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

PhD Entrance Test Syllabus

PhD in Engineering: Computer Science & Engineering

Module I: 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.

Module II: 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.

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

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

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

Module VI: 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.

Module VII: Theory of Computation
Finite automata, Regular expressions, Context-free grammars, Turing machines and undecidability.

Module VIII: 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:

GITAM SCHOOL OF TECHNOLOGY

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Computer Organization

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

Data Structures 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

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

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