**Arab Academy for Science and Technology and Maritime Transport**
**Computer Science Curriculum**
**Course Syllabus**

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| **Course Code:** CS425 | **Course Title:** Distributed Systems | **Classification:** E | **Coordinator's Name:** Prof. Dr. Aliaa Youssif | **Credit Hours:** 3 |
| **Pre-requisites:** CS322 (Operating Systems) | **Co-requisites:** None | **Schedule:** Lecture: 2 hours Tutorial-Lab: 2 hours | | |

**Course Description:**
This course presents an introduction to distributed systems principles and paradigms. Key principles in the distributed systems arena are presented including: communication, processes, naming, synchronization, consistency and replication, and fault tolerance. In addition, different paradigms are outlined including object-based systems, distributed file systems, and document-based systems. A practical component of the course will allow students to experiment with a simple distributed system including modification of some of its components.

**Textbook:**

Coulouris G., Jean Dollimore J., Kindberg T., and Blair G., *Distributed Systems: Concepts and Design*, 5th Edition, Addison-Wesley.

**References:**

George Coulouris, Jean Dollimore, and Tim Kindberg*, Distributed Systems Concepts and Design*, 4th Edition, Addison-Wesley.

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| Course Objective/Course Learning Outcome: | Contribution to Program Student Outcomes: |
|---|---|
| 1. Understand distributed systems principles such as communication, processes, naming, synchronization, consistency and replication, fault tolerance and security. | SO1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions. |
| 2. Understand distributed systems paradigms such as object-based systems, distributed file systems, and document-based systems. | (SO2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline. |
| 3. Solve synchronization problems related to distributed systems | (SO6) Apply computer science theory and software development fundamentals to produce computing-based solutions. |
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| **Course Outline:**<br><br>1. Introduction to distributed Systems<br>2. Distributed Systems Architectures<br>3. Processes and Threads in Distributed Systems<br>4. Communication Models<br>5. Remote Procedure Call (RPC) and Remote Method Invocation (RMI) | 6. Naming Introduction<br>7. Naming (DNS and LDAP)<br>8. Synchronization<br>9. Mutual Exclusion<br>10. Consistency and Replication<br>11. Fault Tolerance<br>12. Distributed File Systems |
| Grade Distribution:<br><br>7th Week Assessment (30%)<br><br>12th Week Assessment (20%)<br><br>Year Work (10%)<br><br>Final Exam (40%) | |

Policies:

Attendance:
AASTMT Education and Study Regulations (available at aast.edu)

Academic Honesty:
AASTMT Education and Study Regulations (available at aast.edu)

Late Submission:
*Late submissions are graded out of 75% (1 week late), 50% (2 weeks late), 25% (3 weeks late), 0% (more than 3 weeks late)*