

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

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|---|---|--|---|---------------------------|----------|---------|-----------|---------|------|---------|
| Course Code: CS322 | Course Title: Operating Systems | Classification: | Coordinator: Dr Essam Elfakharany Lecturer: | Credit Hours: 3 | | | | | | |
| Pre-requisites: <ul style="list-style-type: none"> • CE243 (Intro. to Computer Architecture) • CS212 (Data Structures and Algorithms) | Co-requisites: None | Schedule: <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;">Lecture:</td> <td>2 hours</td> </tr> <tr> <td>Tutorial:</td> <td>2 hours</td> </tr> <tr> <td>Lab:</td> <td>2 hours</td> </tr> </table> | | | Lecture: | 2 hours | Tutorial: | 2 hours | Lab: | 2 hours |
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| Tutorial: | 2 hours | | | | | | | | | |
| Lab: | 2 hours | | | | | | | | | |
| Office Hours: | | | | | | | | | | |
| Course Description: The course is an introduction to modern operating systems. Upon successful completion of the course, the student should acquire ample knowledge about the concepts, structure, design principles, implementation issues, and mechanisms of operating systems. Hands-on experience will be gained through a lab component and programming assignments. Furthermore, where appropriate, Windows, Unix/Linux will be presented as case studies of operating systems. | | | | | | | | | | |
| Textbook: William Stallings, <i>Operating Systems: Internals and Design Principles</i> , PEARSON. | | | | | | | | | | |

References:

- Andrew S Tanenbaum and Albert S Woodhull, *Operating Systems Design and Implementation*, Prentice Hall.
- Andrew S. Tanenbaum, *Modern Operating Systems*, Prentice Hall.

Contribution to Program Student Outcomes:

(SO-1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.

(SO-2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline.

(SO-6) Apply computer science theory and software development fundamentals to produce computing-based solutions.

| Course Objective/Course Learning Outcome: | Contribution to Program Student Outcomes: |
|--|---|
| 1. Understand the processes and threads concepts. | (SO-1) |
| 2. Apply process management techniques. | (SO-1) (SO-2) |
| 3. Experiment with memory management techniques. | (SO-1) |
| 4. Practice with sample resource management problems such as concurrency control and mutual exclusion. | (SO-1) (SO-2) (SO-6) |
| 5. Master operating systems algorithms such as CPU scheduling and page replacement algorithms. | (SO-1) (SO-2) (SO-6) |
| 6. Evaluate performance of various OS components. | (SO-1) (SO-2) (SO-6) |

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| <p>Course Outline:</p> <p>Week 1. Course Introduction and Computer System Overview</p> <p>Week 2. Computer System Overview (cont.)</p> <p>Week 3. Operating System Overview</p> <p>Week 4. Process Description and Control</p> <p>Week 5. Process Description and Control (cont.)</p> <p>Week 6. Threads</p> <p>Week 7. 7th Week Exam</p> <p>Week 8. Concurrency: Mutual Exclusion and Synchronization</p> | <p>Week 9. Concurrency: Mutual Exclusion and Synchronization (cont.)</p> <p>Week 10. Memory Management</p> <p>Week 11. Virtual Memory</p> <p>Week 12. 12th Week Exam</p> <p>Week 13. Uniprocessor Scheduling</p> <p>Week 14. File Management</p> <p>Week 15. Disc Scheduling/Revision</p> <p>Week 16. Final Exam</p> |
| <p>Grade Distribution:</p> <p>7th Week Assessment (30%):</p> <p>Exam (25%) + Tutorial assignments (Programming and homework assignments) (5%)</p> <p>12th Week Assessment (20%):</p> <p>Exam (15%) + Tutorial assignments (Programming and homework assignments) (5%)</p> <p>Term Work (10%):</p> <p>Lab work (Exams + assignments) (10%)</p> <p>Final Exam (40%)</p> | |

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)