Hunter College
Department of Computer Science
Computer Science 340: Operating Systems
Summer 2023

Instructor: Stan Wine Email address: stanley.wine@baruch.cuny.edu
Section: 01-LEC SixWk 1 code: 3963 Meeting times: Monday - Thursday, 3:20 to 4:54 P.M.
Mode of delivery: In person   Classroom: North C107
Office hours: By appointment
Office location: Baruch College, Vertical Campus, 55 Lexington Avenue, cube 12-210C (look for door marked ZSB Faculty Offices 12-210; this door is locked; call me at my desk and I will let you in).
Office phone: (646) 312-3413   **Contact me by email, not phone**
Class website: http://www.cuny.edu

Course description:
A computer is controlled by its operating system, which manages the system's hardware and software resources, orchestrating their operation to ensure that the system functions safely and efficiently. This course will teach you how a computer system works.

This course is concerned with the general issues and principles that appear in all operating systems; it is not an exhaustive study of any particular operating system. This is not a vocational course that teaches you how to install or configure an operating system. This course develops a sound understanding of the basic concepts underlying operating systems, giving you the background to be able to learn the specifics of any operating system on your own.

To stay abreast of the ever-changing developments in the industry, we will discuss articles from newspapers such as *The New York Times* and other sources. Students are expected to come to class prepared to discuss current developments. Recent articles can be found in the newspaper articles folder on the course website.

We will introduce operating systems and their history, and develop a sound understanding of hardware operation and interrupt processing, supervisor calls, memory management and virtual memory, processor and process management, concurrent processes and virtual machines.

Learning goals:
This course satisfies the following departmental learning goals:
    1B: understanding the relationship between computer architecture and software systems by discussing virtual memory, hardware support for various OS tasks, interrupt handling, and parallel processing.
    3C: ability to perform competitively on the (former) Computer Science GRE by exposing them to some of the material on that (former) exam.

Required text:
Silberschatz, Galvin and Gagne, Operating Systems Concepts, Tenth Edition, Wiley and Sons, 2019
ISBN: 978-1-119-329480
https://hunter.textbookx.com/institutional/index.php?action=browse#books/3827944/

Website: http://www.cuny.edu
Slides, handouts, newspaper articles, supplemental sources and suggested study topics for exams are posted on the website.   I frequently post announcements on Blackboard as well. You should check our Blackboard site and your email on a daily basis. I will use it to notify you of newly published articles which you are to read, and for all advisories.

Announcements of Class Cancelations
Some students posing as instructors have made announcements to classmates via email or through signs affixed to classroom doors. These announcements have indicated that a class in which an exam has been scheduled has been canceled.

If I cancel a class, you will be notified via Hunter email (I will never use Gmail or any other account that a student could create in my name) and by posting an announcement on the Blackboard site.

Student Email and Blackboard site: Please verify that you have a valid email address in Blackboard. Any email that you send to me must include the course number and section in the subject line. Please check your email and the BlackBoard site on a daily basis. These tools will be used to notify you of assignments and of newly posted materials, and for all advisories; **"I didn't know" is not an acceptable excuse.**

A word to the wise:
This course introduces a plethora of <u>acronyms</u> and <u>jargon</u>. It is important that you become familiar with these terms and their usage. I strongly recommend that you take <u>extensive notes</u>.
This course covers a vast amount of material. It is imperative that you do the assigned reading before class.

Homework:
Homework questions (Exercises and Practice Exercises) for each chapter are listed in the schedule below. The questions are intended to verify and strengthen your understanding of concepts and terminology and to prepare you for exams. <u>Answers should be in your own words</u>; verbatim copying of material from the text, web or other sources will not improve your understanding or retention.
Homework should be completed for the next class meeting after each chapter is completed in class. The homework will not be collected, but the answers to certain questions will be discussed in class and you will be expected to demonstrate your mastery of the material by participating in the discussion.

Electronic Devices:
Please turn off cell phones, smartphones and other devices which may disturb the class. Laptops may be used for taking notes; they may not be used for any purpose unrelated to the lecture.

Grading:

First Midterm	33.33%
Second Midterm	33.33%
Final	33.33%

Exams: Exams will be derived from both the reading assignments and from material covered in the lectures. Some of the lecture material will not be found in the text. Therefore, it is critical that you attend class regularly, take good notes and keep up with the pace of the reading assignments.

Exams will consist of a mix of multiple choice, fill-in-the-blank, matching (particularly for terminology), true/false, short and long answer questions and problems to be worked. In some sections, you may be able to choose from among a set of questions. Exams are not cumulative. See Exams in the Course Materials content area on Blackboard for exam study guides.

Class participation will also be considered in determining your course grade.

There will be no "extra-credit" assignments and make-up tests will not be given. Students will have an opportunity to check their graded exams but the instructor will retain all exams.

Exams will consist of a mix of multiple choice, fill-in-the-blank, matching of terms with definitions, short answer, longer answer and problems to be worked. In some sections, you will be able to choose from among a set of questions.

Academic integrity:
Hunter College regards acts of academic dishonesty (e.g., plagiarism, cheating on examinations, obtaining unfair advantage, and falsification of records and official documents) as serious offenses against the values of intellectual honesty.   The college is committed to enforcing the CUNY Policy on Academic Integrity and will pursue cases of academic dishonesty according to the Hunter College Academic Integrity Procedures.

