EECE.4810/EECE.5730: Operating Systems
Spring 2019
Syllabus

Course Meetings

Section 201: MWF 2-2:50 PM, Kitson 305

Course Website

Main page: http://mjgeiger.github.io/OS/sp19/

Schedule: http://mjgeiger.github.io/OS/sp19/schedule.htm

<u>All</u> course announcements will be posted on the course Blackboard page. You are responsible for checking that site, as well as the sites listed above, on a regular basis.

Instructor

Dr. Michael Geiger
<u>E-mail:</u> Michael_Geiger@uml.edu
<u>Office:</u> Ball Hall 301A
<u>Phone:</u> 978-934-3618 (x43618 on campus)
<u>Office hours:</u> Monday/Wednesday/Friday 1-1:50 PM; Tuesday/Thursday by appointment only

During office hours, student questions are our top priority. Feel free to stop by the office, e-mail questions, or schedule a one-on-one appointment. Office hours are subject to change.

Teaching Assistant

Santosh Pandey
<u>E-mail:</u> Santosh_Pandey@student.uml.edu
TA office hours will be posted ASAP.

Recommended Textbook

T. Anderson and M. Dahlin, *Operating Systems: Principles and Practice*, 2nd Edition, 2014, Recursive Books.
ISBN: 978-0985673529

Course Overview

<u>Catalog Description:</u> 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.

<u>Prerequisites:</u> 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, distributed file systems

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. Also note that students in graduate courses cannot earn grades of C-, D+, or D—the only grade below C is an F.

The weights assigned to the various items are:

Programming/homework assignments	55%
Exam 1	15%
Exam 2	15%
Exam 3	15%

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

Important notes:

- **Students in EECE.5730 will be required to complete more work than students in EECE.4810. This additional work may take the form of extra assignments, extra problems on assignments given to the whole class, and/or extra exam problems.**
- **Your grade is based strictly on the work you do during the semester. Please do not ask for extra credit work to improve your grade—any extra credit work we give is available to the whole class, not just the students who ask for it.**

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.

<u>Programming assignments:</u> You will have to complete 3-4 large programming projects, as well as potentially writing some smaller programs as well. All assignments will be posted on the course web page and discussion group.

Assignment policies include the following:

- Projects will be submitted via Blackboard. You will have to submit all source code as well as the makefile used to build your code. Each project will specify minimum requirements for code submissions.

- Projects may be written in C or C++ unless otherwise specified.

- Your solutions must run on a Linux machine in Ball 410 after being compiled with gcc (C) or g++ (C++)

- Each assignment will specify whether it is to be completed individually or in a group. When groups are allowed, the maximum group size will be 3 students.

- 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 textbook sections associated with each lecture and the due dates for each assignment.

The exam dates will be fixed shortly after the start of the semester. Tentative dates for the first two exams are shown below (during weeks 5 and 10), and the third exam will be held **during final exams, at a date and time to be determined by the registrar's office**.

Also, please be aware of the deadlines for withdrawing with a grade of "W": undergraduate students (even those taking EECE.5730) must withdraw by **Tuesday, 4/9**, while graduate students must withdraw by **Friday, 4/26**.

Week	Date (M)	Lecture Topics
1	1/21	*No Monday lecture—classes start 1/22* Course introduction/overview Processes and process management
2	1/28	Processes and process management
3	2/4	Multithreading
4	2/11	Synchronization basics
5	2/18	*No Monday lecture—Presidents Day* *Tuesday, 2/19 follows Monday schedule* **EXAM 1 (W 2/20 or F 2/22)** Synchronization (continued)
6	2/25	Synchronization and deadlock
7	3/4	CPU scheduling
8	3/11	*No classes—Spring Break*
9	3/18	CPU scheduling (continued)
10	3/25	**EXAM 2 (M 3/25 or W 3/27)** Memory management
11	4/1	Memory management (continued)
12	4/8	Memory management (continued)
13	4/15	*No Monday lecture—Patriots' Day* File systems
14	4/22	Protection and security
15	4/29	Topics TBD Exam 3 Preview (Friday, 5/3) *Classes end Friday, 5/3*
	TBD	**EXAM 3: during finals; time/location TBD**