 4: Students will hone their analytical skills in order to comprehend societal issues and find solutions.

Semester V: Social Thought

CO 1: Students will study about basic social theories and views.

CO 2: The learner will be able to comprehend the rise of capitalism and the resulting class struggle.

CO 3: Students will acquire critical thinking skills in order to comprehend societal issues such as suicidal inclinations in society.

CO 4: Students will be taught about theoretical viewpoints and how they can be used to better comprehend society.

Semester VI: Social Research Paper

CO 1: Students will get an understanding of research procedures and scientific techniques.

CO 2: Students will study about several research designs and their applications.

CO 3: Students will study about data collection procedures and sampling methodologies for a representative sample.

CO 4: The students will be able to understand data handling and analysis.

Course Outcomes: Philosophy

Semester-I: Elementary Philosophy

- **CO 1:** This course introduces students to the fundamentals of philosophy and related subjects.
- **CO 2:** Will enable students to comprehend the philosophical framework.
- **CO 3:** Students are expected to get familiar with the major branches of philosophy as well as distinct philosophical viewpoints, along with societal issues. Specifically, casteism, gender equality and discrimination, the necessity for world peace, and how to achieve it.

Semester-II: Ethics: Western and Indian

- **CO 1:** Students are introduced to basic moral principles and traditional moral philosophy stories (Plato's Virtue, Kant's Goodwill, Views of Benthem, and J.S. Mill)
- **CO 2:** Introducing the students to Nishkam Karm, Bhagwat Geeta Yoga, Truth, and Guru Nanak Dev Ji's Hukam.
- **CO 3:** To familiarize learners with a more enlightened version of Buddhist ethics.

Semester-III: Indian Society

- **CO 1:** Students will get an understanding of Indian society, its characteristics, and its unity in diversity.
- **CO 2:** It will raise student awareness about sociological issues.
- **CO 3:** Students will learn about the definition of family, its types, functions, and changes.

Semester-IV: Inductive Logic and Environmental Ethics (Opt. I)

- **CO 1:** Students will be able to explain the principles of western logic so that students can apply logical reasoning in everyday situations.
- **CO 2:** The Logic course assists students in developing a fundamental understanding of logic and language ideas.
- **CO 3:** Students will learn to use logical reasoning in everyday situations.
- **CO 4:** Students will learn about the nature and conditions of valid hypothesis, environmental ethics, and population dynamics through practical activities.
- **CO 5:** Student’s awareness of nuclear threats and potential solutions will be raised.

Semester-V: Western Metaphysics and Epistemology

- **CO 1:** Students will be introduced to the origins, character, and depth of Western Philosophy's principles.
- **CO 2:** Subjective and Objective Idealism are the two types of Idealism that students will learn about.
- **CO 3:** Pragmatism will be grown in philosophy of reality for understanding the validity of truth proofs.

Semester-VI: Opt. (I) Indian Metaphysics and Epistemology

- **CO 1:** Students will learn about the philosophical components of Vedic Darshan in India, including many schools of vedic darshan and Avaidic Darshan, as well as their views on atma, Brahman, and creation.
- **CO 2:** The Maya doctrine of Shankracharya will be discussed.
- **CO 3:** Yoga Drshan and Visheshika Darshan are introduced to the students.

Course Outcomes: Punjabi (Compulsory)

Classes: B.A/ BSc/ B.COM/ BBA

SEMESTER-I: General Punjabi

CO 1: By reading Modern poetry students will be able to understand issues of Modernism.
CO 2: The students get the literary sense of essay and comprehension of the subject.
CO 3: The students get the basics knowledge of language.

SEMESTER-II: General Punjabi

CO 1: The students will be able to know the Poetry as a form of literature.
CO 2: The students get the basics knowledge of Biography.
CO 3: The students will be able to know the nature of different types of words and words category.
CO 4: They will get the basic knowledge of writing the application.

SEMESTER-III: General Punjabi

CO 1: The students will be able to know the Prose as a form of literature.
CO 2: The students will be able to know the one act play.
CO 3: The students will be able to understand the difference aspects of grammar.

SEMESTER-IV: General Punjabi

CO 1: The students will be able to know the play as a form of literature.
CO 2: The students will be able to understand human life at the Universal Level.
CO 3: The students will be able to get knowledge about the rule of words formation.

SEMESTER-V: General Punjabi

CO 1: The study of poetry will develop the sense of humanity among students.
CO 2: The students know the novel as a form of literature.
CO 3: The students will also be able to know phonology and causal factor.

SEMESTER-VI: General Punjabi

CO 1: The students will be able to analyze Mediaeval Poetry as a form of literature.
CO 2: The Students will be able to know about different historical places with the help of Safar Nama.
CO 3: The students will be able to know about the word formation and vocabulary.

Course Outcomes: Punjabi (Elective)

SEMESTER-I: Elective Punjabi

CO 1: The student will be able to know the Novel as a form of literature.
CO 2: The student will be able to enrich their aesthetic sense by reading Modern poetry.
CO 3: The student will be able to get knowledge of Indian Kav Sash tar.

SEMESTER-II: Elective Punjabi

CO 1: This course will enrich their aesthetic sense of students with the reading of medieval poetry.
CO 2: The students will get to know about our heroes.
CO 3: The students will get more knowledge of structure and semantics.

SEMESTER-III: Elective Punjabi

CO 1: The students will be able to know the medieval poetry as a form of literature.
CO 2: The students will be able to know story as form of literature.
CO 3: The students will be able to analyze the different literary forms.

SEMESTER-IV: Elective Punjabi

CO 1: The students can understand the basic of criticisms of mediaeval poetry.
CO 2: The students will be able to know prose as form of literature.
CO 3: The students will be able to develop their basic skills in language.

SEMESTER-V: Elective Punjabi

CO 1: The students will be able to know about the mediaeval poetry and modern prose.
CO 2: The students can analyze the literary forms.
CO 3: The students get the knowledge of their literary and moral values.

SEMESTER-VI: Elective Punjabi

CO 1: The students will be able to get knowledge about Punjabi language and Literature.
CO 2: The students will be able to understand one act play.
CO 3: The students will be able to know literary forms and criticism.

Course Outcomes: Basic Punjabi

SEMESTER-I: Basic Punjabi

CO 1: The students will be able introduced to basics of Punjabi Language.
CO 2: Students will learn the alphabets, words and sentences making in Punjabi language.
CO 3: Students will learn the vocabulary related to business, Relationship, agriculture and daily life.

SEMESTER-II: Basic Punjabi

CO 1: Students will learn SHABDA-SHARENIA like: Noun, Pronoun, verb, adjective, adverb, conjunction, connector and Interjection.
CO 2: Students will be able to learn the technique of sentence making.
CO 3: Students will be able to know the basic information for paragraph and précis writing.

SEMESTER-III: Basic Punjabi

CO 1: Knowledge about Punjabi writing skills will be increased.
CO 2: Students will learn translation from English to Punjabi.
CO 3: Student will acquire the skills of poem reading and writing.

SEMESTER-IV: Basic Punjabi

CO 1: The study of poetry will develop the sense of humanity among students.
CO 2: The students get the basics knowledge of the poem writers.
CO 3: The students can analyze the correct writing.

SEMESTER-V: Basic Punjabi

CO 1: The students will be able to understand the literature and folk literature.
CO 2: The students will be able to know about folk song and folk dance.
CO 3: The students get the knowledge of folk games and folk art.

SEMESTER-VI: Basic Punjabi

CO 1: The sense of cultural value will be developed among students.
CO 2: The students will come to know our historical and religious fairs.
CO 3: The students will be able to get the knowledge of traditional believes and traditional foods.

Course Outcomes: Hindi (Elective)

Semester-I: आधुनिक कविता, व्याकरण तथा अनुवाद

CO 1: छात्राओं को आधुनिक काल के विशिष्ट कवियों के व्यक्तित्व एवं कृतित्व की जानकारी
CO 2: विद्यार्थियों मैं कविताओं की व्याख्या के माध्यम से उनमें विश्लेषणात्मक दृष्टि को परिपक्व करना
CO 3: व्याकरणिक सिद्धांतों का अनुप्रयोगिक बोध
CO 4: विद्यार्थियों को अनुवाद लेखन एवं अनुवाद संबंधी शब्दावली का सूक्ष्म एवं व्यावहारिक ज्ञान

Semester-II: गद्य साहित्यः सैद्धांतिकी, व्याकरण तथा पत्रकारिता

CO 1: छात्राओं को साहित्यिक विधाओं–कहानी, एकांकी एवं निबन्ध का तात्विक बोध प्रदान करना
CO 2: साहित्यिक विधाओं के माध्यम से विद्यार्थियों में भारतीय संस्कृति एवं नैतिक मूल्यों का विस्तार
CO 3: मीडिया लेखन एवं पत्रकारिता संबंधी शब्दावली का कौशल ज्ञान
CO 4: छात्राओं को कार्यालयी पत्रों एवं आत्म–परिचय लेखन का सूक्ष्म बोध

Semester-III: मध्ययुगीन काव्य, इतिहास, व्याकरण तथा काव्यांग

CO 1: मध्यकालीन कवियों एवं उनके काव्य का सूक्ष्म ज्ञान
CO 2: संत कवियों की शिक्षाओं से छात्राओं का मार्ग–दर्शन
CO 3: हिन्दी साहित्य के आदिकाल का सम्पूर्ण बोध एवं मूल्यांकन
CO 4: विद्यार्थियों को काव्य एवं व्याकरण के विविध पहलुओं का व्यावहारिक ज्ञान

Semester-IV: उपन्यास, नाटक : सैद्धांतिकी, व्याकरण तथा भक्तिकाल

CO 1: छात्राओं को उपन्यास एवं नाटक का तात्विक ज्ञान
CO 2: मुंशी प्रेमचन्द कृत 'निर्मला' उपन्यास और डॉ. लक्ष्मीनारायण लाल कृत मिस्टर अभिमन्यु नाटक के माध्यम से विद्यार्थियों में संवेदनशील दृष्टिकोण का निर्माण करना
CO 3: विद्यार्थियों को 'हिन्दी साहित्य के स्वर्णयुग भक्तिकाल का सूक्ष्म बोध प्रदान कर उनमें आदर्शों को स्थापित करना
CO 4: व्याकरणिक कोटियाँ–विराम चिह्न, समास एवं कारक की अनुप्रयोगात्मक जानकारी

Semester-V: विशिष्ट कवि एवं काव्य सिद्धांत, कामकाजी हिन्दी तथा रीतिकाल

CO 1: छात्राओं में श्री रामधारी सिंह दिनकर द्वारा रचित 'रश्मिरथी' के माध्यम से दानवीरता, कर्म सिद्धांत एवं अहिंसा जैसे गुणों की स्थापना करना
CO 2: काव्य सिद्धांत एवं उसके स्वरूप का काव्य शास्त्रीय विश्लेषण
CO 3: कार्यालयी या प्रयोजनमूलक हिन्दी के प्रकार्यों का विस्तृत अध्ययन
CO 4: विद्यार्थियों को 'हिन्दी साहित्य के रीतिकाल' का सूक्ष्म बोध

Semester-VI: लघु विधाएँ, आधुनिक काल, निबन्ध लेखन तथा पारिभाषिक शब्दावली

CO 1: छात्राओं में साहित्य की विविध लघु विधाओं के लेखन–कौशल का विकास करना
CO 2: हिन्दी साहित्य के आधुनिक काल के विविध युगों का विस्तृत अध्ययन
CO 3: ज्ञान–विज्ञान के क्षेत्रों में प्रयुक्त होने वाली पारिभाषिक शब्दावली का व्यावहारिक बोध
CO 4: विद्यार्थियों को राजभाषा एवं राष्ट्रभाषा के प्रयोजनमूलक पक्षों से अवगत करवाना

Course Outcomes: English (Compulsory)

Classes: B.A./B.Sc./B.COM./ B.B.A.

Semester–I: General English

CO 1: Be able to study the content and make it comprehensible by stressing on its theme or central idea.
CO 2: Thorough and detailed examination of content and be able to utter interpretation.
CO 3: To have the knowledge of the utilization of language and its use in expressing views.
CO 4: Enriching ability to assess the various cultures, beliefs and their traditions.
CO 5: Acquiring the knowledge of second language perfectly.

Semester-II: General English

CO 1: Knowing sentence formation by having the knowledge of parts of speech.
CO 2: Having the knowledge of complex and compound structures of the language.
CO 3: Developing the critical point of view in respect to the text and keep it open to
CO 4: Developing writing skills by learning the tenses and parts of speech and arrangement of text.

Semester-III: General English

CO 1: Acquiring knowledge of technical aspect of the language.
CO 2: To have the updated global knowledge about all the aspects of the life and thereby develop refined lifestyle.
CO 3: The study of multiculturalism widens the outlook and propagates reflection on cultural diversity.
CO 4: Poetry encourages the ability to evaluate symbolic aspects of the language.
CO 5: Poetic forms like lyric, mock-epic, ballad, sonnet, dramatic monologue and enhancement of cognitive skills.
CO 6: Creative writing is promoted through the practice of writing poems in different verse forms.

