BCA Sem-I

Subject: Introduction to Programming – C
Subject Code: Paper-I
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To introduce students to a powerful programming language – C.
- To understand the basic structure of a C program.
- To gain knowledge of various programming errors.
- To enable the students to make flowchart and design an algorithm for a given problem.
- To enable the students to develop logics and programs.

Course Outcomes

- In-depth understanding of various concepts of C language.
- Ability to read, understand and trace the execution of programs.
- Skill to debug a program.
- Skill to write program code in C to solve real world problems.

Subject: Introduction to Computers and Information Technology
Subject Code: Paper-II
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To impart knowledge about the structure, components and functions of a computer system.
- To understand working of basic input and output devices.
- To learn about the binary number representation along with its operations.
- To give detailed knowledge of MS-Office.
- To give an in-depth understanding of role of computers in business, education and society.

Course Outcomes

- Familiarization with the terms like Operating System, peripheral devices, networking, multimedia, internet etc.
- Ability to use internet for searching information on web, sending e-mails and many other tasks.
- Skill to work with MS-Word, Excel and PowerPoint.
- Initiation into the process of writing business letters or job applications, tabulating data, preparing PPTs etc using MS-Office.

Subject: Mathematics (Applied and Discrete Mathematics)
Subject Code: Paper-III
Periods per week: 12
Duration of period: 45 minutes

Course Objectives

- To understand and solve discrete mathematical problems.
- To impart knowledge regarding relevant topics such as set Theory, basic logic, graphs, trees or discrete probability.
- To familiarize students with linear Algebra, differential and integral calculus, numerical methods and statistics.

Course Outcomes

- Develops formal reasoning.
- Creates habit of raising questions.
- Knowledge regarding the use of Discrete Mathematics in Computer Science.
- Helpful in formulating questions.
- Ability to communicate knowledge, capabilities and skills related to the computer engineer profession.

Subject: Communication Skills in English – I & II (BCA Sem-II)
Subject Code: Paper-V
Periods per week: 6
Duration of period: 45 minutes

Course Objectives

- To enable the learner to communicate effectively and appropriately in real life situation.
- To use English effectively for study purpose across the curriculum.
- To develop and integrate the use of four language skills:
  a) Reading
  b) Writing
  c) Listening
  d) Speaking
- To revise and reinforce structure already learnt.

Course Outcomes

- **Reading Skills:-** Ability to read English with ability to read English with understanding and decipher paragraph patterns, writer techniques and conclusions.
- **Writing Skills:-** Skill to develop the ability to write English correctly and master the mechanics of writing the use of correct punctuation marks and capital letter.
- **Listening Skills:-** Ability to understand English when it is spoken in various contexts.
- **Speaking Skills:-** Develop the ability to speak intelligibly using appropriate word stress, sentence stress and elementary intonation patterns.

BCA Sem-II

Subject: Introduction to Programming- C++
Subject Code: Paper-I
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To give an overview of benefits of Object Oriented Programming (OOP) approach over the Traditional Programming approach.
- To deliver comprehensive view of OOP concept.
- To impart detailed knowledge of a powerful object oriented programming language – C++.

Course Outcomes

- Familiarization with a widely used programming concept – Object Oriented Programming.
- Develop logical thinking.
- Skill to write codes in C++ by applying concept of OOP, such as Objects, Classes, Constructors, Inheritance etc., to solve mathematical or real world problems .
- Ability to isolate and fix common errors in C++ programs.

Subject: Principles of Digital Electronics
Subject Code: Paper-II
Periods per week: 12
Duration of period: 45 minutes

Course Objectives

- To gain basic knowledge of digital electronics circuits and its levels.
- To understand and examine the structure of various number system and its conversation.
- To learn about the basic requirements for a design application.
- To enable the students to understand, analyze and design various combinational and sequential circuits.
- To understand the logic functions, circuits, truth table and Boolean algebra expression.

Course Outcomes

- Skill to build and troubleshoot digital logic circuits.
- Skill to use the methods of systematic reduction of Boolean expression using K- Map.
- Ability to interpret logic gates and its operations.
- Familiarization with semiconductor memories in electronics.

