EECE.4810/EECE.5730: Operating Systems

Spring 2017

Syllabus

Course Meetings

Section 202: MW 2-3:15, Kitson 305

Course Website

Main page: http://mjgeiger.github.io/OS/sp17/

Schedule: http://mjgeiger.github.io/OS/sp17/schedule.htm

Course Discussion Group

All course announcements will be posted on the discussion group—you are responsible for checking the board regularly or enabling direct e-mail updates from Piazza.

Sign up link: http://piazza.com/uml/spring2017/eece4810eece5730

Instructor

Dr. Michael Geiger
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Phone: 978-934-3618 (x43618 on campus)
Office hours: Monday 9:30-11, Wednesday 9:30-11, Thursday 1:30-3

During the above hours, student questions are my top priority. I will also be in my office MW 11-11:45 and F 10-11:45, and I am available by appointment at other times.

Feel free to stop by my office, e-mail me questions, or schedule a one-on-one appointment. Office hours are subject to change.

Textbook

A. Silberschatz, P.B. Galvin, and G. Gagne, *Operating System Concepts*, 9th Edition, 2012, Wiley.
ISBN: 978-1118063330

Course Overview

Catalog Description: Covers the components, design, implementation, and internal operations of computer operating systems. Topics include basic structure of operating systems, Kernel, user interface, I/O device management, device drivers, process environment, concurrent processes and synchronization, inter-process communication, process scheduling, memory management, deadlock management and resolution, and file system structures. Laboratories include examples of components design of a real operating systems.

Prerequisites: EECE.2160: ECE Application Programming, EECE.3170: Microprocessors I, and EECE.3220: Data Structures

Course Objectives: By the end of this course, you should understand and be able to work with all of the following fundamentals of operating systems:

1. **Process Management:** Multithreading, scheduling, synchronization
2. **Memory Management:** Memory allocation, paging, virtual memory management
3. **Storage Management:** File systems, disk management, input/output systems
4. **Protection and Security:** Access rights and control, system security
5. **Distributed Systems:** Networks, socket programming

Grading: Grades will be computed on an A to F scale; A+ grades may only be assigned in the graduate course (EECE.5730), in accordance with UMass Lowell policy. The weights assigned to the various items are:

Programming/homework assignments	55%
Midterm exam	20%
Final exam	25%

Incomplete grades will only be given in exceptional situations, and the student must be passing the class at the time the grade is requested.

Please note that students in EECE.5730 will be required to complete more work than students in EECE.4810. This additional work may take the form of additional assignments, extra problems on assignments given to the whole class, and/or extra exam problems.

Exams: Make-up exams will only be offered in exceptional circumstances. You must notify your instructor as early as possible in order to determine an appropriate make-up date.

Class participation: You are responsible for all material discussed or announced in class. You are expected to attend class regularly and participate in any in-class discussions, as such exercises are essential to your learning. Although lecture attendance is not explicitly required, regular attendance will improve your understanding of the course concepts.

Programming/homework assignments: Your assignments will be a mix of typical homework problems and group programming projects. All assignments will be posted on the course web page and discussion group.

Assignment policies include the following:

- Problem sets:
    - All problem sets must be completed individually.
    - All assignment solutions must be clearly legible.
    - Although typewritten solutions are preferred, handwritten solutions are acceptable in some cases.
    - All electronic submissions <u>must</u> be combined into a single file—archive files are not acceptable, nor are scanned pages in which each page is in a separate file. Failure to follow this rule will result in a 10 point deduction.
- Programming projects:
    - All programming projects can be completed in groups of up to 4 students unless otherwise specified.
- Late policy:
    - Assignments are penalized at a rate of 10% per day, including weekends and holidays.
    - Assignments more than 5 days late will not be accepted.

Academic Honesty

All problem sets and exams must be completed individually unless otherwise specified. Group programming projects should be completed with no collaboration between groups. You may discuss concepts or material covered in class, but may not share any details of your solutions to assigned problems, including algorithms and code. Plagiarism is also unacceptable and will be treated as an instance of cheating.

Any assignment or portion of an assignment that violates this policy will receive a grade of zero for all parties concerned. Depending on the severity of the infraction, or in cases of repeat violations, additional penalties may be given at the instructor's discretion, up to and including a failing grade in the course.

Further information on the university Academic Integrity policy can be found at:

http://www.uml.edu/Catalog/Undergraduate/Policies/Academic-Policies/Academic-Integrity.aspx

Course Schedule

This schedule contains a tentative schedule of topics we will cover throughout the term; the course website will contain the most up-to-date version. The web page will also describe which section(s) of the textbook are associated with each lecture and the due dates for each assignment.

Please note that the midterm exam will be held **Wednesday, March 8 (time and location to be determined)** and the final exam will be held **at a date/time to be determined**.

Also, please be aware of the deadlines for withdrawing with a grade of "W": undergraduate students (even those taking EECE.5730) must withdraw by **Wednesday, 4/5**, while graduate students must withdraw by **Friday, 4/21**.

Week	Date (M)	Lecture Topics
1	1/16	*No Monday lecture—Martin Luther King, Jr. Day* Course introduction/overview
2	1/23	Processes and process management
3	1/30	Threads
4	2/6	Synchronization
5	2/13	Memory management and virtual memory
6	2/20	*No Monday lecture—Presidents Day* *Lecture on Tuesday, 2/21 (Mon. schedule)* CPU scheduling
7	2/27	CPU scheduling (continued)
8	3/6	Midterm exam preview **WEDNESDAY, 3/8: MIDTERM EXAM**
9	3/13	*No classes—Spring Break*
10	3/20	Operating systems, networks, and distributed communication
11	3/27	File systems
12	4/3	Distributed systems
13	4/10	I/O systems, mass-storage structure
14	4/17	*No Monday lecture—Patriots' Day* *Lecture on Friday, 4/21 (Mon. schedule)* Protection and security
15	4/24	Case studies Final exam preview
	TBD	**FINAL EXAM**