Semester-IV: General English

CO 1: Enhancement of linguistic and grammatical skills through the study of tenses, voice, modals etc.
CO 2: Sensitivity for environment and devastation caused by the human interference in ecology.
CO 3: The study of text enhances the phonetic knowledge.
CO 4: Students come to know about the Victorian poetry.
CO 5: Reading of poetry is useful for the betterment of creativity among the students.

Semester-V: General English

CO 1: Students learn to evaluate the poems in light of the background of Romantic and Victorian period.
CO 2: Values are inculcated through the prescribed poems written on the various aspects of human life.

CO 3: Concept of American Dream and its impact on the world is highlighted through the play "All My Sons"

CO 4: Critical study of the lives of all the characters of the story and relation of their actions in modern life.

CO 5: Development of professional and technical writing through resume and report writing, formal letters and personal letter.

Semester-VI: General English

CO 1: Plays are useful to make the students more confident for deep understanding of the text.

CO 2: Historical, social and economic aspects are introduced to the students through variety of text.

CO 3: Students become familiar with the themes elucidated in the works of well-established writers.

CO 4: The RK Narayan's novel The English Teacher highlights the depth of the psychological and social features of the human personality.

Course Outcomes: English (Elective)

Semester-I: Elective English

- **CO 1:** Development of critical approach of English literature.
- **CO 2:** Understanding the characteristic and the use of English literary devices.
- **CO 3:** Learn the art of analyzing the text critically in the light of culture, psychology and socio-economic factors.
- **CO 4:** Better pronunciation and deep understanding of the phonetics.

Semester-II: Elective English

- **CO 1:** Betterment of critical approach of the text.
- **CO 2:** Advancement of the previous knowledge about the use and characteristics of English literary devices.
- **CO 3:** Advancement of the art of analysing the text critically in the light of culture, psychology and socio-economic factors.
- **CO 4:** Advancement of pronunciation and deep understanding of the phonetics.

Semester-III: Elective English

- **CO 1:** Students are introduced with the contemporary issues of the society.
- **CO 2:** Development of critical abilities and analytical skills of the students through the text.
- **CO 3:** Creative writers and their valuable literary works are introduced to the students.
- **CO 4:** Inculcating the empathetic approach among the students through the text which highlights the various aspects of the society.

Semester-IV: Elective English

- **CO 1:** Establish the sensitivity among the students to the contemporary issues of the society
- **CO 2:** Strengthening the critical abilities and analytical skills of the students through the text.
- **CO 3:** Creative writers and their valuable literary works are introduced to the students.
- **CO 4:** Learning the various linguistic skills like problem marking, solution and creative writing and developing critical ability.

Semester-V: Elective English

- **CO 1:** Study the background of English Literature and have the knowledge of the evolution of English Drama, English Poetry and English Novel.
- **CO 2:** The art of reading English Drama with a critical approach is inculcated among the students.
- **CO 3:** Developing the sensitivity for cultural differences as well as the universal features of human civilization.
- **CO 4:** Advancement of critical approach for understanding the background of the historical backgrounds of the themes.

Semester-VI: Elective English

- **CO 1:** Study the contemporary movements and their relation and impact on the English Literature.
- **CO 2:** Developing the art of reading the novel by focusing its relation with the current social setup.

CO 3: Students get to know the historical implications of the Second World War on the world.
CO 4: Development of the deep understanding of the common issue of human life through the characters and incidents of the story.

Course Outcomes: Sanskrit

Semester-I: Sanskrit

CO 1: Story of Bhagat Poorna Singh who helped the poor, needy, helpless and disable persons, founder of Pingalwara in Amritsar will be introduced to the students to develop the sense of humanity.
CO 2: Students will learn about the values of humanity, selflessness, sacrifices and help of needy people.
CO 3: Students will be introduced to Sanskrit alphabets as well as the pronunciation.
CO 4: Students will know the use of Sanskrit Avyaya Pad.
CO 5: Students will learn rules of Swar-Sandhi, and use of verb words in Sanskrit as Dhaatu Roop.

Semester II: Sanskrit

CO 1: Students will be introduced to Sanskrit literature and moral education in Sanskrit.
CO 2: It will enlighten and motivate students about their success path.
CO 3: Student will know about the basic grammar of Sanskrit as use of words in different formation, unchanged words.
CO 4: Students will be able to take first step to learn translation from Hindi to Sanskrit.
CO 5: Students writing skill would be enhanced.

Semester-III: Sanskrit

CO 1: Students will be introduced to Sanskrit-Play.
CO 2: Students will learn about Terminology used in Theaters.
CO 3: Students will know about the greatness of madhyam-vyayoga (Mahabharata) characters.
CO 4: Knowledge of Verb formation, Sandhi words and Tadhit Pratyaya will be imparted to students.
CO 5: Student will know about the recitation of Verse and Sanskrit poems.

Semester-IV: Sanskrit

CO 1: Students will learn the moral and value education through Sanskrit stories of Panchtantra.
CO 2: Students will learn moral education in funny and entertaining way.
CO 3: Students will imbibe the values which will help them to lead successful life.
CO 4: In grammatical phase student will learn about Shabda Roop, Stree Pratyaya, Samaas Pad.
CO 5: Students will be able to learn translation from Hindi to Sanskrit.

Semester-V: Sanskrit

CO 1: Students will learn the moral and value education through Sanskrit stories.
CO 2: In grammar portion student will learn rules of Visarga Sandhi.
CO 3: Students will be introduced to our ancient and rich Vedic literature.
CO 4: Students will learn the use of Nich and San Pratyaya.
CO 5: Students will know about our traditional days, months, seasons, sunshine's, 10 directions and some daily life using words in Sanskrit.

Semester-VI: Sanskrit

CO 1: Students will be introduced to World's most popular book 'Bhagawat Geeta'.

CO 2: Student will learn about Nishkaam Karma Yoga.
CO 3: In grammar, students will be made familiar with basic laukik literature and some texts.
CO 4: Students will take a step ahead to Samaas, knowledge of Alankaar.
CO 5: They will increase the capabilities of Sanskrit learning by Sanskrit Essay Writing.

Course Outcomes: EVS

(Compulsory) (All UG Classes)

Semester-III/ IV: EVS

CO 1: Students will get basic understanding of environment, its definition & scope, they will acquaint with various renewable and non-renewable energy resources.
CO 2: Students will understand concept, structure and function of ecosystem, they will understand about the energy flow in ecosystem through food chains, food webs.
CO 3: They will get to know how a barren rock converts to a forest through ecological succession.
CO 4: Students will understand the basic concept and types of biodiversity. They will study about different threats to biodiversity and various in situ and ex-situ method to conserve it.
CO 5: Students will study about the causes, effects and remediation of various pollutions.
CO 6: Students will acquaint with various social issues related to environment; they will study about different existing legislations regarding environment.
CO 7: Students will study about human pollution, rights and value education.
CO 8: The course is not confined to the classroom only but it has a field work unit where students prepare project reports on different topics mentioned in the syllabus.

Course Outcomes: Drug Abuse: Problem, Management and Prevention

Semester-I & II: Drug Abuse: Problem, Management and Prevention

Students will be able to:

CO 1: Develop awareness regarding the Drug Abuse which is the burning issue of the society.
CO 2: Know the actual meaning of Drugs.
CO 3: Understand the causes of the Drug Abuse in Punjab and India.
CO 4: Identify Impacts of the Drugs on family, society and states.
CO 5: Develop knowledge about preventions of the drugs and its management.
CO 6: Understand the state's laws and Acts to prevent the Drugs.
CO 7: Know about the Medical and psychiatrist management of Drugs.

Program Outcomes: B.Sc. (Economics)

On completion of the programme the students will be able to:

PO 1: Understand and use the idea of equilibrium to maximize welfare at both the microeconomic and macroeconomic levels.

PO 2: Develop a grasp of how trade works to distribute wealth and how market outcomes are based on the best individual decision-making.

PO 3: Identify essential macroeconomic variables and measurements of economic reform, progress, and development that will assist them in comprehending the overall functioning of an economy.

PO 4: Analyze, evaluate, and understand economic data, and provide recommendations for measures that will promote long - term economic growth of the country.

Course Outcomes: Economics

Classes: B.A./B.Sc.

Semester-I: Micro Economics

The students will be able to:

- **CO 1:** Explain the principle of demand, as well as the elements that influence demand, the reasons of a negatively sloped demand curve, and the different forms of demand.
- **CO 2:** Estimate consumer's stability by evaluating price, income, and cross elasticity of demand.
- **CO 3:** Use illustrations to depict the revenue and expense curves.
- **CO 4:** Compare various market types and producers' equilibrium in various markets.

Semester-II: Macro Economics

Students will be prepared to:

- **CO 1:** Analyze and connect micro and macroeconomics.
- **CO 2:** Make a comparison with the characteristics of the Classical and Keynesian Income, Output, and Employment models.
- **CO 3:** Comprehend the notion of effective demand and its significance in determining income and employment.
- **CO 4:** Explain and illustrate the idea of consumption function, M.P.C., and A.P.C.

Semester-III: Indian Economy

The students will be able to:

- **CO 1:** Comprehend the key features of the Indian economy, the development strategy in India since independence, and the Indian economy's significance in the globalized world.
- **CO 2:** Examine the development and dynamic nature of the agricultural, industrial, and tertiary sectors, as well as their contributions to the economy of the world at large.
- **CO 3:** Acquire a viewpoint on India's many economic issues.
- **CO 4:** Describe the Indian government's strategic planning and economic reforms, including their goals, shortcomings, and successes.

Semester- IV: International Economics and Public Finance

The students will develop the capability to:

- **CO 1:** Explain the ideas of terms of trade and compare and contrast the different theories of international trade.
- **CO 2:** Examine the impact of international commerce on economic development by contrasting free trade and protectionist policies.
- **CO 3:** Examine the impact of public policy on resource allocation, as well as public spending, taxation, budgeting procedures, and debt difficulties.
- **CO 4:** Define fixed and flexible exchange rates, as well as ways for resolving a negative balance of payments.

Semester-V: Economics of Development

The students will be able to:

CO 1: Understand economic development's concepts, elements, and metrics.
CO 2: Define what underdevelopment is and what it looks like.
CO 3: Examine various economic growth models.
CO 4: Compare and contrast the development policies of promoting exports and import substitution.
CO 5: Evaluate the sources of investment and growth and the procedures employed.
CO 6: Describe the function of organization in developing countries, including its importance, objectives, strategy, types, and issues.

Semester- VI: Quantitative Methods for Economists

The students will be able to:

CO 1: Demonstrate Sets, Relations, Functions, Limits, Continuity, Derivatives, Maxima/Minima, and Matrices principles.
CO 2: Understand and use the central tendency, dispersion, skewness, and kurtosis metrics.
CO 3: Examine the variables' underlying relationships, analyze covariance and correlation coefficients, and calculate regression coefficients.
CO 4: Create index numbers for a variety of uses and check for consistency.
CO 5: Using various interpolation approaches, estimate the missing values.

S.L. Bawa D.A.V. College

Batala(143505), Punjab

Faculty of Science

Program Outcomes (POs)

&

Course Outcomes (COs)

Program Outcomes: B.Sc. (Medical)/B.Sc. (Non-Medical)/ B.Sc. (Computer Science)

PO 1: The program targets to impart knowledge in the subjects of Physical Sciences, Computer Sciences & Life Sciences.

PO 2: The curriculum is designed to develop critical thinking and ability to solve problems using basic subject knowledge.

PO 3: Instills skill to use instruments and develop ability to perform experiments thereby developing analytical aptitude and research acumen.

PO 4: Interdisciplinary approach of the program helps to sharpen creative thinking leading to innovative ideas.

PO 5: Develops a sensitivity and responsibility towards the environment which has its importance in the sustenance of life.

Course Outcomes: Physics

Semester-I:

Paper A - Mechanics

- **CO 1:** Students will be able to articulate different coordinate system and other concepts of space and time
- **CO 2:** They will learn the concept of central force and its whole mechanics including laws governing planetary motion
- **CO 3:** Students will understand fundamentals of different frames of references and transformation laws.
- **CO 4:** They will know the mechanism of different types of collisions.

Paper B - Electricity and Magnetism

- **CO 1:** The candidate will acquire knowledge about fundamental laws and concepts in electricity and magnetism, especially with regard to Maxwells laws.
- **CO 2:** There will be inculcated an understanding electrical circuits and the most common components in such: resistors, capacitors, and inductors.
- **CO 3:** Students will get familiarized the properties of static electric and magnetic fields and how they arise.
- **CO 4:** This course will enable students to know the properties of simple, time-dependent electric and magnetic fields and what kind of physical phenomena they generate.

Semester-II:

Paper A - Relativity and Electromagnetism

- **CO 1:** Students will understand fundamental ideas of special theory of relativity and four vector formalism.
- **CO 2:** They will develop an ability to use Maxwell's equations in calculations featuring: both free and stationary electromagnetic waves.
- **CO 3:** Students will be able to examine the phenomena of wave propagation in different media and its interfaces.
- **CO 4:** This will enable student to analyze the nature of electromagnetic wave propagation in guided medium.

