Course Outcome
(COs)

B.Sc. (Comp.Sci), B.C.A.,B.Sc.,M.Sc.(Comp.Sci),M.M.S.[C.M]

Bachelor of Computer Application

Bachelor Computer Application

F.Y. Sem I

Accountancy-I- BCA-101-I

CO1. To understand the basic accounting concepts.

CO2. To understand generally accepted accounting principles.

CO3. To understand Journal, Ledger, trail balance & Final Accounts & the Bank Reconciliation Statement.

CO4. To understand the sources of raising capital in corporate.

CO5. To understand the application of computers in accounting.

Industrial Economics- BCA-102-II

CO1. Describe and explain the determinants of the size and structure of firms and the implications of the separation of ownership and control

CO2. Describe and explain the pricing behaviour by firms with market power and its welfare implications

CO3. Apply analytical models of firm behaviour and strategic interaction to evaluate various business practices, including tacit collusion, entry deterrence, product differentiation, price discrimination and vertical restraints

CO4. Recognise and explain the basic determinants of market structure and the key issues in competition policy and regulation.

Business Statistics - BCA-103-III

CO1. Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis

CO2. Critically evaluate the underlying assumptions of analysis tools

CO3. Understand and critically discuss the issues surrounding sampling and significance

CO4. Discuss critically the uses and limitations of statistical analysis

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CO5. Solve a range of problems using the techniques covered

CO6. Conduct basic statistical analysis of data.

Operating System-I - BCA-104-IV

CO1. Identify the role of Operating System. To understand the design of control unit.

CO2. Understanding CPU Scheduling, Synchronization, Deadlock Handling and Comparing CPU Scheduling Algorithms. Solve Deadlock Detection Problems.

CO3. Describe the role of paging, segmentation and virtual memory in operating systems.

CO4. Description of protection and security and also the Comparison of UNIX and Windows based OS.

CO5. Defining I/O systems, Device Management Policies and Secondary Storage Structure and Evaluation of various Disk Scheduling Algorithms

Communication Skills - BCA-105-V

CO1. Acquire knowledge about the various principles of communication, understand its various stages and the role of audience and purpose, deal with the barriers that affect communication in a professional set up.

CO2. Understand the different channels that are functional at the work place.

CO3. Learn the importance of verbal and non-verbal communication in the professional world along with its uses.

CO4. Learning the uses and application of RP to improve pronunciation.

CO5. Understanding the importance of intonation, word and sentence stress for improving communicative competence, identifying and overcoming problem sounds, Importance of syntax for cultivating effective language skills.

Office Automation Tools - BCA-106-VI-A

CO1. To perform documentation ·

CO2. To perform accounting operations ·

CO3. To perform presentation skills

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Basic Web Technology-I BCA-106-VI-B

CO1. Students will develop an understanding of the formalistic (aesthetic) aspects of design and visual communication.

CO2. Students will demonstrate cross-platform (web, mobile, broadcast, print) storytelling skills.

CO3. Students will demonstrate a consideration of audience and/or users in their production work.

CO4. Students will become familiar with graphic.

CO5. Apply a structured approach to identifying needs, interests, and functionality of a website

CO6. Use of colours and hexadecimal colours to change look and feel of website.

CO7. Design dynamic websites that meet specified needs and interests.

CO8. Effectively use styles and visual effects to web pages.

CO9. Write well-structured, easily maintained, standards-compliant HTML, CSS, script code to present html pages in different ways.

CO10. Use JavaScript to add dynamic content to pages.

CO11. Effectively debug JavaScript code, making use of good practice and debugging tools.

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BCA F.Y. Sem II

Accountancy-II- BCA-201-VII

CO1. Acquire the knowledge in accounting, system of maintenance of accounts, journal, ledger, bill of exchange, account current, average due date and bank reconciliation statement.

CO2. Familiarise and understand the basic accounting concepts and conventions, preparation of subsidiary books and final accounts, account of Consignment, Joint venture and non-trading concerns.

CO3. Develop the application skills to create adjusting journal entries in rectifying errors, preparation of entries in bill of exchange, consignment and joint venture, receipts and payments account, income and expenditure account of non-profit organization.

CO4. Develop the analytical skills in accounting equation, preparation of trial balance and suspense account, normal loss in consignment. Analyzing the reasons for differences between pass book and cash book transactions in the Bank Reconciliation Statement.

CO5. Evaluate delcredere commission, normal and abnormal loss, value of unsold stock in consignment account and familiarize the financial position of sole proprietor through final accounts

Industrial Organisation-202-VIII

CO1. Explain and analyse the main issues and debates in the field of industrial economics

CO2. Describe the workings of different market structures

CO3. Critically evaluate different policy approaches to industry

CO4. Analyse the value and the limitations of existing theory in the area of industry economics

CO5. Explain the economic behaviour of different industries, firms and markets in relation to their output and pricing decisions

CO6. Analyse and provide policy recommendations about monopolies, cartels, non-cooperative oligopolies and other forms of imperfect competition

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CO7. Critically evaluate the relationship between industrial structure and performance and the various approaches to innovation, entrepreneurship and industry policy

Mathematics - 203-IX

CO1. Learn fundamental concepts of set theory, operation on sets, venn diagrams, statement problems, laws, duality, partitioning of a set.

CO2. Understand the concept of graph theory and how to make various types of graphs.

CO3. Understand the concept of relation and types of relations, graph of relations, properties of relations and matrix representation.

CO4. Understand logic operations, truth tables, arguments and laws of logic, mathematical system and propositions over universe.

CO5. Principle of mathematical induction, recursion, recurrence relations, binomial theorem.

Programming in C - 204-X

CO1. Identify and understand the working of key components of a computer system (hardware, software, firmware etc.)., Understand computing environment, how computers work and the strengths and limitations of computers. Identify and understand the various kinds of input/output devices and different types of storage media commonly associated with a computer.

CO2. Identify and understand the representation of numbers, alphabets and other characters in computer system.

CO3. Understand, analyze and implement software development tools like algorithm, pseudo codes and programming structure.

CO4. Study, analyze and understand logical structure of a computer program, and different construct to develop a program in 'C' language & Write small programs related to simple/ moderate mathematical, and logical problems.

Principles of Management - 205 – XI

CO1. Evaluate approaches to addressing issues of diversity.

CO2. Integrate management principles into management practices.

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CO3. Specify how the managerial tasks of planning, organizing, and controlling can be executed in a variety of circumstances.

CO4. Assess managerial practices and choices relative to ethical principles and standards.

CO5. Determine the most effective action to take in specific situations.

Operating System-II (UNIX)- 206-XII-A

CO1. Identify the role of Operating System. To understand the design of control unit.

CO2. Understanding CPU Scheduling, Synchronization, Deadlock Handling and Comparing CPU Scheduling Algorithms. Solve Deadlock Detection Problems.

CO3. Describe the role of paging, segmentation and virtual memory in operating systems.

CO4. Description of protection and security and also the Comparison of UNIX and Windows based OS.

CO5. Defining I/O systems, Device Management Policies and Secondary Storage Structure and Evaluation of various Disk Scheduling Algorithms.

Basic Web Technology-II- -206-XII-B

CO1. Analyse a web page and identify its elements and attributes.

CO2. Create web pages using XHTML and Cascading Style Sheets.

CO3. Build dynamic web pages using JavaScript (Client-side programming).

CO4. Create XML documents and Schemas.

CO5. Build interactive web applications using AJAX.

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BCA S.Y. Sem III

Principles of Management –XIII

CO1. Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, and have same basic knowledge on international aspect of management

CO2. To understand the planning process in the organization

CO3. To understand the concept of organization

CO4. Demonstrate the ability to directing ,leadership and communicate effectively

CO5. To analysis isolate issues and formulate best control methods.

OPPS Using C++ - XIV

CO1. Creating class and objects in C++.

CO2. Basic of Structures and Unions, Functions.

CO3. Implementing inheritance, polymorphism and object relationship in C++.

CO4. Designing methods and procedures, Constructor and destructor programs.

CO5. Data manipulation through file in C++.

Business Law-I -XV

CO1. Students would learn the basics of Laws governing commercial contracts and nuances of competency to contract, rules of Consideration and Objects of Contracts with case laws and illustrations.

CO2. Students would learn the concept of Consent & Free Consent, different types of Agreements and Contracts, different Modes of discharge of Contracts, Breach of contracts and remedies for the aggrieved parties.

CO3. Students would learn the rules regarding the Contract of Indemnity & Guarantee, Contract of Bailment, Contract of Pledge and Contract of Agency and types of Agents.

CO4. Students would learn the rules regarding the Contract of Sale, Distinction between Sale & Agreement to sell, Condition & Warranty, Doctrine of Caveat Emptor, Rights of Unpaid Seller and Remedies for Breach of Contract of Sale.

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CO5. Students would learn various provisions related to The Negotiable Instrument Act, 1881 with Amendment Act, 2015. Rules related to Bills of Exchange, Promissory Note and Cheque. Legal process on Dishonour of Cheque and Penalties.

DBMS-XVI

CO1. Model Entity-Relationship diagrams for enterprise level databases[L3]

CO2. Formulate Queries using SQL and Relational Formal Query Languages[L3]

CO3. Apply different normal forms to design the Database[L3]

CO4. Summarize concurrency control protocols and recovery algorithms[L5]

CO5. Identify suitable Indices and Hashing mechanisms for effective storage and retrieval of Data[L3]

E-Business Essential – XVII

CO1. Understand the basic concepts and technologies used in the field of management information systems.

CO2. Have the knowledge of the different types of management information systems.

CO3. Understand the processes of developing and implementing information systems.

CO4. Be aware of the ethical, social, and security issues of information systems.

Data Structure and Algorithm – XVIII-A

CO1. Understanding of fundamental Data Structures including linked-lists, trees, binary search trees, AVL trees, stacks, queues, priority queues, and hash-tables and skiplists.

CO2. Understanding of fundamental abstract data types which can include: Maps, Sets and Vectors.

CO3. Ability to program data structures and use them in implementations of abstract data types.

CO4. Ability to devise novel solutions to small scale programming challenges involving data structures and and recursion.

CO5. Understanding of basic algorithmic complexity.

CO6. Ability to estimate the algorithmic complexity of simple, non-recursive programs

CO7. Ability to perform simple inductive proofs and proofs by contradiction and reason about program correctness and invariants.

CO8. Ability to sensibly select appropriate data structures and algorithms for problems and to justify that choice.

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RDBMS Using ORACLE-XVIII-B

CO1. Master the basic concepts and appreciate the applications of database systems.

CO2. Master the basics of SQL and construct queries using SQL.

CO3. Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.

CO4. Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.

CO5. Mater sound design principles for logical design of databases, including the E-R method and normalization approach.

CO6. Be familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B-tree, and hashing.

CO7. Master the basics of query evaluation techniques and and query optimization.

CO8. Be familiar with the basic issues of transaction processing and concurrency control.

CO9. Master working successfully on a team by design and development of a database application system as part of a team.

