UMBC CMSC 421 (Section 02) – Principles of Operating Systems
Tuesday/Thursday 11:30AM - 12:45PM – Sherman Hall 014

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

TA: Naveen Bansal (`nbansal1@umbc.edu`)
Office Hours: Monday 1:30PM - 3:30PM, Tuesday 10:00AM - 11:00AM (Location TBA)
TA: Vedmurtty Chavan (`ved1@umbc.edu`)
Office Hours: Wednesday 2:30PM - 5:30PM in ITE 334

Course Description:

An introduction to the fundamentals of operating systems. Topics include interprocess communication, process scheduling, deadlocks, 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:

https://bluegrit.cs.umbc.edu/~lsebald1/cmsc421-sp2017/
https://piazza.com/umbc/spring2017/cmsc421/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, and Deadlocks

- Memory Management/Virtual Memory

- Storage and Filesystems

- Input and Output

- 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. All exams will take place in the normal classroom, unless you are otherwise informed by the instructor. 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. If you cannot sign up for the course Piazza, please notify the instructor as soon as possible. You should check the Piazza regularly as the semester progresses.

The Piazza board for this class is shared with section 03 of the course, and occasionally information specific to one section of the course or the other may be posted on Piazza. Be sure to pay attention when a specific section is mentioned.

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 – please see the TAs or instructor in our office hours for direct assistance with code.

The instructors and TAs will attempt to monitor the responses posted on Piazza by students, however it is not the responsibility of the staff to verify the fine points of student responses.

Grading Policy:

Student grades will be determined as follows:

Assignment	Weight
Homework, Class Participation, Quizzes	15%
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 only be to the benefit of the students.

A grade of Incomplete will only be issued under specific 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 Policies:

The following policy items apply to all homework assignments and projects assigned in this 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 especially 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.

- 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 (non-code) portions of assignments must be typed using a word-processor of your choice. The only acceptable file 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 or a grade of 0 for repeated offenses. **You are not allowed to submit any assignments in Microsoft Word (.doc or .docx), Apple Pages, LibreOffice or any other such format. Convert these documents to PDF for submission.** Written portions of homework assignments will be submitted using the course Blackboard site.

- Code portions of assignments will be submitted on GitHub (`https://github.com/`). You must have a a GitHub account in order to turn in assignments, so if you do not already have an account with GitHub, please sign up for one at your earliest convenience. You are welcome to use an already existing GitHub account, but please be sure to associate your UMBC email account with the GitHub account to ensure that it will work properly for this course.

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

Late Policy:

All assignments are to be completed by the due date posted with the assignment. However, we do realize that sometimes things happen and an you may miss the due date of the assignment. To this end, each student is allowed a single "late submission" during the course of the semester, with a 20% penalty on the grade of the assignment (that is to say that if you would have gotten a 95% on the assignment, your grade will instead be a 75%). To use your late submission, you must send an email to the instructor and the TAs informing us that you would like to use your late submission. This email must be sent before the original due date of the assignment in order to be considered a valid request. You will then be given an additional week to complete your assignment.

You are only given one late submission during the course of the semester. Any further assignments submitted past their due dates will receive a score of 0.

Late submissions may be approved by the instructor without penalty for valid excuses. If you have some sort of emergency that prevents you from turning in an assignment on time, please contact the instructor by email as soon as possible to work out an alternate plan for turning in the assignment. The instructor may require documentation of the excuse (for instance a doctor's note) before approving a late submission in these cases.

Lab Policy:

For this class, you may request cardswipe 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 or TAs may schedule lab sessions in this computer lab to demonstrate the concepts that might be used in your projects or other assignments. 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 inform Student Disability Services (http://sds.umbc.edu) of any accommodations that are needed so that appropriate arrangements can be made.