Paper B - Vibration and Waves

- **CO 1:** Students will acquire the ability to recognize and use a mathematical oscillator equation and wave equation, and derive these equations for certain systems.
- **CO 2:** They will be familiarized with the concept of damping and damped harmonic motion.
- **CO 3:** Students will know the fundamentals of forced oscillator and coupled oscillator such as q-factor.

Semester-III

Paper A - Statistical Physics and thermodynamics

- **CO 1:** Students will understand the basic statistical methods and concepts like probability etc.
- **CO 2:** They will be able to develop the relation between microscopic and macroscopic description through statistical mechanics.
- **CO 3:** Students will be able to find the efficiency of Carnot's engine and the significance of first law and second of thermodynamics and implications of the second law of thermodynamics.
- **CO 4:** This course will develop the ability to evaluate entropy changes in a wide range of processes and determine the reversibility or irreversibility of a process from such calculations.

Paper B - Optics

- **CO 1:** To introduce students with phenomenon based on light and related theories.
- **CO 2:** Students will get skills to identify and apply formulas of optics and wave physics
- **CO 3:** Students will be able to analyze the applications of diffraction and polarization.
- **CO 4:** Student will understand the resolving power of different optical instruments.
- **CO 5:** They will know the working of optical fiber and their applications in communication.

Semester-IV

Paper A - Quantum Mechanics

- **CO 1:** Students will be able to calculate the de Broglie Wavelength of a wave associated with the particle, explain the importance of Davisson and Germer and GP Thomson experiments and Heisenberg‟s Uncertainty Principle and Describe the illustrations.
- **CO 2:** They will be able to describe wave function and derive the Schrödinger equation and interpret the wave function and Eigen value equation.
- **CO 3:** Students will be familiarized with the different types of potentials and derive the solutions of Schrödinger equation for the same.

Paper B - Atomic and Molecular Spectra

- **CO 1:** Student will understand the emergence of quantum concept
- **CO 2:** They will be able to distinguish between different photo devices and working.
- **CO 3:** Students will learn different atomic models
- **CO 4:** They will analyze the prerequisite in a molecule towards its Rotational and vibrational activity.

Semester-V

Paper A - Condensed Matter Physics

- **CO 1:** This course will explain students the symmetry elements and Bravais lattice.
- **CO 2:** Student will be able to distinguish between crystalline and amorphous solids, calculate atomic packing factor for Cubic structure.
- **CO 3:** They will analyze the success and failure of free electron theory, the origin of band gap.
- **CO 4:** Student will learn the concept of Conductors, Insulators and semiconductors.

Paper B - Nuclear physics

- **CO 1:** Students will be inculcated with nuclei properties, compare a drop of liquid with that of a nucleus and understand Shell model.

CO 2: This course will let them describe basic radioactivity, calculate half-lives and understand radiation hazards.

CO 3: They will be capable to explain natural and artificial transmutations, calculate Q-value of a reaction and recognize the applications of isotopes.

Semester-VI

Paper A- Electronics

CO 1: Students will acquire basic knowledge of semiconductor diode, rectifier and filter circuits.

CO 2: They will understand transistor biasing and working principle of Amplifiers.

CO 3: They will learn the concept of feedback and oscillatory circuits

CO 4: They will be able to comprehend the operation and characteristics of FET, MOSFET

Paper B-Particle Physics

CO 1: Students will be able to distinguish between principles and working of different types of detectors, counters and accelerators.

CO 2: They will know the basics of forces of nature recall the properties of cosmic rays and classify elementary particles.

Course Outcomes: Chemistry

Semester-I

Paper I (Inorganic chemistry):
The students will be able:

- **CO 1:** To understand about structure of atom and learn how to write electronic configuration of elements by applying Aufbau, Pauli exclusion principle and Hund's rule of maximum multiplicity
- **CO 2:** To predict properties of elements in terms of ionization energy, atomic radii, electron affinity and further explaining chemical behavior,
- **CO 3:** To know importance of VSEPR theory predicts shapes of inorganic molecules and Molecular orbital theory to Homonuclear & Heteronuclear molecules.
- **CO 4:** To learn structure of ionic solid like NaCl, Zinc Blende and understand polarizability of ions by using Fajan's rule.

Paper II (Organic chemistry):
The students will be able:

- **CO 1:** To study structure and bonding in organic compound and learn how to explain reaction mechanisms, and find out reaction intermediates.
- **CO 2:** To learn how alkane is synthesized in laboratory and what is use of alkane in day-to-day life.
- **CO 3:** To understand mechanism involved in electrophilic addition reaction of alkenes
- **CO 4:** To identify aromatic character of benzene and their electrophilic substitution reactions with special reference to halogenation, sulfonation, nitration and Friedel craft reaction.

Practical (Chemistry)

- **CO 1:** To undergo semi micro analysis and identification of ions present in a salt.
- **CO 2:** To determine Melting and boiling point of substance.
- **CO 3:** To understand laboratory techniques and follow safety protocol.

Semester-II:

Paper I (Inorganic chemistry-II):
The students will be able:

- **CO 1:** Understand general characteristics of Alkali and Alkaline earth metals.
- **CO 2:** Explain general characteristics of Boron, Carbon, and Nitrogen, family elements in special reference to hydrides, halides, oxides and oxyacid's.
- **CO 3:** Study properties of oxygen and halogen family elements and also important compounds of p-block elements.
- **CO 4:** Differentiate between first transition and second & Third transition elements in terms of properties like atomic radii, magnetic behavior.

Paper II (Physical chemistry-I):
The students will be able:

- **CO 1:** To understand kinetic theory of gas, ideal gas behavior and deviation from ideal gas behavior. Learn how to calculate of root mean square, average and most probable velocities
- **CO 2:** To explain properties of liquids, liquid crystals, thermography and seven segment cells.

CO 3: To study colloidal state, stability of colloids, and emulsion and learn how colloidal sol can be prepared and purified

CO 4: To differentiate between ideal and non-ideal solution Study of colligative properties and their experimental determination.

Practical (Chemistry)

CO 1: Concept of Crystallization

CO 2: To determine Surface tension, Viscosity of liquids and enthalpy of neutralization of Strong/weak acid and base

CO 3: Hands on technical exposure to equipment.

Semester-III

Paper I (organic chemistry-II):

The students will be able:

CO 1: To understand Stereochemistry of organic compound and study of optical &Geometrical Isomerism by taking day-to-day life examples.

CO 2: To study Conformational isomerism of alkane and cycloalkanes.

CO 3: To study monohydric and dihydric alcohol and comparison of acidic character with phenols.

CO 4: To understand physical and chemical properties of aldehyde &ketone.

Paper II (Physical chemistry-II):

The students will be able:

CO 1: To study concept of Thermodynamics, and learn how to calculate w, q, du & dH for the expansion of ideal gas using first law of thermodynamics.

CO 2: To understand need of second law of thermodynamics, and study of Carnot cycle and its efficiency. Further, determination of entropy change in ideal gas.

CO 3: To know about Third law of thermodynamics and thermodynamic equilibrium and spontaneity.

CO 4: Derivation of Gibbs phase rule and phase equilibria in one component and two components system.

Practical (Chemistry)

CO 1: To undergo Volumetric and Gravimetric analysis of day to day life example of commercial sample.

CO 2: To determine Rf values and identification of organic compound by Thin layer chromatography.

CO 3: Laboratory safety procedure and handling of hazard materials.

Semester-IV

Paper I (Inorganic chemistry-III):

The students will be able:

CO 1: To study Werner coordination theory, magnetic properties, color of coordination compounds and their application in everyday life.

CO 2: To describe Non aqueous solvents and oxidation reduction as electron transfer reaction, and their application in preparatory chemistry.

CO 3: To understand chemistry of Lanthanides and actinides elements and their comparison in terms of oxidation states and magnetic properties.

CO 4: To explain essential and trace elements and importance of these elements in biological system.

Paper II (organic chemistry-III):
The students will be able:

CO 1: To compare acidic strength of carboxylic acid with phenols and study of reactions

CO 2: To study cleavage of ether and epoxide with water &Grignard reagents. Study of five and six membered heterocyclic compounds.

CO 3: To understand basicity of amine, stereochemistry and Phase transfer catalyst.

CO 4: To explain synthetic application of Organomagnesium, organolithium and organocopper compound.

Practical(Chemistry)

CO 1: Qualitative analysis of detection of elements in organic compound.

CO 2: Qualitative analysis of detection of functional group in organic compound.

CO 3: Laboratory safety procedure and handling of hazard materials.

Semester V:

Paper I (Inorganic chemistry-IV):
The students will be able:

CO 1: Learn Crystal field theory and its application in elaborating colour and magnetic properties of Transition metal complexes.

CO 2: Measurement of paramagnetism and study of variation of paramagnetism with temperature.,

CO 3: Explain thermodynamic and kinetic stability of metal complexes and mechanism of Nucleophilic substitution in square planer complexes.

CO 4: Study of LS coupling and electronic transition of transition metal complexes.

CO 5: Calculate Effective atomic number of organometallic compound and application of these compounds in synthetic industry.

PaperII (Physical chemistry-III):
The students will be able to:

CO 1: Study conduction in metals and in electrolytic solutions. Study of Galvanic and electrolytic cells.

CO 2: Information about EMF of cell and calculation of thermodynamic quantity

CO 3: Understand Polarization, overvoltage and its application. Learn how to determine pH and solubility product.

CO 4: Recognize concept of radioactivity. Learn Nuclear structure, nuclear models and detection of radioactivity and its measurement. Concept of Nuclear fission and nuclear fusion and application of radioactivity.

CO 5: To explain the application of rotational, vibrational and electronic transition in molecules.

Practical (Chemistry)

CO 1: Synthesis and analysis of transition metal compounds.

CO 2: Determination of end point of Strong/weak acid and base by conductometric titration

CO 3: To determine refractive index of liquids by Abbe refractometers.

Semester VI:

Paper I (Organic chemistry-IV):
The students will be able:

- **CO 1:** To describe UV, IR and NMR spectroscopy and its application to elucidate structure of organic compound.
- **CO 2:** To learn synthetic application of malonic ester and ethyl acetoacetate molecule
- **CO 3:** Introduction of carbohydrates, determination of ring size. interconversion of monosaccharides.
- **CO 4:** To study acid base behavior of amino acids, structure of peptides and proteins and Helical structure of DNA.

Paper II (Physical chemistry-IV):
The students will be able to:

- **CO 1:** Derive Schrodinger wave equation and its importance in one dimensional , two and three dimensional box.
- **CO 2:** Discuss solution and wave function of Schrodinger wave equation and undergo qualitative investigation of hydrogen atom.
- **CO 3:** Derive Bragg;s law and determination of crystal structure of NaCl, KCl by powder method
- **CO 4:** Differentiate between thermal and photochemical process. Jablonski diagram depicting processes occurring in the excited states.

Practical (Chemistry)

- **CO 1:** Synthesis and analysis of organic compounds.
- **CO 2:** Separation of leaf pigments from spinach leaves separation of dyes by column chromatography.
- **CO 3:** Handling of hazardous materials

Course Outcomes: Zoology

Semester-I

Paper ZOO-IA (Cell Biology)

- **CO 1:** Comprehensive understanding of different types of microscopes, tools & techniques, as well as fixatives and staining protocols.
- **CO 2:** Acquiring a detailed knowledge about the structure of plasma membrane and mechanism of transport across it.
- **CO 3:** Learning about the structural and functional complexities of various cell organelles.
- **CO 4:** Students will get to discern the process of transformation of normal cells into cancer and basic aspects of immunity

Paper: ZOO-IB (Biodiversity-I)

- **CO 1:** Gaining knowledge about basic concepts of classifying diverse organisms into different taxonomic levels and evolutionary relations between different phyla.
- **CO 2:** Students will learn the morphological and physiological details of the type examples from phylum Protista to Annelida.
- **CO 3:** Achieving an understanding of pathogenic Protozoans' and parasitic adaptations of Helminths.
- **CO 4:** Students will be able to identify, scientifically classify & write ecological specificities, morphological features and economic importance of the specified specimens.

Semester-II

Paper: II A (Ecology)

- **CO 1:** Students would get to understand nature and scope of ecology along with its various components, ecological factors and types of ecosystems.
- **CO 2:** Students will develop an understanding w.r.t. biogeochemical cycles of nature, concept of limiting factors, ecological succession and ecological niche.
- **CO 3:** Students would learn about inter- & intra- Specific relationships, and types of adaptations at morphological, physiological and behavioural level to survive in a particular habitat.
- **CO 4:** Students will be able to fathom the impact of environmental pollution, importance of alternative energy resources and conservation of natural resources.

