

Department of Computer Applications

BCA: Course outcome

I Semester:

1. C Programming:

Students will acquire knowledge of C language. Students will learn to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems. Demonstrate an understanding of computer programming language concepts. To be able to develop C programs on linux platform. Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage. Able to define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures. Student must be able to define union and enumeration user defined data types. Develop confidence and ability for life-long learning needed for Computer language.

2. Computer Organization:

Expose students to the basic architecture of processing, memory and i/o organization in a computer system. The students will be able to Identify, understand and apply different number systems and codes, understand the digital representation of data in a computer system, general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design. Understand computer arithmetic formulate and solve problems, understand the performance requirements of systems , the functional units of a processor, addressing modes, instruction formats and program control statements and Distinguish the organization of various parts of a system memory hierarchy.

3. Discrete Mathematics:

Students will be able to understand the concepts of Sets, Subsets, Equal Sets, Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, De-Morgan's law, Simple Applications. They will also learn Relations, Properties of Relations, Equivalence Relation, Function- Domain and Range, Onto, Into, One to One, one to many Functions, Composite and Inverse Functions. They can recognize the Proposition and truth values, Logical Connectives and their truth tables, Converse, Inverse and Contrapositive, Tautology and Contradiction, Logical Equivalence, Standard Theorems, Switching Circuits.

Students will be able to write the Definition of matrix, order, also they will be able to identify the different types of matrices. They can recognize the Value of determinant of order 2×2 , 3×3 , minors, cofactors, adjoint, inverse of a matrix. Solutions of linear equations: Cramer's rule and matrix method involving two and three variables. Eigen values and Eigenvectors: Characteristic equation, characteristic roots, characteristic vectors (without any theorems) only 2×2 order. They will learn Cayley Hamilton theorem Without proof, able to verify

Cayley Hamilton theorem (only 2x2 matrices), using the same finding the powers of A (A⁴, A⁵, A⁻¹, A⁻²), Inverse of a Matrix using Cayley Hamilton theorem.

Students will be able to understand the definition of Logarithm, Indices leading to Logarithms and vice versa, Laws of Logarithms with proofs, Problems, they can also recognize Characteristic and Mantissa, they are now capable to use of Logarithmic Tables, Problems. Permutation and Combination: Fundamental Principle of Counting, Factorial n, Permutations: Definition, Examples, Derivation of Formula nPr, Permutation when all the objects are not distinct, Problems, Combinations, Definition, examples, students now can derive some standard formulae and also, they can solve problems using that formulae.

Students will learn the definition of Binary operation, group, subgroups, theorems as properties only statement and problems. Students will be able to differentiate between vector and scalar, able to find vector addition, dot and cross product, projection of a vector on the other, students now able to explain and solve the problems on area of parallelogram, area of a triangle, scalar triple product, volume of parallelepiped, co planarity of three vectors, vector triple product.

Students will be able to find Coordinates, Distance formula, Section Formula, Area of the Triangle formula (no derivation), Locus of point. Straight Line Slope of a line and angle between two lines, Various forms of equations of lines – Derivation and Problems. Equation of family of lines passing through the point of intersection of two lines, Distance of a point from line.

II Semester

1. **Data Structures using C:** To provide the knowledge of basic data structures and their implementations. To understand importance of data structures in context of writing efficient programs. To develop skills to apply appropriate data structures in problem solving.
2. **Database Management Systems:**

The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS Describe the fundamental elements of relational database management systems • Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL. • Design ER-models to represent simple database application scenarios • Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data. • Improve the database design by normalization. • Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing

3. Numerical Analysis and Statistical Methods:

Upon completion of the course, Students will be able to recognize the error in the number generated by the solution, Compute solution of algebraic and transcendental equation by numerical methods like Bisection method and Newton Raphson method, Apply method of interpolation and extrapolation for prediction. They will be able to recognize elements and variable in statistics and summarize qualitative and quantitative data, Calculate mean, median and mode for individual series. Students can also outline the properties of correlation and compute Karl-Pearson's coefficient of correlation.

III Semester

1. Operating Systems:

On the successful completion of this course students will be able to identify the basic components of Operating system. They acquire the knowledge of Process Management, Process Synchronization, Deadlocks, Memory Management, File Management, Disk Management, Protection and security. Students will be able to understand the functions of Operating systems. Case studies helps the students to know the implementation part of Windows and Linux operating systems.

2. Object Oriented Programming using C++:

To describe the advantages of a high level language like C++, the programming process, and the compilation process. To describe and use software tools in the programming process. To apply good programming principles to the design and implementation of C/C++ programs. After completion of this course, student will be able to Identify importance of object-oriented programming and difference between structured oriented and object oriented programming features. Able to make use of objects and classes for developing programs. Able to use various object-oriented concepts to solve different problem

3. Financial Accounting and Management Systems:

To ensure and adequate supply of funds to the concern. To ensure adequate return to the shareholders which will depend upon the earning capacity, market price of the share, expectations of the shareholders. To ensure optimum funds utilization. once the funds are procured, they should be utilized in maximum possible way at least cost. To ensure safety on investment, i.e, funds should be invested in safe ventures so that adequate rate of return can be achieved. To plan a sound capital structure -There should be sound and fair composition of capital so that a balance is maintained between debt and equity capital.

