FA24-CS332001 Principles Of Oper Sys

Jump to Today ✎ Edit

CS 332: Principles of Operating Systems, Fall 2024

Course Overview

The principles underlying operating systems. Topics include process management, thread concurrency, CPU scheduling, synchronization, memory management, file systems, and virtualization.

Instructor: Prof. Zhihao “Zephyr” Yao, Ph.D.

Email: zhihao.yao@njit.edu

Office Hours: Monday 11:00 AM - 12:00 PM, GITC 4317A

Class Schedule: MW 1:00 PM - 2:20 PM, FMH 313

Teaching Assistant: Jinil Patel

Email: jp2336@njit.edu (mailto:jp2336@njit.edu)

Office Hours:

By appointment before the first midterm.

In-person starting 10/18/2024 on Fridays 11:00 AM - 12:00 PM, Location TBD

Course Textbook: Required:

zyBook: CS 332: Principles of Operating Systems

ISBN: 979-8-203-35252-1

1. Sign in or create an account at learn.zybooks.com (http://learn.zybooks.com)
2. Enter zyBook code: NJITCS332YaoFall2024
3. Subscribe

Assessment and Grading

Standard grading matrix:

Homework (on zyBook)	20%
Midterm Exam 1	20%
Midterm Exam 2	20%
Final Exam	20%

Project	20%
Extra Credit (Course Evaluation)	1%

Letter Grades

Letter Grades will be assigned in accordance with the NJIT undergraduate grade legend (**https://www.njit.edu/dos/policies/gradingpolicy.php** **(https://www.njit.edu/dos/policies/gradingpolicy.php)**) and calculated in an absolute scale converting numerical scores to letter grades:

- A: 90.00% and above
- B+: 85.00% and above
- B: 80.00% and above
- C+: 75.00% and above
- C: 70.00% and above
- D: 60.00% and above
- F: Below 60.00%

Homework: Weekly reading assignments and activities from zyBooks are due on Sundays by 11:59 PM. The first assignment is due September 8, 2024, 11:59 PM.

Exams: All exams are in-class, closed-book, and 1 hour 20 minutes.

Course Projects: **https://njit.instructure.com/courses/38376/pages/cs332-project** **(https://njit.instructure.com/courses/38376/pages/cs332-project)**

A team can have at most three people. Each of team members must contribute. Reports need to specify the contributions of each team member. At any point, a team may be split, but no new teams are allowed to form after the team name and formation due date. After a team is split, the separated members are allowed to use the team's work prior to the split.

Team name and formation due 9/11 11:59 PM
First report due 10/16 11:59 PM
Second report due 11/20 11:59 PM
Final report, code (as a zip file), and a presentation video due during the Final Week* (date TBD).
** Completing the project ahead of schedule could make your final week less busy.*

Final Exam Grade Override Policy:

If a student's Final Exam grade is higher than the overall course grade calculated through the standard grading matrix of all course components (homework, midterm, etc), the Final Exam grade alone may be used to determine the student's final course grade, provided ALL of the following conditions are met:

- Your Final Exam grade is equal or above 90.00%, AND,
- Your project grade also is equal or above 90.00%, AND,
- You have attended (i.e., taken and submitted) at least one of the midterms, and the grade for at least one of the midterms grade is equal or above 70%.

If all these conditions are met, and your Final Exam grade is higher than the grade you would have earned based on the grading matrix of all course components, your Final Exam grade will automatically be used for your overall letter grade conversion. **Please note that this policy will not reduce your grade if your performance on the final exam is lower than your overall course grade.** This policy is intended to reward significant improvement over the semester, as demonstrated by your performance on the final exam and the project.

Examples:

- A student has the following scores:
  - Midterm 1: 71/100
  - Midterm 2: 66/100
  - Homework: 100% completion
  - Project: 91/100
  - Final Exam: 93/100

  Based on the grading matrix, the student's overall grade would be 84.2, resulting in a B. However, because the student meets all the conditions, the Final Exam score will automatically override the grading matrix, resulting in a final letter grade corresponding to 93 (an A).

- A student has the following scores:
  - Midterm 1: 71/100
  - Midterm 2: 62/100
  - Homework: 70% completion
  - Project: 86/100
  - Final Exam: 99/100

  In this example, the project score is below 90, and therefore the student does not qualify for the **Final Exam Grade Override Policy**. The student's final grade will be calculated using the standard grading matrix.

Policies

Accommodations and Supports

If you need an accommodation due to a disability please contact the Office of Accessibility Resources and Services at OARS@NJIT.EDU, or visit us in Kupfrian Hall 201 to discuss your specific needs. A Letter of Accommodation Eligibility from the office authorizing student accommodations is required.

Deadlines

- All deadlines are firm (in EST). Late homework will not be accepted.
- Late project submissions will be accepted up to 20 hours past the deadline, with a 5% deduction for each hour late.

Absenteeism

- You are responsible for catching up on any material or information missed if you do not attend class.
- If you miss one exam due to special circumstances, you must contact the Dean of Students (DOS) within 2 working days from the day the reason for the absence is lifted with all necessary documentation. If DOS approves, your missing exam grade will be set equal to the average of the non-missing exam grades.
- Missing two exams leads to an automatic F in the course.