Paper: ZOO-IIB (Biodiversity-II)

- **CO 1:** Learning the morphological and physiological details of type examples from phyium Arthropoda to Echinodermata.
- **CO 2:** Understanding social organization & behaviour in insects, torsion, pearl formation as well as the larvae of phylum Echinodermata.
- **CO 3:** Students will learn about the evolutionary phenomenon through the study of hemichordata species whereby inferring the origin of chordates from nonchordates.
- **CO 4:** Students would gain knowledge about classification of invertebrates (Arthropoda to Echinodermata),
- **CO 5:** Ecological details and economic importance of specified specimens.

Semester-III

Paper ZOO-III A (Evolution)

- **CO 1:** Pupils will learn about concept of evolution and develop its understanding through various theories and evidences of organic evolution.
- **CO 2:** Students would obtain knowledge about origin of life, concept of micro, macro & mega-evolution as well as speciation.
- **CO 3:** Comprehending the idea of fossil formation & its significance, extinction of reptiles and evolution of human species.
- **CO 4:** Leaning the process of migration, parental care, and adaptive radiations (like scales & fins) in fish.
- **CO 5:** Students would absorb an understanding regarding poison apparatus in snakes, flight adaptations & migration in birds, and dentition in mammals.

Paper: ZOO-III B (Biodiversity-III)

- **CO 1:** Students will gain knowledge about the characteristic features of chordates and would be able to decipher the origin of chordates from non-chordates through the affinities shown by lower chordates with either.
- **CO 2:** Students will be acquainted with Urochordata, Cephalocordata & Cyclostomata and study details of Amphioxus.
- **CO 3:** Learning anatomical and functional details of various organ systems of representative member of each Vertebrate class.
- **CO 4:** Pupils will be able to identify and classify various chordate animals along with details of their general features, habitat and economic importance.

Semester-IV

Paper ZOO-IV A (Biochemistry)

- **CO 1:** Students will develop an understanding as regard the concept of biochemistry and its scope.
- **CO 2:** To learn about classification of carbohydrates, proteins, fats and nucleic acids along with the details of their metabolism.
- **CO 3:** Students will get a comprehensive idea about enzymes, their categorization, mechanism of action and co-enzymes.
- **CO 4:** To perform and interpret various biochemical tests.

Paper: ZOO-IVB (Animal Physiology)

- **CO 1:** Understanding basic concepts about physiology of digestion, its types & regulation and physiology of respiration.
- **CO 2:** Learning about blood composition, its physiological details & regulation of blood circulation and also the physiology of excretion.
- **CO 3:** Detailed understanding of ultra-structure of muscle and basis of muscle contraction along with physiological basis of nerve coordination and integration of nervous system.
- **CO 4:** Students will learn about structure & physiology of endocrine glands, and physiological basis of behaviour.
- **CO 5:** Ability to differentiate and draw diagrams of skeletal bones of representative members of various vertebrate classes.

Semester-V

Paper ZOO-VA (Developmental Biology)

- **CO 1:** Students will become well versed with the fundamental principles of developmental biology, gametogenesis and various stages of embryonic development.

CO 2: Attain knowledge about the basic concept of determination, differentiation, organisers & inducers and details of embryonic development & metamorphosis in Herdmania.

CO 3: Developmental details till the formation of three germinal layers, fate of germ layers and fate map in Frog & Chick besides metamorphosis in frog.

CO 4: Students will get to understand the phenomenon of embryonic development in Rabbit, formation of foetal membranes & their role. Process of placenta formation, its types and functions

CO 5: Students will learn about gerontology and basis of regeneration, ageing & death.

Paper: ZOO-V B (Genetics)

CO 1: Students will get to understand the basic concept of inheritance and analyse various ratios of modified genes & inter-allelic interactions along with the concept of linkage and crossing over as the basis of variations.

CO 2: Configuring molecular structure of genetic material and in-depth details of DNA duplication & RNA synthesis.

CO 3: Concept learning of genetic code, gene expression in protein synthesis and regulatory mechanism of gene expression.

CO 4: Categorizing types of mutation & mutagens, evidences of mutations, and basis of inborn metabolic disorders in humans.

CO 5: Students will be able to figure out the principle of population genetics & calculate the frequency of genes in a population.

CO 6: Understanding about recombinant DNA technology and its impact in applied genetics.

Semester-VI

Paper ZOO-VI A (Opt-ii) -Economic Entomology-I

CO 1: Students will get well versed with general terminology and practical methodologies practiced in the study of pests.

CO 2: Students will learn about the taxonomic position, peculiar habits and types of damage being caused by pests of sugarcane, cotton, paddy wheat and vegetables.

CO 3: Comprehensive idea about the pests of stored grains and would learn their scientific classification, special habits and damage caused.

CO 4: Learn the details of commercially important insects and principles of Sericulture, Apiculture and Lac industries.

Paper: ZOO-VIB (Opt-ii) - Economic Entomology-II

CO 1: Students will learn about the taxonomic position, peculiar habits and type of damage being caused by pests of medical importance.

CO 2: Students will gain knowledge of the taxonomic position, peculiar habits and the type of damage being caused by pests of veterinary importance.

CO 3: Students will be able to differentiate between structure of mouth parts of different insects.

CO 4: Learning about Principles of chemical pest control & will be able to catalogue the type of pesticide used.

CO 5: Understanding of biological control of insect pests, its importance, Principle behind it and the latest methodologies being exercised.

Course Outcomes: Botany

Semester I

PAPER–I A: DIVERSITY OF MICROBES

- **CO 1:** Students will get knowledge of general characters, habitat, vegetative structure, reproduction economic importance of different members of algae.
- **CO 2:** Students will also get a deep insight on life cycle and economic importance of Virus and Bacteria.
- **CO 3:** Students will get knowledge of general characters, habitat, vegetative structure, reproduction economic importance of different members of fungi.
- **CO 4:** Students will critically examine and observe the morphology and anatomy of different members of algae, fungi, lichen through practical classes.

PAPER–I B: DIVERSITY OF CRYPTOGAMS

- **CO 1:** Students will study in detail the general characters, habitat, vegetative structure, reproduction of different members of Bryophytes.
- **CO 2:** Students will develop an understanding that how plants are evolving on the earth from thallus body to first vascular plant on the earth-Pteridophytes.
- **CO 3:** Student can identify morphologically different members of Bryophytes and Pteridophytes
- **CO 4:** Students will perform the section cuttings of different Bryophytes and Pteridophytes to study their anatomical features.

Semester II

PAPER–II A: CELL BIOLOGY

- **CO 1:** Students will study about structure of nuclear membrane, nuclear pore and nucleus along with their functions.
- **CO 2:** Students will get to know about extranuclear genome present in mitochondria and chloroplast and their inheritance in plants.
- **CO 3:** Students will be familiarized with structural organization of chromosomes, they will also get to know about the different types of chromosomal aberrations.
- **CO 4:** They will be able to understand the difference between the cell wall and cell membrane, students will understand the basic nature of plasma membrane, its bi layered structure, transport across plasma membrane and its functions.

Paper IIB: Genetics

- **CO 1:** Students will get to know about the basic nature of genetic material (DNA), its structure, replication and functions.
- **CO 2:** Students will be able to differentiate between the mitosis and meiotic cell divisions, they will get to know about laws of inheritance
- **CO 3:** Students will acquaint with the concept of gene, its translation and post translation modifications.
- **CO 4:** They will also have basic understanding of damage and repair of DNA.

Semester III

PAPER–III A: Structure, Development and Reproduction in Flowering Plants- I

- **CO 1:** Students will get knowledge about basic morphology of plant. They will develop an understanding from the leaves to the pattern of branching.
- **CO 2:** They will get insights on the organization of shoot apical meristem.

CO 3: Students will develop an understanding of primary and secondary xylem, structure and function of phloem, role of cambium and annual rings.

CO 4: Students will be able to understand the origin, development, arrangement and diversity of leaves; they will also identify various adaptations of leaves in relation to photosynthesis.

Paper IIIB: Structure, Development and Reproduction in Flowering Plants–II

CO 1: Students will study about the formation and functions of root system in plants.

CO 2: Students will get knowledge about the structure and development of flower

CO 3: They will develop an understanding about the structure and development of male and female reproductive parts and gametophytes of the flower.

CO 4: Students will be able understand about different ways of pollination, about various pollinators and fertilization in plants.

Semester-IV

Paper IV A: Diversity of Seed Plants and their Systematics- I

CO 1: Student will be able to understand the evolution of the seed habit in plants, they will also get knowledge about various distinguishing features of angiosperms and gymnosperms.

CO 2: They will get to know about the evolutionary history of gymnosperms.

CO 3: Students will learn about geological time scale and fossilization.

CO 4: Through practical classes they will observe the morphology and anatomy of root, stem and leaf of various members of gymnosperms like pinus, cycus, epherda and ginkgo which they have studied in the their theoretical classes.

Paper IV B: Diversity of Seed Plants and their Systematics–II

CO 1: Students will understand about the basics of taxonomy, contribution of cytology, phytochemistry and taximetrics in taxonomy.

CO 2: They will get to know about various systems of classifications like Bentham and Hooker, Engler and Prantl.

CO 3: Through practical classes they will able to dissect flower.

CO 4: Student will be able differentiate various families of the angiosperms on the basis of morphological and anatomical features.

Semester-V

Paper V A: Plant Physiology

CO 1: Students will get to know about various aspects of plant physiology like how plants uptake water and nutrient from soil.

CO 2: They will get to know about the roles of various nutrients and what kind of deficiency symptoms they caused.

CO 3: Students will get basic understanding of photosynthesis, photophosphorylation, and photorespiration.

CO 4: They will also acquaint with the different types of plant growth regulators present in the plants and their physiological roles.

Paper V B: Biochemistry and Biotechnology

CO 1: Students will be acquainted with the basic of enzymology, their discovery and nomenclature, concept of holoenzyme, apoenzyme, coenzymes and cofactors regulation of enzyme activity, mechanism of action.

CO 2: Students will get to know about two major physiological aspects of plants, respiration and nitrogen metabolisms.

CO 3: They will develop deep understanding about aerobic and anaerobic respiration, biology of nitrogen fixation, synthesis and mobilization of various saturated and unsaturated fatty acids.

CO 4: Students will get to know the basics of genetic engineering, biotechnology and plant tissue culture.

Semester–VI

Paper VI A: Ecology

CO 1: Students will get to know about the different abiotic factors like air, water, light, temperature and soil and their effects on the growth and development of plants.

CO 2: They will also understand the different kinds of Morphological, anatomical and physiological responses plants induced in them to cope up with stress induced by these abiotic factors.

CO 3: Students will understand the basic concept of ecosystem and energy flow in the ecosystem through food chains, food webs, biogeochemical cycles.

CO 4: Students will also get to know about various kinds' growth curves, different biogeographic regions of India.

Paper VI B: Economic Botany

CO 1: Students will get the knowledge of morphology, anatomy, cultivation practices and uses of various food plants.

CO 2: Students will acquire understanding of various fiber and vegetable oil yielding plants.

CO 3: Students will develop an understanding to use various spices and different types of medicinal plants available in their surroundings to treat basic diseases.

CO 4: They will get to know in detail about the cultivation and processing of tea, coffee and rubber.

Course Outcomes: Mathematics

Classes: B.A. /B.Sc.

Semester-I

Paper A- Algebra:

Students will be able to:

- **CO 1:** Distinguish between homogeneous and non-homogeneous systems with more than two equations and variables, as well as how to solve them.
- **CO 2:** Inculcate the concepts of limit, indeterminate form of limits, and continuity, which serve as the foundation for a variety of higher mathematics outcomes and topics.
- **CO 3:** Apply problem solving Methods to get solutions of solving cubic and bi-quadratic equations.
- **CO 4:** Link the roots and equation of an nth order polynomial and solve the equation.
- **CO 5:** Understand the concepts of Eigen Values and Eigen Vectors For square matrices,.
- **CO 6:** Transform equations in order to obtain the roots of a given equation in a specific form, which they will then use to determine the symmetric function of roots.

Paper B- Calculus and Trigonometry:

Students will be able to:

- **CO 1:** Demonstrate a working knowledge of the Real Number System and its properties, as well as the ability to solve problems using the lub and glb properties and their applications in basic algebra.
- **CO 2:** Understand the notion of limits and function continuity, as well as their properties, and be able to solve problems based on them, as well as find points of discontinuity and uniform continuity of a function.
- **CO 3:** Knowledge about Hyperbolic functions and their differentiation, integration, successive differentiation, Leibnitz theorem, Taylor's and Maclaurin's theorems, and their applications.
- **CO 4:** Conceptual Clarity about De–Theorem Moivre's and its Applications.
- **CO 5:** Skills to recognize circular and hyperbolic functions, as well as their inverses.
- **CO 6:** Techniques for solving power series about ordinary and solitary points.

Semester-II

Paper A- Calculus and Differential Equations

Students will be able to:

- **CO 1:** Locate the x and y intercepts, any undefined points, and any asymptotes of any given equation or graph.
- **CO 2:** Trace the graph of any given curve and will also be able to find the points of Concavity, convexity and point of inflexion of that curve
- **CO 3:** Evaluate definite integrals that may involve logarithms, exponentials, polynomials, and powers by using the Fundamental Theorem of Calculus.
- **CO 4:** Calculate length of an arc, area under curve and volume enclosed between the curves using definite integral.
- **CO 5:** Solve first-order differential equations with separable, exact, linear, homogeneous, or Bernoulli instances using standard approaches. and The approach of indeterminate coefficients and parameter variation is used to find the complete solution of a non-homogeneous differential equation with constant coefficients.
- **CO 6:** Inculcate a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.