Subject: Numerical Methods and Statistical Techniques
Subject Code: Paper-III
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To learn how to perform error analysis for arithmetic operations.
- To demonstrate working of various numerical methods.
- To provide a basic understanding of the derivation and use of methods of interpolation and numerical integration.
- To impart knowledge of various statistical techniques.
- To develop students' understanding through laboratory activities to solve problems related to above stated concepts.

Course Outcomes

- Skill to choose and apply appropriate numerical methods to obtain approximate solutions to difficult mathematical problems.
- Ability to apply various statistical techniques such as Measures of Central Tendency and Dispersion.
- Understanding of relationship between variables using the method of Correlation and Trend Fit Analysis.
- Skill to execute programs of various Numerical Methods and Statistical Techniques for solving mathematical problems.

BCA Sem-III

Subject: Computer Architecture
Subject Code: Paper-I
Periods per week: 12
Duration of period: 45 minutes

Course Objectives

- To enable the students to understand the functionality and implementation of computer system.
- To familiarize with the various instruction codes and formats of different CPUs.
- To introduce the students to I/O and memory organization of computer system.
- To deliver an overview of Control Unit of a computer system.
- To learn the usage of parallel and vector processing.

Course Outcomes

- Ability to understand the functionality, organization and implementation of computer system.
- Skill to recognize the instruction codes and formats.
- Knowledge of the internal working of main memory, cache memory, associative memoryand various modes of data transfer.

- Familiarization with the working of parallel processing and vector processing.

Subject: Database Management System
Subject Code: Paper-II
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To introduce the students to the database system.
- To learn how to design a database by using different models.
- To enable the students to understand the database handling during execution of the transactions.
- To understand the handling of database by concurrent users.
- To gain complete knowledge of SQL and PL/SQL.

Course Outcomes

- Familiarization with Database Management System.
- Comprehensive knowledge of database models.
- Ability to code database transactions using SQL.
- Skill to write PL/SQL programs.

Subject: Computational Problem Solving Using Python
Subject Code: Paper-III
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To impart knowledge of one of the latest and powerful programming languages – Python.
- To make students understand about to read and write files.
- To give a broad view of concept of Object Oriented Programming (OOP) applied in Python.
- To learn how to connect Python programs to a database.

Course Outcomes

- Ability to create and execute Python programs.
- Understanding the working of file I/O.
- Ability to manipulate database using Python programs.

BCA Sem-IV

Subject: Data Structure and File Processing
Subject Code: Paper-I
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To familiarize the students with data structures used for representing data in memory like Arrays, Linked Lists, Graphs, Trees etc.
- To analyze the performance of algorithms.
- To learn how to apply algorithms of data structures on data.
- To gain knowledge of various methods used in data structures such as brute force, divide and conquer, greedy, etc.

Course Outcomes

- Skill to analyze algorithms and to determine algorithm correctness and their time efficiency.
- Knowledge of advanced abstract data type (ADT) and data structures and their implementations.
- Ability to implement algorithms to perform various operations on data structures.

Subject: Information System
Subject Code: Paper-II
Periods per week: 6
Duration of period: 45 minutes

Course Objectives

- To understand the categories of Information System (IS) and its various operations support systems.
- To gain knowledge about various IS like Accounting System, Inventory Control System and Office Automation System.
- To explain various phases of software development life cycle (SDLC).
- To enable the students to understand managerial issues related to the information systems.

Course Outcomes

- Ability to analyze a problem and identify and to define the computing requirements appropriate to its solution.
- Understand and evaluate a computer based information system.
- Capability to assist in the creation of an effective Project plan.

Subject: Internet Applications
Subject Code: Paper-III
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To introduce the students to the network of networks - Internet.
- To enable the students to use various services offered by internet.
- To gain knowledge about the protocols used in various services of internet.
- To understand the working and applications of Intranet and Extranet.

Course Outcomes

- Comprehensive knowledge of Internet and its working.
- Ability to use services offered by internet.
- Skill to develop websites using HTML and DHTML.

Subject: System Software
Subject Code: Paper-IV
Periods per week: 12
Duration of period: 45 minutes

Course Objectives

- To introduce the students about the system software and its application.
- To understand the working of different translators viz. Assembler and Compiler.
- To learn about the instructions of assembly language.
- To familiarize with various software development tools.