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BCA S.Y. Sem IV

Cost Accountancy-XIX

CO1. Imbibe conceptual knowledge of cost accounting.

CO2. Understand the significance of cost accounting in the modern economic environment

CO3. Select the costs according to their impact on business

CO4. Differentiate methods of schedule costs per unit of production

CO5. Differentiate methods of calculating stock consumption

CO6. Identify the specifics of different costing methods

CO7. Interpret the impact of the selected costs method

CO8. Apply cost accounting methods to evaluate and project business performance

CO9. Demonstrate mastery of costing systems, cost management systems, budgeting systems and performance measurement systems.

Java Programming-XX

CO1. Understand the concept of oops as well as the purpose and usage principles of Inheritance, polymorphism, encapsulation etc.

CO2. Understand the basic concepts of classes and objects.

CO3. Understand JVM Concept , Data types and Operators, Strings

CO4. Understand Internet Programming Using Java Applets & Graphic Programming & Make use of array, constructors, Inheritance, Packages and Interfaces.

CO5. Understand the concept of Exceptional Handling/Event Handling & Java I/O Handling.

MIS & DSS-XXI

CO1. Solve the problems related to the analysis, design & construction of MIS.

CO2. Demonstrate the knowledge & ability to define the concept & definition of Information systems.

CO3. Describe the system development stages

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CO4. Describe the organizational structure & business processes within these structures. 5. Describe the system design & implementation

CO5. Ability to perceive the characteristics of the decision models in real time or not.

CO6. Ability to locate and select appropriate data to support decision models.

CO7. Ability to analyze, investigate and evaluate a decision model.

CO8. Ability to analyze and draw conclusions on:

CO9. Characteristics and variables in the standardization of decision models

CO10. The characteristics and type of data required to develop and support decision models

CO11. Characteristics and methodological approach to developing decision support systems

Business Law-II-XXII

CO1. Students would learn the basics of Laws governing a Company, concepts and features of companies, Roles, Duties & Liabilities of Promoters, Classification of Companies, Pre & Post-incorporation stages, Lifting of Corporate Veil, Memorandum of Association & Articles of Association, Common procedure for Incorporation of Company, Prospectus and Private Placement.

CO2. Students would learn various provisions related to Member of a Company, Modes of Acquiring & Cessation of Membership, Rules regarding Director, Qualification & Disqualification, and Legal position of Director. Directors Identity Number. Legal provisions relating to Company Meetings, i.e. Annual General Meeting, Extra-ordinary General Meeting, Board Meeting.

CO3. Students would learn the rules regarding The Partnership Act, 1932, Concepts, Essentials, True Test of Partnership, Types, Rights & Duties. Modes & Consequences of Dissolution of Partnership. Concepts, Characteristics of LL.P. under Limited Liability Partnership Act, 2008.

CO4. Students would learn the rules regarding the Consumer Protection Act, 1986, Concepts, Consumer Dispute, Complaint, Defect, Deficiency, Unfair Trade Practices, Redressal Agencies. Salient Features and Objects of Competition Act, 2002, the concepts

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of Anticompetitive Agreements, Abuse of Dominant Position & Competition Commission.

CO5. Students would learn various provisions related to Intellectual Property Rights. Concepts, Objectives & Rules relating to Patents Act, 1970, Copyright Act, 1957 & Trade Marks Act, 1999. Applicability, Duration, Registrations Procedures.

Entrepreneurship Development-XXIII

CO1. Understand theories of entrepreneurship and business development

CO2. Understand the key resources required to develop an existing business such as ideas and finance, launch a new venture, or initiate a business enterprise

CO3. Be able to state, understand and evaluate the key factors needed to develop a successful business

CO4. Understand the central role of opportunity recognition and marketing to business development

CO5. Understand the creation of business sustainability

PC Maintenance- Elective-XXIV

CO1. Describe the components of a computer system, mobile devices and basic security for protecting people, equipment, and environments from accidents, damage, and contamination.

CO2. Perform installation of operating system, printer and assemble/upgrade a computer system.

CO3. Apply good communications skills and professional behaviour while working with customers.

CO4. Perform preventive maintenance and advanced troubleshooting. Assess customer needs, analyse possible configurations, and provide solutions or recommendations for hardware, operating systems, networking, and security.

Advanced Networking- Elective-XXIV

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CO1. Differentiate between different LAN-based forwarding devices so that they can make thoughtful suggestions on how to build a network.

CO2. Write networking code that uses TCP and UDP in client-server applications.

CO3. Design and implement networking protocols.

CO4. Design and implement networking applications.

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BCA T.Y.Sem V

Management Accounting-XXV

CO1. Students would explain the significance of basic concept, importance & Functions of Management Accounting

CO2. Students would illustrate the Vertical format of financial statements, and also tools of financial analysis such as Trend Analysis, Comparative Analysis and Common Size Statement.

CO3. Students would calculate the various ratios and interpret it

CO4. Students would calculate the estimated working capital requirement of the entity

CO5. Students would apply Capital Budgeting methods such as Pay Back Period method, Net Present Value method, Profitability Index method and Average Rate of Return method in decision making

SQL 2017 -XXVI

CO1. Write complex SQL queries to retrieve information from databases with many tables to support business decision making.

CO2. Write SQL DDL to create, modify and drop objects within a relational database.

CO3. Retrieve and store information in a relational database using SQL in a multi-user, web based environment.

VB – XXVII

CO1. Design, create, build, and debug Visual Basic applications.

CO2. Explore Visual Basic's Integrated Development Environment (IDE).

CO3. Implement syntax rules in Visual Basic programs.

CO4. Explain variables and data types used in program development.

CO5. Apply arithmetic operations for displaying numeric output.

CO6. Write and apply decision structures for determining different operations.

CO7. Write and apply loop structures to perform repetitive tasks

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CO8. Write and apply procedures, sub-procedures, and functions to create manageable code

CO9. Create one and two dimensional arrays for sorting, calculating, and displaying of data.

CO10. Write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism. K. Write Windows applications using forms, controls, and events.

Organizational Behaviour – XXVIII

CO1. Demonstrate the applicability of the concept of organizational behaviour to understand the behaviour of people in the organization.

CO2. Demonstrate the applicability of analyzing the complexities associated with management of individual behaviour in the organization

CO3. Analyze the complexities associated with management of the group behaviour in the organization. Demonstrate how the organizational behaviour can integrate in understanding the motivation (why) behind behaviour of people in the organization.

Software Engineering – XXIX

CO1. Students will be able to decompose the given project in various phases of a lifecycle.

CO2. Students will be able to choose appropriate process model depending on the user requirements.

CO3. Students will be able perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance.

CO4. Students will be able to know various processes used in all the phases of the product

Banking & Insurance – XXX-A

CO1. The learners will become computer literate and will be able to access, create, save and manage documents, spreadsheets, make effective presentations, emails and use the internet effectively.

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CO2. They will gain a comprehensive understanding of the ecommerce landscape, current and emerging business models and the technology and infrastructure underpinnings of the business.

CO3. They will be able to develop an understanding on how internet can help in growth of the business.

CO4. They will gain an understanding on the importance of security, privacy and ethical issues as they relate to ecommerce.

CO5. They will be able to describe fundamental concepts behind modern e-banking/mobile banking technologies.

Retail Management- XXX-B

CO1. Clarify the concept and related terms in retailing.

CO2. Comprehend the ways retailers use marketing tools and techniques to interact with their customers.

CO3. Understand various formats of retail in the industry.

CO4. Recognize and understand the operations-oriented policies, methods, and procedures used by successful retailers in today's global economy.

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BCA T.Y.Sem VI

Elements of Commercial Portals (HTML 5) –XXXI

CO1. Analyze a web page and identify its elements and attributes.

CO2. Create web pages using XHTML and Cascading Style Sheets.

CO3. Build dynamic web pages using javascript (Client side programming).

CO4. Build interactive web applications using AJAX.

CO5. To learn javascript for creating dynamic websites.

CO6. To learn the operations perform on data among web applications using XML

CO7. To acquire knowledge on creation of software components using JAVA Beans.

CO8. To learn Server-Side Programming using Servlets and Java Server Pages.

CO9. To learn the creation of pure Dynamic Web Application using JDBC.

Android 9 –XXXII

CO1. Understand Android OS, gradle, Android Studio.

CO2. Debug Android Application

CO3. Develop UI based Mobile Application using Android Studio.

CO4. Design application for Mobile using various sensors.

CO5. Design and develop an application using Database.

CO6. Adapt to learn new mobile technologies.

Business Law-III- XXXIII

CO1. Students would recall various definitions of Company Law and would be acquainted with the concepts of Foreign Company, One-person Company, etc.

CO2. Students would be aware of various procedures involved in bringing a company into existence and the scope and importance of documents like Memorandum of Association and Articles of Association.

CO3. Students would recall and discuss the process of raising funds for a company by inviting the public to contribute to the same.

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CO4. Students would discuss the meaning and features of private placement and would examine the circumstances in which companies could raise capital only through known sources

CO5. Students would be acquainted with various types of shares and debentures issued by companies and their features.

Software Testing- XXXV

CO1. List a range of different software testing techniques and strategies and be able to apply specific (automated) unit testing method to the projects.

CO2. Distinguish characteristics of structural testing methods.

CO3. Demonstrate the integration testing which aims to uncover interaction and compatibility problems as early as possible.

CO4. Discuss about the functional and system testing methods.

CO5. Demonstrate various issues for object oriented testing.

Services Marketing – XXXVI-A

CO1. Understand the Concept of Services and intangible products

CO2. Discuss the relevance of the services Industry to Industry

CO3. Examine the characteristics of the services industry and the modus operandi .

CO4. Analyse the role and relevance of Quality in Services

CO5. Visualise future changes in the Services Industry

Export Management-XXXVI –B

CO1. The learner studies the difference between the Domestic Market & Export Market also the factors that influence Export Marketing & the various risks involved in the overseas market.

CO2. The learner examines the various types of Tariff & Non-Tariff Barriers, the positives & negatives of WTO & Overseas Market selection process.

CO3. The learner understands the Foreign Trade Policy, Role of DGFT, Benefits to status Holders and concepts relating to EOU/SEZ's/ AEZ's.

Major Project

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CO1. Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.

CO2. Students are provided to work on multidisciplinary Problems.

CO3. Students should be able to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire systems.

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Bachelor of Science
(Computer Sci.)

Bachelor of Science (Computer Sci.)

B.Sc. (C.S.) F.Y.Sem I

CS101-T- COMPUTER FUDAMENTAL

CO1. Knowledge of computer fundamental CPU and its functionalities.

CO2. Understanding of block diagram of hardware peripherals

CO3. Understanding the concept of software and its types

CO4. Understanding the number of system and its conversion between different numbers of systems

CO5. Understanding the computer-based application such as email and video conferencing

CO6. Be able to identify computer hardware and peripheral devices

CO7. Be familiar with software applications

CO8. Understand file management

CO9. Accomplish creating basic documents, worksheets, presentations with their properties.

