University of Delaware

CISC 361 – Operating Systems

Spring 2021

1 Administrative Information

- Instructor: Chien-Chung Shen
- Contact Information:
  - Office: 450 Smith Hall
  - Email: `cshen@udel.edu`
  - Phone: (302) 831-1951
  - Zoom: `https://udel.zoom.us/j/3028311951`
  - Office Hours: Tuesday 3:15–4:15 pm, Wednesday 3:45–4:45 pm, and by appointment
- Meeting Schedules:
  - 010 & 013: MWF 1:25 pm – 2:15 pm on https://udel.zoom.us/j/94294798780
  - 011 & 014: MWF 2:30 pm – 3:20 pm on https://udel.zoom.us/j/92263692732
- Teaching Assistants
  - Mr. Syed Ali Asif
    - email: `asifrabi@udel.edu`
    - Office Hours for all sections: Tuesday 12:30 – 1:30 pm and Thursday 1:30 – 2:30 pm
    - Zoom: `https://udel.zoom.us/j/4545387589`
  - Mr. Yang Wu
    - email: `wuyang@udel.edu`
    - Office Hours for all sections: Monday 9 – 11 am
    - Zoom: `https://udel.zoom.us/j/9169502677`
- Textbooks:
  - zyBook: Operating Systems
    1. Sign in or create an account at `learn.zybooks.com`
    2. Enter zyBook code: `UDELCISC361ShenSpring2021`
    3. Subscribe
  - Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau, Operating Systems: Three Easy Pieces (OSTEP). [free online access]
  - Suzanne J. Matthews, Tia Newhall, and Kevin C. Webb, Dive into Systems (DIS). [free online access]
  - W. Richard Stevens and Stephen A. Rago, Advanced Programming in the UNIX Environment, 3rd edition, Addison Wesley (2013), ISBN 0-32-163773-9 or 978-0321637734. [UD ebook]

  - Russ Cox, Frans Kaashoek, and Robert Morris, Xv6, a simple Unix-like teaching operating system, MIT.

- Recommended Books:
  - Thomas Anderson and Michael Dahlin, Operating Systems: Principles and Practice, Recursive Books, ISBN-10: 0985673524, ISBN-13: 9780985673529, 7/15/2014.
  - Thomas W. Doeppner, Operating Systems In Depth: Design and Programming, Wiley 2011, ISBN: 978-0-471-68723-8.
  - Avi Silberschatz, Peter Baer Galvin, and Greg Gagne, Operating System Concepts, 9th Edition, John Wiley & Sons Inc., ISBN 978-1-118-06333-0.
  - Brian Kernighan and Dennis Ritchie, The C Programming Language, 2nd edition, Prentice Hall (1988), ISBN 0-13-110362-8.
  - Syed Mansoor Sarwar and Robert M. Koretsky, UNIX: The Textbook, 3rd edition, Chapman and Hall/CRC (2016), ISBN 0-32-122731-X or 978-0321227317.
  - Jean J. Labrosse, uC/OS-III: The Real-Time Kernel, Micrium Press, 2009, ISBN 9-78-098233753-0 or 978-0982337530.

- Course website: `https://www.cis.udel.edu/~cshen/361`
- Piazza signup: `https://piazza.com/udel/spring2021/cisc361`
- Piazza website: `https://piazza.com/udel/spring2021/cisc361/home`

2 Course Statement

This course introduces students to the **principles/design** and the **practice/implementation** of operating systems. The lectures focus primarily on the principles and design of operating systems; course projects expose students to the design and implementation aspects of operating systems, and 'large' software systems in general. The main concepts taught in this class include process, concurrency, multi-threading, mutual exclusion, synchronization, scheduling, memory management, virtual memory, file systems, and distributed systems in modern, multiuser, multitasking operating systems such as Unix.

3 Student Background

The prerequisites for this course are:

- A minimum grade of C− in both CISC220 and CISC260/CPEG222.
- Ability to design, code, compile, and execute programs in `C` on a Unix (Linux) machine.

I expect that you are here to learn, and are willing to work hard on it.

4 Work Requirement

During the semester, you are responsible for completing the assigned readings, homework assignments, (team) programming assignments, one midterm exam and the final exam.

