COMPUTER SCIENCE 12TH

(CBSE / ICSE / STATE BOARD)

Syllabus for Computer Science

12th

Unit 1: Computer Systems and Organization

- **Computer Networks**:
  - Types of networks: LAN, MAN, WAN, PAN.
  - Network devices: Hub, Switch, Router, Repeater, Gateway.
  - Network Topologies: Star, Bus, Ring, Mesh.
  - Network Protocols: TCP/IP, HTTP, FTP, SMTP.
  - Domain Name System (DNS), IP Addressing (IPv4, IPv6).
  - Introduction to Web Services.
- **Mobile Telecommunication Technologies**: 2G, 3G, 4G, and 5G.
- **Cloud Computing**: Basics of Cloud computing, advantages, and cloud service models (IaaS, PaaS, SaaS).
- **Types of Memory**: Primary and secondary memory, Cache, Virtual memory.
- **Data Representation**: Number systems (binary, octal, hexadecimal), binary addition, and subtraction.

Unit 2: Computational Thinking and Programming

- **Revision of Python Basics**: Variables, operators, data types, control structures (if-else, loops), functions.
- **Functions**:
  - Recursion: Definition, working, and examples of recursive functions.
  - Sorting algorithms (Bubble sort, Insertion sort, Merge sort, and Quick sort).
  - Searching algorithms (Linear search, Binary search).
- **Data Structures**:

- Stack: Implementation using lists, push and pop operations.
- Queue: Implementation using lists, enqueue and dequeue operations.
- Linked List: Concept and basic operations.

- **Object-Oriented Programming (OOP)**:
  - Concepts of OOP: Class, object, inheritance, polymorphism, abstraction, and encapsulation.
  - Constructors and destructors.
- **File Handling in Python**:
  - Operations: Opening, reading, writing, and closing files.
  - Binary file handling.
- **Exception Handling**: Try, except, finally statements in Python.

Unit 3: Database Management System (DBMS)

- **Database Concepts**:
  - Introduction to databases, need for DBMS.
  - Relational databases: Concepts of tables, records, fields.
  - Keys: Primary key, foreign key, candidate key.
- **SQL (Structured Query Language)**:
  - **DDL (Data Definition Language)**: CREATE, ALTER, DROP commands.
  - **DML (Data Manipulation Language)**: SELECT, INSERT, UPDATE, DELETE.
  - **TCL (Transaction Control Language)**: COMMIT, ROLLBACK.
  - **Joins**: Inner join, outer join (left, right).
  - SQL functions (AVG, COUNT, SUM, MAX, MIN).
- **Normalization**: Concept of normalization and its types (1NF, 2NF, 3NF).

Unit 4: Boolean Algebra

- **Boolean Logic**:
  - Boolean algebra, logic gates (AND, OR, NOT, NAND, NOR, XOR, XNOR).
  - Truth tables and simplification using Boolean identities.
  - Use of Karnaugh Maps (K-Maps) for minimizing expressions.

Unit 5: Networking and Communication

- **Communication Media**: Wired and wireless communication.
- **Network Security**: Concepts of encryption and decryption, public and private key cryptography.
- **Firewall and its types**.
- **Cyber Threats**: Malware, phishing, denial of service (DoS) attacks, etc.

Unit 6: Societal Impacts of Technology

- **Ethical Issues in Computing**: Digital divide, net neutrality, cybercrime.
- **Cyber Ethics**: Social networking, plagiarism, digital footprint.
- **E-waste Management**.
- **Intellectual Property Rights (IPR)**: Software licensing, open source, proprietary software.