CO10. Experience working with email and recognize email netiquette.

CS102-T-Digital Electronics

CO1. Identify basics of number systems used in computer science.

CO2. Understand how the basic logic gates operate and are used to build complex computer circuits

CO3. Solve logic problems using K- Maps.

CO4. Learn how combinational and arithmetic logic circuits are constructed.

CO5. Study Flip-Flops and important building block for most sequential circuits.

CO6. Understand the counters with various types.

CO7. Understand shift Registers and its input and Out puts.

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CS103-T- Microprocessor – I

CO1. Define the history of microprocessors

CO2. Describe the architectures of 8085 and 8086 microprocessors.

CO3. Draw timing diagram 4

CS104-T- C Programming – I

CO1. Write, compile and debug programs in c language

CO2. Developed simple applications in c using basic constructors

CO3. Design programs involving design structures, loops

CO4. Design and implement application using arrays

CO5. Understand the basic terminology used in computer programming

CO6. Use different data types in a computer program.

CO7. Design programs involving decision structures, loops and functions.

CO8. Explain the difference between call by value and call by reference.

CO9. Understand the dynamics of memory by the use of pointers.

CO10. Use different data structures and create/update basic data files

CS105-T- Communication Skill – I

CO1. Students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. From multiple perspectives.

CO2. Presentation skills training courses provide strategies to plan, structure and deliver powerful presentations. Learn how to structure presentations in order to deliver effective messages as well as receive the coaching to dramatically improve your personal presentation. This specific program is one ofthe leading presentation skills training courses developed to help people engage audiences.

CO3. A group discussion among students is being organized to see and evaluate their thinking skills, listening abilities and how they are communicating their thoughts. One

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should learn to control the conversation through listening attentively and then having the perseverance to mould it towards his/her own direction.

CO4. Develop, exhibit and accurate sense of self and nurture a deep understanding of personal motivation. Develop an understanding of and practice personal and professional responsibility.

CO5. To practice and develop writing processes pertaining to invention, revision, organization, drafting through multiple drafts, editing, and adjusting for rhetorical context (purpose, audience, persona). To discuss and share writing and reading with one another and develop a shared vocabulary for talking about writing.

CS106-T- Mathematical Foundation

CO1. Know how to represent various statements using set relations functions permutations and combinations groups Graves and trees.

CO2. Use logical notations to formulate and reason about the fundamental mathematical concepts relations functions and algebraic structures.

CO3. Analyse the growth of functions and real-world problems using various concept like recurrence relations graph implementations etc.

CO4. Apply mathematical logical to solve problems pigeonhole principal to solve real time problems.

CO5. Model and solve real world problems using graphs and trees

Programming methodology

CO1. Learn the history and types of programming

CO2. Learn various approach of writing programming

CO3. Learn to develop simple algorithms and flow charts to solve a problem.

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B.Sc. (C.S.) F.Y.Sem II

CS201-T- Data Structure

CO1. Ability to understand fundamental data Structure like arrays, linked-list, stack, queues, trees, graphs.

CO2. Ability to understand abstract data types

CO3. Ability to program data structure and use them in implementation of abstract data types

CO4. Understanding of basic algorithm complexity

CO5. Ability to sensibly select appropriate data structure and algorithms for problems and to justify that choice

CO6. Ability to understand searching and sorting algorithms their implementation and suitable applications

CS202-T- Operating System

CO1. Gain knowledge of system software program and process.

CO2. Understand types of operating system basic functions of OS and evolution of OS.

CO3. Understand the concept of process control block and threads.

CO4. Understand the CPU scheduling non-primitive and primitive scheduling algorithms.

CO5. Understand the concept of synchronization and deadlock.

CO6. Understand functions, structures and history of operating systems.

CO7. Understand process management concepts including scheduling, synchronization, deadlocks.

CO8. Understand and implement multithreading concept.

CO9. Analyze concepts of memory management including virtual memory.

CO10. Design the protection and security mechanisms.

CS203-T- Microprocessor – II

CO1. Write programs using 8086

CO2. Distinguish between the different modules of operation of microprocessors.

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CO3. Interface peripherals to 8086

CO4. Evaluate the appropriateness of a memory expansion interface based on the address reference with particular application.

CO5. Apply the above concepts to real world electrical and electronics problems and applications.

CS204-T- C Programming – II

CO1. Develop and implement modular application in c using functions

CO2. Develop applications in c using structure and pointers

CO3. Design applications using sequential and random-access file processing

CO4. Identify the difference between call by value and call by reference

CS205-T- Communication Skill – II

CO1. Understand the significance and essence of a wide range of soft skills

CO2. Learn how to apply soft skill in a wind wide range of routine social and professional settings

CO3. Learn how to employees of skill to improve interpersonal relationships

CO4. Learn how to apply soft skills to enhance employee ability and ensure workplace and career success

CS206-T- Numerical Computation Method

CO1. Students will be able to explain and measure errors in numerical computations

CO2. Students will be able to find solutions of interpolation problems

CO3. Students will be able to solve numerical integration problems using different techniques

CO4. Students will be able to derive solutions for a system of linear equations

CO5. Students will be able to find solutions of algebraic and differential equations

CO6. Students will be able to design and compare different numerical algorithms with respect to accuracy and efficiency of solution

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B.Sc.(C.S.) S.Y.Sem III

CS301-T- Advance Data Structure

CO1. Implement List adts and their operations.

CO2. Develop programs for sorting.

CO3. Develop programs for implementing trees and their traversal operations.

CO4. Implement graph traversal algorithms.

CO5. Apply algorithm design techniques.

CS302-T- Unix Operating System

CO1. To familiarize students with the concepts, design, and structure of the UNIX operating system.

CO2. To teach students the use of basic UNIX Utilities

CO3. To teach students the principles of UNIX shell programming.

CS303-T- PC Maintenance

Early detections of issues.

CO1. Prevention against viruses

CO2. Speed up your computer

CO3. Maximize your software efficiency

CO4. Prevent data loss

CS304-T- Programming in CPP

CO1. Gain the basic knowledge on Object Oriented concepts. • Ability to develop applications using Object Oriented Programming Concepts.

CO2. Ability to implement features of object-oriented programming to solve real world problems.

CO3. Use the characteristics of an object-oriented programming language in a program.

CO4. Use the basic object-oriented design principles in computer problem solving.

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CO5. Use the basic principles of software engineering in managing complex software project.

CO6. Program with advanced features of the C++ programming language.

CS305-T- Database Management System

CO1. The Subject teaches about the basic concept of database management, Relational model, SQL, Functions and Block structure.

CO2. Prepares student for back-end Database Structure Management.

CS306-T- Statistical Method

CO1. How to calculate and apply measures of location and measures of dispersion -- grouped and ungrouped data cases.

CO2. How to apply discrete and continuous probability distributions to various business problems.

CO3. Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases. Understand the concept of p-values.

CO4. Learn non-parametric test such as the Chi-Square test for Independence as well as Goodness of Fit.

CO5. Compute and interpret the results of Bivariate and Multivariate Regression and Correlation Analysis, for forecasting and also perform ANOVA and F-test. Further, understand both the meaning and applicability of a dummy variable and the assumptions which underline a regression model. Be able to perform a multiple regression using computer software.

CS307-P- Data Structure using CPP and DBMS

CO1. Gain the basic knowledge on Object Oriented concepts.

CO2. Ability to develop applications using Object Oriented Programming Concepts.

CO3. Ability to implement features of object oriented programming to solve real world problems.

CO4. Use the characteristics of an object-oriented programming language in a program.

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CO5. Use the basic principles of software engineering in managing complex software project.

CO6. Program with advanced features of the C++ programming language

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B.Sc. (C.S.) S.Y.Sem IV

CS401-T- Software Engg.

CO1. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.

CO2. An ability to function on multi-disciplinary teams.

CO3. An ability to identify, formulate, and solve engineering problems.

CO4. An understanding of professional and ethical responsibility.

CO5. An ability to communicate effectively.

CS402-T- Fedora

CO1. Describe the general architecture of computers

CO2. Describe, contrast and compare differing structures for operating systems

CO3. Understand and analyse theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files

CO4. Become familiar (if not already) with the C language, gcc compiler, and Makefiles

CO5. Understand the high-level structure of the Linux kernel both in concept and source code

CS403-T- Basic of Networking

CO1. Independently understand basic computer network technology.

CO2. Understand and explain Data Communications System and its components.

CO3. Identify the different types of network topologies and protocols.

CO4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

CO5. Identify the different types of network devices and their functions within a network

CO6. Understand and building the skills of subnetting and routing mechanisms.

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CO7. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation

CS404-T- Core Java

CO1. Implement Object Oriented Programming Concepts.

CO2. Use and create packages and interfaces in a Java program.

CO3. Create final year project with database connectivity.

CS405-T- Adv. DBMS

CO1. The subject teaches advanced concept of DBMS like ,file organization, physical database design and tunning, concurrency control transactions and schedule, crash recovery.

CO2. It also teaches about parallel and distributed database object database systems, data warehousing concepts and data mining.

CS406-T- Web Fundamental

CO1. Explain the history of the internet and related internet concepts that are vital in understanding web development.

CO2. Discuss the insights of internet programming and implement complete application over the web.

CO3. Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.

CO4. Utilize the concepts of javascript

CO5. Use web application development software tools i.e. Ajax, PHP and XML etc. And identify the environments currently available on the market to design web sites.

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B.Sc.(C.S.) T.Y.Sem V

CS501-T- Software Cost Estimation

CO1. Perform a specification takeoff in preparation for quantity takeoff.

CO2. Identify types of bids and their use.

CO3. Apply appropriate type of cost estimate by contract type.

CO4. Perform quantity takeoff for site work, concrete, wood, steel, and masonry construction, plus finish items.

CO5. Apply direct cost of materials to quantity takeoffs to determine the materials cost of a project.

CO6. Apply labor costs to quantity takeoffs to determine the labor cost of a project.

CO7. Determine direct job overhead applicable to a construction project.

CO8. Use computer applications to compile and organize a construction estimate.

CS502-T- Basic of Android O. S.

CO1. Understand Android OS, gradle, Android Studio.

CO2. Debug Android Application

CO3. Develop UI based Mobile Application using Android Studio.

CO4. Design application for Mobile using various sensors.

CO5. Design and develop an application using Database.

CO6. Adapt to learn new mobile technologies.

CS503-T- Core Java-II

CO1. After successful completion of the course, the students are able to.

CO2. Use the syntax and semantics of java programming language and basic concepts of OOP.

CO3. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.

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CO4. Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.

CO5. Design event driven GUI and web related applications which mimic the real word scenarios.

CS504-T- Basic of Computer Graphics

CO1. Understand the basics of computer graphics, different graphics systems and applications of computer graphics.

CO2. Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.

CO3. Use of geometric transformations on graphics objects and their application in composite form.

CS506-T- Basic of ASP.Net

CO1. Explain the three pillars of object-oriented programming.

