CSC 246: Operating Systems

(really, Concepts and Facilities of Operating Systems for Computer Scientists)

Teaching Staff

- Instructor:
  - Shuyin Jiao (sjiao2@ncsu.edu)
    - Office hours (Zoom): Tuesday 10 - 11 am
      Thursday 11 am - 12 pm
- Teaching Assistants:
  - Imranur Rahman (irahman3@ncsu.edu)
    - Office Hours: Tuesday/Thursday 12 - 2pm (Zoom) or by appointment
  - Yanbo Zhao (yzhao62@ncsu.edu)
    - Office Hours: Monday 2 - 4 pm (in-person) and Wednesday 2 - 4 pm (Zoom) or by appointment
  - Minghao Guo (mguo6@ncsu.edu) (Grader)

Electronic Resources

- Course Homepage
  - In Moodle http://wolfware.ncsu.edu
    - Announcements
    - Office Hours Calendar
    - Instructor Slides and Examples
    - Quizzes, Programming Exercises and Homework Assignments
    - Grades
- Gradescope Course Page
  - Programming Exercise and Homework Assignment Submission and Feedback Return
- Online discussion via Piazza

Course Requirements

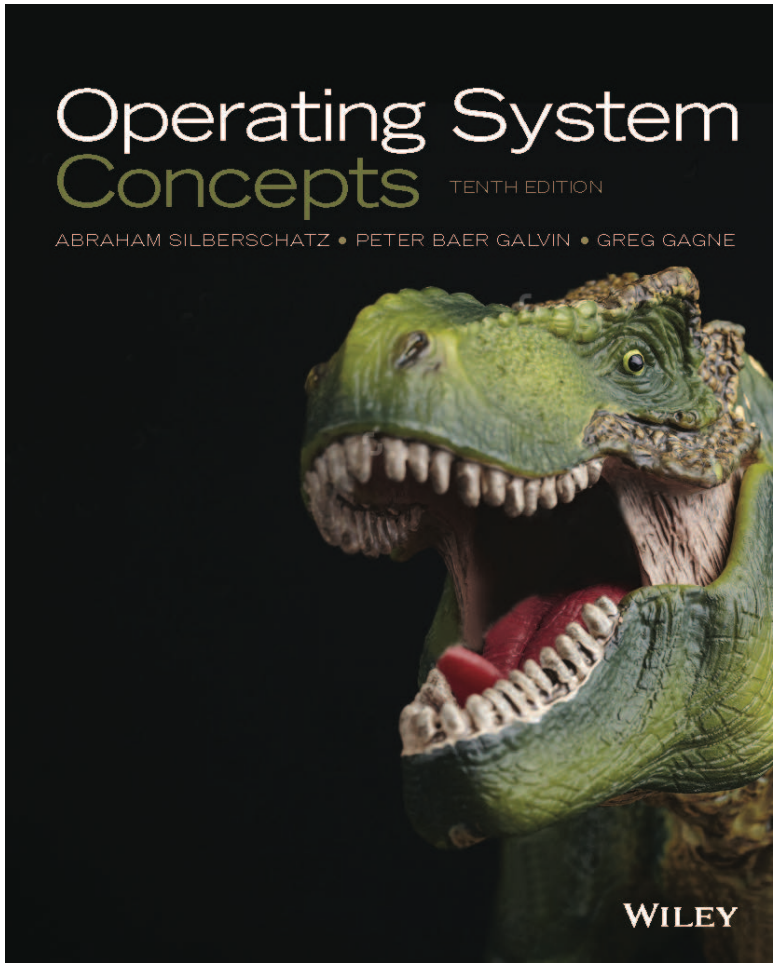
- Prerequisites
  - CSC 230: C and Software Tools
  - Programming skills in C

Course Requirements

- What to Expect
  - Lots of Material (lectures, textbooks, other documentation)
  - Homework Assignments
  - Quizzes almost every week
  - Frequent Programming Exercises
  - Midterm Exam, February 22, 11:45 am - 1 pm
  - Final Exam, May 1, 12 - 2:30 pm

