

COMP 4270 Operating Systems (3 cr) – Fall 2022
University of Memphis
MW 2:20PM – 3:45PM

Instructor:

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Office Hours: By appointment

TAs: TBD

Catalog Course Description: Hierarchy of storage devices, I/O buffering, interrupts, channels; multiprogramming, processor and job scheduling, memory management: paging, segmentation, and virtual memory; management of asynchronous processes; interrupt procedure calls, process state and automatic switch instructions, semaphores, concurrency; security and recovery procedures.

Prerequisite(s): COMP 2150, and either COMP 3410 or EECE 4278, or permission of instructor.

Description of Instructional Methods:

This course is lecture oriented. Most lectures will be of a chalk and talk variety. Students will be encouraged to participate in numerous group discussions throughout the semester.

Required Textbook(s): *Operating Systems Concepts* by Silberscharz, Yale, and Gagne, Wiley, Ninth Edition, ISBN 978-1-118-06333-0.

Software Required: None.

Required Programming Language Skills: C, C++, or C#.

Course Policy:

Attendance: It is crucial that you attend class regularly. You are responsible for all material covered during lectures. In-class exercises and quizzes will be given throughout the semester to assess your understanding of the lecture materials.

Evaluation consists of two in-class exams worth 100 points each, a final exam worth 150 points, and 15 quizzes/in-class exercises worth 10 points each. Out of class homework assignments worth 250 points will be assigned during the semester. These will be a combination of 3 written assignments and 4 programming problems.

Assignments: Late assignments will be penalized 20% after the due date and are due at 11:59PM on the due date. If you have not completed your assignment by the due date, you should submit the work you have done for partial credit. No work will be accepted once the graded work has been returned or the solution has been disclosed to the class, except for unusual circumstances which the instructor feels reasonable. Note that any kind of hardware or software failure or machine unavailability in the lab does not merit an extension on the assignment.

Exams: Exams must be taken on the hour they are scheduled. In the event, if you cannot attend the class to take the exam due to some emergency or some unavoidable situation (such as serious illness, death in the family, participation in university sports, religious observations, and so on) you must notify me as soon as possible before the exam and also you must validate your absence by providing me a document (e.g., with a letter from your doctor).

Plagiarism/Cheating Policy: Plagiarism or cheating behavior in any form is unethical and detrimental to proper education and will not be tolerated. All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any

part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but appropriate references must be included for the materials consulted, and appropriate citations made when the material is taken verbatim. If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to:

<http://www.people.memphis.edu/~jaffairs/>

ABET Learning Outcome:

1. Recognize the role and responsibility of the operating system in the operation of a computer
2. Evaluate the processes and data structures used by the operating system to manage resources
3. Evaluate the operating system design components which provide an extended view of resources to processes
4. Analyze how the operating system and hardware cooperate to (i) boot a computer and (ii) start a process.
5. Analyze to identify how operating system avoid common operating system problems such as priority inversion, deadlock, etc.
6. Evaluate the Operating System design leading to user and kernel space.
7. Evaluate common operating systems services to perform tasks such as creation and deletion of processes and/or threads and communication between processes and/or threads.
8. Evaluate the various operating design methods which allow users to view view or change a running operating system's configuration.

Expected Performance Criteria:

Assessment Tools: Written Assignments, Programming Assignments, Quizzes/Exercises (Attendance and Participation), and Exams.

Programming Assignments (4)	150
Written Assignments (3)	100
Quiz/In-class exercises (15) (Attendance and Participation)	150
Midterm 1	100
Midterm 2	100
Final Exam	150
Total Points	750

A+: $\geq 97.5\%$, A: $\geq 92.5\%$, A-: $\geq 90\%$

B+: $\geq 85\%$, B: $\geq 82.5\%$, B-: $\geq 80\%$

C+: $\geq 75\%$, C: $\geq 72.5\%$, C-: $\geq 70\%$

D+: $\geq 65\%$, D: $\geq 62.5\%$

F: $< 62.5\%$.

Tentative Course Schedule:

DATE (BY DAY OR WEEK)	TOPIC	
Week 1	Course Overview	PART 1 Overview
Week 2	Chapter 1: Introduction Chapter 2: Operating System Structures	
Week 3	Chapter 3: Processes	PART II Process Management (Basics)
Week 4	Chapter 3: Processes	
Week 5	Chapter 4: Threads	
Week 6	Midterm 1	
Week 7	Chapter 5: Process Synchronization	Part III Process Management (Advanced Concepts)
Week 7	Chapter 6: CPU Scheduling	
Week 8	Chapter 6: CPU Scheduling	
Week 9	Chapter 7: Deadlocks	
Week 10	Midterm 2	
Week 10	Chapter 8: Main Memory	Part III Memory Management
Week 11	Chapter 8: Main Memory Chapter 9: Virtual Memory	
Week 12	Chapter 9: Virtual Memory	
Week 12	Chapter 10: Mass Storage Systems	Part IV Storage Management
	Final	

COVID-19 Health and Safety Policy:

(<https://www.memphis.edu/coronavirusupdates/guidelines/index.php>)

- **Masks are required to be worn by all persons while indoors and in places where maintaining appropriate social distancing is not possible.**
- All students, faculty and staff are strongly encouraged to receive the COVID-19 vaccine.
- Do not come to campus if you are experiencing symptoms, are in isolation or quarantine due to positive test results or exposure, pending test results, or have reason to believe you have come in contact with the virus.
- Daily symptom monitoring and self-reporting of positive test results are required.