CO2. Develop working knowledge of C# programming constructs and the .NET Framework.

CO3. Write an object-oriented program using custom classes.

CO4. Build and debug well-formed Web Forms with ASP. NET Controls.

CO5. Perform form validation with validation controls.

CO6. Create custom controls with user controls.

CO7. Use ADO.NET in a web application to read, insert, and update data in a database.

CS507-T- Data Mining

CO1. Understand the functionality of the various data mining and data warehousing component

CO2. Appreciate the strengths and limitations of various data mining and data warehousing models

CO3. Explain the analysing techniques of various data Analyze

CO4. Describe different methodologies used in data mining and data ware housing.

CO5. Compare different approaches of data ware housing and data mining with various technologies

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CS508-T Advanced Networking

CO1. Students are able to explain and demonstrate knowledge about networking system, protocols and addressing system.

B.Sc.(C.S.) T.Y.Sem VI

CS601-T- Software Quality & Testing

CO1. List a range of different software testing techniques and statergies and be able to apply specific(automated) unit testing method to the projects.

CO2. Distinguish characterstics of structural testing methods.

CO3. Demonstrate the integration testing which aims to uncover interaction and compatibility problems as early as possible.

CO4. Discuss about the functional and system testing methods.

CO5. Demonstrate various issues for object oriented testing.

CS602-T- Android Application Development

CO1. Build enterprise level mobile applications with Kotlin on Android

CO2. Understand both the basic and advanced concepts of Kotlin

CO3. Understand why use Kotlin over Java

CO4. Install and configure Android Studio

CO5. Explain and use key Android programming concepts

CO6. Deploy the application on Google Play

CO7. Become a certified Android developer

CS603-T- Theory of Computation

CO1. Design deterministic and non-deterministic finite state machines and understand their capabilities and limits

CO2. Design deterministic and non-deterministic context-free grammars and pushdown automata

CO3. Design and analyze Turing machines, their capabilities and limitations

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CO4. Demonstrate the understanding of complexity classes and current unsolved problems in theoretical computer science

CO5. Apply the theoretical concepts to the practice of program design with regular expressions, parsing, and complexity analysis

CS604-T- Advanced Computer Graphics

CO1. Extract scene with different clipping methods and its transformation to graphics display device.

CO2. Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

CO3. Render projected objects to naturalize the scene in 2D view and use of illumination models for this.

CS605-T Advanced Prog. With PHP

CO1. Introduce the creation of static webpage using HTML.

CO2. Describe the function of javascript as a dynamic webpage creating tool

CS606-T- Programming Language: C#

CO1. Describe basic concepts and develop programs in C# using object-oriented features like delegates, events, errors and exceptions

CO2. Explain Common language runtime (CLR) as a platform for managed code

CO3. Describe the features of Common language runtime (CLR) and develop efficient code with C# on .NET framework

CO4. Develop windows-based applications & services on .NET framework

CO5. Describe overview of .NET framework

CO6. Interpret data access and develop windows applications

CO7. Apply an understanding of the .NET technology and C#.net components to develop a windows-based application which solves specified problem domain

CO8. Use of ADO.NET technology for developing database-oriented applications

CO9. Understand the professional responsibility

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CO10. Apply an understanding of the need for high ethical standards in the practice of engineering towards people and the environment

CS607-T - E-Commerce

CO1. Analyze the impact of E-commerce on business models and strategy.

CO2. Describe the major types of E-commerce.

CO3. Explain the process that should be followed in building an E-commerce presence.

CO4. Identify the key security threats in the E-commerce environment.

CS608-T- Ethics and Cyber Law

CO1. Students identify and analyze statutory, regulatory, constitutional, and organizational laws that affect the information technology professional.

CO2. Students locate and apply case law and common law to current legal dilemmas in the technology field.

CO3. Students apply diverse viewpoints to ethical dilemmas in the information technology field and recommend appropriate actions.

CO4. Students distinguish enforceable contracts from non-enforceable contracts.

CO5. Students demonstrate leadership and teamwork.

CS610-P- Major Project

CO1. Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.

CO2. Students are provided to work on multidisciplinary Problems.

CO3. Students should be able to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire systems

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Bachelor of Science

MICROBIOLOGY

COURSE OUTCOME

B. Sc. I

Fundamentals of microbiology (P I and PIII)

- Study of types of microorganism
- We study taxonomy of microorganism
- Identification of micro organism on the basis ofhabitat
- Basic study ofvirus
- Study of characteristics of all types of microorganism
- Study of microscope which is used to seen micro organism not seen by nakedeyes

General microbiology (P II and P III)

- Study of identification of micro organism on by using various method ofstaining
- Study of production of all types of media which is useful for growth of microorganism
- Study of cultivation ofanaerobes
- Study of various method of sterilization
- Study of method required in amplification of microorganism
- Role of micro organism in our life

Cytology and general microbiology (P IV and P VI)

- Study of microbial call and cell organelles
- With the help of cytology we can study bacterial celldivision
- Study of nutritional requirements to growth of microbialcell
- Study of bacterial growth curve and variousaspects
- Study of water purification and degradation ofwaste

Basic biochemistry and microbial physiology (P V and P VI)

- Study of biomolecules i.e. carbohydrate ,lipid,proteinetc
- Study of classification ofbiomolecules
- Study of factors affect on thebiomolecules
- Study of various test to detect the biomolecule of present insubstance
- Study of photo synthesis of bacterial and uptake of Nutrient

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B.Sc. II

Environmental microbiology (P VII and P IX)

- Study of hazardous waste bioremediation
- Study of aquaticmicrobiology
- We can check water quality in variousaspects
- Study of waste water treatment by usingmicrobes
- Certain bacteria can help in cleaning the oil spillsa
- Microbiologist check factory waste which can cause pollution of air or water thus increasing rate of poisoning or disease intreatment

Immunology (P VIII and P X)

- Study of host defencemechanism
- Study of antigen i.e. foreign partical which causedisease
- Study of antigen -antibody reaction i.e. mechanism of killing of microorganism
- Study of vaccine and preparationmethod
- Study of MHC molecules which is useful in graderejection
- Diagnosis of disease by varioustest

Applied microbiology (P XI and P X III).

- Study of dairy microbiology and production of dairyproduct
- Study of food microbiology and food poisoning by microorganism
- Study of food bornedisease
- Study of production of fermented product andprobiotics
- Study of mushroomcultivation
- Methods of preservation offood

Clinical microbiology,(P XII and P XIV)

- Study of human disease caused by bacteria with all dimension and diagnosismethod
- Study of all types of viruses which cause disease tohuman
- Study of enteric bacteria andspirochetes
- Study of oncogenic virus may cause cancer
- Study of protozoa , fungi which cause disease to human and diagnosismethod

B.sc. III

Micobial genetics (P XV and P X VII)

- Study of DNA and RNA of microorganism
- Study of molecular properties of DNA and method ofreplication
- Study of gene expression i.e. proteinsynthesis
- Study of genetic code andfeatures
- Regulation of gene expression inmicrobes
- Study of gene mutation andmutant
- Study of bacterialrecombination

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Microbial metabolism (P XVI and P XVIII)

- Study of production ofenzyme
- Study of types of enzyme and various inhibitionmethod
- Study of factors affect onenzyme
- Commercial use of enzyme in variousindustries
- Study of microbial metabolism
- Study ofrespiration
- Study of biosynthesis ofnucleotides

Recombinant DNA technology, (P XIX and P XXI)

- Production of genetically modifiedorganisms
- Study of various techniques use in recombinant DNAtechnology
- Role of microbial DNA in production ofGMO
- Study of production of GM crop i.e. pesticideresistant
- RDT help in medical i.e. genetherapy
- RDT help to change genetics of animal or any organism which we required by usingvarious techniques

Industrial microbiology (P XX and P XXII)

- Study of production of biopolymer.biosurfactant,biofloculant
- Study of production of vitamins,ethanol,
- Study of production ofbiofilm
- Study of recovery ofmaterial
- Study of pt ofbiofuel
- Study of treatment of organicwaste
- Study of various micro organism used inindustry

DEPARTMENT OF COMPUTER SCIENCE

Course outcomes

CSC01 – Computer Fundamentals

- Student will be able to understand the Basics of computer systems
- The knowledgeof software and hardware details and their application

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COURSE OUTCOMES

B. Sc. First Year Chemistry

Semester I

Paper no. I Inorganic chemistry

- To adopt basics of atomic structure and principles related to filling of atomic orbital.
- Briefly elaborate trends in periodic properties viz. atomic and ionic radii, ionization energy, electron affinity and electro negativity with application in predicting chemical behavior.
- To study basic chemistry of elements of s and p- block.

Paper no. II Organic chemistry

- To understand basic concepts in organic chemistry- classification of reactions, reagents and mechanisms of organic reactions.
- To learn fundamental concepts from stereochemistry and its importance.
- To familiarize with chemistry of hydrocarbons and their importance

Semester II Paper no. IV Physical chemistry

- To understand basic mathematical concepts related to chemistry
- To understand kinetic theory of gases, kinetic gas equation, and gas laws.
- To study kinetics and dynamics of chemical reaction.
- To adopt concepts of Catalysis and Enzyme catalysis.
- To learn basics and classification of liquid and solid state
- To familiarize with colloidal state and their properties

Paper no. V Inorganic chemistry

- To understand chemical properties of the noble gases and chemistry of xenon
- To learn types and theories related to bonding
- To adopt basics and applications of nuclear chemistry
- To study theories of volumetric analysis and its components.

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B. Sc. Second Year Chemistry

Semester III

Paper no. VII Organic chemistry

- To understand structure, reactivity, methods of preparation and chemical reactions of different types of organic compounds - alcohols, Phenols, aldehydes, ketones, amines and carboxylic acids.
- To adopt and develop skills of writing mechanism of some named reactions
- To learn uses of reagents in organic chemistry like LiAlH4, LTA, PTC.

Paper no. VIII Physical chemistry

- Able to learn basic concepts in thermodynamics.
- To understand the laws of thermodynamics.
- To study Carnot cycle and its applications,
- To adopt concept of entropy, Gibbs and Helmholtz Functions, Criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change.
- Able to understand equilibrium constant, free energy and laws related to it.

Semester IV

Paper no. X Inorganic chemistry

- To gain knowledge of co-ordination compounds.
- To learn basic concepts and theories of acids and bases.
- To understand Chemistry of d-Block and f-Block Elements.
- Able to classify solvents and learn reactions in non-aqueous solvents

Paper no. XI Physical chemistry

- Know the meaning of phase, component and degree of freedom.
- Creates awareness about rate of reactions and factors influencing rate of chemical reaction.
- After completion of these courses students should be able to Know the rate constant and factors affecting rate of reactions
- Write an expression for rate constant (K) for first order, second order reaction.
- Know the terms cell constant, specific conductivity, equivalent conductivity and molar conductivity.