Paper B- Calculus

Students will be able to:

- **CO 1:** Get complete knowledge about the basic principles of multi-variable calculus with theorems along with their proofs &applications together with the techniques to solve problems involving the fundamental tools such as continuity, partial differentiability and differentiability.
- **CO 2:** Find jacobians and affix the same concept to revel the dependency or independency of variables.
- **CO 3:** Locate points of maxima, minima or saddle points of functions in two variables.
- **CO 4:** Evaluate multiple integrals (Double and triple)and apply them for the evaluation of areas, volumes, Surfaces of solid of revolutions
- **CO 5:** Develop skills to simplify double or triple integral problems by changing the order of integration.

Semester-III

Paper A- Analysis

Students will be able to:

- **CO 1:** Understand sequence of real numbers, limits of bounded and monotonic sequences furthermore will also be able to discuss convergence of sequence using cauchy's criteria.
- **CO 2:** Understand Series of real numbers and will also be able to analyze convergence or divergence of series using various tests.
- **CO 3:** Understand the core and theory of integration using Upper Sum, Lower sum, Upper integral and Lower integral. They will be able to check the existence of Riemann integrability of functions and find the integral using algebra of integrable functions.
- **CO 4:** Develop the knowledge of solving infinite integrals called Improper integrals
- **CO 5:** Check the conditions for the existence of Improper Integrals and can test the convergence of improper integral
- **CO 6:** Develop the knowledge of Beta and Gamma functions and their applications.

Paper B- Analytical Geometry:

Students will be able to:

- **CO 1:** Learn to simplify and solve the equations in two or three variable by shifting of origin or by rotating the axis.
- **CO 2:** Identify the type of geometric figure (one of parabola, ellipse, hyperbola) associated with second degree equation.
- **CO 3:** Evaluate tangents and normal, Pole and polar, pair of tangents at a point, Chord of contact of parabola, ellipse and hyperbola.
- **CO 4:** Understand how geometry is related to algebra by using their algebraic equations.
- **CO 5:** Solve the problems of lines in three dimension, planes, spheres, and cylinders and how geometry is related to algebra by using their algebraic equations.

Semester-IV

Paper A- Statics and Vector Calculus

Students will be able to:

- **CO 1:** Understand the concepts of mechanics (static) forces, resolution of forces, moment, Couples, Equilibrium of coplanar forces and their application in problem solving.
- **CO 2:** Memorize definition of directional derivative and gradient and illustrate geometric meanings with the aid of sketches.

CO 3: Memorize theorem relating directional derivative to gradient and reproduce proof and Calculate directional derivatives and gradients.
CO 4: Apply gradient to solve problems involving normal vectors to level surfaces.
CO 5: Explain the concept of vector integration a plane and in space.

Paper B- Solid Geometry
Students will be able to:

CO 1: Identify the type of geometric figure (one of cylinder, cone, paraboloid, ellipsoid, hyperboloid) associated with equation of second degree in x, y, z.
CO 2: Generate the equation of cylinder, cone with the revolution of a particular line.
CO 3: Develop the knowledge about different kinds of cylinder, cone and their application.
CO 4: Inculcate Knowledge about Surfaces represented by general equation of 2nd degree, tangent lines, tangent planes and Normal plane along with their applications.

Semester-V

Paper A- Dynamics
Students will be able to:

CO 1: Understand rectilinear motion in straight line, curvilinear motion, motion along inclined plain and oscillations along with their application in problem solving.
CO 2: Develop knowledge about Newton's laws of motion, their real world applications as well as applications in problem solving.
CO 3: Understand concepts like Work, Power Kinetic Energy, Potential energy & Conservative forces in depth and implement these concepts in problem solving.

Paper B- Number Theory
Students will be able to:

CO 1: Demonstrate knowledge and understanding of topics including, but not limited to divisibility, prime numbers, congruences, quadratic reciprocity, Diophantine equations.
CO 2: Learn methods and techniques used in number theory.
CO 3: Solve various problems on properties of integers and use the basic concepts of divisibility and their applications in basic algebra.
CO 4: Apply Euclid's algorithm and backwards substitution.
CO 5: Understand the definitions & properties of congruence's, residue classes and least residues and apply these concepts to solve congruence's and other problems.

Semester-VI

Paper A- Linear Algebra
After completing this course student will be able to:

CO 1: Use the concept of basis and dimension of vector spaces linear dependence and linear independence, to solve problems.
CO 2: Understand the concept of inner product spaces to find norm of vectors and distance between vectors.
CO 3: Check the orthogonality of vectors, to find the orthogonal and orthonormal basis.
CO 4: Apply the properties of linear transformations to linearity of transformations, kernel and rank of linear transformations, inverse transformations to solve the problems of matrix transformations as well as change of basis.

Paper B- Numerical Analysis

After completing this course student will be able to:

- **CO 1:** Perform an error analysis for a given numerical method.
- **CO 2:** Solve an algebraic or transcendental equation using an appropriate numerical method.
- **CO 3:** Solve a linear system of equations using an appropriate numerical method.
- **CO 4:** Learn not only how to use the finite element method, but also how to formulate and code a finite element method for any given set of partial differential equations. Thus, the finite element method is developed as a tool for the numerical solution of partial differential equations, and not confined only to structural mechanics applications the way it is typically taught.
- **CO 5:** Solve the Ordinary differential equation, find the Integration & Derivative of higher order by various methods.

Program Outcomes: M.Sc. (Mathematics)

PO 1: The Program has been designed to produce professionals in the field of mathematics and opens the gate for research in pure mathematics, applied mathematics & statistics.

PO 2: Ability to apply conceptual learning and technical skills in practical projects like construction, instrumentation, pharmaceutical production etc.

PO 3: To develop analytical expertise in data interpretation and formulation of mathematical models.

PO 4: The program helps to achieve proficiency in marketing, consultancy and entrepreneurship.

Course Outcomes: M.Sc. (Mathematics)

Semester-I

Real Analysis-I
Student will be able to:

- **CO 1:** Develop knowledge about basic definition of metric space, norm linear space and inner product space
- **CO 2:** Develop the ability to handle convergence of series and sequence of functions.
- **CO 3:** Knowledge will be developed about core Riemann integrals and Riemann Stieltjes Integral and its application
- **CO 4:** Skills will be gained to differentiate functions in $\mathbb{R}^n$.
- **CO 5:** Apply Implicit and inverse function theorem, moving towards calculus on manifolds.
- **CO 6:** Viewing C[0, 1], i.e., the space of continuous functions on [0, 1] as a metric space and understand the notion of convergence in C[0,1] and related theorems.
- **CO 7:** Realizing the differentials in terms of geometric properties.

Complex Analysis

- **CO 1:** In this course the students will learn about series of functions and power series. The concept of radius of convergence will be introduced and calculated.
- **CO 2:** This course gives insight of complex integration which is different from integration of real valued functions. In particular, Cauchy integral formula will be proved.
- **CO 3:** The students will learn that if a function is once (complex) differentiable then it is infinitely many times differentiable. This will be a sharp contrast with the theorems of real analysis.
- **CO 4:** The various properties of obius transformations that have a wide variety of applications along with major theorems of theoretical interest like Cauchy-Goursat theorem, Morera's theorem, Rouche's theorem and Casorati-Weierstrass theorem will be articulated.
- **CO 5:** Students will be able to develop understanding of topological and geometric properties of the complex plane, differentiation and integration of functions on C, with applications to problems from real analysis.
- **CO 6:** Competency developed in viewing analytic functions as conformal mappings.

Algebra-I

- **CO 7:** Students will be able to understand structure of permutation groups, alternating groups, and apply them for solving the problems.
- **CO 8:** Students will be introduced to the commutator subgroups, Homomorphism, Isomorphism Theorems, Cayley's theorem, Direct Products: External and Internal, Automorphisms and will also be able to understand the structure of a problem where the problem involving these concepts and solve them.
- **CO 9:** Competency will be developed to work with situations involving commutative rings, in particular monogenic algebras of matrices. Implies facility in working with matrices, a concept that finds a large number of applications in real life including the graphs and networks.

Mechanics-I

- **CO 1:** Students will be able to learn about motion of a particle along a curve. They will learn about angular velocity and acceleration in case of rotating body as well as body in moving axes.
- **CO 2:** Students will understand real life phenomenon based on Newton's Laws of motion and conservation principles. Applications of these laws will help them to understand facts behind some real time activities.
- **CO 3:** Students will be able to describe Moment of Inertia and theorems of parallel and perpendicular axes.

Differential Equation

- **CO 1:** Through this course students are expected to understand the basic concepts of existence and uniqueness of solutions of Ordinary Differential Equations (ODEs).
- **CO 2:** Students will be able to identify Sturm Liouville problems and to understand the special functions like Legendre's polynomials, Bessel's function, Hermite and Laguerre polynomials.
- **CO 3:** Students will be introduced to the concept of Laplace transform, Inverse Laplace transform, Convolution theorem and basic properties of the Laplace transform.
- **CO 4:** Skills will be developed to apply Laplace transform to solve linear differential equations and simultaneous linear differential equations with constant coefficients.
- **CO 5:** Students will be introduced to the concept of Fourier transform, Inverse Fourier transform, Convolution theorem and basic properties of Fourier transform
- **CO 6:** Skills will be developed to apply Fourier transform to solve linear ordinary differential equations.

Semester-II

Real Analysis – II

- **CO 1:** Students will have the knowledge and skills to test the convergence of sequence and series of functions
- **CO 2:** Students will able to understand basic theorem on lebesgue measure
- **CO 3:** Understanding will be developed about basic theory of measurable set, measurable functions and measurability.
- **CO 4:** Students will be introduced to the concept of Lebesgue Integral, Lebesgue Integral of bounded function, Comparison of Riemann and Lebesgue Integral, Integral of a non-negative function, General Lebesgue Integral & Convergence in measure.

Tensors and Differential Geometry

- **CO 1:** Students will be able to understand about tensors and their properties. Chistoffel symbols and their transformation.
- **CO 2:** Students will learn all about curve, Surfaces and contact between both. Moreover different types of curves are also introduced to students.
- **CO 3:** Knowledge will be developed about Geodesics, its differential equation and properties.
- **CO 4:** Students will be introduced to Clairaut's theorem, Gauss- Bonnet theorem, Joachimsthal's theorem, Geodesic Mapping, Tissot's theorem.

Algebra-II

- **CO 1:** Knowledge will be developed about Polynomial rings, EDs, PIDs, & UFDs, and relations among them along with their applications.
- **CO 2:** Students will be able to understand Universality of Polynomial rings and solve polynomial equations using formulas for roots.
- **CO 3:** Students will be able to relate the group theory and Galois Theory in finding the Galois extension and Galois group.
- **CO 4:** Skills will be developed to apply the concept of a field extension, algebraic extensions, splitting fields to various mathematical problems including geometric constructions and perfect division of a circle into n parts
- **CO 5:** Competency will be developed to apply mathematical methods to the real-life problems including cryptography.
- **CO 6:** Students will be able to deal with module theory which is indispensable in wide ranges of mathematical disciplines such as algebra, topology, number theory, operator theory etc.

Mechanics-II

- **CO 1:** Students will understand motion of a rigid body in two dimensional and three dimensional space.
- **CO 2:** Students will able to defining minimum number of independent co-ordinates using generalized co-ordinates to define a system properly.
- **CO 3:** Students will learn to find number of paths between two points using linear functional. They will understand Hamilton's Principle and principle of least action along with Rayleigh-Ritz method of approximation.

Differential & Integral Equations

- **CO 1:** Students are expected to understand the basic concepts and method of finding the solution of first and second order Partial Differential Equations (PDEs).
- **CO 2:** Students will be able to know the classification of second order PDEs, singularity and fundamental solution.
- **CO 3:** Students will able to solve wave equations, heat equations, boundary value problems and Laplace equations by method of separation of variables and Fourier transforms.
- **CO 4:** Students will be able to know the role of Green's function in the solution of Partial Differential Equations especially Laplace, waves and diffusion equation.
- **CO 5:** Students will be introduced to the concept of Volterra Integral equations and their kinds, Fredholm Integral equations, Volterra equation L2 Kernels and functions, Fredholm's equations with Pincherte-Goursat Kernel's and The Fredholm theorem.
- **CO 6:** Skills will be gained to solve Volterra and Fredholm integral equations and will also be able to link integral equation and differential equation.

Semester-III

Functional Analysis-I

- **CO 1:** Students will be imparted knowledge about Normed linear spaces, Banach spaces, subspaces, quotient spaces, Lp spaces and theorems related these along with their proves.