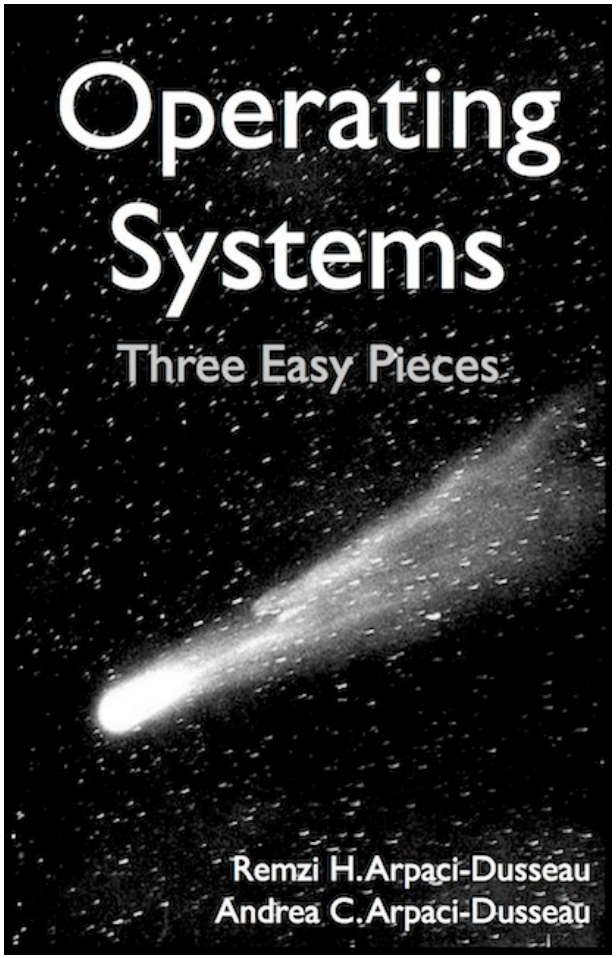
Textbook - The Official One

- Silberschatz/Galvin/Gagne Operating System Concepts, 10th Edition



Textbook - Supplementary

- Remzi H. Arpaci-Dusseau
  Andrea C. Arpaci-Dusseau
- Operating Systems:
  Three Easy Pieces
- http://pages.cs.wisc.edu/~remzi/OSTEP/



Why OS?

- Execution Environment for User Programs
  - What's provided to programs
  - What form it takes
  - How we're supposed to use it
  - How it's implemented in the OS

Topics

- Processes and Threads
- CPU Scheduling
- Synchronization
- Memory Management and Virtual Memory
- GPU Programming
- Networking and Distributed Systems
- Persistent Storage and File Systems
- Protection and Security

Read Course Schedule available on Moodle

Grading

Category	Weight
Homework Assignments	35%
Programming Exercises	15%
Quizzes	10%
Midterm Exam	15%
Final Exam	25%

Letter	Score
A+, A, A-	>= 90%
B+, B, B-	80%-90%
C+, C, C-	70%-80%
D+, D, D-	60%-70%
F	< 60%

- If necessary, we will curve those standards in your favor, but we will not raise them. A score of 90% guarantees at least an A-.
- We do not apply any curves **until** the end of the semester.

Homework Assignments

- Goals
  - Understand Key Concepts and Use Basic OS Services
  - Acquire Systems Programming Experience and Skill: Processes, Threads, Synchronization, Memory, Networking, File Systems.
- Plan
  - Seven individual Homework Assignments
  - Electronic Submission to Gradescope
    - Early Submission? ☺
    - Late Submission? 😐 48-hour late window with 25% off on the problem(s) you submit late.

Homework Assignments

- Structure
  - Short Answer Questions
  - Small- to Medium-Sized Problems to Solve
  - Medium-Sized Programming Problems
- Facilities
  - EOS Linux systems (grading environment if Gradescope auto-grader is not available.)
  - Your own Linux Machine or VM
  - MacOS machine? Mixed results.
  - Gradescope auto-grader gives you some immediate feedback

Programming Expectations

- First, your programs need to compile
- You'll need to comment and consistently indent
- Try for 20% - 25% of the source code as comments
- You can use external sources
  - Textbook, my examples, manual pages, other examples
  - You **must** credit any sources, even if you modify the source
  - You still **must** write most of your program

Submit your own work

- You can discuss assignments with others, but each of you need to write your own code.
  - During your discussion, do NOT come up with pseudo code, which will later be followed

Programming Exercises

- Little, frequent programming problems
- Due on Monday evening, at 11:59 pm
- An effort to:
  - Try out more parts of the OS
  - Get a little more practice
- Same language: C
- Same execution environment: Gradescope auto-grader or EOS Linux machines
- You get to drop your one lowest

Weekly Quizzes

- A quiz for almost every week
  - Due on Sunday evening, at 11:59 pm
  - Reflect on what you just learned
  - … and the previous lecture
  - A reason to pay attention and keep up with the lectures
  - A chance to earn some easy points
- You get to drop your one lowest

Exams

- Midterm Exam: February 22, 11:45 am - 1 pm
- Final Exam: May 1, 12 - 2:30 pm
- All exams are closed book, closed notes

Communication

- Moodle Course Site
  - For getting course materials and other resources
- Discussion Forums on Piazza
  - For asking questions outside class
  - … and getting answers from teaching staff
  - … and discussing with other students
- Office Hours
  - Office hours Google calendar link on Moodle

How to Succeed in Operating Systems

- Do the homework
  - Get started early
  - Ask questions
- Come to lecture
  - Earn easy points on quizzes
  - Be engaged in class
    - Expect to understand everything
    - Ask questions if you don’t
  - Opportunity to practice some material

How to Survive/Enjoy OS

- Use available resources
  - Moodle pages, textbook, lecture slides, examples
  - Office hours
  - Online resources, manual pages
- Let me know if I need to
  - Speak more loudly
  - Slow down (or speed up)
- **Put your effort, i.e., read the textbooks multiple times**

- Questions?

- Please read the syllabus thoroughly and carefully this week and post questions on Piazza if you have any!