

A.P.P.S.C. Government Polytechnic College Lecturer Posts

Computer Engineering Syllabus

Paper I: General Studies and Mental Ability

- Major Current Events and Issues of International, National, and State of Andhra Pradesh.
- General Science and its applications to the day to day life Contemporary developments in Science & Technology and Information Technology.
- History of India – emphasis will be on a broad general understanding of the subject in its social, economic, cultural, and political aspects with a focus on AP and the Indian National Movement.
- Geography of India with a focus on Andhra Pradesh.
- Indian polity and Governance: constitutional issues, public policy, reforms and eGovernance initiatives.
- Indian Economy and Planning
- Sustainable Development and Environmental Protection
- **Disaster management:** vulnerability profile, prevention, and mitigation strategies, Application of Remote Sensing and GIS in the Assessment of Disaster
- Logical reasoning, analytical ability, and logical interpretation.
- **Data Analysis:** Tabulation of data Visual representation of data Basic data analysis (Summary Statistics such as mean, median, mode, and variance) and Interpretation.

Paper II: Computer Engineering

1. Hardware:

Logic families, gates, flip-flops, Multiplexers, decoders, registers, counters, adder circuits, Boolean algebra, Combinational circuit design, minimization, sequential circuit design, number systems, inter conversion, number representation, computer organization, instruction formats, addressing modes, micro-programming, ALU organization, multiplication and division algorithms, memory hierarchy, cache and associate memories, virtual memory, memory IC's, I/O organization schemes, interrupts, arbitration, DMA, microprocessors, interfacing, pipeline, SIMD and MIMD organizations

2. Discrete Mathematics:

Proposition and predicate logics, methods of deduction, set theory, relations, functions, algebraic structures, lattices, recursion, combinatorics, Graph theory: representation, Shortest paths, Warshall's algorithm, cyclic and bipartite graphs, Hamiltonian graph, chromatic number, trees, binary tree traversals, representation of expressions, breadth-first and depth-first algorithms, spanning trees, Prim's and Kruskal's algorithms.

3. Theory of Computation:

Finite automata, pushdown automata, grammars: type 0, 1, 2, and 3, Turing machines.

4. Compilers:

Lexical Analysis, LL and LR grammars, parsing, Flex, Bison

5. Programming:

Flow-charts, programming methodologies, 'C', C++, Java.

6. Data Structures and Algorithms:

Linked Lists, Stacks, Queues, Binary Search Trees, height balanced trees, AVL trees, Algorithms, searching and sorting methods, Algorithm Design paradigms: divide and conquer, dynamic programming, greedy.

7. DBMS:

Database models, query languages, normalization and indexing

8. Operating systems:

Process vs thread, CPU scheduling, memory allocation, paging and segmentation, synchronization, deadlocks and prevention, concurrent processing and file management.

9. Computer networks:

OSI model vs TCP/IP model, Application layer protocols: HTTP, SMTP, FTP, Skype, Operation of TCP and UDP, IP routing, subnetting, IPv4/IPv6, network routing algorithms, error control, TDMA/CDMA/FDMA/CSMA, ARQ mechanisms, Ethernet and Wi-Fi.

10. Computer graphics:

DDA algorithms, graphic primitives, 2-D transformations, graphic input devices

11. AI techniques:

Natural language processing, machine learning, knowledge representation, expert systems, LISP, PROLOG.

12. Software Engineering:

Software engineering development life-cycle, system analysis, modular design, testing and validation, CASE tools