∞ COMP 345 Operating Systems ∞
M-W-F Lecture – 11:30-12:20

Who:	Michael Gousie
Where:	Science Center 1325
When:	Mon 2:00-3:30; Wed 1:30-2:30; Thu 2:00-3:30
	and by appointment
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Required Text:

Modern Operating Systems, 4th Edition, by Tannenbaum and Bos (Pearson, 2015).

Course Content/Prerequisites

This is a course on general operating systems theory, with special emphasis on parallel programming and the use of multiple cores. At the end of the course, you should be able to answer questions such as:

- How do multiple processes run on one processor?

- How do you take advantage of multiple processors?

- How is data retrieved from or stored in RAM? On disk?

Knowing some hardware is helpful, so the course is a bit easier if you have had COMP 220 - Computer Organization; however, some of this material will be reviewed in class. You will be expected to review some hardware issues on your own.

To put theory into practice, there will be several projects, all written in C++. Two of the projects will deal with concurrency, and use tools specific to the Linux operating system, which is available on the computers in csLab and also via free download. The text has a chapter devoted to Linux, and you will get additional handouts in class. The other projects will be simulations that put your knowledge of operating system concepts to the test.

Grading:

There will be two exams during the semester and a final exam. The exams are worth 50% of your grade. Programming projects will account for another 44% of your grade. One or more of these can be done with a partner. Homework problems will make up the remaining 6%.

Grades will be assigned according to the following scale:

A = 93-100, A- = 90-92, B+ = 87-89, B = 83-86, B- = 80-82, etc.

Exam Schedule:

Exam	Weight	Date
Exam 1	15%	October 9
Exam 2	15%	November 6
Final	20%	December 15 @ 9:00 AM

Project Schedule:

Project	Weight	Topic	Due Date
OS1	8%	Threads	September 24
OS2	12%	CPU scheduling simulation	October 15
OS3	12%	Mutual exclusion	November 1
OS4	6%	Memory usage	November 19
OS5	6%	Working set simulation	December 10

Course Policies:

- You are responsible for all material covered in class.

- You are responsible for all reading assignments, indicated on the schedule below.

- If you must miss a quiz or exam for any reason, you must inform me BEFORE the test. Except in the case of emergency, illness (almost death), or Bill Gates has finally destroyed the universe, makeup exams will not be given.

- Some of the programming assignments must be completed using Linux, either in csLab or on your own computer. The other programming projects can be done on any platform, as long as ANSI C++ is used. All programming projects will be handed in electronically.

- Written homeworks should be neat and done on loose-leaf or printer paper. Do not tear paper out of a notebook. Staple multiple pages together.

- Assignment due dates are FIRM.

  - All programming projects must be submitted electronically by 11:59:59 PM on the due date, unless noted otherwise on the specification sheet. Projects submitted on the following day will receive a 15% penalty. Anything turned in later will receive a 0. Hard copy must be submitted at the beginning of class on the next day or as instructed in the project specifications.
  - Written homeworks must be submitted at the beginning of class on the due date. There is no provision for homework turned in late.

- You are expected to adhere to the Honor Code.

  - Although *discussion* of assignments is encouraged, the *implementation* of programs is to be the result of your, or your group's, own work. Any copying of programs or portions of programs will result in a 0 for that assignment or failure of the course.
  - Written homework should absolutely be your own work.
  - Collaboration on exams is prohibited.
  - You will be required to write and sign an Honor Code pledge on all work turned in: *I have abided by the Wheaton Honor Code in this work.*
  - Any violation of the above guidelines will result in a 0 for that assignment or exam, and/or a failing grade for the course.

- Except when an in-class exercise/problem is being worked on, **the use of a laptop or other computer/pad is not allowed during lecture.** Special arrangements can be made if necessary.

- The use of cell phones, iPods, iPads, iPhones, iPlops, iFlops, and other personal electronic devices is prohibited during class and exams.

Course Schedule (Subject to change):

Week #	Week Begin	Topic	Reading
	August		
1	30	Introduction, basic structures	Chapter 1
	September		
2	6	Processes, Linux threads	Chapter 2, Sections 2.1–2.2
3	13	Synchronization	Chapter 2, Section 2.3
4	20	CPU scheduling, OS2 project discussion	Chapter 2, Sections 2.4–2.5
5	27	Linux semaphores	Handouts
	October		
6	4	Deadlocks, Exam 1	Chapter 6
7	11	OCTOBER BREAK, Multiple processors	Chapter 8
8	18	Memory management	Chapter 3, Sections 3.1–3.4
9	25	Paging, segmentation	Chapter 3, Sections 3.5–3.7
	November		
10	1	File systems, Exam 2	Chapter 4
11	8	Input/output	Chapter 5
12	15	The Cloud	Chapter 7
13	22	Security, THANKSGIVING BREAK	Chapter Turkey
14	29	More security	Chapter 9
	December		
15	6	Case study	TBD
	13	Final exam, December 15 @ 9:00 AM	