CO 2: Knowledge will be developed about Finite dimensional normed linear spaces and compactness, Riesz Theorem, The conjugate space N*, natural imbedding of N into N**, The Hahn-Banach theorem and its consequence as well as applications.

CO 3: Students will be able to understand proves of important theorems such as Open mapping theorem, closed graph theorem and uniform boundedness principle.

CO 4: Concepts of Inner product spaces, Hilbert spaces, orthogonal complements, orthonormal sets and the conjugate space H* will be introduced.

Topology-I

CO 1: Students will be able to understand basics of Topological Spaces

CO 2: Knowledge will be developed about Connected Spaces, Limit Point Compactness, Local Compactness and their applications in solving problem.

CO 3: Students will be able to achieve the zenith in treating Countable Axioms, Separable, Regular and Normal spaces.

CO 4: Knowledge about proves and applications of theorems like The Urysohn's Lemma, Urysohn's Metrization Theorem.

Discrete Mathematics-I

CO 1: Students will be able to understand concepts of pure mathematics as relations, functions and their types, inclusion and exclusion principle, Hasse diagram as well as Pigeon hole principle and its applications

CO 2: Students will be able to learn about mathematical logics such as Basic logical operations, conditional and biconditional statements, tautologics, quantifiers and prepositional calculus.

CO 3: Students will learn about Semi Groups and Monoids, Recurrence Relations and Generating Functions and their applications.

Statistics-I

CO 1: Students will be imparted knowledge about measures of central tendency and application of these measures to sort and analyze collected data.

CO 2: Students will be able to understand axiomatic theory of probability, random variable and its types.

CO 3: Students will get knowledge about probability mass function, probability density function, cumulative mass function and cumulative density function and can evaluate theses easily.

CO 4: Develop knowledge about two and higher dimensional random variables, joint distribution, marginal and conditional distributions, Mathematical expectations and moments, moment generating function and its properties.

CO 5: Students will gain detailed knowledge about specific discrete probability distributions and continuous probability distributions along with their application to real world problems.

Operations Research-I

CO 1: Understand basics and formulation of linear programming problems and appreciate their limitations, solve linear programming problems using graphical method.

CO 2: Students will be skilled to apply simplex method to solve real life problems.

CO 3: Students will be able to solve artificial variable technique, duality theory, revised simplex method, sensitivity analysis, transportation and assignment problems.

CO 4: Students will be able to understand the concept of Game theory, and investment analysis with real life applications.

Semester-IV

Functional Analysis-II

CO 1: Students will learn about Strong and weak convergence in finite and infinite dimensional normed linear spaces, Weak convergences in Hilbert spaces and weakly compact set in Hilbert spaces.

CO 2: Finite dimensional spectral theory will be introduced to the students.

CO 3: Knowledge will be developed about compact linear operator on normed spaces, properties of compact linear operators, spectral properties of compact linear operators.

CO 4: Students will be able to learn about Banach algebra and Spectrum of an element of Banach Algebra along with some examples.

Topology-II

CO 1: Knowledge will be developed about Higher Separation Axioms including completely regular spaces, Tychonoff spaces, completely normal space and T5 – spaces.

CO 2: Students will be able to get detailed knowledge about compact spaces and compact sets.

CO 3: Students will be able to understand The Stone-Čech compactification, Evaluation mappings, Embedding lemma, Tychonoff cube and Urysohnmetrization theorem.

CO 4: Concepts of Directed sets and nets as well as Canonical way of converting nets to filters and vice-versa will be discussed in detail.

Discrete Mathematics-II

CO 1: Concept of Lattices will be covered which includes some special lattices, partially ordered sets, properties and lattices as algebraic system.

CO 2: Students will develop knowledge about Boolean Algebra and its application in switching circuits.

CO 3: Students will be familiar with Graph theory, Euler's theorem on the existence of Eulerian paths and circuits.

CO 4: Students will be able to learn about trees in detail, Kruskal's algorithm, colouring of the graph, four-colour problem, chromatic polynomials.

Statistics-II

CO 1: Students will be introduced to the concepts of Sampling Distributions such as Chi-square, t and F-distributions with their properties and application.

CO 2: Students will be able to find the distribution of sample mean and variance, order statistics and sample range from continuous populations.

CO 3: Concept of Point Estimation will be introduced and discussed in detail which includes Estimators, Properties of unbiasedness, consistency, sufficiency, efficiency, completeness and uniqueness.

CO 4: Students will be made aware of Testing of Hypothesis techniques and various tests as M.P. test, UMP test and Likelihood tests and their real world applications.

CO 5: Students will be made aware of various linear estimator models and theorems such as Gauss Markoff linear models, BLUE and Gauss Markoff Theorem.

Operations Research-II

- **CO 1:** Students will be able to solve real life problem using integer programming.
- **CO 2:** Students will be skilled enough to use dynamic programming in multistage solution problem.
- **CO 3:** Knowledge will be developed to deal with inventories of various goods with and without shortages.
- **CO 4:** Student will be able to understand and deal with queuing theory, Non-linear (concave) real life optimization problems, Quadratic programming problems.

Course Outcomes: Computer Science

Classes: B.A. /B.Sc. (Computer Science)/B.Sc. (Economics)

Semester-I

Paper: Computer Fundamental & PC Software

- **CO 1:** This paper provides fundamental criteria about computer and its working. A number of devices that can be attached with a machine now a day are also discussed.
- **CO 2:** After completing this paper, students become able to formulate the fundamental concept of computers with their present level of knowledge about computers.
- **CO 3:** This paper explains Microsoft Office programs which enable the students to create professional and academic documents.
- **CO 4:** Students also learn about various accounting related operations in MS Excel and presentation skills using MS PowerPoint which makes them able to work in field of Office Automation and Desktop Publishing as well.

Semester-II

Paper: Programming Using C

- **CO 1:** This paper summarizes basic knowledge of programming skills to the students who are beginning their course work in various Computer Programming Languages.
- **CO 2:** C Programming translates the base of Programming Languages which will thoroughly increase the interest of students in Programming Field.
- **CO 3:** All Advanced Computer Programming Languages are belonging to the base concept of C Programming and Learning the basic concept of this course, will help students in Advance Languages also.
- **CO 4:** This Language is being accepted as Universal Programming Language; therefore the concept of this language will simplify thorough learning of procedures of Programming Language in Students.

Semester-III

Paper: Computer Oriented Numerical and Statistical Methods

- **CO 1:** This paper provide the learning insights of Concept of Statistical Analysis of the Data to the students so that they can effectively and efficiently store the data inside the systems where it will be having a low cost and timing access easily.
- **CO 2:** In the field of Computing, this course work will help the students to research and experiment about the statistical details of the data and perform mathematical calculations of the data as well.
- **CO 3:** This paper demonstrates complete means to calculate various statistical calculations on Data like Calculating Mean, Median, Mode, Kurtosis, Moments and Regression.
- **CO 4:** This paper work maximizes the critical and analytical strategies in students so that students can pursue their carrier in Research and Development Field.

Semester-IV

Paper: Data Structures & Programming Language Using C++

- **CO 1:** This paper is one of the main and technical paper after which students become able to select appropriate data structures as applied to specify problem definition.
- **CO 2:** Students learn about application of various data structure like stacks, queues, tree, graph, linked list etc. related to different operations.

CO 3: This paper is highly important to learn and implement logics in computer science.
CO 4: It also includes the various concepts related to data storage in computers.
CO 5: Students learn to analyze and formulate algorithms for efficiency.

Semester-V

Paper: Data Base Management System & Oracle

CO 1: This paper is very significant for the graduate students as it delivers detail conclusion of database systems and its design.
CO 2: It elaborates types of industry/institutions because all kind of necessary data is to be stored in database.
CO 3: This paper also delivers the design and implementation of databases and generates opportunity for students to become data managers, Data base administrators and get jobs in any kind of business house.
CO 4: It develops opportunity for future development and research in the field of database techniques like data ware housing and data mining as these are the basic needs of all types of business now and in future.

Semester-VI

Paper: Information Technology

CO 1: This paper provides the deep estimate to students about Information Technology and Networking so that students can learn the basic concepts of Internet and Computer Networks.
CO 2: This paper constructs complete illustration of Protocols, Topologies and Latest Technologies with the advancements in the field of Networking.
CO 3: This paper provides the demonstration of cables, connections, connectors and all the required technologies for Networking like IEEE, TCP/IP etc.

S.L. Bawa D.A.V. College

Batala(143505), Punjab

Faculty of Computer Science & I.T.

Program Outcomes (POs)

&

Course Outcomes (COs)

Program Outcomes: BCA/B.Sc. (IT)

On completion of the programme the students will be able to:

PO 1: This programme inculcates the basic understanding of Computer and Computer Programming Languages in students so that they can have complete knowledge about the system and its inner working details.

PO 2: This programme make the students well versed with the computing environment and the various concepts, topics and subjects related to this field.

PO 3: This Programme enables the students to have the complete understanding of various branches of Computer and Technology such as Computer Graphics, Operating Systems and Data Structures.

Course Outcomes: Bachelor of Computer Application (BCA)

Semester-I

Paper: I - Introduction to Programming-C

- **CO 1:** This paper develops the basic programming skills of the students.
- **CO 2:** C Programming forms the base of programming languages which will formulate the interest of students in programming field.
- **CO 3:** The students will be able to learn C programming language which acts as a base to learn new programming languages.
- **CO 4:** This paper specifically elaborate the concept of the multitude of applications, including advanced scientific systems and operating systems to the students.

Paper: II - Introduction to Computers and Information Technology

- **CO 1:** This paper is about the fundamental information about computer and its working.
- **CO 2:** Students discover the fundamental concept of computers with their present level of knowledge about computers.
- **CO 3:** his paper teaches about MS Word, MS PowerPoint etc which enable the students to create professional and academic documents.
- **CO 4:** Students elaborate various accounting related operations in MS Excel and presentation skills by using MS PowerPoint which makes them able to work in field of office automation and desktop publishing as well.

Paper: III - Applied and Discrete Mathematics

- **CO 1:** This paper demonstrates the basic mathematical fundamentals to students.
- **CO 2:** Set theory and matrices determinants are demonstrated through this course structure, so that students can prepare themselves for further understanding of topics related to other subjects of computer applications.
- **CO 3:** This paper develops the programming base of the students.

Semester-II

Paper: I - Introduction to Programming-C++

- **CO 1:** This paper illustrates the concepts of object oriented programming languages so that students can learn about the real time problem solving techniques.
- **CO 2:** Knowledge of this paper is being used in system programming and embedded systems for the establishment of Computer Aided Designs and Computer Aided Manufacturing purposes also.
- **CO 3:** This Course emphasis on real world problem solving techniques and methods using c++ programming.
- **CO 4:** C++ inculcates all the required concepts, methodologies and structure oriented guidance in Students which motivates them to be a Good Programmer in future.

Paper: II Principles of Digital Electronics

- **CO 1:** This paper allows students to study the internal circuitry of the processor and memory.
- **CO 2:** Digital Electronics makes students summarize about the internal mechanism of Arithmetic Logical Unit inside the processor performing various calculations and manipulations.
- **CO 3:** The motive of this paper is to help students understand the working of the internal hardware of the computer.

CO 4: Students can pursue their future in hardware engineering by having complete learning of electronics.

Paper: III Numerical Methods & Statistical Techniques

CO 1: This paper summarizes the concept of numerical and statistical analysis of the data to the students.

CO 2: In the field of computing, this paper will help the students in research and experiment about the numerical and statistical details of the data and perform mathematical calculations of the data as well.

CO 3: This gives students complete elaboration to calculate various statistical calculations on data like calculating Mean, Median, Mode, Kurtosis, Moments and Regression.

Semester-III

Paper: I Computer Architecture

CO 1: This paper demonstrates the way the hardware components operate and how they are connected together to form the computer system

CO 2: This demonstrates the system components, circuit design, logical design, structure of instruction, computer arithmetic, processor control, assembly programming and methods of performance enhancement.

CO 3: This paper is especially designed for the students to learn hardware details so that they can work in the Field of Hardware Engineering.

Paper: II Database Management System

CO 1: This paper is very significant for the graduate students as it delivers details of database systems and its design.

CO 2: This paper also organizes the design and implementation of databases and generates opportunity for students to become data managers.

CO 3: It provides opportunity for future development and research in the field of database techniques like data analytics, data ware housing and data mining as these are the basic needs of all types of business.

Paper: III Computational Problem Solving using Python

CO 1: This paper is specially designed for providing demonstration of python programming to students.

CO 2: Going from the basics to complete detail of the python programming concept, this paper enables students to apply their own logics in computer system.

CO 3: Students can build up their own software projects by using the syntaxes and semantics of this programme.

Semester-IV

Paper: I Data Structures & File Processing

CO 1: This paper is one of the main and technical papers of BCA course after which students are able to discover appropriate data structures as applied to specify problem definition.

CO 2: Students can compare about application of various data structure like stacks, queues, tree, graph, linked list etc. related to different operations.

CO 3: It also illustrates the various concepts related to data storage in computers.