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B. Sc. Third Year Chemistry

Semester V

Paper no. XVII Physical chemistry

- To study basic concepts of quantum mechanics
- Able to understand properties of wave functions
- To learn depth knowledge of quantum numbers and its importance
- To acquire basic features of spectroscopy
- To familiarize with thermal & photochemical processes
- To study the physical and chemical properties of nonmaterial

Paper no. XIV Organic chemistry

- Are skilled in solving combined problems of spectroscopy
- To understand concept and mechanism of organometallic compounds
- Able to analyze fats, oils and detergents

Semester VI

Paper no. XVII Organic chemistry

- Learn the mechanism of Electrophilic Substitution reaction of Heterocyclic Compounds
- Know the characteristics and Classification of Drugs and Dyes
- Explaining theories of Color and chemical constitution of Dyes
- Get basic knowledge of carbohydrates.
- Able to classify synthetic polymers.

Paper no. XVI Inorganic chemistry

- Able to understand fundamentals of organometallic compounds
- Will understand concept of VBT, CFT, etc.
- Able to understand basics of molecular geometries
- Learn concept of chromatography and its applications

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DEPARTMENT OF BOTANY

COURSE OUTCOMES

B. Sc. Semester I

Diversity of Cryptogams I & II (P I & P IV)

- The courses have been designed to benefit all Botany students to study various aspects of plant science including its practical applications.
- These students can take up teaching at different levels, research work in research institutes and or industry, doctoral work, environment impact assessment, biodiversity studies, entrepreneurship; scientific writing relevant topics have been included in the curriculum.
- Syllabus also deals with study the understand the multi functionality of plant cells in production of fine chemicals and their wide spread industrial applications.
- Cryptogams have an important role & function in bio prospecting.
- Algae, Fungi along with Bryophyte & Pteridophytes have many ecological, economic & industrial applications which can be grasped by students.

Morphology of Angiosperms(P II)

- Useful in basic botany study.
- Useful in plant classification (Taxonomy study).
- Creates hands on agricultural field practices.
- Benefited in plant breeding study.

Histology, Anatomy and Embryology (P VI)

- Creates knowledge regarding plant internal cell structure.
- Benefited in plants science research.
- Study of anatomy, embryology useful for research on various aspects of plant.

Practical based on course (P I , II, V AND VI)

- Useful in identification of plants, fruits, flowers.
- Provides knowledge of pollination and reproduction in plants.
- Useful for identification of different types of flowers and fruits.

B.Sc. II

Taxonomy of Angiosperm (P IX)

- Making aware about plant diversity and flowering plants.
- To acquaint with world history about classification of plants.
- To create awareness regarding structural features of plants.

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- To develop vision of identifying plants around the world.
- To classify plants on basis of various morphological features.

Plant Ecology (P X)

- In this subject student studies Plant Interactions with nature & Other Organisms.
- It is the study of interactions of organisms with one another as well as with their environment.
- In plants, competition generally is indirect, through the resource, not direct, one-on-one. Plants with the same life form and growth requirements are often in competition but surviving in slightly different microenvironments.
- In a symbiosis, two different kinds of organisms live together in an intimate and more or less permanent relationship.
- There are many practical applications of ecology in conservation biology, wetland management, natural resource management city planning (urban ecology), community health, economics, basic and applied science
- Ecosystems sustain life-supporting functions and produce natural capital, such as biomass¬ production (food, fuel, fiber and medicine).

Gymnosperms and Utilizations of Plants resources (P XIII)

- Create awareness about plant resources.
- To aware regarding non-flowering plants around the world.
- Create awareness about economic important plants.
- To acquaint with agricultural practices for common crops of India

Practical's based on (P IX and XIII)

- Identification of plants based on morphological characters.
- Creates awareness regarding economic important plants and there cultivation practices.

Plant Physiology (P XIV)

- Plant physiology is the study of the structure and function of plants and other processes of plants.
- Plant physiology is a division of biology pertaining to plant life, along with their¬ processes and functions. Fundamental processes such as photosynthesis, respiration, plant nutrition,
- Plant hormone functions, tropisms, nastic movements, photoperiodism, photomorphogenesis, circadian rhythms, environmental stress physiology, seed germination, dormancy and stomata function and transpiration, both parts of plant water relations, are studied by plant physiologists.

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- It is an experimental, laboratory-based field of science that requires knowledge of physics and chemistry.
- Plant physiologists study a wide range of processes and functions that plants use to live and survive.
- To function and survive, plants produce a wide array of chemical compounds not found in other organisms.
- Plant physiology includes the study of biological and chemical processes of individual

B. Sc. III

Cell Biology and Molecular Biology (P XVII)

- To acquaint with basic structure of all cells.
- To acquaint with structures of cell organelles and their function.
- To get detailed knowledge of cell at molecular level.
- To aware about basic terminology of plant cell.
- To apply information for new research in cell and molecular biology.

Plant Breeding and Seed technology (P XVIII B)

- Provides knowledge of various methods of crop improvement.
- It provides basic knowledge of methods of hybridization in plants which are used astool¬ in seed companies.
- Useful in agricultural research.

Genetics and Biotechnology (P XXI)

- To develop knowledge regarding history of Basic genetics.
- To create awareness regarding terminology of genetics.
- Develop the sense of research in genetic engineering.
- Theoretical and practical awareness about genes and it functional features.
- Creating awareness regarding genetic disorders in human and all living organisms.

Practical's based on (P XVII and XXI)

- Hands on cell division process.
- Identification of various chromosomes.
- Awareness regarding Mendal's experiments.

Economic Botany (XXII B)

- Useful in agricultural field.
- Gives knowledge of importance of various crop and economic values.

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Practical's (XXI and XXII)

- Hands on plant breeding experiment.
- Useful in study of plants on economic basis.

DEPARTMENT OF PHYSICS

COURSE OUTCOMES

B.Sc Semester-I

PHY-101 Paper-I

After completion of this course students is able to know

- Gravitation and its applications for human being.
- Nature and properties of elastic and non-elastic materials.
- Properties of liquid.
- What are ultrasonic waves, how they are produces and its applications in daily life

PHY-102 Paper-II

Heat and Thermodynamics

- Learn thermal properties of materials
- How heat is transferred from one medium to other medium.
- How heat engine is worked, What is the process of working of heat engine

PHY-104 Paper-IV

Geometrical and physical optics

- It gives the knowledge of nature of light and optical instruments
- Student is able to wave properties of light
- Applications of optical phenomenon in real life

PHY-105 Paper-V

- Electricity and Magnetism By studying this course student is able to know basic mathematics useful in physics.
- Know about electric and magnetic field, its applications in daily life

PHY-201 Paper-VII

Mathematical, Statistical Physics and Relativity

- By studding this paper students are able to apply mathematical tools to physics
- Know about the statistical approach to Physics
- Understand classical and quantum statistical mechanics

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PHY-202 Paper-VIII

Modern and Nuclear Physics

- Understand particle nature of light and its applications in daily life.
- Generation of X-rays and its applications
- Know about the nuclear forces and models and its applications in daily life.

PHY-205 Paper-XI

General Electronics

- Student will get basic knowledge of electrical circuits and its applications.
- By studding transistors and amplifiers students will learn basic of computer

PHY-206 Paper-XII

Solid State Physics

- After studding this paper students will get basic knowledge of crystal structures.
- Know the thermal properties of materials and its applications.
- Learn connection between chemical approaches of materials.

PHY-301 Paper-XV

Classical and Quantum Mechanics

- Understand mechanics of single particles and many particle systems.
- Get knowledge about motion of bodies and its equations of motions.
- Understand link between classical and quantum mechanics.
- Understand dual nature of light and its applications.

PHY-302 Paper-XVI

Electrodynamics

- Get the knowledge of static and dynamic charges.
- Know the production of electromagnetic waves and its applications in daily life.
- Understand the properties of electromagnetic waves and its interaction with the matter.

PHY-305 Paper-XIX

Atomic and Molecular Physics and LASER.

- By studding this paper student is able to know basic structure of atom its properties and Different atomic models.
- Know about molecular structure and its applications.

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- Understand LASER source and its properties, its applications in industry, medical field and biology.

PHY-306 Paper-XX

Non-conventional energy sources and optical fiber

- Students are able to know about conventional and non-conventional energy sources.
- Know about solar energy, wind energy, tidal energy, hydro energy and its production

DEPARTMENT OF MATHEMATICS

Course Outcome: B. Sc. MATHEMATICS

Differential and Integral Calculus

After completing the course, students will able to

- Verify the values of limit of a function at a point using the definition of a limit.
- Students will be familiar with the techniques of integration and differentiation of function with real variables
- Identify and apply the intermediate value theorem, Mean value theorem and L□Hospital□s rule.
- Student will be able to understand the concept of divergence, curl, gradient and it's applications

Differential Equations

After completing the course, students will able to

- Identify types of differential equations and solve differential equations such as Exact, homogeneous, non-homogeneous, and linear and Bernoulli differential equations etc.
- Understand homogenous linear equation with constant coefficient and variable coefficient
- Find the solution of non homogenous first order differential equations.
- Find the solution of partial differential equations

Geometry

After completing the course, students will able to

- Solve the problems of lines in three dimension, planes, spheres, and cylinders and how geometry is related to algebra by using their algebraic equations
- To understand geometrical terminology for plane, right line, sphere, cylinder and cone.

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- Student will be able to find angle between two planes and to find length of perpendicular from a given point to a given line.
- Students are able to identify parallel and perpendicular lines

Number Theory

After completing the course, students will able to

- Solve various problems on properties of integers and use the basic concepts of divisibility– and their applications in basic algebra.
- Apply Euclid's algorithm and backwards substitution
- Understand the definitions of congruence, residue classes and least residues

Numerical Methods

After completing the course, students will able to

- Formulate and code a finite element method for any given set of partial differential equations.
- Solve the Ordinary differential equation by various methods.
- Learn how to find the Integration & Derivative by various methods.
- Learn how to find the roots of the equation by various methods.

Integral Transform and Partial differential Equations

After completing the course, students will able to

- Learn the methods and properties of Laplace transform and Inverse Laplace Transform, apply them to solve Linear Differential equations.
- Know the difference between linear and nonlinear partial differential equations.
- Solve the linear and nonlinear partial differential equation by various methods like Lagrange's, Charpit's, Jacobi's, Monge's Method.

Mechanics

After completing the course, students will able to

- Know what is projectile and motion of projectile.
- Understand the concepts particle, rigid body, force, equilibrium etc.
- know the differential and pedal equations of central orbits
- Find the components of velocity and acceleration in a given direction.
- Follow the concepts momentum, angular momentum, work, energy and points functions in mechanics.

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Abstract Algebra

After completing the course, students will able to

- Identify the various algebraic structures with their corresponding binary operations.
- Generalize the groups on the basis of their orders, elements, order of elements and group relations.
- Compare two groups of same orders on the basis of isomorphism Criteria.
- Compute the possible subgroups of given group of specific orders and will recognize them.

