Competitive Exam Materials for the College of Computer Science and Information Technology / Postgraduate Studies
Department / University of Wasit / for the academic year
2025-2026

1-Artificial Intelligence

References:

- Luger, George F . "Artificial Intelligence: Structures and Strategies for Complex Problem Solving"by George F. Luger, 6th Edition

Topics:
1. Definitions of Artificial Intelligence:
2. The Propositional Calculus:(Sentences,Syntax & Semantics).
3. Rules of Logic
4. Knowledge Representation:
5. The Predicate Calculus (Syntax & Semantics).
6. Sentences & Atomic Sentences:
7. Converting English Sentences into Predicate Calculus Form.
8. Inference Rules:
9. Unification:
10. State Space Search Representation of Problems.
11. State Space Search Directions:
12. State Space Search or Traversal Strategies
A. Uninformed Search:
1.Depth-First Traversal (DFT) and Depth-First Search (DFS).
2.Breadth-First Traversal (BFT) and Breadth-First Search (BFS).
B. Informed Search.
1. Heuristic Search.
2. Hill-Climbing Search.
3. Best-First Search.
4. Uniform Cost Search.
5. A* Search.
6. Greedy Search.

2-Software Engineering

References:

- Software Engineering,10 th Edition by Ian Sommerville.

Topics:

- Introduction to Software Engineering.
- Software processes.
- Design and implementation.
- Software testing.
- Software evolution.

3-computer network

References:

- **Computer Networks:** A Top-Down Approach by James F. Kurose and Keith W. Ross, 6th Edition.
- **Computer Networks:** A Systems Approach by Peterson and Davie, Morgan Kaufman, 5th Edition.
- Data Communications and Networking by Behrouz A. Forouzan, 4th Edition.

Topics:

- Network fundamentals
- OSI model and TCP/IP
- Physical and logical topologies
- IP address
- Error detection and correction

مواد التنافسي 2025-2026

4-Data Structures and Algorithms

References:

- Data Structures and Algorithms in C++2nd ed.by Michael T. Goodrich
- Data Structures and Algorithms in C++ by Adam Drozdek. Fifth edition.

Topics:

- Arrays, Linked Lists, and Recursion.
- Analysis Tools (Mathematical Foundations).
- Stacks and Queues.
- Lists and Abstraction.
- Trees Structures.
- Sorting Algorithms.
- Searching Algorithms.
- Graphs.

5- Object Oriented Programming

References:

- **Object Oriented Programming with C++ E. Balagurusamy.**

Topics:

- **Understanding class definition.**
- **Object interaction.**
- **Grouping Objects.**
- **Improving structure with inheritance.**
- **More about inheritance.**
- **Further abstraction techniques.**

6-Operating System

References:

- "Operating System Concepts" Abraham Silberschatz, Greg Gagne, Peter B. Galvin, Year :2018, Edition:10.

Topics:

Process Management

- - Process Concept.
- - Operations on Processes.
- - Interprocess Communication threads

CPU Scheduling

- - Scheduling Criteria.
- - Scheduling Algorithms.
- - Multiple-Processor Scheduling.
- - Thread Scheduling.

Process Synchronization

- - Critical Section Problem.
- - Semaphores and Monitors.
- - classic Problem of Synchronization

Deadlocks

- - The Deadlock Problem.
- - Methods for Handling Deadlocks.
- - Deadlock Detection, Avoidance, Prevention, and Recovery.