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# Computer Science Syllabus for Uttarakhand State Civil Services Preliminary Exam-2011

# COMPUTER SCIENCE

## COMPUTER FUNDAMENTALS

**Algorithms and flow charts:** Problem analysis, flow charts, the concept and properties of algorithms, elementary algorithms development, algorithms evolving decision and loops.

Simple model of computer, Characteristics and generation of computers-Binary number Codes and arithmetic: Binary, octal, hexadecimal number systems and their conversion from one number system to another number system.

**Data Representation:** Data types, fixed and floatina point-representation. Description of I/O units, memory organization: RAM, ROM, Cache memory, serial and random access memory, concept of operating systems, Computer communication and network.

**Computer Based Numerical Methods & Fortran Programming:** Floating and normalized floating point representation of numbers. Simulataneous linear equation: matrix inversion, Gauss-Jordan and Gauss elemination method with pivoting and without pivoting. Ill condi ned, equations refinement of solutions.

Numerical Intigration, numerical solutions of algebric equations, solutions of ordinary differential equations.

**Fortran Programming:** Programming preliminaries constants and variables arithmetic etc.

**Logical Organisation of Computers:** Basic logic Design: Truth tables, Boolen algebra, Combinational circuit design with AND, OR, NOT, NAND, NOR, XOR gates and multiplex ers. Flip flops, shift registers and counters simple arithmetic and logic circuits.

**CPU Architecture, I/O Architecture:** I/O Channels and pheripheral processors.

## DATA AND FILE STRUCTURES

**Operating Systems:** Operating system as resource manager, operating system services and classification: single user, multi interactive and real time, processor management; memory management, case study of DOS, Unix and Windows 95.

**Data Communication and Networks:** Concept of data transmission, Single encoding, modulation methods, synchronization multiplexing and concentration, coding methods, cryptography.

**Networks:** Local area networks (LAN) CSMA CD, token bus, token ring techniques. Link level control (LLC) protocols, medium access control (MAC) protocol. Wide area networks (WAN).

**Object-Oriented Programming in C++:**

**Object-Oriented programming:** Pardigms and Metaphors: Active Data. Classes Encapsulation and inheritance, Type of object oriented system.

Complex programming exercises in C++ involving functional decomposition and object oriented design; use of templates, inheritance, virtual functions; graphics in C++; Windows programming through Visual C++.

Data Base Management System.