



Syllabus for CSE150-01: Operating Systems

Spring 2025

Coordinator: Wan Du

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Office Hours: Every Wednesday 1:30-2:45pm.

Office hours, lectures, and exams are all in-person.

Course Objectives/Student Learning Outcomes: Students will build a working operating system using Nachos framework in two different phases. First phase requires implementation of synchronization constructs that Kernel threads will utilize to control the whole OS. They will solve truly cooperative thread problem using only synchronization (monitors) among threads. Priority Scheduler skeleton will be completed to schedule different tasks and solution for priority inversion. Second phase implements support for User threads using syscall interface with the kernel to give a user program access to filesystem and IO including the console.

Program Learning Outcomes:

- A) An ability to apply knowledge of computing and programming appropriate to the discipline;
- B) An ability to analyze a problem and identify the computing requirements appropriate for its solution;
- C) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs;
- D) An ability to use operating system techniques, skill, and tools necessary for computing practice;
- E) An ability to function effectively as a member of a team in order to accomplish a common goal;
- F) An ability to apply mathematical foundations, algorithmic principles, and computer science theory to the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices.

Prerequisite by Topic: Class Prerequisite: CSE 021, CSE 031 and CSE 100

Course Policies: CLASS/LAB SCHEDULE
CSE150 is a 4-credit course, which includes 2.5 hours of lecture, 3 hours of lab each week. You should plan on spending at least 6.5 hours outside of lecture and lab on reading, studying, and project assignments.

STUDENT RESPONSIBILITIES:

Please be sensitive to the learning environment. It is assumed that every student is attending class to learn; therefore, anything which distracts any student from learning is not appropriate classroom behavior (for example, cell phones, conversing during lecture, checking E-mail or Facebook, Internet use not related to current class topic).

In attempting to keep with a business-like, professional atmosphere, any behavior which would be considered inappropriate in a business setting will be addressed in class (talking during lecture, sitting on the floor, feet on chairs, etc.)

DEVICE AND FACILITY POLICIES:

Computers are NOT needed for exams or for any in-lecture activities. Please do not bring laptops or mobile gaming devices to lecture. It is not necessary for you to have your own computer for this course, as all computing resources necessary will be provided in the lab. Projects can be completed within the designated weekly lab sessions and with use of any Open Access lab. Even though our labs will use the Linux operating system, the Eclipse programming environment we will use is identical for Linux, Windows and macOS.

COLLABORATION POLICIES:

The project assignments will be done in groups of 5 to 6 students. You may help each other understand the assignment, and are encouraged to approach other students to ask about concepts, algorithms, or general approaches to solve problems. However, each group must write their OWN CODE, and submitted work MUST be of the students turning them in. Allowing students from other groups to see your code, asking to see another group's code, or copying code/solutions from any other sources IS STRICTLY PROHIBITED.

You may, of course, seek assistance from the course TAs and the course instructor for all the assignments.

USE OF STUDENT WORK:

Work submitted by students may be used as examples for future students for educational or academic purposes. Names will be removed as possible. You may specifically request to not participate.

DEADLINE AND LATE POLICIES:

The posted deadline on CatCourses will be the official deadline for each assignment. The instructor has the discretion to change the deadline on a per-assignment basis.

You will receive a total of 2 slip-days for the semester per group (that CANNOT BE USED FOR DESIGN DOCUMENT). This allows for flexibility in planning the project deadlines with other courses. After the slip days are all used up, the penalty will be 10% for each day you are late with the submission unless stated otherwise.

If you know before a project assignment begins that you will not be able to make a deadline, please inform and make arrangements with the instructor and TA ahead of time. Similarly, make-up exams will NOT be provided unless arrangements are made beforehand.

CLASS/LAB ATTENDANCE POLICIES:

You are expected to attend the lab sessions for which you are enrolled, unless you make explicit arrangements with the instructor. Lab sessions are where you will get most of the information and learn so it is important to be there physically every week.

If you will be missing class lectures or labs due to participation in sports or academic activities (e.g., seminar), you should provide the professor with documentation at the start of the semester, and then provide confirmation before missing each such date. This is particularly important in the case of exams and

program deadlines; as mentioned earlier, make-up exams and extension of deadlines will NOT be provided unless arrangements are made beforehand.

Academic Dishonesty Statement:

- a. Each student in this course is expected to abide by the University of California, Merced's Academic Honesty Policy and CSE Policy of Academic Honesty (https://eeecs.ucmerced.edu/sites/eeecs.ucmerced.edu/files/page/documents/computer_science_department_policy_on_academic_honesty_fall_2019.pdf). Any work submitted by a student in this course for academic credit will be the student's own work.
- b. You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e mail, an e mail attachment file, a diskette, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Policy can also be extended to include failure of the course and University disciplinary action.
- c. During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

Disability Statement:

Accommodations for Students with Disabilities: The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

Topics:

Broadly the topics are:

- Processes and Threads
- Scheduling and Synchronization
- Protection Schemes
- Address translation and Caching
- Paging (on-demand)
- File Systems
- Networking and Distributed Systems
- Security

Class/laboratory Schedule:

Please find the detailed information in my lecture slides.

Assessment/ Grading Policy:

Grading will be based on written tests, projects and lab participation. The penalty for late submissions will be 10% for each day you are late with the submission. All tests will be closed-book. Your final grade will be calculated based on the following (Note that the final grade components may change):

- Three homework: 18%
- Midterm: 15%
- Final exam: 29%
- Two Projects: 38%, including 8% for participation in lab sessions.