1. Readings and participation activity

- **zyBook Operating Systems: participation activity**
- OSTEP and DIS textbooks, lecture slides, and websites (including videos)

2. Homework assignments
   - Homework assignments are based on class notes, reading assignments, and class discussions. Homework answers (in pdf) should be submitted to Canvas.
   - Late homework submissions will **not** be graded.
3. Programming assignments in teams of AT MOST TWO students
   - Programming assignments shall be implemented in the `C` language, and submitted to Canvas.
   - Late programming assignments will be penalized by 5% per day.
4. Exams
   - Midterm exam – TBA, with one sheet of letter size paper
   - Final exam – TBA, with one sheet of letter size paper
   - Exams will be based on course readings, class discussions, homework assignments, and programming assignments.

Important information (about exams, assignments, projects, policies) may only be communicated in the class. Furthermore, the lectures may contain material not contained in the textbooks, and the exams may test any material covered either in the lecture or in the textbook. If you do happen to miss lectures, you are responsible for finding out what materials were covered and if any announcements were made.

5 Grading

- Final scores will be determined using the following formula:

  2% C review self-quizzes

  10% zyBook participation activity

  10% Homework Assignments

  38% Programming Assignments

  20% Midterm Exam

  20% Final Exam

  Final grades will be determined according to the following table.

A	A-	B+	B	B-	C+	C	C-	D+	D	F
90%	87%	84%	80%	77%	74%	70%	67%	64%	60%	below

- I will **not** assign incompletes unless it is for a documented medical reason.

6 Schedule

The exact amount of lecture time devoted to each topic (and therefore homework/programming assignment dates) is subject to change, though the ordering of topics will remain generally the same.

- C and Unix debugging tools
- Operating system concepts and Shell
- Operating system structures and processes
- Concurrency: threads
- Concurrency: mutual exclusion and synchronization
- CPU scheduling
- File systems
- Memory management
- Virtual memory
- Distributed systems

7 Academic Honesty

I don't mind if you help each other with understanding the material; in fact, I encourage it. However, **all** work turned in on homework assignments, programming assignments, and exams must be your (team's) own work. If any portions of homework assignments, programming assignments, or exams are found to be shared between two (or more) students/teams, there will be 0 (zero) credit given to **all** students concerned and all students will be disciplined. We will act harshly at any sign of plagiarism or other academic misconduct. This policy is in the interest of those students who do their own work, which hopefully applies to all of you in this class. I encourage you to familiarize yourself with the University's Policy of Academic Dishonesty found in The Official Student Handbook.

8 Title IV Federal Student Aid regulation 34 CFR 668.22(a)

Compliance under Title IV Federal Student Aid regulation 34 CFR 668.22(a). A student earns federal student aid through attendance and the institution must ensure they are actively participating in enrolled courses.

9 A Note on Sexual Misconduct

Our school is committed to fostering a safe, productive learning environment. Title IX and our school policy prohibits discrimination on the basis of sex. Sexual misconduct — including harassment, domestic and dating violence, sexual assault, and stalking — is also prohibited at our school.

Our school encourages anyone experiencing sexual misconduct to talk to someone about what happened, so they can get the support they need and our school can respond appropriately. If you wish to speak confidentially about an incident of sexual misconduct, want more information about filing a report, or have

questions about school policies and procedures, please contact our Title IX Coordinator, which can be found on our school's website.

Our school is legally obligated to investigate reports of sexual misconduct, and therefore it cannot guarantee the confidentiality of a report, but it will consider a request for confidentiality and respect it to the extent possible.

As a teacher, I am also required by our school to report incidents of sexual misconduct and thus cannot guarantee confidentiality. I must provide our Title IX coordinator with relevant details such as the names of those involved in the incident.

10 The Safety of Our Learning Environment

Student learning can only occur when students and their instructors feel safe, respected, and supported by each other. On the first in-person class session of the semester you will select your seat/desk. This will become your assigned seat for the entire semester. To ensure that our learning environment is as safe as possible, and in keeping with CDC guidelines to slow the transmission of COVID-19, our in-person class sessions will adhere to the practice of physical distancing. This means that you:

- Should avoid congregating in groups outside of the classroom before and after class
- Return to your assigned seat for the entirety of the semester
- Upon entering the classroom, wipe down your seat and desk area
- May not move your chairs/desks from their designated positions at any time
- Must remain at least 6 feet apart from your classmates, Teaching Assistants, and instructors at all times
- Must wear a cloth mask that covers your nose and mouth