IV Semester

1. **Operational Research :** To impart knowledge in concepts and tools of Operations Research To understand mathematical models used in Operations Research . To apply these techniques constructively to make effective business decisions.

2. **Visual Programming:**

Visual programming provides the students with skills and knowledge required to use essential features and capabilities of Visual BASIC, a programming system used to produce Graphical User Interfaces and applications in a Windows environment. It includes basic programming concepts, problem solving, programming logic, and the design of event-driven programming. The students will be able to explain the concepts of windows programming, write pseudo code for windows program, develop program using Visual Basic, develop program using VC++ and develop real time applications using VB and VC++.

3. **Unix Programming:**

Students familiarize with the concepts, design and structure of the Unix Operating systems. Students will be able to demonstrate Unix commands for file handling and basic utility commands. They will be able to design and code shell Programming. They will be able to write regular expression for pattern matching and apply them for various filters for a specific task.

V Semester:

1. **Microprocessor and Assembly language:**

To illustrate the architecture of 8085 and 8086 microprocessors. To introduce the programming and interfacing techniques of 8086 microprocessor. To analyse the basic concepts and programming of 8051 microcontroller. To understand the interfacing circuits for various applications of 8051 microcontroller. To introduce the architecture of advanced microprocessors and microcontrollers.

2. **Software Engineering:**

Software Engineering subject prepare our students to be successful professionals in the field with solid fundamental knowledge of software engineering. Students will learn how to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment. An ability to work in one or more significant application domains. Work as an individual and as part of a multidisciplinary team to develop and deliver quality software. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle. Demonstrate an ability to use the techniques and tools necessary for engineering practice.

3. Java Programming:

Students gain extensive experience with Java and its object-oriented features. They learn to design and program Stand-alone Java applications. They also learn Graphical user Interface, multithreading, Exception handling, Wrapper classes, vectors, and read and write files in Java. They will also learn to design Applet Programming. This course help students to develop small Java application Projects.

4. Computer Architecture:

Students will acquire the knowledge of structure, functions and characteristics of computer system. It helps them to understand the design of the various functional units and components of computers, the students identify the elements of modern instruction set and their impact on processor design. The students will be able to demonstrate computer architecture concepts related to design of modern processors, memories and input output. Analyse the performance of commercially available computers and to develop logic for assembly language programming.

5. Data Communication and Network:

Understand the rudiments of how computers communicate. Be familiar with the architecture of a number of different networks. Understand the principles of protocol layering. Be familiar with modern telecommunications Independently understand basic computer network technology. Understand and explain Data Communications System and its components. Identify the different types of network topologies and protocols. Enumerate the layers of the OSI model and TCP/IP. Explain the functions of each layer. Identify the different types of network devices and their functions within a network Understand and building the skills of subnetting and routing mechanisms. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation

6. Project:

Demonstrate knowledge on programming using VB. It helps individual learning process, by which the students can deepen their learning, applying their knowledge in new situations and various learning activities. Demonstrate knowledge on creating windows based applications by using a vastly used IDE in the industry. It emphasizes student engagement, collaboration and hands-on learning through engagement with complex tasks based on real-life applications.

VI Semester:

1. **System Programming:** Study the architecture of a hypothetical machine ,its assembly language ,macro language. Understand the structure and design of assemblers, linkers and loaders. Understand the concepts and theory behind the implementation of high level programming languages.

2. **Web Programming:**

Students will learn HTML tags and JavaScript Language programming concepts and techniques, develop the ability to logically plan and develop web pages. Students will be able to write scripts using JavaScript in a web page, Effectively incorporate JavaScript in a web page, Create forms and check for data accuracy, use JavaScript system objects, embed objects in a web page, effectively use decision and looping statements in JavaScript programs, manipulate strings, use array processing. Students learn to write, test, and debug web pages using HTML and JavaScript. Students develop various Web applications and gain knowledge of current and emerging technologies and practices.

3. **Theory of Computation:**

This course offers the mathematical foundations of computation including automata theory; the theory of formal languages and grammars; the notions of algorithm, decidability, complexity, and computability. It imparts a formal connection between algorithmic problem solving and the theory of languages and automata and develop them into a mathematical view towards algorithmic design and in general computation itself. Students get deeper understanding about compiler design and the applications of formal languages and grammars.

4. **Cryptography:**

Through the subject cryptography students were able to learn coding and decoding, cryptographic attacks, network security, different types of functions used in cryptography like hash functions, security at application layers in network and modern ciphers in cryptography. Overall students will learn how to secure the network and to encrypt and decrypt.