UPPSC LT Assistant Teacher Syllabus

SYLLABUS
Subject: Computer

Digital Logic and Circuits and Discrete Mathematical Structures: Number Systems, Boolean algebra and Logic Gates, Simplification of Boolean Functions, Combinational Circuits, Sequential Circuits, Memory circuits, Sets, Relations & Functions, Mathematical Logic, Boolean algebra, Combinatorics & Recurrence Relations, Graph theory.

Computer Organization and Architecture: Stored Program Concept, Components of a Computer System, Machine Instruction, Op codes and Operands, Instruction Cycle, Organization of. Central Processing Unit, ALU, Hardwired & Micro programmed Control Unit; General Purpose and Special Purpose Registers. Memory Organization, I/O Organization, Functioning of CPU, Instruction Formats, Instruction Types, Addressing Modes, Common Microprocessor Instructions, Multi-core Architecture, Multiprocessor and Multicomputer.

Data Structures and Algorithm: Definition and types, Linear Structures, Non-Linear Data Structures, Hashing and Collision Resolution Techniques. Searching and Sorting, Algorithms, Analyzing. Algorithms, Complexity of algorithms, Growth of functions, Performance measurements, Advanced Data Structures, Red-Black trees, B - trees, Binomial Heaps, Fibonacci Heaps. Introduction to Design Techniques: Divide and Conquer, Greedy algorithms, Optimal Reliability Allocation, Knapsack, Minimum Spanning trees Prim's and Kruskal's algorithms, Single source shortest paths - Dijkstra's and Bellman Ford algorithms. Dynamic Programming, Kanpsack, All pair shortest paths - Warshal's and Floyd's algorithms, Resource allocation problem. Backtracking, Branch and Bound with examples such as Travelling Salesman, Problem, Graph Coloring, n-Queen Problem, Hamiltonian Cycles and Sum of subsets. Algebraic computation, fast Fourier Transform, String Matching, Theory of NP- completeness, Approximation algorithms and Randomized algorithms.

Problem Solving through C Programming: Basic Programming Concepts, Introduction
to: C Programming Language and programming in C

Object Oriented Techniques: Object orientation, Encapsulation, information hiding, polymorphism, generosity, Object Oriented modelling, UML, Structural Modelling, Behavioural. Modelling and Architectural Modelling. Object Oriented Analysis, Object oriented design, Object design. Structured analysis and structured design (SA/SD), Jackson Structured Development (JSD). Object oriented programming style. Introduction to Java, Java Beans, Enterprise Java beans (EJB), Java Swing; Java as internet programming language. The connectivity model, JDBC/ODBC, Bridge, Introduction to servlets.

Operating System: Definition, Design Goals, Evolution, Structure and Functions of Operating System. Process Management, Memory Management, Concurrent Processes, File and Secondary Storage Management, UNIX and Shell Programming, Windows Programming

Database Management Systems: Database Systems, View of Data Models, Database Languages, DBMS Architecture, Database Users and Data Independence. ER Modelling, Relational Model, Introduction to SQL Relational Database Design, Database Security, Transaction Management, introduction to Query. Processing and Query Optimization, Concurrency Control, and Recovery Techniques.

Computer Networks: Network definition, network topologies, network classifications, network protocol, layered network architecture, overview of OSI reference. Model, TCP/IP protocol suite. Data Communication Fundamentals and Techniques, Networks Switching Techniques and Access mechanisms, Data Link Layer Functions and Protocol, Multiple Access Protocol and Networks, Networks Layer Functions and Protocols, Transport Layer Functions and Protocols, Overview of Application layer protocol.

Software Engineering: Definition, Software development, and life-cycle models, CMM, Software Quality, role of metrics and measurement. Requirements Analysis .and Specification, Software Project Planning, Software Architecture, Software Design and implementation, Software Testing and Reliability

Internet Technology, Web Design and Web Technology: Internet Technology and Protocol, Internet Connectivity, Internet Network, Services on Internet, Electronic Mail, Current Trends on Internet, Web Publishing and Browsing, HTML Programming Basics, Interactivity Tools Internet. Security Management Concepts, Information Privacy and Copyright Issues, Web Technology: protocols, development strategies, applications, Web project and team. Web Page Designing, Scripting, Server Site Programming.

System Analysis And Design: Analysis and Design of a System, documenting and evaluating the system, Data Modelling, Development of Information Management System, Implementation, Testing and Security Aspects .

Information Security and Cyber Laws: Distributed Information Systems, Role of Internet and Web services, Threats and attacks, Assessing-Damages, Security in Mobile and Wireless Computing, Security Threats to E-Commerce, E—Governance and EDI, Concepts in Electronics payment systems, E-Cash, Credit/Debit Cards. Physical Security-Needs Disaster and Controls, Basic Tenets of Physical Security and Physical Entry Controls, Access Control. Model of Cryptographic Systems, Design and Implementation Issues, Policies, Network Security, Attacks, Need of Intrusion 'Monitoring and Detection, Intrusion Detection. Security metrics- Classification and their benefits. Information Security & Laws, Ethics- Ethical Issues, Issues in Data and Software Privacy. Overview and types of Cyber Crimes .

Computer Graphics Types of computer graphics,-Graphic Displays Random scan displays, Raster scan displays, Frame buffer and video controller, Line and Circle generating algorithms, Transformations, Windowing and Clipping, Three Dimensional graphics, Curves and Surfaces, Hidden Lines and Surfaces.