Real Analysis

After completing the course, students will able to

- Understand the concept of series of real numbers, convergence and Divergence.
- Understand the definition of Metric Space and continuous function on metric space and difference between open sets and closed sets.
- Define Riemann integral and its properties and also Fourier Series and its application

Ordinary Differential Equations

After completing the course, students will able to

- Students are able to find the solution of linear differential equation of first and second order.
- Students understand the initial value problem and its solutions.
- Students know the concept Wronskian of solution.
- Students can find singular point and regular singular point of the differential equation

DEPARTMENT OF ZOOLOGY

COURSE OUTCOMES

Cell Biology

- Students understand the basic unit of life and its components along with its function and coordination among the cells
- They know the histological techniques of making slides of tissues, staining them with different dyes
- Gain the knowledge of DNA and RNA
- After first Semester students are aware of the basic structure and different parts of the Microscope, their use, how to handle it, focus it.
- Knowledge of Simple Microscope, Compound Microscope, Light Microscope, Phase Contrast Microscope and Electron Microscope is gained by students

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- They are also imparted with the knowledge of different types of cancer, its types, causes, Preventive measures and its cure

Protozoa to Annelida and Arthropoda to Echinodermata

- Students acquire the knowledge of all the invertebrates and their biodiversity in detail
- They grasp the small microscopic animals like protozoa, their evolution and phylogeny
- They yield the knowledge of some Parasitic protozoa and Arthropoda, their structure and their diseases with preventive measures and its cure
- They harvest the knowledge of different molluscan animals, their shells, use of the shells in different industries and ornaments

Genetics I and II

- Students gain knowledge of basic concepts of genetics, genes and the Laws of Mendel
- They come by with the basics of genetic disorders, gene mutation and its causes andsome inborn diseases caused by genes in adults and infants
- They also come across with the cross breeding in plants and interbreeding between different species in animals
- They clinch up with the DNA structure and genetic code, protein synthesis, negative feedback mechanism and how Information is stored on DNA

Vertebrate Zoology

- Pupils get cleared basic differences between vertebrates and invertebrates (Animals with backbone or vertebral column and without backbone or spine), their classification and behavior
- They understand the importance of all the five classes of vertebrata viz. Pisces, Amphibia, Aves, Reptilia and Mammalia
- They get keen ideas of the organs of the Class Mammalia, also the they understand the systems of Mammalia and their function, functions of organs and their diseases and cure
- They get expertise in the information of extinct animals like fishes, for Example Super class Agnatha which includes all the extinct fishes from the formation of earth till today.

Animal Physiology

- Students know that when we intake food it is digested, but how it is digested, its details comes into light in this study
- They have grip on the structure of the different organs of animals, their systems, functioning of the systems and coordination between the different organs in one system
- They are empowered with the knowledge of their own body like respiration, digestion, reproduction and so on.

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Biochemistry and Endocrinology

- Human body performs N number of functions, but for each function there is need of some command and instructions which are given by Hormones produced by pituitary gland and controlled by Hypothalamus, this makes the students Pioneer in the practical happenings in their own body and other animals
- They are able to judge and know the functioning of the their own body and other animals
- They enrich with the different endocrine and exocrine glands, their structure, function, their diseases and deficiency, cause and cure
- Thorough cognition of enzymes, proteins, lipid, fats, carbohydrates, sugars, cholesterol, their role in functioning the body and diseases related to them and their cure and prevention

Ecology and Evolution

- Firstly, students come to know the meaning of the small word Ecology which has a vast widespread importance
- They understand the different Ecological Niches
- They are able to realize the Natural Selection Process which is continuously going on the earth's surface
- Evolution of human from the very single cell bacteria is understood here They have thorough knowledge of Extinction of Speceis, Natural Selection and Evolution

Parasitic Protozoa and Helminthes I and II

- Students are aware of most of the diseases in the earths surface, but here they acquire knowledge the parasites which are spreading these diseases
- From cough and cold to Malaria, Typhoid, Kala azar, AIDS and other various disease spread by protozoa and helminth parasite are expertise by students
- Students have a detail knowledge of the parasites, its structure, its role in spreading disease, its precautive measures and its cure.

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Master of Management Science
(Computer Management)

Master of Management Science (MMS – Computer Management)

SEM I

Computer Organization

CO-1. Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os.

CO-2. Analyze the performance of commercially available computers.

CO-3. To develop logic for assembly language programming.

Operating System

CO-1. Identify the role of Operating System. To understand the design of control unit.

CO-2. Understanding CPU Scheduling, Synchronization, Deadlock Handling and Comparing CPU Scheduling Algorithms. Solve Deadlock Detection Problems.

CO-3. Describe the role of paging, segmentation and virtual memory in operating systems.

CO-4. Description of protection and security and also the Comparison of UNIX and Windows based OS.

CO-5. Defining I/O systems, Device Management Policies and Secondary Storage Structure and Evaluation of various Disk Scheduling Algorithms

Information Technology Concepts

CO-1. Design and develop software solutions for contemporary business environments by employing appropriate problem-solving strategies.

CO-2. Configure and administer database servers to support contemporary business environments.

CO-3. Comprehend and resolve common desktop and network issues.

CO-4. Analyze common business functions and identify, design, and develop appropriate information technology solutions (in web, desktop, network, and/or database applications)

CO-5. Learn future technologies through acquired foundational skills and knowledge and employ them in new business environments.

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CO-6. Practice communication, problem solving and decision-making skills through the use of appropriate technology and with the understanding of the business environment.

Financial Accounting

CO-1. To understand the basic accounting concepts.

CO-2. To understand generally accepted accounting principles.

CO-3. To understand Journal, Ledger, trail balance & Final Accounts & the Bank Reconciliation Statement.

CO-4. To understand the sources of raising capital in corporate.

CO-5. To understand the application of computers in accounting.

Programming in C

CO-1. Identify and understand the working of key components of a computer system (hardware, software, firmware etc.) Understand computing environment, how computers work and the strengths and limitations of computers.

CO-2. Identify and understand the various kinds of input/output devices and different types of storage media commonly associated with a computer.

CO-3. Identify and understand the representation of numbers, alphabets and other characters in computer system.

CO-4. Understand, analyze and implement software development tools like algorithm, pseudo codes and programming structure.

CO-5. Study, analyze and understand logical structure of a computer program, and different construct to develop a program in 'C' language & Write small programs related to simple/ moderate mathematical, and logical problems.

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SEM II

Programming in CPP

CO-1. Introduces Object Oriented Programming concepts using the C++ language.

CO-2. Understanding the principles of data abstraction, inheritance and polymorphism combinations.

CO-3. Apply the principles of virtual functions and polymorphism

CO-4. Analyzing the handling formatted I/O and unformatted.

CO-5. Evaluate the I/O Introduces exception handling.

Management Concept

CO-1. Identify and apply appropriate management techniques for managing business

CO-2. Have a conceptual knowledge about the planning and decision making

CO-3. Apply the concept of organising for the effective functioning of a management

CO-4. Evaluate leadership style to anticipate the consequences of each leadership style

CO-5. Demonstrate the techniques for controlling and coordination

Data Structure and pascal

CO-1. Identify and apply appropriate management techniques for managing business

CO-2. Have a conceptual knowledge about the planning and decision making

CO-3. Apply the concept of organising for the effective functioning of a management

CO-4. Evaluate leadership style to anticipate the consequences of each leadership style

CO-5. Demonstrate the techniques for controlling and coordination

CO-6. Design simple Pascal programs using variables, constant assignment statements and comment

CO-7. Identify reserved words in Pascal. Illustrate the use and description of reserved words. Describe the meaning and purpose of reserved words.

CO-8. Identify the concept of 'Program Control'. Develop effective programs by obeying the most important rules of programming: the IF statement (decision making), FOR Loop and the REPEAT…UNTIL loop.

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Management Information System

CO-1. Relate the basic concepts and technologies used in the field of management information systems

CO-2. Compare the processes of developing and implementing information systems.

CO-3. Outline the role of the ethical, social, and security issues of information systems.

CO-4. Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.

CO-5. Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

Stastical Method

CO-1. Understand the concept of a statistical population and a sample from a population.

CO-2. Classification and tabulation of data. Different types of data. Diagrammatical and graphical representation of data.

CO-3. Measures of central tendency, Dispersion, Skewness and Kurtosis and Moments.

CO-4. Concept of correlation, correlation coefficients - Karl Pearson's correlation coefficient, Spearman's rank correlation coefficient, multiple and partial correlation coefficients, Interclass correlation.

Project

CO-1. Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.

CO-2. Students are provided to work on multidisciplinary Problems.

CO-3. Students should be able to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire systems.

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Sem III

Software Engineering

CO-1. Explain the fundamental concepts of Software Engineering Lifecycle models.

CO-2. Summarize the software requirement specifications and the SRS documents.

CO-3. Describe software engineering layered technology and Process frame work.

CO-4. Examine the various design and development solutions with proper analysis.

CO-5. Demonstrate the competence in communication, planning, analysis, design, construction, and development of software as per the requirements.

CO-6. Demonstrate the software project management skills through case studies.

Data Communication Network

CO-1. Describe basic computer network technology.

CO-2. List the layers of the OSI model and TCP/IP and explain the functions of each layer identify the design issues, perform error detection and correction.

CO-3. Employ the various routing algorithms for the different network designs.

CO-4. Compare and contrast the various protocols used in respective layers of OSI reference model.

CO-5. Design a network for the given scenario.

DBMS And Oracle

CO-1. Demonstrate the basic elements of a relational database management system.

CO-2. Identify the data models for relevant problems.

CO-3. Design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.

CO-4. Demonstrate their understanding of key notions of query evaluation and optimization techniques.

CO-5. Extend normalization for the development of application software's.

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Functional Management-I

Personal Management

CO-1. Understand what is meant by management and managerial effectiveness

CO-2. Identify the roles which are fulfilled while working as a manager

CO-3. Identify managerial activities that contribute to managerial effectiveness

CO-4. Identify a cause of stress in managerial life from a range covering mismatches between capabilities and role, player-manager tension and everyday stressors

CO-5. Understand time pressures and the need for time management.

System Analysis

CO-1. Define the system development life cycle.

CO-2. Conducts research on existing systems.

CO-3. Develop plans for the new system.

CO-4. Make the feasibility study about the system.

CO-5. Explore the technical risks involved in the system's and technical possibilities.

CO-6. Scheduling with using GANTT and PERT techniques.

CO-7. Evaluates the economic self-sufficiency whether to install the system.

CO-8. Carry out the system analysis.

CO-9. Identifies problems in the system.

CO-10. Determine the cause of the problem in the system.

CO-11. Find a solution of the problem in the system.

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SEM IV

Artificial Intelligence and Application

CO-1. Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.

CO-2. Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.

CO-3. Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.

CO-4. Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.

CO-5. Demonstrate proficiency in applying scientific method to models of machine learning.

