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Fall 2023

CS 630: Operating System Design

Zhihao Yao

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Recommended Citation
Yao, Zhihao, "CS 630: Operating System Design" (2023). *Computer Science Syllabi*. 331.
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CS630001-Operating Systems Design

Edit

CS 630: Operating Systems Design

Professor: Dr. Zephyr Yao (zhihao.yao@njit.edu (mailto:zhihao.yao@njit.edu))

Office hours: Wednesday 3:00 PM - 4:00 PM

Class time/place: Friday 1:00 PM - 3:50 PM KUPF 106

Teaching assistant: Huzefa I. Pitolwala (hip2@njit.edu (mailto:hip2@njit.edu))

Teaching assistant office hours: Tuesday 2:00 - 3:00 PM

https://meet.google.com/dnr-esev-rzj

Tutoring hours:

Rini Joseph, Wednesday 2:00 PM - 7:00 PM, GITC3701/Webex

Srikavya Machineni, Saturday 1:00 PM - 6:00 PM, GITC3701/Webex

https://computing.njit.edu/graduate-tutoring (https://computing.njit.edu/graduate-tutoring)

Course Goals:

This course covers operating systems structure and design decisions, including process management, scheduling, privilege levels, interrupts, I/O, virtual memory, and communication between different components of an operating system.

This course does not talk about how to use a specific OS like Windows or Linux. This course is intended to provide an in-depth understanding of how an operating system works. You are expected to read and code.

Course Policies:

All exams are closed note and closed book. You are expected to independently develop all source code (i.e., you cannot make use of source code found on the internet) for the coding assignments,

unless it is approved in writing by teaching staffs. If you decide to work on the course project as a group (max 3 people), you must inform the teaching staffs. Academic integrity is a shared responsibility within the group. If any member of the group engages in plagiarism (e.g., copying code from the internet), the entire group may be subject to disciplinary measures. That is being said, you must adhere to NJIT Academic Integrity Policy both as an individual and as part of a group.

Knowingly allowing someone to copy your work is considered academic dishonesty. Sharing course materials, such as past exams and course project, with anyone outside this class without instructor permission is prohibited. However, you are allowed and encouraged to engage in discussions related to course concepts, ideas, and syntax errors.

NJIT Academic Integrity policy:

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.

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

Respectful Behavior: Treating instructors, peers, and course staff with respect and professionalism. Turning your electronic devices to silent mode during classes and exams.

Attendance: You are strongly encouraged to attending all classes. If you miss a class, it is your responsibility to catch up on missed material. If you have a documented emergency, you must send your request directly to NJIT Dean of Students as soon as possible. See instructions at, **https://www.njit.edu/dos/student-absence-verification (https://www.njit.edu/dos/student-absence-verification)** . **Do not send your documentation to the teaching staffs.** After the Dean of Students approves your request, you may take a make-up exam. If you miss an exam without approval from the Dean of Students, you will receive no credit for the missed exam. The lowest two in-class quiz scores will be dropped, so you do not need to inform the teaching staffs if you are going to miss an in-class quiz. There is no make-up quizzes.

If you need any accessibility accommodation, you should contact NJIT Office of Accessibility Resources and Services. Their contact information is listed at, **https://www.njit.edu/accessibility/accommodations-and-support-services**

(https://www.njit.edu/accessibility/accommodations-and-support-services) .

Canvas: Regularly check Canvas for updates and announcements. This syllabus and schedule are subject to change. It is the student's responsibility to stay informed about any changes or additional information posted by the instructor.

Grading:

In-class quizzes 15%

Midterm Exam 1 15%

Midterm Exam 2 15%

Project 25% (see below for breakdown)

Final Exam 30%

Letter grades are translated as follow,

A 85% and above

B+ 75% and above

B 65% and above

C+ 55% and above

C 45% and above

F otherwise

Quizzes: There is a quiz each week except for the first week and the weeks that already has a midterm exam or the final exam. The quiz will be administered during a lecture session at an unspecified time. It is the students' responsibility to be familiar with all the material covered in class, as well as in the assigned readings.