The use of artificial intelligence (AI) is strictly prohibited in all coursework and assignments. This includes, but is not limited to, the use of AI-generated text, speech, or images, as well as the use of AI tools or software to complete any portion of a project or assignment. Any violations of this policy will result in disciplinary action, up to and including a failing grade for the assignment or course. Our goal is to encourage critical thinking and creativity, and the use of AI detracts from this objective. Students are expected to use their own knowledge, research and analysis to complete coursework.

I have **zero tolerance** for any of the offenses described above. The Dean of Students will be advised of any incident of suspected academic dishonesty.

Students with disabilities:
In compliance with the American Disability Act of 1990 (ADA) and with Section 504 of the Rehabilitation Act of 1973, Hunter College is committed to ensuring educational parity and accommodations for all students with documented disabilities and/or medical conditions. It is recommended that all students with documented disabilities (Emotional, Medical, Physical and/ or Learning) consult the Office of AccessABILITY located in Room El124 to secure necessary academic accommodations. For further information and assistance please call (212) 772-4857/TTY (212) 650-3230).

Hunter College Policy on Sexual Misconduct:
In compliance with the CUNY Policy on Sexual Misconduct, Hunter College reaffirms the prohibition of any sexual misconduct, which includes sexual violence, sexual harassment, and gender-based harassment retaliation against students, employees, or visitors, as well as certain intimate relationships. Students who have experienced any form of sexual violence on or off campus (including CUNY-sponsored trips and events) are entitled to the rights outlined in the Bill of Rights for Hunter College.
      a. Sexual Violence: Students are strongly encouraged to immediately report the incident by calling 911, contacting NYPD Special Victims Division Hotline (646-610-7272) or their local police precinct, or contacting the College's Public Safety Office (212-772-4444).
      b. All Other Forms of Sexual Misconduct: Students are also encouraged to contact the College' s Title IX Campus Coordinator, Dean John Rose (jtrose@hunter.cuny.edu or 212-650-3262) or Colleen Barry (colleen.barry@hunter.cuny.edu or 212-772-4534) and seek complimentary services through the Counseling and Wellness Services Office, Hunter East 1123.
CUNY Policy on Sexual Misconduct Link: http://www.cuny.edu/about/administration/offices/la/Policy-on-SexualMisconduct-12-1-14-with-links.pdf

Attendance:
You are expected to be present and punctual for each class meeting.

Academic calendar:
See https://hunter.cuny.edu/students/registration/academic-calendar/

Schedule: Course content and schedule may be changed at the instructor's discretion. The dates for holidays, withdrawal, and final exams were taken from the academic calendar and should be checked by the student against the official academic calendar. All other dates are approximate.

Week	Date	Topic	Assignments
1	5/30 5/31 6/1 6/5	Chapter 1: Introduction Some material from Chapter 12 is integrated into Chapter 1 coverage.	Read Chapter 1. HW: 1.1 - 1.6, 1.8, 1.10 – 1.12, 1.14, 1.16, 1.18 -1.20, 1.24 – 1.27. Read Chapter 12 on I/O Systems as a review or introduction to material which may have been covered in CSCI 260.
2	6/6 6/7 6/8 6/12	Introduction, continued	
3	6/13 6/14 6/15 **6/19** 6/20	Operating System Structures Chapter 3: Processes **College closed**	Read Chapter 2. HW: 2.1 - 2.8, 2.11, 2.13, 2.15 – 2.17,2.19 - 2.20. Read Chapter 3. HW: 3.5, 3.6, 3.8, 3.10, 3.15.
4	6/21 6/22 **6/26** 6/27	Processes, continued Chapter 4: Threads and Concurrency Chapter 5: CPU Scheduling **Exam 1** Chapter 5, continued	Read Chapter 4. HW: 4.1 - 4.4, 4.8 - 4.11, 4.13, 4.15, 4.16, 4-20 Read Chapter 5. HW: 5.2, 5.6, 5.8, 5.9 5.11, 5.12, 5.14, 5.20, 5.23, 5.26, 5.28, 5.29. Covers Chapters 1 – 3.
5	**6/28** 6/29 7/3 **7/4** 7/5	**Classes follow Monday schedule** Review exam; Chapter 5, continued Chapter 6: Synchronization Tools Chapter 6, continued Chapter 9: Main Memory **College closed** **Midterm** Chapter 9, continued	Read Chapter 6. HW: 6.1 – 6.8, 6.12, 6.15, 6.17, 6.19, 6.20, 6.23, 6.24, 6.26. Read Chapter 9. HW: 9.1, 9.2, 9.4 – 9.7, 9.10 – 9.12, 9.14 – 9.19, 9.25 – 26. Covers Chapters 4 – 6.
6	7/6 7/10 7/11 **7/12**	Review exam Chapter 10: Virtual Memory Chapter 18: Virtual Machines **Final Exam 3:20 – 4:35 (75 minutes)**	Read Chapter 10. HW: 10.1 - 10.3, 10.5, 10.7, 10.8, 10.13, 10.15 - 10.17, 10.19 – 23, 10.29 – 10.32, 10.36 - 10.38, 10.40, 10.41. Read Chapter 18. HW 18.1 – 18.6. Read Basics of Emulation Techniques Used by VMMs. Covers Chapters 9, 10 and 18.

Supplementary references:
These book(s) are on reserve in the library and can be optionally used as a supplemental resource:

Stallings, William, *Operating Systems: Internals and Design Principles*, 8th Ed., Prentice-Hall, ISBN 0133805913 QA76.76 .O63 S733 2015