UMBC CMSC 421 (Section 04) – Principles of Operating Systems
Tuesday/Thursday 11:30AM - 12:45PM – University Center 115

Instructor: Mr. Lawrence Sebald (lsebald1@umbc.edu)
Office and Hours: ITE 368 – Tuesday/Thursday 12:45PM - 1:45PM and by appointment

Course Description:

An introduction to the fundamentals of operating systems. Topics include interprocess communication, process scheduling, deadlock, memory management, virtual memory, file systems and distributed systems. Formal principles are illustrated with examples and case studies of one or more contemporary operating systems.

Course Website:

http://bluegrit.cs.umbc.edu/~lsebald1/cmsc421-sp2016/
https://piazza.com/umbc/spring2016/cmsc42104/home

Required Textbook:

Operating System Concepts (9th Edition). Silberschatz, Galvin, and Gagne. Wiley, 2012 – ISBN-13: 978-1-118-06333-0.

Prerequisites:

(CMSC 341 or CMSC 341H) and (CMSC 313 or (CMPE212 and CMPE310)) all with a grade of C or better.

Topics to be covered:

- Operating System Structures
- Processes
- Threads
- Process Synchronization
- CPU Scheduling
- Deadlocks
- Memory Management/Virtual Memory
- Storage and Filesystems
- I/O
- Protection and Security
- Special Topics

Course Objectives:

At the core of the software of any computer system is that computer's operating system kernel. The kernel is responsible for maintaining the state of the various processes running on the computer, managing the computer's memory, delegating access to hardware, and many other core tasks. Because of it's major role in managing the computer systems, developing a deep understanding of operating system design principles is essential in the study of computer science.

In this course, students will learn the fundamental concepts of operating systems, including design and implementation techniques. Students will also develop skills to apply the concepts learned in practical applications through several programming projects.

Required Work:

You are expected to complete all assignments for the course. Assignments will consist of three exams (including a comprehensive final exam), three programming projects, and several written homework assignments. Assignments must be submitted by the given due date to receive credit.

In addition to the assigned work for the course, you are expected to attend class regularly and participate in class discussions. Pop quizzes may be given in-class at the instructor's discretion and cannot be made up if missed.

Exams:

There will be three exams in this course, including a comprehensive final exam. The format and location of the exams will be announced in class.

The final exam will be comprehensive, however it will be slightly biased toward the material presented after the second exam.

Please bring your UMBC ID or other valid government-issued photo ID when taking an exam.

If you expect to miss an exam, you must make prior arrangements with the instructor for a make-up exam. You must have a documented excuse (for instance, a doctor's note) for missing an exam.

Discussing any exam with a student who has not already taken the exam is cheating and will be dealt with in accordance with the UMBC Academic Integrity policy.

Course Discussions:

This semester, we will be using Piazza for class-related discussion. The Piazza site for the course is listed in the course website section of this syllabus. If you cannot sign up for the Piazza site, please notify the instructor as soon as possible. You should check the Piazza site regularly as the semester progresses. I hope that this site provides a useful and valuable resource to discuss class-related materials.

You are welcome to use Piazza to discuss course material, including homework assignments. However, you should be careful to not violate the academic integrity policy in your discussions on Piazza. You are forbidden from posting any answers to homework assignments on the Piazza discussion board. Also, you should not post any code for the projects on Piazza without prior approval from the instructor. If you want help with your code, you should seek out the instructor during his office hours. If you cannot make the instructor's office hours, you should attempt to make alternative arrangements with him.

The instructor will attempt to monitor the responses posted on Piazza by students, however it is not the responsibility of the instructional staff to verify the fine points of each student response.

