

Fall 2020

## CS 332-005: Principles of Operating Systems

Alex Gerbessiotis

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## 1.1 CONTACT INFORMATION

**Instructor:** Alex Gerbessiotis  
**Office:** GITC 4213, 4th floor  
**Office Hours:** Check course web-page  
**Assistant:** TBA on WEB  
**Class Hours:** Tue and Thu 2:30-3:50pm, Online Webex  
**Web-Page:** <http://www.cs.njit.edu/~alexg/courses/cs332/index.html>  
**Web-Page:** <http://web.njit.edu/~alexg/courses/cs332/index.html>

**E-mail:** alexg+cs332@njit.edu  
**Tel:** (973)-596-3244

## 1.2 COURSE ADMINISTRATION

**CourseWork:** 3 exams (including the final); 5 Homeworks (HW) ;  
Points: 1000 points = Ex1(250) + Ex2(250) + Ex3(350) + HW(150)

**HW:** Five homeworks due before noon on a Thu. Submission through canvas.njit.edu.

**Exams:** Dates in Course Calendar. Exam1,2: 75min, Exam 3 (final): 120min. ProctorU Review+ will be used for the exams. Exam 3 is cumulative but Exam2 is not. Exams are closed everything.

## 1.3 BASELINE COURSE SYLLABUS

**Course:** CS332. Principles of Operating Systems.  
**Credits:** 3 credits.  
**Prerequisites:** CS 114 or CS 116 or IT 114.  
**Description:** Organization of operating systems covering structure, process management and scheduling; interaction of concurrent processes; interrupts; I/O, device handling; memory and virtual memory management and file management.  
**Textbook:** [Required/Recommended, designated] Operating Systems: Internals and Design Principles 9th edition, William Stallings, Pearson. ISBN-13: 978-0-13-467095-9, ISBN-10: 0134670957

**Learning Outcomes:**

1. Be able to describe and discuss the basic components of a modern computer-based operating system.
2. Be able to define and explain the operating systems concepts of process, thread, deadlocks, synchronization, systems calls.
3. Be able to explain file systems, and file structure and organization in an operating system.
4. Learn how different CPU scheduling algorithms work, compare and explain their relative merits.
5. Understand memory organization, physical and virtual memory, and differences between segmented and paged memory, and be able to describe their usage and relative merits.
6. Understand I/O and I/O device behavior and be able to compare and explain the merits of interrupt-driven vs DMA access.
7. Describe and reason about the interactions among the various basic components of a computer-based operating system.

**Topics (with references to chapters of the designated textbook):**

- T01.** Computer system overview (chap 1)
- T02.** Operating system overview (chap 2)
- T03.** Processes (chap 3)
- T04.** Threads (chap 4)
- T05.** Scheduling (chap 9)
- T06.** Multiprocessor scheduling (chap 10)
- T07.** Memory management (chap 7)
- T08.** Virtual memory (chap 8)
- T09.** I/O Management and disk scheduling (chap 11)
- T10.** File management (chap 12)
- T11.** Process Synchronization (chap 5)
- T12.** Concurrency and deadlocks (chap 6)
- T13.** OS security (chap 13)

## 1.4 CALENDAR

Fall 2020		
Week	Item Out	Item In
W01	HW1 out on 9/1	Week starts on a Tue!
W02		HW1 in on 9/10
W03	HW2 out on 9/15	
W04		HW2 in on 9/24
W05	Exams on Thu!	<b>Exam 1 is on Oct 1; ProctorU</b>
W06	HW3 out on 10/6	
W07		HW3 in on 10/15
W08	HW4 out on 10/20	
W09		HW4 in on 10/29
W10		<b>Exam 2 is on Nov 5; ProctorU</b>
W11		
W12	HW5 out on 11/17	
W13		Thanksgiving Week no class Thu
W14		HW5 in on 12/3
W15		12/10 is last day of classes
W16	Ask Registrar for	<b>Exam 3 date ? ;ProctorU</b>

**Any modification/deviation from the calendar and its items will be done in consultation with the attending a class students and be posted on the course web-page. It is imperative that students check the course web-page regularly and frequently. Exceptions are as announced by the Provost's Office.**

## 1.5 COURSE POLICIES

**OARS:** If you need special accommodations, contact the Office of Accessibility Resources and Services, KUPF 201, to discuss your specific needs. A Letter of Accommodation Eligibility from OARS authorizing your accommodations will be required and should be received by us at least two weeks plus two days before the first exam, if it also relates to exams.

**MISSING:** If you miss a class, you make up for lost time. If you miss an exam 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 and email the instructor of your intent and absence. The maximum accommodation period will be the number of missing days to the exam date: it is imperative then that you contact DOS even before the 2 working day period has expired if the accommodation period would be shorter. For Exam1, a DOS approval will get you a scaled Exam2 grade for Exam1. A makeup for Exam 2 will be given in the rarest of cases or a scaled Exam 3 grade will be used.

**Devices:** Power down and switch off (not just silence) mobile and other devices and place them in a bag or backpack or on the floor, screen facing down. **IF A STUDENT GETS CAUGHT HAVING A DEVICE (on or off) ON HIM/HER, the exam receives a 0. DEVICES MUST BE OFF and NOT ON YOU. For ProctorU exams "ON YOU" means anywhere viewable including at a distance of less than 6ft. A not completely powered down device of yours is assumed to be "ON YOU" independently of proximity.**

## 1.5 COURSE POLICIES (continued)

- Grading:** For paper exams, if any, do not use pencils to write down your answers. If you do use a pencil do not complain about grading after an exam. Scratch paper is forbidden unless explicitly allowed in an online exam. Work submitted will be graded for conciseness and correctness; be brief and to the point and write clearly. Material covered in class and appearing in the relevant notes and chapters of the designated textbook can be used without proof. Everything else requires a proof (justification) of solution.
- Grades:** Check marks and report errors promptly. **Resolve any issues WITHIN 2 CALENDAR WEEKS and before the first Reading Day** starting from the day an exam is returned/released, or homework graded. For the Final exam, within 5 calendar days from the day grades are posted on canvas or Banner, as applicable. Talk to the grader first, and then to the instructor (if different). The final grade is decided on a 0 to 1000 point scale. If you get less than 500 points in the class, expect an F or D. If you collect at least 500 points you should expect a C or better. 850 points or more are usually needed for an A but this threshold can be lower. (All these assuming no violation of the Collaboration policy.)
- Incomplete:** A grade of I(incomplete) is given in rare cases where work cannot be completed during the semester due to documented long-term illness or absence (e.g. unexpected national guard duty). A student needs to be in good standing (i.e. passing the course before the absence). An email (in lieu of a written letter) with a timeline of what is needed to be done will be sent to the student and the Department Chairperson. Not showing up in the final will probably get you an F rather than an I.
- Collaboration:** **Collaboration of any kind (in HW, Exams) is PROHIBITED. Students must turn in work that has fully been composed and written by them and no-one else. Finding an answer on the Internet, Web, or otherwise, or it is product of someone else's work, or it is common with another student submission, in the same or other section/course risks punishment as outlined by the University. All parties of such interaction receive a 0 and letter grade is lowered by one or two levels. The work you submit must be the result of your own mental effort.**
- Email/SPAM:** Use an NJIT email address or your email might not reach us. Send email to the designated course email address per Handout 0 instructions!

**The NJIT Academic Integrity (Honor) Code will be upheld; violations will be reported to the Dean of Students (DOS). Read this handout carefully!** ■