GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)
(Declared as Deemed to be University u/s 3 of UGC Act, 1956)
Visakhapatnam │ Hyderabad │ Bengaluru
Accredited by **NAAC** with **A++** Grade
Website: www.gitam.edu

GITAM SCHOOL OF TECHNOLOGY
Department of Computer Science & Engineering
PhD in Engineering: Computer Science & Engineering
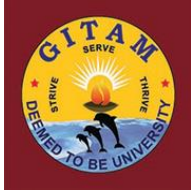**PhD Entrance Test Syllabus - 2023-2024**

PhD in Engineering: Computer Science & Engineering

1. Computer Organization Logic functions, minimization, design and synthesis of combinatorial and sequential circuits. Machine instructions and addressing modes, ALU and control, memory interface, I/O interface interrupt and instruction pipelining, cache, main and secondary storage, virtual memory.

2. Data Structures and Algorithms The notion of abstract data types, stack, queue, list, set, string, tree, binary search tree, heap, graph, tree and graph traversals, connected components, spanning trees, shortest paths, hashing, sorting, searching, Algorithmic techniques: greedy, dynamic, divide and conquer, back tracking, asymptotic analysis (best, worst, average cases) of time and space, upper and lower bounds.

3. Operating Systems Classical concepts (concurrency, synchronization, deadlock), processes, threads and inter process communication, CPU scheduling, memory management.

4. Software Engineering: Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, Agile modeling, Software testing

5. Database Management Systems E-R model, relational model, database design, integrity constraints, normal forms, Structured Query Language (SQL), transaction and concurrency control

6. Data Communication and Networks ISO/OSI stack, transmission media, data encoding, multiplexing, flow and error control, LAN technologies (Ethernet), network devices: switches, gateways, routers; ICMP, application layer protocols: SMTP, POP3, HTTP, DNS, FTP, Telnet.

7. Theory Of Computation : Finite automata, Regular expressions, Context-free grammars.

8. Artificial Intelligence: Concepts of Agents, Solving problems by search-informed and uninformed, Local Optimization, CSP's, Knowledge Representation and Reasoning-propositional and first order, Probablistic Reasoning

Reference Books:

Computer Organization

1. M. Morris Mono, Computer System Architecture, 3/e, Pearson education, 2008. Data Structures and Algorithms

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DataStructures and Algorithms

1. Data Structures, Algorithms and Applications in Java, Second Edition by Sartaj Sahni, Universities Press.

2. Object Oriented Data Structures using Java, Nell Dale, Austin Daniel T Joyce, Chip Weems, Jones and Bartlett Publishers.

Operating Systems

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Operating System Concepts with Java, 9/e, John Wiley, 2016.

Software Engineering

1. Roger S. Pressman, Software Engineering: A Practitioner's Approach,7/e, McGraw Hill, International Edition, 2009.

Database Management Systems

1. Database Management Systems, Raghu Ramakrishnan and Johannes Gehrke McGraw-Hill , 3rd Edition,2014.

Data Communication and Networks

1. William Stallings, Data and Computer Communications, 8/e, Pearson Education., 2013.

Theory of Computation

1. John E. Hopcroft, Rajeev Motwani and Jeffrey D. Ullman, Introduction to Automata Theory, Languages and Computation, 3/e, Pearson, 2008.

Artificial Intelligence

Stuart Russell and Peter Norvig, Artificial Intelligence: A Modern Approach, 2nd Edn.

David Poole and Alan Macworth " Artificial Intelligence" 2nd Ed.