Paper: II Information System

CO 1: This paper carries importance because information system management acts as distinguisher for all industries/institutions by the use of information technology.

CO 2: This paper is best suitable for all the students who want to build their carrier in the system analyst, system designer and system manager as these are special jobs for new system development and design.

CO 3: This paper is important for development of new techniques in business development.

Paper: III Internet Application

CO 1: This paper provides the basic knowledge of internet and its applications.

CO 2: Students learn about the various internet protocols.

CO 3: Paper gives suitable information to students about intranet and extranet

Paper: IV System Software

CO 1: This paper demonstrates complete concepts to the students about the system software's and their working.

CO 2: Detailed insights about the Loader, Linker, Assembler and Compiler are developed and are demonstrated to the students

CO 3: Study of various phases of the Compiler makes students more enthusiastic to learn about the internal process working of the system so that they can do specialization in the particular course for higher education also.

CO 4: Students can compare the concept of macros, multi-threading etc.

Semester-V

Paper: I Software Engineering

CO 1: Software engineering calls upon interdisciplinary skills like critical thinking, cost analysis & project management.

CO 2: This paper will help students to take part in software engineering with a focus on new technologies and areas of application, such as cyber security, big data, or mobile application development etc.

CO 3: This paper will develop a comprehensive solution of programming, software architecture, and software testing which is in high demand in various MNCs and in vast IT Sector.

Paper: II Web Technologies

CO 1: This paper is highly recommended for the provision of demonstration to the students about website development and software development.

CO 2: This course is the combination of many server side and client side programming technologies like CSS, Java Script, Java Servlets, ASP.net and PHP for the successful establishment of Website or Software.

CO 3: Students will get through the internal knowledge of back-end and front-end processes using which they will be able to design their own websites or software.

CO 4: This paper illustrates information about the data base connectivity along with the given front end website or software so that the students can learn about the data transfer procedures form frontend to back-end and vice-versa.

Paper: III Operating System

CO 1: This paper demonstrates about the importance of computer system resources and the role of operating system in their management policies to get a better understanding about the concept of various Process Management Techniques under different operating systems available.

CO 2: The paper gives detailed description about the process and functions of operating system in order to schedule manage and control the processes going inside the system.

CO 3: The study of operating system helps students to analyse the memory management and its allocation policies which is the prime factor of consideration in every operating system,

Paper: IV JAVA Programming Language

CO 1: JAVA is the popular for website and Software Development and this course formulates a basic core and advanced both types of technical information about JAVA Language.

CO 2: Students get to learn about the basic concepts of object oriented programming and basic as well as advance Java Programming constructs.

CO 3: This programme enables students to implement the constructs and structure of the Java Programming Language in the successful creation of Java Applets and Java Servlets.

CO 4: The Specialization of this will increase the opportunities for students to get jobs in the field of programming, website and software development, software testing etc.

Semester-VI

Paper: I Computer Graphics

CO 1: This paper demonstrates the detailed knowledge of Computer graphivs

CO 2: Students will get to know about the details of Image Resolution, Pixels, Bitmap and Pixel Map which helps them to understand the process of Image Processing.

CO 3: Computer Graphics is a kind of Programme that enables students to understand algorithms of line drawing, circle drawing and various transformations

Paper: II Computer Networks

CO 1: This paper inculcates the complete formulation of networking in students which is the most essential and advantageous in the present scenario of internet and networking.

CO 2: Complete understanding of this paper provides students with the information of various network topologies, network protocols, network essentials and network controlling.

CO 3: This Course will help students to get proper information about many network devices and compare their uses so that students can use them in real world also.

CO 4: Students will thoroughly elaborate the transmission media and compare different LAN, MAN and WAN topologies.

Paper IV Project

CO 1: The project will enable students able to identify the requirements for the real world problems and correlating them which will make them able to develop software solutions for them.

CO 2: Project Modules make students learn logically and analytically so that they can pursue their carrier in the field of Software Development in different MNCs and industries.

CO 3: This paper motivates students to work in teams and manage the conduct of the research study in near future.

CO 4: Students can develop Projects as Websites and Software in various different languages like JAVA, ASP.net, PHP and Android also.

Course Outcomes: B.Sc. (IT)

Semester-I

Paper I- Fundamentals of Computers

- **CO 1:** This paper is about the fundamental information about computer and its working.
- **CO 2:** Students discover the fundamental concept of computers with their present level of knowledge about computers.
- **CO 3:** This paper teaches about MS Word, MS PowerPoint etc. which enable the students to create professional and academic documents.
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Paper: II Introduction to Programming-C

- **CO 1:** This paper develops the basic programming skills of the students.
- **CO 2:** C Programming acts as the base of programming languages which will formulate the interest of students in programming field.
- **CO 3:** The concept of C programming language act as a base to learn new programming languages.
- **CO 4:** This paper is specifically elaborate the multitude of applications, including advanced scientific systems and operating systems

Paper: III Applied & Discrete Mathematics

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Semester-II

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CO 3: This gives students complete elaboration to calculate various statistical calculations on data like calculating Mean, Median, Mode, Kurtosis, Moments and Regression.

Semester-III

Paper: I Introduction to Python

CO 1: This paper is specially designed for providing demonstration of python programming to students.

CO 2: Going from the basics to complete detail of the python programming concept, this paper enables students to apply their own logics in computer system.

CO 3: Students can build up their own software projects by using the syntaxes and semantics of this programme.

Paper: II Data Structure

CO 1: This paper is one of the main and technical papers of BCA course after which students are able to discover appropriate data structures as applied to specify problem definition.

CO 2: Students can compare about application of various data structure like stacks, queues, tree, graph, linked list etc. related to different operations.

CO 3: It also illustrates the various concepts related to data storage in computers.

Paper: III System Analysis & Design

CO 1: This paper illustrates the analyses and designing procedures of a system so that students can go through inside details.

CO 2: Students can build their career as System Analyst and System Handlers in various companies and IT industry.

CO 3: This paper summarizes the concepts of various constructs and structures useful in analysing the system and designs.

Semester-IV

Paper: I Database Management System

CO 1: This paper is very significant for the graduate students as it delivers details of database systems and its design.

CO 2: This paper also organizes the design and implementation of databases and generates opportunity for students to become data managers.

CO 3: It provides opportunity for future development and research in the field of database techniques like data analytics, data ware housing and data mining as these are the basic needs of all types of business.

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CO 1: This paper provides the basic knowledge of internet and its applications.

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CO 3: Paper gives suitable information to students about intranet and extranet.

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CO 1: JAVA is the popular for website and Software Development and this course formulates a basic core and advanced both types of technical information about JAVA Language.

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CO 3: This programme enables students to implement the constructs and structure of the Java Programming Language in the successful creation of Java Applets and Java Servlets.

CO 4: The Specialization of this will increase the opportunities for students to get jobs in the field of programming, website and software development, software testing etc.

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Semester-V

Paper: I Computer Networks

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CO 3: This Course will help students to get proper information about many network devices and compare their uses so that students can use them in real world also.

CO 4: Students will thoroughly elaborate the transmission media and compare different LAN, MAN and WAN topologies.

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CO 1: This paper demonstrates about the importance of computer system resources and the role of operating system in their management policies to get a better understanding about the concept of various Process Management Techniques under different operating systems available.

CO 2: The paper gives detailed description about the process and functions of operating system in order to schedule manage and control the processes going inside the system.

CO 3: The study of operating system helps students to analyze the memory management and its allocation policies which is the prime factor of consideration in every operating system.

Paper: III E-Business

CO 1: This paper is one of the strong theoretical concepts regarding the online business.

CO 2: This paper illustrates the clear concept regarding traditional and online business.

CO 3: This paper helps illustrates the basics of the E-cash, and techniques to handle business digitally in order to have productive outcome from the business.

CO 4: This paper demonstrates students about the online payment and online banking systems.

Semester-VI Paper: I Network Operating System

CO 1: This paper demonstrates the detailed concepts NOS.

CO 2: Students will get to know about the networks and the internal working of NOS.

CO 3: Students can work as network administrators.

Paper: III Project

CO 1: The project will enable students able to identify the requirements for the real world problems and correlating them which will make them able to develop software solutions for them.

CO 2: Project Modules make students learn logically and analytically so that they can pursue their carrier in the field of Software Development in different MNCs and industries.

CO 3: This paper motivates students to work in teams and manage the conduct of the research study in near future.

CO 4: Students can develop Projects as Websites and Software in various different languages like JAVA, ASP.net, PHP and Android also.

Program Outcomes: M.Sc. Information Technology (M.Sc. IT)

On completion of the programme the students will be able to:

PO 1: This programme will provide the ability to students to communicate well and to understand the concepts and designs of computer effectively and professionally.

PO 2: This programme will enable the students to apply the knowledge of computing in research and education field to produce effective designs and solutions for specific problems.

PO 3: This programme will inculcate the ability of identify, analyze and synthesize scholarly literature relating to the field of computer science and IT.

PO 4: This programme will be effective to combine the understanding of the use of software development tools, IDEs, various software system and modern computing platforms.

Course Outcomes: M.Sc. Information Technology (M.Sc. IT)

Semester-I

Paper: MIT-101 Analysis and Design of Embedded System

- **CO 1:** Embedded System is designed to function with minimal or no human interference. This course explains embedded system concepts and architecture of embedded systems.
- **CO 2:** This paper also explains the architecture of PIC, AVR and DSP microcontrollers.
- **CO 3:** Students can learn different types of operating systems and their services used required for designing embedded systems.
- **CO 4:** This paper illustrates the design issues and elements for an embedded systems and tools for development of embedded systems.

Paper: MIT-102 Distributed Computing

- **CO 1:** This paper is highly specialized in M.Sc. (IT) which elaborates the future design and implementation in the field of networking.
- **CO 2:** This paper explains advance development in the field of networking, storing and fetching of information.
- **CO 3:** This helps specialized networking techniques which ensure the processing of large information systems without any failures.
- **CO 4:** Students learn about remote network and server processing in which data is never placed in server but data is available to user as and when required.

Paper: MIT-103 Advanced Computer Organization and Architecture

- **CO 1:** The study of computer architecture and organization focuses on the interface between hardware and software, and emphasizes the structure and behavior of the system that provides hardware details of the system to the students.
- **CO 2:** This paper explains the hardware concepts of processor in students and it is important that computer students need a basic illustration of computer system itself in order to rectify the problems. There are a fundamental relationship between hardware and the many aspects of programming and software components in computer systems.

Paper: MIT-104 Network Operating System

- **CO 1:** This paper is one of the highly specialized programme in M.Sc., which provides the detail knowledge of Network Operating System specifically Microsoft Windows Server.
- **CO 2:** Students get to learn about the various concepts related to Network Operating System like User/Group Management, Disk Quotas, Server Setup (WEB Server, DHCP, DNS etc.) in Windows and Linux.
- **CO 3:** This paper enables students to create and manage highly efficient networks using Microsoft Server product.
- **CO 4:** This paper is highly recommended for students as it gives them an insight into comparing Windows Server products and Linux Server Solution in order to implement network solutions in organizations.
- **CO 5:** Students can get many job opportunities related to Network Administrator in various industries/organizations.

Paper: MIT-105 Computational Problem Solving Using Python

- **CO 1:** This paper is specially designed for demonstrating concepts of programming to students.
- **CO 2:** Going from the basics to complete detail of the programming concept, this programme enables students to apply their own logics in computer system.
- **CO 3:** This paper is being widely used in various companies and MNCs. This programme will help students to get through their training projects after placements.
- **CO 4:** Students can build up their own software projects by using the syntaxes and semantics of this programme.
- **CO 5:** The basic foundation of this particular programme will raise the interest of students in other high level programming languages to accomplish the need of becoming a successful Software Developer

Semester-II

Paper: MIT-201 Mobile Computing

- **CO 1:** This paper demonstrates the different wireless communication System.
- **CO 2:** Through this subject student came to know about the mobile radio Propagations and how a channel is allocated to each subscriber.
- **CO 3:** The GSM system for mobile Computing is also taught to students.
- **CO 4:** A complete description of SMS (Short Message Service) and its architecture is given to students through this subject.

Paper: MIT-202 Distributed Databases

- **CO 1:** This paper is highly specialized in M.Sc. (IT) which elaborates the future design and implementation in the field of networking.
- **CO 2:** This paper provides advance development in the field of networking, storing and fetching of information.
- **CO 3:** This helps in learning specialized networking techniques which ensure the processing of large information systems without any failures.
- **CO 4:** Students learn about remote network and server processing in which data is never placed in server but data is available to user as and when required.
- **CO 5:** This paper demonstrates large networks, data warehousing and data mining. Students' gets very good option for becoming good network administrator.

Paper: MIT-203 Image Processing

- **CO 1:** This paper will explain the student's useful and essential skills and experience to make career in creative professionals such as graphic designers, gallery managers, art curators, commissioning editors and art directors etc.
- **CO 2:** This paper demonstrates the students to get detailed functions of image processing software so that students can learn about restoration, manipulation and development of various Imaging techniques.
- **CO 3:** This paper concludes the layout and production design of newspapers, magazines, corporate reports, journals and other publications.
- **CO 4:** The advanced features of image processing are being used to develop motion picture and motivate students to work in television industry.

