CS 464 Operating Systems

# Course Syllabus - Spring 2025

**Description**: Study the fundamental principles of modern operating systems. Topics include process management; concurrency; deadlock; CPU scheduling; memory management; disk management; files systems; security; distributed, real-time, and multiprocessor operating systems.

**Course Outcomes**: Upon completion of this course, the student should be able to:

1. Describe the functions of a contemporary operating system with respect to convenience, efficiency, and the ability to evolve;
2. Identify potential threats to operating systems and the security features designed to guard against them;
3. Practice and perform system-level programming skills;
4. Efficiently use professional literature;
5. Explain trends and directions of computer systems;

**Undergraduate CS program Student Outcomes:** The following student outcomes are assessed in this course:

1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of computer science.
3. Apply computer science theory and software development fundamentals to produce computing-based solutions.

**Prerequisites:** CS 226 and CS 219

**Classes**: 16:15--17:40 Monday and Wednesday Hodson Technology, Floor 1, Room 113

**Instructor**: Dr. CK Chiang

Email: [chiang@hood.edu](mailto:chiang@hood.edu)

**Class Website**: You are responsible for checking the class website for any new material,

*i.e.* homework, announcement, references, breaking news, *etc.* posted. Grades of assignments and exams will be posted on the college ‘Blackboard’ system approximately one week after its due time.

# Textbook:

Andrew S. Tanenbaum and Herbert Bos, [*Modern Operating systems*](http://www.pearsonhighered.com/educator/product/Modern-Operating-Systems/9780133591620.page)*, 4th ed.*, Pearson, 2015 (required);

**Homework**: There will be a variety of homework assignments in the form of general questions, programming tasks, or algorithms. For programming assignments, the deliverable should also include a running result of the program, either with a script file or with a screen snapshot. In addition, you will need to send the source code to the instructor by Email before the due date. Unless specified, you can pick up whichever programming language or platform to complete the homework. Do *not* send in executable code. Keep a copy of all coursework before you submit them.

By default, homework is due in class one week after it is assigned. Up to one homework or programming assignment may be marked as excused for *an extraordinary* situation; no points will be assigned and the assignment will not be used in computing your final grade. Absent from a class, approved or not, is not an excuse to miss or delay homework. A student missing from a class is ultimately responsible for catching up with homework assignments and turning them in on time.

Any homework, projects, or programming submissions may be used for evaluation, teaching, or research purposes; they may also be made public without additional notice.

Students entering this class are expected to have knowledge and skills in C/C++ programming and the UNIX programming environment. We may have programming assignments to help understand conceptual and algorithmic issues. However, essential programming techniques are assumed, and will not be the main topics of this class.

**Exams**: There will be a midterm exam and an accumulative final exam

**Final grade** = 25% Project + 40% Homework (assignments and quizzes)

+ 15% Midterm + 15% Final + 5% Attendance

A: ≥ 91 A-: ≥ 88

B+: ≥ 85 B: ≥ 81 B-: ≥ 78

C+: ≥ 75 C: ≥ 71 C-: ≥ 68

D+: ≥ 65 D: ≥ 61 D-: ≥ 58

F: < 58

**Attendance**: All students are expected to attend each meeting of the course, on time, fully prepared, and ready to participate. If you cannot attend a class, please send the instructor an Email in advance. Students arriving late or leaving early, without receiving authorization from the instructor prior to the class period, may be marked absent. Three absences will cost all attendance points.

If you miss a meeting, it is your responsibility to obtain notes from a fellow student. Office hours are not meant for individual lectures.

Any student who needs accommodation for a documented disability should pass the letter from the College academic service center to the instructor at the beginning (within 2 weeks) of the semester. If you need to take the midterm or final exam at the academic service center rather than with the class, you need to inform the instructor in writing at least two weeks in advance.

Unlike a programming class, the operating systems class attempts to foster a broader vision in the computer system field, curtailed by neither the boundary of software nor hardware. Be prepared to spend at least 3-4 hours per week on this course outside of the classroom on reading-related topics.

# Tentative Schedule:

1. Introduction and Overview of Operating Systems; 1-2 weeks;
2. Processes and Threads; 2-3 weeks;
3. Memory Management; 2-3 weeks;
4. Midterm Exam, followed by recess;
5. File Systems; 1 week;
6. Deadlocks; 1 week;
7. Multiple Processor Systems; 1 week;
8. Security; 1 week;
9. Discussions on Linux; 1 week;
10. Discussions on Windows; 1 week;
11. Final Exam;

**Academic Integrity:** You are bound by the Hood College Honor Code. As computer science practitioners, we all follow the ACM/IEEE Joint Software Engineering Code of Ethics and Professional Practice.

Discussions within/without class are encouraged and promoted. Exams and homework should reflect the student's own individual efforts. Discussion of homework or projects among students is allowed, but not to the point where detailed answers are being formed collectively. Answers that are identical beyond coincidence (either to another student's work or, to say, from a reference book or website) will be considered to be in violation of academic integrity. You are responsible for the security of your work, both electronic and hard copies. Do not show your completed assignment to anyone.

*Code ‘copy & paste’ is strictly prohibited under any circumstances.* If you get ideas from a book, talk, or the Internet in your work, please give proper credit to the original sources. *If* a quiz or exam is open-book, you cannot discuss it with *anyone, in person or electronically*; and you cannot use a computer in any exam unless approved by the instructor in advance.

**Note:** This course syllabus/outline is tentative and subject to perpetual revisions as needed. The instructor may change any aspect of it with advance notice to students.