CO-6. Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

Marketing Management

CO-1. Critically evaluate the key analytical frameworks and tools used in marketing

CO-2. Apply key marketing theories, frameworks and tools to solve Marketing problems

CO-3. Utilise information of a firm's external and internal marketing environment to identify and prioritise appropriate marketing strategies

CO-4. Exercise critical judgement through engagement and reflection with existing marketing literature and new developments in the marketing environment

CO-5. Critically evaluate the marketing function and the role it plays in achieving organizational success both in commercial and non-commercial settings

CO-6. Evaluate and act upon the ethical and environmental concerns linked to marketing activities.

System Programming

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CO-1. To understand the basics of system programs like editors, compiler, assembler, linker, loader, interpreter and debugger.

CO-2. Describe the various concepts of assemblers and microprocessors.

CO-3. To understand the various phases of compiler and compare its working with assembler.

CO-4. To understand how linker and loader create an executable program from an object module created by assembler and compiler.

CO-5. To know various editors and debugging techniques.

Java Programming-

CO1. Use object oriented programming concepts to solve real world problems.

CO2. Explain the concept of class and objects with access control to represent real world entities.

CO3. Demonstrate the behaviour of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.

CO4. Use overloading methodology on methods and constructors to develop application programs.

CO5. Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords.

CO6. Describe the concept of interface and abstract classes to define generic classes.

CO7. Use dynamic and static polymorphism to process objects depending on their class.

CO8. Illustrate different techniques on creating and accessing packages (fully qualified name and import statements).

CO9. Understand the impact of exception handling to avoid abnormal termination of program using checked and unchecked exceptions.

CO10. Demonstrate the user defined exceptions by exception handling keywords (try, catch, throw, throws and finally).

CO11. Use multithreading concepts to develop inter process communication.

CO12. Understand and implement concepts on file streams and operations in java programming for a given application programs.

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CO13. Describe the backend connectivity process in java program by using JDBC drivers.

CO14. Develop java application to interact with database by using relevant software component (JDBC Driver).

CO15. Understand the process of graphical user interface design and implementation using AWT or swings.

CO16. Use different layouts (Flow Layout, Boarder Layout, Grid Layout, Card Layout) to position the controls for developing graphical user interface.

CO17. Build the internet-based dynamic applications using the concept of applets.

CO18. Develop applets that interact abundantly with client environment and deploy on the server.

CO19. Knowledge on usage of graphical IDE for design and implementation of real time applications in java.

CO20. Posses the knowledge and skills for employability and to succeed in national and international level competitive exams.

Optimization Technique

CO1. Recall the theoretical foundations of various issues related to linear programming modelling to formulate real-world problems as a L P model

CO2. Explain the theoretical workings of the graphical, simplex and analytical methods for making effective decision on variables so as to optimize the objective function.

CO3. Identify appropriate optimization method to solve complex problems involved in various industries.

CO4. Demonstrate the optimized material distribution schedule using transportation model to minimize total distribution cost.

CO5. Find the appropriate algorithm for allocation of resources to optimize the process of assignment.

CO6. Explain the theoretical workings of sequencing techniques for effective scheduling of jobs on machines.

CO7. Identify appropriate equipment replacement technique to be adopted to minimize maintenance cost by eliminating equipment break-down.

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CO8. Apply the knowledge of game theory concepts to articulate real-world competitive situations to identify strategic decisions to counter the consequences.

CO9. Demonstrate the various selective inventory control models to analyse and optimize inventory systems.

CO10. Explain the theoretical workings of dynamic programming method to find shortest path for given network.

Project:

CO1. Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.

CO2. Students are provided to work on multidisciplinary Problems.

CO3. Students should be able to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire systems.

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Master of Science
(Computer Sci.)

Msc Comp.Sci.

Sem I

Constitution of India

CO1. Understand and explain the significance of Indian Constitution as the fundamental law of the land.

CO2. Exercise his fundamental rights in proper sense at the same time identifies his responsibilities in national building.

CO3. Analyse the Indian political system, the powers and functions of the Union, State and Local Governments in detail

CO4. Understand Electoral Process, Emergency provisions and Amendment procedure

Research methodology

CO1. Critically analyse research methodology identified in existing literature.

CO2. Choose appropriate quantitative or quantitative method to collect data.

CO3. Purpose and distinguish appropriate research design and methodologies to apply to a specific research project.

CO4. Develop a comprehensive research methodology for research question.

CO5. Apply the understanding of feasibility and practically of research methodology for proposed project.

Programming I A (Java Group)

Upon completion of the course students should be able to:

CO1. Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.

CO2. Read and make elementary modifications to Java programs that solve real-world problems.

CO3. Validate input in a Java program.

CO4. Identify and fix defects and common security issues in code.

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CO5. Document a Java program using Javadoc.

CO6. Use a version control system to track source code in a project.

Programming I B (Microsoft Group (C++)

After completing this course, you will be able to:

CO1. Describe oops concepts

CO2. Use functions and pointers in your C++ program

CO3. Understand tokens, expressions, and control structures

CO4. Explain arrays and strings and create programs using them

CO5. Describe and use constructors and destructors

CO6. Understand and employ file management

CO7. Demonstrate how to control errors with exception handling

Programming I B (Open Group (Python)

CO1. Explain basic principles of Python programming language

CO2. Implement object oriented concepts

CO3. Implement database and GUI applications.

Introduction to Algorithm

Students who complete the course will have demonstrated the ability to do the following:

CO1. Argue the correctness of algorithms using inductive proofs and loop invariants.

CO2. Analyze worst-case running times of algorithms using asymptotic analysis. Compare the asymptotic behaviors of functions obtained by elementary composition of polynomials, exponentials, and logarithmic functions. Describe the relative merits of worst-, average-, and best-case analysis.

CO3. Analyze average-case running times of algorithms whose running time is probabilistic. Employ indicator random variables and linearity of expectation to perform the analyses. Recite analyses of algorithms that employ this method of analysis.

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CO4. Explain the basic properties of randomized algorithms and methods for analyzing them. Recite algorithms that employ randomization. Explain the difference between a randomized algorithm and an algorithm with probabilistic inputs.

CO5. Analyze algorithms using amortized analysis, when appropriate. Recite analyses of simple algorithms that employ this method of analysis. Describe different strategies for amortized analysis, including the accounting method and the potential method.

CO6. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.

CO7. Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic-programming algorithms, and analyze them.

CO8. Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.

Relation Database Management

CO1. Upon successful completion of this course, students should be able to:

CO2. Describe the fundamental elements of relational database management systems

CO3. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

CO4. Design ER-models to represent simple database application scenarios

CO5. Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.

CO6. Improve the database design by normalization.

CO7. Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.

Mathematical foundation and statistical method

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CO1. Students are able to perform mathematical operation based on set theory and statistical analysis.

CO2. The theoretical component of the course treats fundamental concept as well as some necessary topic in set theory and statistical analysis. The practical component of the course addresses the computer implementation of these methods.

CO3. In this way students can develop a solid foundation for employment or further study in a wide range of scientific and engineering fields that relay and set theory and statistical modelling.

Modern Operating systems

CO1. Student who complete this course successfully are expected to:

CO2. Gain extensive knowledge on principles and modules of operating systems.

CO3. Understand key mechanisms in design of operating system moduels.

CO4. Understand process management, concurrent processes and threads memory management, virtual memory concepts, deadlocks.

CO5. Compare performance of processor scheduling algorithms.

CO6. Produce algorithmic solutions to process synchronisation problems.

CO7. Use modern operating system call such as Linux process and synchronization libraries.

CO8. Learn thread and multi core programming.

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Sem II

Technical report writing

CO1. Critically analyse research methodologies identified in existing literature.

CO2. Choose appropriate quantitative or qualitative method to collect data.

CO3. Propose and distinguish appropriate research design and methodologies to apply to a specific research project

CO4. Develop a comprehensive research methodology for a research question.

CO5. Apply the understanding of feasibility and practically of research methodology for a proposed project.

Programming II-A-(Java Group (Advance Java)

Students should be able to

CO1. Learn the Internet Programming, using Java Applets.

CO2. Create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings.

CO3. Apply event handling on AWT and Swing components.

CO4. Learn to access database through Java programs, using Java Data Base Connectivity (JDBC)

CO5. Create dynamic web pages, using Servlets and JSP.

CO6. Make a reusable software component, using Java Bean.

CO7. Invoke the remote methods in an application using Remote Method Invocation (RMI)

CO8. Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).

CO9. Develop Stateful, Stateless and Entity Beans.

CO10. Use Struts frameworks, which gives the opportunity to reuse the codes for quick development.

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CO11. Map Java classes and object associations to relational database tables with Hibernate mapping files

Programming II-B-(Microsoft Group (VB.Net)

CO1. Design, formulate, and construct applications with VB.NET

CO2. Integrate variables and constants into calculations applying VB.NET

CO3. Determine logical alternatives with VB.NET decision structures

CO4. Implement lists and loops with VB.NET controls and iteration

CO5. Separate operations into appropriate VB.NET procedures and functions

CO6. Assemble multiple forms, modules, and menus into working VB.NET solutions

CO7. Create VB.NET programs using multiple array techniques

CO8. Build integrated VB.NET solutions using files and structures with printing capabilities

CO9. Translate general requirements into data-related solutions using database concepts

Programming II-B-(Open Group (Advance Python)

CO1. Interpret the basic principles of Python programming language.

CO2. Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.

CO3. Identify the commonly used operations involving file systems and regular expressions. Implement database and GUI applications.

CO4. Implement Machine Learning algorithms

Data Communication

On successful completion of this module, the student should:

CO1. Understand the rudiments of how computers communicate.

CO2. Be familiar with the architecture of a number of different networks.

CO3. Understand the principles of protocol layering.

CO4. Be familiar with modern communication systems.

CO5. Understand the basic aspects of packet-based protocol design and implementation.

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Software engineering

CO1. Students are able to analyse processing, draw actor interactions and optimization processes

CO2. Student decides process models; ensure proper software testing versioning of software

CO3. Student able to identify the cost of designed software products and services etc. Course contents

Elective I-A- Image Processing

CO1. Review the fundamental concepts of a digital image processing system.

CO2. Analyze images in the frequency domain using various transforms.

CO3. Evaluate the techniques for image enhancement and image restoration.

CO4. Categorize various compression techniques.

CO5. Interpret Image compression standards.

CO6. Interpret image segmentation and representation techniques.

Elective I-B- Data Mining

By completing the course the students will be able:

CO1. To fully understand standard data mining methods and techniques such as association rules, data clustering and classification.

CO2. Learn new, advanced techniques for emerging applications (e.g. Social network analysis, stream data mining).

CO3. Gain practical intuition about how to apply these techniques on datasets of realistic• sizes using modern data analysis framework

Elective I-C- Fundamentals of Satellite Remote Sensing

CO1. Understanding basic components of remote Sensing

CO2. Students may able to obtain knowledge of the sensor characteristics of various RS Systems

CO3. Acquire knowledge of different missions & their utility

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CO4. Students may able to understand functioning, data acquisition and orbit operations of missions.

Elective I-D- Foundation of Electronics

CO1. Will be able to tell theory of semiconductors.

CO2. Recognizes conductor, semiconductor, and insulator and explains characteristics of these materials.