Paper: MIT-204 Fuzzy Systems

- **CO 1:** This paper demonstrates the basic knowledge of probability, fuzzy logic and neural networks that allows students to handle problems with imprecise and incomplete data.
- **CO 2:** The paper explains the fuzzy logic toolbox and covers a wider range of operating conditions, more readily customizable in natural language terms.

CO 3: This paper provides demonstration of various membership functions of fuzzy logic and use of fuzzy and neural for various real world problems.

CO 4: This paper also demonstrates the various types of neural networks and their algorithms.

Paper: MIT-205 Network Design and Performance Analysis

CO 1: Developing networking skills almost immediately places and to make a career in virtually any sector. All the industrial sectors like the financial services, transport, manufacturing, education, technology, Government, healthcare, hospitality, and retail and so on experience shortage of skilled networking specialists.

CO 2: Students can make a mark immediately in the field you desire. The Government sectors have considerable value for networking technology. The Defence and Intelligence services need networking specialists regularly.

CO 3: The technology is such that you can choose to start your own business as well. Networking skills can help you connect to other businesses thereby helping you to market your business and services efficiently.

Semester-III

Paper: MIT-301Network Protocols

CO 1: This paper demonstrates how information is transmitted accurately and unambiguously across the systems.

CO 2: It inculcates students about the overview of creating IP addresses and their configurations

CO 3: This paper illustrates about different networking topologies, media, systems and their management

CO 4: Students can use different protocols to ensure integrity and security of communication of underlying network.

CO 5: This paper also helps in setting up procedures for sending and receiving messages, acknowledgement of receipt, congestion avoidance, error correction etc.

Paper: MIT-302 Advanced Web Technologies

CO 1: ASP.net supports multiple programming languages like C#, visual basic dot net, J#, C++ and service-oriented architectures.

CO 2: Student having proficiency in on programming languages can build one module of large application and can be used simultaneously with modules develop by other students having good hand in other programming language.

CO 3: ASP.net provide is reliable and flexibility. Student can develop applications for different devices like laptop, smart-phones; pocket PCs and so on using single language.

CO 4: ASP.NET drastically reduces the amount of code required to build large applications.

CO 5: Students can easily develop software using Wizards in Dot net framework.

CO 6: Students can get job easily related to software development

Paper: MIT-303 Linux Administration

CO 1: Learning Linux provides Good Job Opportunities to the students in IT sector.

CO 2: Students choose to write efficient, effective scripts with documentation and learn how to go for Substantial Financial Savings.

CO 3: Students will learn how to provide high security to the important data using Linux.

CO 4: Improves Problem Solving Skills of the students.

Paper: MIT-304 System Simulation

CO 1: This paper is really very efficient one in M.Sc. and provides students with great insight of newly systems and their simulations.

CO 2: This paper maximizes the interest of students in the creation of newly computerized systems by first making their simulations.

CO 3: The students will elaborate their work with various MNCs, firms and organization helping in the manufacturing of new systems.

Paper: MIT-305 Microprocessor and Its Application

CO 1: A microprocessor is normally capable of many functions, such as word processing, calculation, and communication via Internet or telephone and this helps students to understand the detailed view of microprocessor about their functionality and their properties.

CO 2: Students can easily write assembly code, for the x86 assembly language.

CO 3: This paper demonstrates how a processor at the lower level receives input from the keyboards and the mice. Students can learn how and why memory segmentation in a process came into existence. This motivates students to learn about the real life applications of the microprocessor.

Semester-IV

Paper: MIT-401 Advanced Java Technology

CO 1: This paper is one of the specialized programme in M.Sc., which provides the detail knowledge of Java Programming Language.

CO 2: Students get to learn about the concepts of object oriented programming and Java Programming constructs.

CO 3: This paper enables students to implement commercial applications in Java & Java Applets.

CO 4: This paper is highly recommended for students in order to pursue career in software development.

CO 5: Students can get many job opportunities and it can also act as a tool in research in some specialized fields.

Paper: MIT-402 Network Security

CO 1: This paper is highly specialized in M.Sc. (IT) which elaborates the various components involved in network security.

CO 2: This paper organizes students to learn basic and advance concepts of most important component i.e. personal level firewall and gateway level firewall.

CO 3: Students are able to apply security concepts, security threats, security services and mechanisms to counter them.

CO 4: This paper demonstrates advance methods in designing networks from security point of view.

CO 5: This helps in choosing specialized networking security device UTM (Unified Threat Management) from a number of available devices in the market.

CO 6: This paper classifies large scope in industry and research.

Paper: MIT-403 Artificial Neural Network

CO 1: This paper is highly specialized in M.Sc. (IT) which elaborates the future design and implementation in the field of networking.

CO 2: It evaluates the present day requirement of Pattern recognition, Character recognition.

CO 3: It closely resembles the human brain networking including learning, logistics, recognitions and retaining information.

CO 4: Now a day this programme is having great significance in all fields where specialization like human is required.

CO 5: Students can create many research and job opportunity after pursuing this specialized programme.

Paper: MIT-405P Project

- **CO 1:** The Project will make Students able to identify the requirements for the real world problems and correlating them which will make them able to develop software solutions for them.
- **CO 2:** Project Modules motivate the students to learn logically and analytically so that they can pursue their carrier in the field of Software Development in different MNCs and Industries.
- **CO 3:** This paper illustrates the important in students to make them a good Software Developer in order to make projects according to the need of customers and companies.
- **CO 4:** This paper motivates students to work in teams and manage the conduct of the research study in near future.
- **CO 5:** Students can make projects as websites and software in various different languages like JAVA, ASP.net, PHP and Android also.

Program Outcomes: Post Graduate Diploma in Computer Applications (PGDCA)

On completion of the programme the students will be able to:

PO 1: This one year programme formulates the development of computing and practical skills in students to enhance their introductory knowledge of using the systems efficiently.

PO 2: The students from various degree programmes of other fields can construct thorough advantages from this programme and use their computer practical knowledge along with their degree course.

PO 3: The main objective of this programme is to demonstrate students with basic knowledge of Computer, PC Computing, Data Base Management System and Internet.

PO 4: This programme will enable the students to work in environment where systems are being highly used and they can use their skills to ensure the better productivity.

Course Outcomes: Post Graduate Diploma in Computer Applications (PGDCA)

Semester-I

Paper: I PC Computing-I (MS-Office)

- **CO 1:** This paper is the base subject for giving the basic fundamental concept of application software to the students.
- **CO 2:** The motive of this subject is to inculcate the basics of computer and MS-Offices to students so that students can pursue their carrier in the field of office automation and desktop publishing.
- **CO 3:** This paper create effective documents, presentation slides and Excel Workbooks in students so that students can use their caliber in the field of banks, corporate sectors etc.

Paper: II PC Computing-II (Professional DTP)

- **CO 1:** This paper provides fundamental information about computer and its working. A number of devices that can be attached with a machine now a day are also discussed.
- **CO 2:** Students become able to discover the fundamental concept of computers with their present level of learning about computers.
- **CO 3:** This paper develops Microsoft Office programs which enable the students to create professional and academic documents.
- **CO 4:** Students also learn about various accounting related operations in MS Excel and presentation skills using MS PowerPoint.

Paper: III Fundamentals of Computer and OS

- **CO 1:** This paper formulates information about computer and its working. A number of devices that can be attached with a machine now a day are also discussed.
- **CO 2:** Students are able to discover the fundamental concept of computers with their present level of learning about computers.
- **CO 3:** This paper includes Microsoft Office programs which enable the students to create professional and academic documents.
- **CO 4:** Students also learn about various accounting related operations in MS Excel and presentation skills using MS PowerPoint which makes them able to work in field of Office Automation and Desktop Publishing as well.

Paper: IV Database Management System

- **CO 1:** This paper is recommended for the graduate students as it delivers details of database systems and its design.
- **CO 2:** It is builds big role in all types of industry/institutions because all kind of necessary data is to be stored in database.
- **CO 3:** This paper also delivers the design and implementation of databases and generates opportunity for students to become data managers, Data base administrators and get jobs in any kind of business house.
- **CO 4:** It elaborates opportunity for future development and research in the field of database techniques like data ware housing and data mining as these are the basic needs of all types of business now and in future.

Semester-II

Paper: I Network Concepts and Management

- **CO 1:** This paper illustrates Networking in students which is the most essential and advantageous in the present scenario of Internet and Networking.
- **CO 2:** Complete demonstration of the specified paper provides students with the information of Various Network Topologies, Network Protocols, Network Essentials and Network Controlling.
- **CO 3:** This paper will motivate students to get proper information about many Network Devices and their Uses so that students can use them in Real World also.
- **CO 4:** Students will formulate knowledge about the transmission media and to realize and compare different LAN, MAN and WAN Topologies.
- **CO 5:** Studying the detailed information about the Internet Protocols will increase the ability in students to work in the real networking development techniques.

Paper: II Programming in C

- **CO 1:** This paper demonstrates programming skills to the students who are beginning their course work in various Computer Programming Languages.
- **CO 2:** C Programming acts as the base of Programming Languages which will maximize interest of students in Programming Field.
- **CO 3:** All Advanced Computer Programming Languages are belonging to the base concept of C Programming and Learning the basic concept of this course, will motivate students in Advance Languages also.
- **CO 4:** This Language is being accepted as Universal Programming Language; therefore the concept of this language will formulate the procedures of Programming Language in Students.
- **CO 5:** This paper explains multitude of applications, including advanced scientific systems and operating systems.

Paper: III Introduction to Scripting Language, Web Designing & Uses of Internet

- **CO 1:** This paper enables students to develop Website and Software which will highly increase their opportunities to work in industries.
- **CO 2:** This paper is the combination of many Sever Side and Client Side Programming Languages like CSS, Java Script, Java Servlets, ASP.net and PHP and is recommended for the successful establishment of Website or Software.
- **CO 3:** Students will determine the internal knowledge of Back- End and Front- End Processes which further help them to design their own Websites or Software.
- **CO 4:** This paper develops the information about the Data base Connectivity along with the given Front End website or software so that the students can learn about the Data Transfer Procedures forms Front-End to Back-End and Vice-Versa.

Paper: IV Visual Basic Programming using Active X

- **CO 1:** This paper is used to demonstrate the use of visual programming to the PGDCA students.
- **CO 2:** This subject demonstrates the use of standard controls for developing GUI interface.
- **CO 3:** Students can develop live projects using VB programming.

Program Outcomes: Diploma in Computer Applications (DCA)

On completion of the programme the students will be able to:

PO 1: This programme summarizes an introductory level of knowledge in computer field so that they can pursue higher studies after higher secondary classes.

PO 2: This one year programme will develop the basic insights of various application software which are being used in various fields, offices and companies.

PO 3: This programme rephrases basic working of computer systems.

PO 4: This programme provides beneficial outcomes to the students for preparing for competitive exams and constructs a job in educational and governmental institutions.

Course Outcomes: Diploma in Computer Applications (DCA)

Semester-I

Paper: I Information Technology and Operating System

- **CO 1:** This paper provides fundamental demonstration about computer and its working. A number of devices that can be attached with a machine now a day are also discussed.
- **CO 2:** Students become able to design the fundamental concept of computers with their present level of knowledge about computers.
- **CO 3:** The study of Operating System helps students to analyze the memory management and its allocation policies which is the prime factor of consideration in every Operating System,
- **CO 4:** This paper demonstrates students to identify use and evaluate the storage management policies with respect to different storage management technologies of Operating Systems like Windows, Linux and UNIX.

Paper: II PC Computing-I

- **CO 1:** This paper elaborates fundamental information about computer and its working. A number of devices that can be attached with a machine now a day are also discussed.
- **CO 2:** Students become able to design the fundamental concept of computers with their present level of knowledge about computers.
- **CO 3:** This paper demonstrates Microsoft Office programs which enable the students to create professional and academic documents.
- **CO 4:** Students also learn about various accounting related operations in MS Excel and presentation skills using MS PowerPoint which makes them able to work in field of Office Automation and Desktop Publishing as well.

Semester-II

Paper: I Database Management System

- **CO 1:** This paper is very significant for the graduate students as it delivers detail study of database systems and its design.
- **CO 2:** It is having big role in all types of industry/institutions because all kind of necessary data is to be stored in database.
- **CO 3:** This paper also delivers the design and implementation of databases and constructs opportunity for students to become data managers, Data base administrators and get jobs in any kind of business house.
- **CO 4:** It discovers opportunities for future development and research in the field of database techniques like data ware housing and data mining as these are the basic needs of all types of business now and in future.

Paper: II PC Computing-II

- **CO 1:** This paper is specifically designed about MS-Access to students and it provides analyzes about the Database Establishment and Connection.
- **CO 2:** MS-Access is being used in various big organizations, industries and MNCs for constructing data simpler and much efficient.
- **CO 3:** Students get to learn about the process of creating Tables and making the concept of Database handling more presentable and understanding for the Software Developers as well.