

CS 433 Operating Systems

Fall 2017

Instructor: Dr. Xiaoyu Zhang
Class meetings: MWF 10:30 - 11:20, SCI2 302
Office hours: MWF 9:30 - 10:30 AM and 1:00 - 1:30 PM or by appointment
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Course Description

This course examines basic issues in operating system design and implementation. The operating system provides a well-known, convenient, and efficient interface between user programs and the bare hardware of the computer on which they run. The course will cover the major components of modern operating systems. Topics include process management (processes, threads, CPU scheduling, synchronization, and deadlock), memory management (segmentation, paging, swapping), file systems, and networking/distributed systems. The course will provide you with some of the most important building blocks needed for the construction of complex, real-world software systems.

Student Learning Outcomes (SLOs)

After taking this course, students should be able to

- Explain the basic concepts underlying the main components of modern multitasking operating systems.
- Analyze the effects of various algorithms and data structures of modern operating systems.
- Improve programming skills in designing, implementing and testing software through the programming assignments.
- Write software documentations to facilitate software maintenance activities.
- Improve skills to independently acquire new computer-related knowledge and skills.

Prerequisites

CS 311 and CS 231 (CS 331 recommended)

Textbooks

“*Operating System Concepts*, 9th edition” (2012) by Abraham Silberschatz, Peter Galvin, Greg Gagne, (ISBN: 978-1-1180-6333-0)

Grading

Your final score will be compiled from following parts:

Programming and Homework Assignments:	50%
Midterm Exam:	20%
Final Exam:	25%
Quizzes (Participation):	5%

Your letter grade will be based on the following scale:

Grade	Total %
A	≥ 90
B	$80 \leq \text{and} < 90$
C	$70 \leq \text{and} < 80$
D	$60 \leq \text{and} < 70$
F	< 60

The above is an absolute scale. You can guarantee yourself a particular grade by attaining the appropriate overall percentage. I may curve the exams according to the distribution of student scores.

Course Guidelines

1. You should try to login the class server, cs433.cs.csusm.edu, and Cougar course (<http://cc.csusm.edu>) as soon as possible. If you have any problems, let me know. You will submit your programming assignments on the class server. Please read carefully the “CS 433 Programming Policies and Submission Guidelines”.
2. You will be dropped from the class if you miss the first two classes without notifying the instructor.
3. There will be five assignments in this class. Each assignment contains both written and programming parts. All assignments must be turned in on time at the beginning of the class on the due date. No late assignment will be accepted without prior agreement from the instructor. Start early on the programming assignments.
4. If you cannot complete an assignment on time due to *family or work related emergencies*, you need to inform the instructor before the due date and provide appropriate written notes to avoid penalty. If, in my judgment, the circumstances are unavoidable and the extension is reasonable, I will grant the extension. Note: conflicts with homework in other classes, simply failing to complete an assignment on time, and oversleeping, are not reasons I will accept.
5. The programming assignments in this class are intensive. You can work in a group of two for the programming part of the assignments. Each group turns in one copy of the program. You still need to work individually on the written part of the assignments. Students in a group should sit and work together in front of a computer at least 80% of the time. You should stick with a fixed partner throughout the entire semester. Any partner change must be approved by the instructor.
6. Students are expected to attend the class and participate in class discussions. Students should read the reading materials before coming to lectures.
7. Short quizzes will be given in class without prior notice to determine the participation score. The goal of quizzes is to give yourself and the instructor an idea about how well you understand the covered materials.
8. Come to the midterm and final exams. No makeup exam will be given.

9. Any discrepancy on grades should be submitted to the instructor ASAP, within one week from the day that the grades are available for the class (not the day you receive it).
10. The cs433 server will be cleared after the end of semester. If you want to keep your files for future use, please download them to your own computer.
11. The University writing requirements will be satisfied by written homework assignments and programming reports.
12. **Academic Honesty:** Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. We encourage you to help one another in understanding the concepts, algorithms, or approaches needed to do the homework assignments for this class. However, what you turn in must be your own, or for group projects, your group's own work. Copying other people's code, solution sets, or from any other sources is strictly prohibited. Read carefully the "Academic Honesty" section of your catalog. Students are responsible for honest completion of their work including examinations. There will be no tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty, in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole. Incidents of Academic Dishonesty will be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University.
13. Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with me during my office hours in order to ensure confidentiality.

Schedule

Please note that this schedule is approximate, and subject to change.

Date	Topics	Readings
week 1	Discussion of the syllabus. Introduction	Chap 1
week 1-2	Operating system structures	Chap 2
week 3	Processes	Chap 3
week 4	Threads	Chap 4
week 5-6	CPU Scheduling	Chap 6
week 7-8	Process synchronization	Chap 5
week 8	<i>In-class Midterm</i> (chapter 1 - 6)	
week 9	Process synchronization	Chap 5
week10	Deadlocks	Chap 7
week 11-12	Main Memory	Chap 8
week 12-13	Virtual Memory	Chap 9
week 14	File Systems	Chap 10
week 15	File System implementation	Chap 11
	<i>Final Exam</i>	