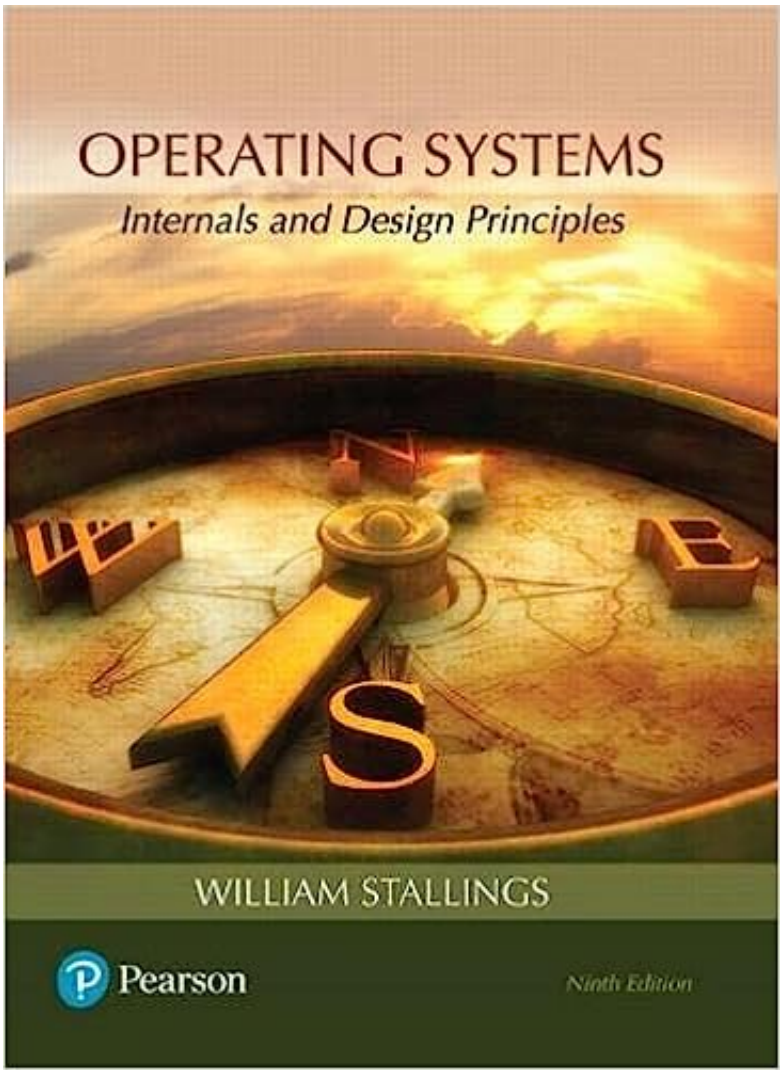
The two quizzes with the lowest scores will be dropped from the final grade calculation. Each quiz will be approximately 20 minutes, mainly focuses on the topic that we have covered in the previous week.

Textbook (required):

Operating Systems: Internals and Design Principles (9th Edition)

Publisher: Pearson

ISBN-10: 0134670957
ISBN-13: 978-0134670959



Additional readings:

Operating Systems: Three Easy Pieces (free online book) **(https://pages.cs.wisc.edu/~remzi/OSTEP/)** (OSTEP) by Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau and Peter Reiher

Course schedule:

Week	Date	Content	Reading

1	9/8/2023	Chapter 1: Computer System Overview	Textbook chp. 1.3-1.8 (optional) OSTEP chp. 13, 36
2	9/15/2023	Chapter 2: Operating System Overview	Textbook chp. 2.1-2.6 (optional) OSTEP chp. 3
3	9/22/2023	Chapter 3: Process Description and Control	Textbook chp. 3.2-3.5 (optional) OSTEP chp. 4, 5
4	9/29/2023	Chapter 3 continued; Chapter 4: Threads	
5	10/6/2023	Chapter 4 continued, **Midterm 1**	
6	10/13/2023	Chapter 5: Concurrency: Mutual Exclusion and Synchronization	
7	10/20/2023	Chapter 5 continued	
8	10/27/2023	Chapter 7: Memory Management	
9	11/3/2023	Chapter 8: Virtual Memory, **Midterm 2**	
10	11/10/2023	Chapter 8 continued	
11	11/17/2023	Chapter 6: Concurrency: Deadlock and Starvation	
12	11/24/2023	Thanksgiving	
13	12/1/2023	Chapter 9: Uniprocessor Scheduling	
14	12/8/2023	Chapter 10: Multiprocessor and Real-Time Scheduling	
TBD	TBD	Final Exam	