Incomplete

A grade of I (incomplete) is given only in **rare** circumstances when a student would normally have completed the course work, but could not do so because of documented special circumstances. See NJIT Catalog for details: **https://catalog.njit.edu/undergraduate/academic-policies-procedures (https://catalog.njit.edu/undergraduate/academic-policies-procedures,)**

Exceptions to Policies

- I have strict policies regarding deadlines and absenteeism. But, exceptions to these policies include documented medical and other officially excusable absence determined by the Dean of Students (DOS): **https://www.njit.edu/dos/student-absence-verification (https://www.njit.edu/dos/student-absence-verification)**
- You must contact the Dean of Students (DOS) within 2 working days from the day the reason for the absence is lifted with all necessary documentation.

Use of ChatGPT and other AI Writing or Coding Tools in Course Project

- The use of AI tools, such as ChatGPT, in course projects is allowed but must adhere to the following guidelines:
  - Students are fully responsible for the accuracy and correctness of all content in their submissions, including any text or code generated by AI. If AI-generated content is incorrect, the assignment will be graded accordingly. Note that AI is known to output incorrect statements and codes.
  - Students must disclose their use of AI tools in a visible part of the assignment, such as a code comment, footnote, or similar section. This disclosure is required for each graph, table, paragraph, or function where AI was used. The disclosure must clearly identify the AI tool and version used and describe any post-generation edits made.
  - Using a single set of prompts to generate an entire coding project or report is strictly prohibited. These attempts are easily detectable by both human graders and software tools and will result in a grade of zero for the submission.

Course Schedule

Week	Date	Topic
Week 1	Sep 4 (Wed)	Introduction & Chapter 1 - Computer Organization
Week 2	Sep 9 (Mon)	Chapter 1 - Computer Organization (cont.)
	Sep 11 (Wed)	Chapter 2 - Operating-System Structures
Week 3	Sep 16 (Mon)	Chapter 3 - Processes
	Sep 18 (Wed)	Chapter 3 - Processes (cont.)
Week 4	Sep 23 (Mon)	Chapter 4 - Threads and Concurrency
	Sep 25 (Wed)	Chapter 4 - Threads and Concurrency (cont.)
Week 5	Sep 30 (Mon)	Chapter 5 - CPU Scheduling
	Oct 2 (Wed)	Chapter 5 - CPU Scheduling (cont.)
Week 6	Oct 7 (Mon)	Chapter 6 - Synchronization Tools
	Oct 9 (Wed)	Chapter 6 - Synchronization Tools (cont.)
Week 7	Oct 14 (Mon)	Chapter 7 - Synchronization Examples
	Oct 16 (Wed)	**Midterm 1 (Chapters 1-6)**
Week 8	Oct 21 (Mon)	Chapter 7 - Synchronization Examples (cont.)
	Oct 23 (Wed)	Chapter 8 - Deadlocks
Week 9	Oct 28 (Mon)	Chapter 8 - Deadlocks (cont.)
	Oct 30 (Wed)	Chapter 9 - Main Memory
Week 10	Nov 4 (Mon)	Chapter 9 - Main Memory (cont.)
	Nov 6 (Wed)	Chapter 10 - Virtual Memory
Week 11	Nov 11 (Mon)	Chapter 10 - Virtual Memory (cont.)
	Nov 13 (Wed)	Chapter 12 - I/O System
Week 12	Nov 18 (Mon)	Chapter 12 - I/O System (cont.)
	Nov 20 (Wed)	**Midterm 2 (Chapters 7-12)**
Week 13	Nov 25 (Mon)	Chapter 13 - File-System Interface

	Nov 27 (Wed)	Chapter 13 - File-System Interface (cont.)
Week 14	Dec 2 (Mon)	Chapter 18 - Virtual Machine
	Dec 4 (Wed)	Chapter 18 - Virtual Machine (cont.)
Week 15	Dec 9 (Mon)	Final Review led by TA
	Dec 11 (Wed)	**Final Exam (Comprehensive)**

Learning Outcomes

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

1. Describe the fundamental components of an operating system and their functions.
2. Explain process management and apply concepts of concurrency and synchronization.
3. Analyze and implement different CPU scheduling algorithms.
4. Understand virtual memory and its hardware support.
5. Understand the role of CPU in privilege management, interrupts, and I/O systems.
6. Explain and simulate solutions to avoid deadlocks in operating systems.
7. Understand file systems interfaces, and the abstraction for storage devices.
8. Explain virtualization methods in modern computing.

Academic Integrity:

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: ***NJIT Academic Integrity Code*** **(https://t.e2ma.net/click/r146wkb/3i2x1wml/rhhrpwx)** .

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at ***dos@njit.edu*** **(mailto:dos@njit.edu)**

This syllabus is subject to updates. See below for a history of syllabus revisions:

History of syllabus revisions:

As of Aug 24, 2024: None.

Course Summary:

Date	Details	Due
Tue Sep 10, 2024	Academic Engagement: Fall 2024 (https://njit.instructure.com/courses/38376/assignments/479386)	due by 11:59pm
Wed Sep 11, 2024	Project team formation (https://njit.instructure.com/courses/38376/assignments/465277)	due by 11:59pm
Wed Oct 16, 2024	First report (https://njit.instructure.com/courses/38376/assignments/465278)	due by 11:59pm
Wed Nov 20, 2024	Second Report (https://njit.instructure.com/courses/38376/assignments/465279)	due by 11:59pm
Wed Dec 18, 2024	Final Project Submission (https://njit.instructure.com/courses/38376/assignments/465280)	due by 11:59pm