

CS 350: Operating Systems

Fall 2005

Coordinates: TR 2:50 – 4:15, LH005 (Section 1)
TR 4:25 – 5:50, S2243 (Section 2)

Instructor: *Dr. Nael Abu-Ghazaleh*
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Office Hrs: 2:30–4:00 MW or by appointment

TA: Adnan Majeed (adnan@cs.binghamton.edu) Office Hours: Tue. Thu. 6–8pm, EB T-5

Prerequisites: CS220 Computer Organization and Assembly Language; Programming expertise (preferably C/C++; if not, please read the short C++ primer on class page)

Textbook: Operating System Concepts, 7th Edition. Silberschatz, Galvin and Gagne. John Wiley and Sons

References:

- Operating Systems: Internals and Design Principles, William Stallings
- Operating Systems: Design and Implementation Tannenbaum and Woodhill
- An Operating Systems VADE MECUM, Raphael Finkel

Description: Introduction to the fundamental concepts underlying the design and implementation of modern operating systems. Process concepts and process management; processor and memory management; virtual memory; file systems; input/output subsystems; protection; security issues. Introduction to distributed systems.

Outline: Emphasis on Fundamental issues and tradeoffs with examples from Linux, Windows and other Operating Systems. Preliminary outline:

- Introduction and Motivation
- Computer System and OS overview
- Processes and Process Management
- Threads
- CPU Scheduling
- Concurrency, Mutual Exclusion and Synchronization
- Deadlock and Starvation
- Memory Management
- Virtual Memory
- File System
- I/O System
- Advanced Topics: Distributed Operating Systems; Security; Networking; etc... Time Permitting.

- Policies:**
- Problems (mostly from the book) will be assigned from time to time (4 or 5 total) and are generally due one week from the date they are assigned. The worst of the homeworks will not count towards your grade.
 - There will be 2–3 programming assignments. These are fairly large and will require time and effort, especially if you have not done this sort of thing before. You will work in groups of 3. Need to learn Unix (or Linux) quickly and brush up on your C++.
 - You have a total of 4 slack days that you can spend on the homeworks and programming assignments. You decide how to spend them (e.g., one assignment can be 4 days late, or 4 assignments can each be one day late). After you run out of slack, each late day you will be penalized 15% of the credit for that assignment – no exceptions.
 - There will be two midterms (dates announced in class). The final exam is comprehensive and will be conducted during finals week. The better of your midterms will count for more than the worst (1.5 times).
 - Academic dishonesty in any form will not be tolerated (F in class, and incident reported in your file). Play fair.
 - The class homepage is at <http://www.cs.binghamton.edu/~nael/cs350>. This page will also have class related announcements and links to resources including class notes (see below). Please check it regularly.
 - Copies of class slides will be posted to the class webpage. I usually prepare the slides the day of the lecture (at least a couple of hours before class).
 - Operating systems is a serious and important class. The amount of work required for a thorough coverage of the topics is above average for computer science classes (I am told that at MIT undergraduate OS has the reputation of being the hardest class in the *university*). Please be prepared for this.
 - Keys to a good grade: (i) come to class; (ii) keep up with the reading; and (iii) have good work habits (start projects and homeworks early). **Ask for help as soon as you dont understand anything (come to office hours, I am willing to schedule time outside of office hours if you need more help)**. Use the TA. Ask questions, and participate in discussions (each lecture has at least 15 minutes set aside for discussion). It will be more fun (for all of us) if I dont end up lecturing AT you.

Grading: Class participation (5%), Written Assignments (20%), Programming Assignments (30%), Midterms (25%), Final exam (20%)

Good luck!