Course Outcomes

- Detailed knowledge of Compilation process of a program.
- Knowledge of internal working of macro processor.
- Familiarization with Assembly language.
- Understanding the working of linker and loaders – components used during the process of program execution.

BCA Sem-V

Subject: Computer Networks
Subject Code: Paper-I
Periods per week: 6
Duration of period: 45 minutes

Course Objectives

- To deliver comprehensive view of Computer Network.
- To enable the students to understand the Network Architecture, Network type and topologies.

- To understand the design issues and working of each layer of OSI model.
- To familiarize with the benefits and issues regarding Network Security.

Course Outcomes

- Knowledge of uses and services of Computer Network.
- Ability to identify types and topologies of network.
- Understanding of analog and digital transmission of data.
- Familiarization with the techniques of Network Security.

Subject: Web Technologies
Subject Code: Paper-II
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To learn various Web Technologies.
- To enable the students to design and implement static and dynamic Web pages.
- To acquire fundamental skills to maintain web server services required to host a website.
- To learn MySQL.

Course Outcomes

- Ability to develop web pages using HTML and Cascading Style Sheets.
- Skill to create XML documents and Schemas.
- Knowledge of client-side (JavaScript) and server-side scripting (PHP, ASP.NET) languages to build dynamic web pages.
- Familiarization with Web Application Terminologies, Internet Tools, E – Commerce and other web services.
- Ability to develop database applications with MySQL.

Subject: Operating System
Subject Code: Paper-III
Periods per week: 12
Duration of period: 45 minutes

Course Objectives

- To deliver a detailed knowledge of integral software in a computer system – Operating System.
- To understand the working of operating system as a resource manager.
- To familiarize the students with Process and Memory management.
- To describe the problem of process synchronization and its solution.

Course Outcomes

- Ability to apply CPU scheduling algorithms to manage tasks.

- Initiation into the process of applying memory management methods and allocation policies.
- Knowledge of methods of prevention and recovery from a system deadlock.

Subject: Java Programming Language
Subject Code: Paper-IV
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To learn the syntax and semantics to write Java programs.
- To understand the fundamentals of object-oriented programming in Java.
- To familiarize with the concept of inheritance, polymorphism, packages and interfaces.

Course Outcomes

- Skill to write Java application programs using OOP principles and proper program structuring.
- Ability to create packages and interfaces.
- Ability to implement error handling techniques using exception handling.

BCA Sem-VI

Subject: Computer Graphics
Subject Code: Paper-I
Periods per week: 9
Practicals per week: 3
Duration of period: 45 minutes

Course Objectives

- To understand the basics of computer graphics, different display devices and applications of computer graphics.
- To learn about algorithmic development of graphics primitives like: point, line, circle, ellipse etc.
- To impart knowledge of 2D and 3D transformations on graphics objects.
- To familiarize with 2D Viewing and different clipping methods.
- To give a broad view of Projection and its types.

Course Outcomes

- Knowledge of working of display systems.
- Skill to execute various Scan Conversion algorithms in laboratory so as to draw Graphics primitives.
- Familiarization with 2D and 3D graphics.
- Develop creativity to create 2D objects.
- Ability to implement 2D geometric transformations on computer system.

Subject: Software Engineering
Subject Code: Paper-II
Periods per week: 6
Duration of period: 45 minutes

Course Objectives

- To introduce the students to a branch of study associated with the development of a software product.
- To gain basic knowledge about the pre-requisites for planning a software project.
- To learn how to design of software.
- To enable the students to perform testing of a software.

Course Outcomes

- Familiarization with the concept of software engineering and its relevance.
- Understanding of various methods or models for developing a software product.
- Ability to analyze existing system to gather requirements for proposed system.
- Skill to design and code a software.

Subject: Project
Subject Code: Paper-IV
Practicals per week: 6
Duration of period: 45 minutes

Course Objectives

- To learn languages to code front end and back end of a software.
- To initiate into the process of designing, coding and testing a software module.
- To develop a complete software module.

Course Outcomes

- Skill to apply Software Development Cycle to develop a software module.
- Ability to use the techniques, skills and modern engineering tools necessary for software development.
- Develop a software product along with its complete documentation.