1 Course Information

This course studies the fundamental principles of modern operating system. Topics include input/output, concurrent processing and threads, synchronization problems, CPU scheduling, memory management, and filesystems. The C programming language will be used for assignments and projects.

Prerequisites

A passing grade in the following course(s) is required:

- **CS 281 - Assembly Language and Computer Architecture**

Textbook


2 Course Topics

- The history and current state of computer systems
- Process management
- Threads
- Interrupts and system calls
- CPU scheduling
- Synchronization of concurrent programs
- Memory management and virtual memory
- Disk scheduling and filesystems
3 Course Outcomes

Students taking this course will:

• Be proficient in the C programming language.
• Be proficient in the use of the Linux environment for coding, compilation, debugging, and testing.
• Design and implement concurrent programs using proper synchronization techniques.
• Evaluate the merits and downsides of various CPU scheduling, memory management, and deadlock handling policies.
• Gain experience designing and implementing key components in a real OS kernel, including a ready queue, a robust CPU scheduler, synchronization mechanisms, and deadlock detection & recovery.

4 Grading

The following grade cutoffs are upper bounds - they might come down, but will not be set higher: A = 95, A- = 90, B+ = 87, B = 83, B- = 80, C+ = 77, C = 73, C- = 70, D+ = 67, D = 64, D- = 60, F = < 60.

Your overall grade will be composed as follows:

<table>
<thead>
<tr>
<th></th>
<th>% Weight</th>
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<tbody>
<tr>
<td>Discretionary</td>
<td>5</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>30</td>
</tr>
<tr>
<td>Programming Projects</td>
<td>25</td>
</tr>
<tr>
<td>Midterm I</td>
<td>12.5</td>
</tr>
<tr>
<td>Midterm II</td>
<td>12.5</td>
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<tr>
<td>Final Exam</td>
<td>15</td>
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</tbody>
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Table 1: Breakdown of Grades

4.1 Assignments

• **Homework Assignments (Work Alone)** – There will be around 4-6 homework assignments, covering various topics out of the book and lectures. Please make sure that your assignments are legible and free of grammatical/spelling errors. If an assignment is difficult to read or understand additional points may be taken off. Collaboration among students is encouraged for problem interpretation, brainstorming, etc., but in general, I expect every student to submit their own work.

• **Programming Assignments** – Paired-programming is strongly recommended (but not required) for the Xinu programming projects. Your source code should conform to good programming style and documentation.

• **Late Work** – For each day either a homework or project assignment is late (includes weekends), a 10% deduction will be assessed, and no late work will be accepted after one week past the due date.

4.2 Exams

There will be two midterms and a final exam, which are all cumulative. They will cover material discussed in lectures, projects, and assignments.
4.3 Discretionary Points

Discretionary points will be given based on your...

- Attendance
- Class participation
- Refrain from activities that can disrupt others, *e.g.*, texting, playing games on your laptop, etc.

5 Policies

5.1 Class Disruptions

I understand the student’s need to have their phone on them to answer the occasional important call. I do ask that you please have your phones on vibrate and take the call outside the classroom out of respect for your fellow students.

5.2 Academic Integrity

You should be aware of the Student Integrity Code at the university. Any suspected cheating (*e.g.*, plagiarizing code, copying homework solutions, etc.) will be reported to the Registrar, which may result in possible suspension/expulsion. See this link for more info:


5.3 Student Accessibility and Accommodation

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Peggy Perno, Director of the Office of Accessibility and Accommodation, 105 Howarth, 253.879.3395. She will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

5.4 Classroom Emergency Response Guidance

Please review university emergency preparedness and response procedures posted at . There is a link on the university home page. Familiarize yourself with hall exit doors and the designated gathering area for your class and laboratory buildings.

If building evacuation becomes necessary (*e.g.*, earthquake), meet your instructor at the designated gathering area so she/he can account for your presence. Then wait for further instructions. Do not return to the building or classroom until advised by a university emergency response representative.

If confronted by an act of violence, be prepared to make quick decisions to protect your safety. Flee the area by running away from the source of danger if you can safely do so. If this is not possible, shelter in place by securing classroom or lab doors and windows, closing blinds, and turning off room lights. Lie on the floor out of sight and away from windows and doors. Place cell phones or pagers on vibrate so that you can receive messages quietly. Wait for further instructions.

5.5 Student Bereavement Policy

The University of Puget Sound recognizes that a time of bereavement can be difficult for a student. Therefore, the university provides a Student Bereavement Policy for students facing the loss of a family member. Students are normally eligible for, and faculty members are expected to grant, three consecutive weekdays of
excused absences, without penalty, for the death of a family member, including parent, grandparent, sibling, or persons living in the same household. Should the student feel that additional days are necessary, the student must request additional bereavement leave from the Dean of Students or the Dean’s designee. In the event of the death of another family member or friend not explicitly included within this policy, a bereaved student may petition for grief absence through the Dean of Students office for approval.