

Point Loma Nazarene University
College of Natural and Social Sciences
Mathematical, Information, and Computer Sciences

CSC 3014: Operating Systems (4 units)

Spring 2026

Meeting Location and Times:

Rohr Science 295
TR – 10:00 - 11:45

Final Exam:

Tuesday May 5th 10:30 - 13:00

Instructor:

Professor Noah Spahn
nspahn@pointloma.edu
619 849 2491
RS 210

Books:

- *Understanding Operating Systems | 8th Edition* Ann McHoes/Ida M. Flynn
- *(Optional/Reference) Operating Systems: Three Easy Pieces* by Arpaci-Dusseau

Course Description:

CSC3014/EGR3014

A systems course focusing on operating systems, topics include basic operating system design, process management, device management, memory management, and file systems. Students are introduced to the basics of software evolution, reliability, concurrency, security and protection in the context of single-core, multi-core, distributed, and virtual environments. Class members gain experience using both GUI and command-line interfaces. In the course of implementing the CPU scheduling simulation, students understand the importance of thorough system testing and attention to system specs as they try to make parts of their systems work with those designed by their teammates.

Learning Outcomes:

By the end of this course, students will be able to:

- Possess a deeper understanding of the complexities involved in modern computational systems
 - Know the history behind the development of different components
 - Understand the foundational algorithms used in components
 - Tradeoffs of the algorithms
 - Problems that the algorithms solve

- Convey a practiced command of presenting technical subject matter to an audience of learners
- Technical (hands-on) experience with the C compilation process and UNIX tools

PLNU Mission

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department Mission

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

Additional Course Information

Cheating:

Cheating on an exam will result in a 'F' in the class.

In addition, we will draft an academic integrity code of conduct for this class that will be posted on canvas and remain authoritative for the semester.

Missed Classes:

Homework missed due to PLNU activities (i.e., sports teams, choirs, etc), can be turned in the day after the student is back. Missed exams due to emergencies can be made up once the dean of students informs Professor Spahn that PLNU has approved the reason. Non-emergency missed exams will result in a zero. It is the student's responsibility to inform the professor of when they will be gone. Missed class activities, which are due to a non-dean of students' approved emergency, will result in a zero.

Late Assignments:

Late assignments will not be accepted in this class.

Grading:

Grades are based on the number of points accumulated throughout the course with the following weights:

Weekly labs	25%
Midterms	30%
Final Exam	25%
Presentation	5%

Quizzes	5%
Synthesis Project	10%

Grading scale

A	B	C	D	F
A [92.5-100]	B+ [87.5-90]	C+ [77.5-80]	D+ [67.5-70]	F [0-60]
A- [90-92.5]	B [82.5-87.5]	C [72.5-77.5]	D [62.5-67.5]	
	B- [80-82.5]	C- [70-72.5]	D- [60-62.5]	

Final Examination Policy

Successful completion of this class requires taking the final examination on its scheduled day. If you find yourself scheduled for three (3) or more final examinations on the same day, you are authorized to contact each professor to arrange a different time for one of those exams. However, unless you have three (3) or more exams on the same day, no requests for alternative final examinations will be granted.

PLNU Academic Accommodations Policy

PLNU is committed to providing equal opportunity for participation in all its programs, services, and activities in accordance with the Americans with Disabilities Act (ADA). Students with disabilities may request course-related accommodations by contacting the Educational Access Center (EAC), located in the Bond Academic Center (EAC@pointloma.edu or 619-849-2533). Once a student’s eligibility for an accommodation has been determined, the EAC will work with the student to create an Accommodation Plan (AP) that outlines allowed accommodations. Professors are able to view a student’s approved accommodations through Accommodate.

PLNU highly recommends that students speak with their professors during the first two weeks of each semester/term about the implementation of their AP in that particular course. Accommodations are not retroactive so clarifying with the professor at the outset is one of the best ways to promote positive academic outcomes.

Students who need accommodations for a disability should contact the EAC as early as possible (i.e., ideally before the beginning of the semester) to assure appropriate accommodations can be provided. It is the student’s responsibility to make the first contact with the EAC. Students cannot assume that because they had accommodations in the past, their eligibility at PLNU is automatic. All determinations at PLNU must go through the EAC process. This is to protect the privacy of students with disabilities who may not want to disclose this information and are not asking for any accommodations.

Additional Course Information

Additional PLNU policies and practices that apply to this course can be found at the following link: <https://docs.google.com/document/d/11BgAANLOJ9tjt837d24EZ181ukM2qzHF/edit>

OSTEP mapped

1. Virtual Memory Paging (Week 4)

This visualizes how the OS manages a page table and translates virtual addresses to physical ones.

- **The Script:** [paging-policy.py](#)
- **The Instructions:** [README-paging](#)
- **The Task:** Run the simulation with "LRU" (Least Recently Used) vs "FIFO." Students can see exactly when a "Page Fault" occurs.

2. CPU Scheduling (Weeks 6–7)

This is the "Golden Model" for their final project. It simulates FIFO, SJF, and RR.

- **The Script:** [scheduler.py](#)
- **The Instructions:** [README-scheduler](#)
- **The Task:** Have students run a "random" workload and try to calculate the response time on paper before the script reveals the answer.

3. Concurrency & Race Conditions (Week 10)

This uses actual C code to show why threads need locks. It is the most "technical" but also the most eye-opening.

- **The Code:** [main-race.c](#)
- **The Task:** Students compile this in their UNIX terminal. They will see that the counter doesn't always equal 2000 (the expected result) because of race conditions.

4. Hard Disk Scheduling (Week 11)

This simulates how the "arm" of a hard drive moves to pick up data (SSTF, SCAN, etc.).

- **The Script:** [disk.py](#)
- **The Instructions:** [README-disk](#)