Grading Policy:

Student grades will be determined as follows:

Assignment	**Weight**
Class Participation and Quizzes	5%
Homework	10%
Project 0	5%
Project 1	10%
Project 2	20%
Exam 1	15%
Exam 2	15%
Final Exam	20%
Total	100%

Your final grade for the course will be determined by the weighted average of your scores on the assignments, determined by the weighting shown above. Grades will be assigned on the standard letter grade scale, as follows:

$[90, 100] \implies A$; $[80, 90) \implies B$; $[70, 80) \implies C$; $[60, 70) \implies D$; $[0, 60) \implies F$.

The instructor reserves the right to curve both final and individual assignment grades. If any curve is applied, it will be to the benefit of the students.

A grade of Incomplete will only be issued under extreme situations as directed by university policy. Failure to complete assignments by the prescribed due date is not a sufficient reason to grant a grade of Incomplete.

You must take all exams and hand in a reasonable attempt at all projects in order to pass the course. While meeting this requirement does not guarantee a passing grade, failing to meet it will result in a grade of F.

Homework and Project Policy:

The following policy applies to all homework assignments and project work in the course:

- You are responsible for keeping up with assignments and other coursework. Homework assignments and the project assigned in this class will demand a significant amount of time to complete. You should start on all assignments as soon as they are assigned to guarantee that you will have the required time to complete the assignment.
- Just to emphasize the point: start on assignments as soon as they are assigned. Your projects will require a significant effort and a significant amount of time to complete.
- Assignment descriptions, due dates, etc. will be posted on the course website. Failure to check the website is not an acceptable excuse for missing an assignment or not adhering to the assignment's instructions.
- **No late assignments will be accepted.** All assignments are due by the date and time posted on the course website. Failure to complete a task and submit it by the due date will result in a score of 0 on the assignment. The only exception to this policy is if the student has a documented excuse that is acceptable under university policy.
- You are expected to complete each assignment individually. You are allowed to discuss the concepts behind assignments, however absolutely no direct collaboration on answers or code is allowed unless otherwise specified in the assignment description.

- Any written portions of assignments must be typed using a word-processor of your choice. The only acceptable formats for written portions of assignments are the PDF format or plain ASCII or UTF-8 text. PDF documents should be formatted as Letter (8.5in x 11in) or A4 (210mm x 297mm) sized pages. If you wish to submit plain text documents, no lines should contain more than 80 characters and the file must use UNIX-style (LF) line endings. Failure to meet these requirements may result in a lower grade on the assignment. **You are not allowed to submit any assignments in Microsoft Word (.doc or .docx) format. Convert Word documents to PDF for submission.**

- You may be asked to explain solutions to assignments to the instructor. Failure to demonstrate an understanding of the solution that the student has provided is considered a violation of the Academic Integrity policy.

Lab Policy:

For this class, you will have access to the computer lab in ITE 240. These computers have virtual machine software installed on them which will allow you to work on your projects. You are highly encouraged to have a USB hard drive or USB flashdrive of adequate size (at least 32 GB) in order to allow you to store your VM images so that you can use them on your personal machines as well as those in the ITE 240 lab.

Please note that this lab is shared amongst many courses in the Computer Science department. Please respect all other students who may be using the lab if you choose to use the lab yourself.

From time to time throughout the semester, the instructor may schedule lab sessions in this computer lab to demonstrate the concepts that might be used in your projects. These lab sessions are not mandatory, however you are highly encouraged to attend if it is possible for you to do so.

Academic Integrity Policy:

By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Undergraduate Student Academic Conduct Policy, consult:

`http://www.umbc.edu/undergrad_ed/ai/`

There is no tolerance for academic dishonesty in this course. Any and all acts of academic dishonesty will be treated severely, as prescribed in the UMBC Undergraduate Student Academic Conduct Policy.

The instructional staff of the course reserves the right to run cheat-checking software over any and all submissions for the course. We would much prefer if we did not have to resort to using such means, however.

ADA Compliance:

We recognize that some students may have disabilities that require special attention from the instructional staff. Please make us aware of them at your earliest opportunity so that UMBC can make suitable arrangements.