Learning Outcomes

1. The Discipline of Computing

1.1 Explains the evolution of counting and positional number system.

1.2 Observes the features of some remarkable computing machines during the evolution of computers and demonstrates them.

1.3 Lists the major developments in each generation of computers.

1.4 Identifies how programming languages are evolved, need of algorithms and computation using Turing machine and explains them.

2. Data Representation and Boolean Algebra

2.1 Distinguishes different number systems.

2.2 Explains conversion of one number system to another.

2.3 Performs binary arithmetic operations.

2.4 Represents numbers in computer memory.

2.5 Identifies various methods for representing characters in computer.

2.6 Lists file formats for sounds, images and videos.

2.7 Explains the concept of Boolean algebra.

2.8 Explains logical operators and logic gates.

2.9 Lists basic postulates and laws of Boolean algebra.

2.10 Designs circuits for simple Boolean expressions.

2.11 Implements basic logic gates using universal gates.

3. Components of the Computer System

3.1 Lists the steps in data processing.

3.2 Describes the basic organisation of computer system.

3.3   Identifies microprocessor and list registers.

3.4   Distinguishes various types of memory and list their importance.

3.5   Distinguishes different types of input/output devices based on their uses and features.

3.6   Recognises the importance of e-Waste disposal and the learner's role in its disposal.

3.7   Explains the concept of green computing

3.8   Distinguishes between system software and application software

3.9   Recognise the need and functions of an operating system.

3.10   Classify various language processors and recognise their need.

3.11   Lists the uses of different types of utility software.

3.12   Distinguishes and list the use of word processor, electronic spread sheets and presentation software.

3.13   Explains the importance of open source concepts

3.14   Distinguishes the difference between freeware, shareware and proprietary software.

3.15   Lists the advantages of freeware and shareware.

3.16   Lists and illustrates various human ware or live ware.

4.   Principles of Programming and Problem Solving

4.1   Explains the basic principle of problem solving by computer.

4.2   Distinguishes the two styles of problem solving approaches by citing examples.

4.3   Lists different stages in programming and explains the activities in each stage.

4.4   Develops algorithms for solving problems.

4.5   Constructs flowcharts to express algorithms.

4.6   Evaluates the best algorithm for solving the same problem.

5.   Introduction to C++

5.1   Lists the C++ character set.

5.2   Categorises various tokens and explains the purpose of each category in programs.

5.3   Identifies valid identifiers and explains the reason for the invalid ones.

5.4   Classifies various literals based on the characteristics.

5.5   Identifies the main components of C++ IDE and uses it for program development.

6.   Data Types and Operators

6.1   Lists the basic data types of C++ with their features.

6.2   Uses type modifiers to overcome the range limit of basic data types

6.3   Uses variables appropriately to refer data.

6.4   Identifies the operators available in C++ to perform operations by the computer and classifies them based on different criteria.

6.5   Creates and evaluates expressions with suitable C++ operators and classifies them based on the operators used.

6.6   Constructs C++ statements to give instructions to the computer for problem solving.

6.7   Develops source codes for problem solving according to the syntax and guidelines.

7.   Control Statements

7.1   Explains the need of decision making statements in problem solving.

7.2   Uses if and if...else statements with correct syntax for decision making in programs.

7.3   Selects nested if statement and else if ladder suitably for multiple branching in programs.

7.4   Distinguishes between switch and else if ladder and uses the appropriate one for multiple branching.

7.5   Explains the need of iteration statements in problem solving and identifies the components of a loop.

7.6   Lists the iteration statements of C++ with their syntax and explains the mode of execution.

7.7   Uses appropriate looping statement of C++ in programs.

7.8   Distinguishes between entry controlled loops and exit controlled loop.

7.9   Implements nesting of loops in programs.

7.10   Identifies the need of jump statements in problem solving.

7.11   Uses goto, break and continue statements properly in programs and explains their impact in the execution of loops.

8.   Arrays

8.1   List the need for using arrays

8.2   Identifies the situations where an array can be used.

8.3   Write the declaration of arrays and design the way of coding.

8.4   Identifies how memory allocation is done for array

8.5   Construct program for array traversal.

8.6   Designs an algorithm and develop program for Selection sort, Bubble sort, Linear search, Binary search.

8.7   Recognise the advantages and differences of selection sort and bubble sort

8.8   Recognise the advantages and differences of linear search and binary search

8.9   Writes the declaration statements for 2D arrays and explain its memory allocation.

8.10   Develop program for different matrix operations.

9.   String Handling and I/O Functions

9.1   Explains how strings are referenced in C++ programs and memory is allocated.

9.2   Lists the console functions for input and output operations of strings and explains their syntax by citing examples.

9.3   Lists the console functions for input and output operations of characters and explains their syntax with the help of examples.

9.4   Compares various stream functions with console functions.

9.5   Uses string and character functions in programs for solving problems.

10.   Functions

10.1   Explain the concept of modular programming

10.2   Lists the advantages of using functions.

10.3   Identifies the situations where a function can be used.

10.4   Recognises the difference between predefined and user defined functions.

10.5   Classifies and operate various predefined functions.

10.6   Writes the declaration of function and designs the way of coding.

10.7   Identifies the importance of prototype and arguments.

10.8   Constructs functions using default arguments.

10.9   Recognises the difference between passing arguments by value and by reference.

10.10   Identifies the scope and life of variables and functions.

10.11   Illustrates the construction and working of recursive functions.

10.12   Recognises the need of header files.

10.13   Constructs header files.

11.   Computer Networks

11.1   Recognises the computer network and its uses.

11.2   Identifies the essential components of communication system.

11.3   Recognises the various communication media.

11.4   Recognises the various data communication devices.

11.5   Identifies and explains the working of data terminal equipments.

11.6   Identifies the importance of each network topologies.

11.7   Lists the different types of network and identifies their scope.

11.8   Distinguishes the logical classification.

11.9   Recognises the need for protocol and explains its uses and functioning.

11.10   List the ways of identifying computers in a network.

11.11   Recognises the structure and working of URL.

12.   Internet and Mobile Computing

12.1   Recognises the people behind the evolution of Internet.

12.2   Identifies the hardware and software requirements for Internet connection.

12.3   Uses the services available on Internet.

12.4   Identifies the role of WWW as a service on Internet.

12.5   Explains the use and working of search engines.

12.6   Explains the structure and working of e-mail.

12.7   Classifies the different types of social media.

12.8   Judges the risks while interacting with social media.

12.9   Recognises the threats to network security.

12.10   Recognises the measures for preventing network attacks.

12.11   Lists the guidelines for using Internet.

12.12   Identifies the various mobile computing and communication concepts.

12.13   Recognises the features of mobile operating systems using Android.

o   Case study : Android