CO3. Recognizes p and n type materials and explains characteristics of these materials.

CO4. Will be able to recognize types of diode, explain basic terms related with diodes and tell the operating principle of diodes.

CO5. Recognizes types and the construction of diodes.

CO6. Tells the operating principles of diodes and Zener diodes.

CO7. Will be able to analyze different diode circuits.

CO8. Recognizes half-wave, full-wave and bridge rectifier circuits and explains the operation of these circuits.

CO9. Recognizes clipping and clamping circuits, explains the operation of these circuits and analyses these circuits.

CO10. Analyzes and measures parameters in basic diode circuits.

CO11. Will be able to tell the structure and the operation of transistors and recognize the different types of transistors.

CO12. Recognizes the different configurations of circuits with transistors and the characteristics of these circuits and compares these circuits.

CO13. Analyzes transistor dc biasing.

CO14. Will be able to explain different circuits with transistors.

CO15. Analyzes and performs measurements in different amplifier circuits.

CO16. Calculates the hybrid parameters of the equivalent circuit of a transistor.

CO17. Calculates parameters in cascade amplifier circuits.

Elective II-A- Artificial intelligence

CO1. Design user interfaces to improve human–AI interaction and real-time decision-making.

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CO2. Evaluate the advantages, disadvantages, challenges, and ramifications of human–AI augmentation.

CO3. Design and develop symbiotic human–AI systems that balance the information processing power of computational systems with human intelligence and decision making.

CO4. Explain the benefits, limitations, and tradeoffs of designing engaging and ethical conversational user interactions, including those supported by chatbots, smart speakers, and other AI-driven, voice-based technologies.

CO5. Design and evaluate conversational interfaces for different users and contexts of use.

Elective II-B- Machine Learning

CO1. Learn the basics of learning problems with hypothesis and version spaces

CO2. Understand the features of machine learning to apply on real world problems

CO3. Characterize the machine learning algorithms as supervised learning and unsupervised learning and Apply and analyse the various algorithms of supervised and unsupervised learning

CO4. Analyze the concept of neural networks for learning linear and non-linear activation functions

CO5. Learn the concepts in Bayesian analysis from probability models and methods

CO6. Understand the fundamental concepts of Genetic Algorithm and Analyze and design the genetic algorithms for optimization engineering problems

Elective II-C- GIS

CO1. Comprehend fundamental concepts and practices of Geographic Information Systems (GIS) and advances in Geospatial Information Science and Technology (GIS&T).

CO2. Apply basic graphic and data visualization concepts such as color theory, symbolization, and use of white space.

CO3. Demonstrate organizational skills in file and database management.

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CO4. Give examples of interdisciplinary applications of Geospatial Information Science and Technology.

CO5. Apply GIS analysis to address geospatial problems and/or research questions.

CO6. Demonstrate proficiency in the use of GIS tools to create maps that are fit-for-purpose and effectively convey the information they are intended to.

CO7. Effectively communicate and present project results in oral, written, and graphic forms.

CO8. Demonstrate confidence in undertaking new (unfamiliar) analysis using GIS, troubleshoot problems in GIS, and seek help from software/website help menus and the GIS community to solve problems.

CO9. Apply mathematical concepts, including statistical methods, to data to be used in geospatial analysis.

CO10. Gather and process original data using a Global Positioning System (GPS) or other Global Navigation Satellite Systems (GNSS).

Elective II-D- Digital Signal Processing

At the end of the course the student should be able to:

CO1. Describe discrete time signals & systems and represent in frequency domain

CO2. Compute dft using fft algorithms and derive dft properties

CO3. Design digital filters using various techniques

CO4. Design fir digital filters using various techniques

CO5. Analyze multirate signal processing techniques

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Sem III

Programming III-A- Android

At the end of this course students will be able to...

CO1. Understand Android OS, gradle, Android Studio.

CO2. Debug Android Application

CO3. Develop UI based Mobile Application using Android Studio.

CO4. Design application for Mobile using various sensors.

CO5. Design and develop an application using Database.

CO6. Adapt to learn new mobile technologies.

Programming III-C- Open Web Programming

CO1. Demonstrate and understand the basic concepts of web programming

CO2. Write well-structured, easily maintained, standards-compliant, web pages using HTML and CSS code.

CO3. Use javascript to add dynamic content to pages that meet specific needs and interests.

CO4. Use javascript libraries jquery and angularjs to create dynamic pages. Apply techniques of form validation using Java Script.

CO5. Describe important concepts related to client side Web Security.

Compiler Design

CO1. Acquire knowledge of different phases and passes of the compiler and also able to use the compiler tools like LEX, YACC, etc. Students will also be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers

CO2. Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table.

CO3. Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes.

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CO4. Acquire knowledge about run time data structure like symbol table organization and different techniques used in that.

CO5. Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization

Computer Graphics

CO1. Upon the completion of the course students will be able to :-

CO2. Explain the applications, areas, and graphic pipeline, display and hardcopy technologies.

CO3. Apply and compare the algorithms for drawing 2D images also explain aliasing, anti aliasing and half toning techniques.

CO4. Discuss opengl application programming Interface and apply it for 2D & 3D computer graphics.

CO5. Analyze and apply clipping algorithms and transformation on 2D images.

CO6. Solve the problems on viewing transformations and explain the projection and hidden surface removal algorithms.

CO7. Explain basic ray tracing algorithm, shading, shadows, curves and surfaces and also solve the problems of curves.

Elective III- Pattern Recognition

On the successful completion of this course Student are able

CO1: Summarize the various techniques involved in pattern recognition

CO2: Categorize the various pattern recognition techniques into supervised and unsupervised.

CO3: Illustrate the artificial neural network based pattern recognition

CO4: Discuss the applications of pattern recognition in various applications

Elective III- Data warehouse

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By the end of the course you will have

CO1. The design experience software background and organisational context that prepares you to succeed with data warehouse development projects

CO2. Student will be able to create data warehouse design and data integration workflows that satisfy the business intelligence needs of organisations

CO3. Evaluate the organisation of data warehouse maturity and business architecture alignment

CO4. Create a data integration workflow using prominent open source software.

CO5. Reflect on the role of change data, refresh constraints, refresh frequency trade-offs and data quality goals in data integration software.

Remote sensing

CO1. Appraise the degree to which remote sensing data can be used efficiently and effectively.

CO2. Student can able to classify,analyze and assess the remotely sensed data and able to design and develop remote sensing data analysis for various applications.

CO3. Ability to develop the problem solving and research skill in this domain

Micro Controller Programming

CO1. Student will be able to independently work on embedded system with8051 and PC Microcontrollers

CO2. Electronic system design with 8051 Microcontrollers

CO3. Electronic system design with PC Microcontrollers

CO4. Embedded coding with 8051 Microcontrollers

Elective IV- I Neural Network and Deep Learning

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CO1. Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.

CO2. Implement deep learning algorithms and solve real-world problems.

Elective IV- II Big Data Analytics

The student will get knowledge of:

CO1. Data Processing and data quality.

CO2. Modelling and design warehouses.

CO3. Write parallelize programs and use basics tools like MPI and POSIX threads

CO4. Apply core ideas behind parallel and distributed computing

CO5. Use methodologies adopted for concurrent and distributed environment

Hyperspectral Image Processing

CO1. Able to describe multispectral and hyperspectral remote sensing

CO2. Ability to design and extract the thematic information

CO3. Able to apply hyperspectral data in various field of applications

CO4. Able to design and develop hyperspectral data processing and analysis system.

CO5. Able to frame advancement of research problems

Internet of things

CO1. Understand what internet of things are

CO2. Controlling home applications from anywhere in the world

CO3. Use some of the physical devices like Arduino and raspberry Pi

CO4. Design some of the IoT applications

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Sem IV

Dissertation

CO1. Capability to acquire and apply fundamental principle of computers science.

CO2. Become master in one specialized technology.

CO3. Ability to communicate efficiently.

CO4. Capacity to be a multi skilled computer science professional with good technical knowledge, management, leadership and entrepreneurship skills.

CO5. Ability to identify formulates and model problems and find solution based on system approach.

CO6. Capability and enthusiasm for self improvement through continuous professional development and life-long learning

Seminar

CO1. Ability to evaluate information and use and apply relevant theories

CO2. Ability to organize and show competence in working with methodology structuring their oral work and synthesizing information

CO3. Ability to deliver and make useful of visual audio and audio-visual material to support their presentation.

CO4. Ability to speak cogently with or without notes and present and discuss either works at an individual

Intellectual property rights

CO1. The students once they complete their academic projects shall get an adequate knowledge on patent and copyright for their innovative research works.

CO2. During their research career information in patent documents provide useful insight on Novelty of their idea from the state-of-the-art search this provide for the way for developing their Idea or innovations.

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CO3. Pave the way for the students to catch up intellectual property(IP) as and career option

CO4. R &D IP counsel

CO5. Government jobs-patent examiner

CO6. Private jobs

CO7. Patent agent and trademark agent

CO8. Entrepreneur

Development of Soft skill and Personality Development

CO1. Developing the effective communication skills among students.

CO2. Inculcating the soft skills in theoretical and practical ways.

CO3. Learning about the essential factors for personality development and bringing them into practice.

CO4. Create understanding of the non-verbal forms of communication.

CO5. Involving students in adapting the techniques of personality development.

R Tool

CO1. After competing this course, you will be able to:

CO2. Explain critical R programming concepts

CO3. Demonstrate how to install and configure Rstudio

CO4. Apply OOP concepts in R programming

CO5. Explain the use of data structure and loop functions

CO6. Analyse data and generate reports based on the data

CO7. Apply various concepts to write programs in R

Communication Skill

CO1. Students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. From multiple perspectives.

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CO2. Presentation skills training courses provide strategies to plan, structure and deliver powerful presentations. Learn how to structure presentations in order to deliver effective messages as well as receive the coaching to dramatically improve your personal presentation. This specific program is one of the leading presentation skills training courses developed to help people engage audiences.

CO3. A group discussion among students is being organized to see and evaluate their thinking skills, listening abilities and how they are communicating their thoughts. One should learn to control the conversation through listening attentively and then having the perseverance to mould it towards his/her own direction.

CO4. Develop, exhibit and accurate sense of self and nurture a deep understanding of personal motivation. Develop an understanding of and practice personal and professional responsibility.

CO5. To practice and develop writing processes pertaining to invention, revision, organization, drafting through multiple drafts, editing, and adjusting for rhetorical context (purpose, audience, persona). To discuss and share writing and reading with one another and develop a shared vocabulary for talking about writing.

Introduction to MATALB

CO1. Able to implement loops, branching, control instruction and functions in MATLAB programming environment

CO2. Able to program curve fitting, numerical differentiation and integration, solution of linear equations in MATLAB and solve electrical engineering problems.

CO3. Able to understand implementation of ODE using ode 45 and execute Solutions of nonlinear equations and DFT in MATLAB.

CO4. Able to simulate MATLAB Simulink examples

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