Course Information

Course Number & Title: COMP 3500 Operating Systems
Credits: 3. Credits: 3. Pre-requisites: COMP 3350 and COMP 2210 (C programming required)

Description

This course introduces students to fundamental concepts and techniques used today in most popular operating systems such as UNIX (including MacOS) and Windows. This course does not present the commands used by a given operating system. Commands are just the interface (one of the functions of an operating system) between the user and the computer. This course will rather focus on rules and policies which *govern* a computer. An operating system could be seen as a *government* that manages resources : CPU, memory, I/O, and external storage. This course introduces the policies, techniques, and rules used by this *government.*

At the end of this class, students must understand how a computer is *governed*. The students must understand the underlying concepts and criteria used to set the policies and rules of that *government*. Finally, it is expected that you will become familiar with Unix systems through laboratory assignments.

Course Objectives:
Upon completion of the course, you should be able to:
- understand the essential concepts of an operating system
- understand the underlying principles behind today's operating systems
- implement, evaluate, and compare simple CPU scheduling policies
- implement, evaluate, and compare simple memory management policies
- understand and manage the data shared problem (process synchronization)
- become familiar with a Unix based system
- learn further independently

Program Information

Program Educational Outcomes
The overall objective of the computer science program is to prepare graduates who will be successful in their chosen career paths. Within a few years of graduation, alumni of the computer science program will attain:
- **PEO 1**: Success in their chosen profession as evidenced by career satisfaction, promotions/raises, and leadership at levels appropriate to their experience.

and/or
- **PEO 2**: Success in post-undergraduate studies as evidenced by satisfaction with the decision to further their education, advanced degrees earned, and professional visibility (e.g., publications, presentations, awards, etc.).

Course Details

Required Books:
- "Operating System Concepts Essentials" by A. Silberschatz et al. published by Wiley (2nd edition. First edition is OK). ISBN: 978-1118804926

Additional Readings
Articles pertinent to each week's topics may be posted for students on Canvas.

Course Structure

The course will follow this general pattern for each module:

1. At the start of each module, students will complete any assigned readings
2. Students will watch a series of lectures on the topics covered in the module
3. Each lecture has graded *Self Study Questions* to assess and **extend** understanding
4. A graded *Review* closes the series of lectures,
5. A graded *Class Quiz*
6. For some modules, students will complete and submit a *programming assignment* for a grade.

Outline of Course

This course consists of seven modules. The following outline presents the topics to be covered in each module.

Module 1: Introduction to Operating Systems
Module 2: Processes and Threads
Module 3: CPU Scheduling
Module 4: Process Synchronization
Module 5: Deadlocks
Module 6: Memory Management (Main Memory)
Module 7: Virtual Memory

Grading Methodology

Achievement in this course will be assessed through completion of the following activities:

Assignment Type	Grade %
Self-Study Questions	15%
Reviews	5%
Laboratory Assignment 1	8%
Laboratory Assignment 2	5%
Laboratory Assignment 3	12%
Class Quizzes	10%
Midterm	15%
Final	30%
Total	100%

Activities

Activities are intended to guide you through thinking about operating systems concepts

Active Participation

Participation in class and through Piazza is expected and *appreciated*. A weak participation will not hurt your final score or letter grade. However, active, **beneficial, and helpful** (to your classmates) participation will be considered by the instructor in case your score is borderline at the end of the term.

Self-Study Questions

Self-study questions are in general multiple-choice questions that make you think about the material just covered and are designed to help you understand it better. Some questions push you **to investigate and search on your own material not covered** in the videos. You will have enough time to review or research on line for help. You will be allowed to take them twice and keep the highest score. When your answer is wrong, consider reviewing the material and think about why your answer was wrong **before** the second attempt. Take the SSQ **before the deadline**: if the second try is late, a penalty will be applied with no exception to the highest score **EVEN** if the highest score was earned before the deadline. **Do not take any second attempt after the deadline**. SSQs are due any day by 11:59pm.

Reviews
Each module will have at least one review that is similar to the Self-Study Questions, but covering a module or a part of the module. Take the Reviews **before the deadline**: if the second try is late, a penalty will be applied with no exception to the highest score **EVEN** if the highest score was earned before the deadline. **Do not take any second attempt after the deadline.** Reviews are due any day by 11:59pm.

Class Quizzes
A class quiz is a **fast paced** review. Reviews are slow paced to give you time to study and reflect about the material. Class quizzes are designed to test whether you know your material. There is only one attempt. Class **Quizzes must be completed within a restricted time window during official scheduled class times**. The class quizzes are proctored through Lockdown Browser and Respondus.

Programming Assignments
You will have one **programming assignment** about every other week to implement some new concept or to illustrate some concept not covered in class. Programming assignments can be completed in groups of AT MOST two students. **It is your responsibility to select a partner, to join a group, and announce it to the instructor at most one week after the class starts. After that, you cannot join or change a group. You can only drop from a group.**

Exams
Exams are similar to class quizzes. They are fast paced. The midterm covers modules up to Module 3. The final covers all modules. **Exams must be completed within a restricted time window during official scheduled class times**. Exams are proctored through Lockdown Browser and Respondus.

Students are expected to follow the exam administration and proctoring method described in this syllabus. Students must express any concerns regarding the proctoring method in writing to both the instructor and the department administration during the first week of class but no later than one week prior to the first exam. The department administration will forward any unresolved student concerns to the University officials who selected the proctoring options for their consideration, but the student is still expected to take the exam as required.

Grading Scale

Grades are determined on straight percentages as follows:

Letter	Range
A	90%+
B	80-89%
C	70-79%
D	60-69%
F	Less than 60%

Auburn uses a 4.0 grade scale. An A equals 4.0; B, 3.0; C, 2.0; D, 1.0; and F equals 0.0. Students must maintain a 2.0 average GPA in all courses in order to progress in this program. If addition, students must earn at least a D in each individual course in order to earn credit and progress to the next course. For more detailed information about university grading standards, please refer to information on the following link:

- [Auburn University Undergraduate Academic Policies on Grades](#)

Course Policies

Late Assignment Policy

It is very important that students submit work on time, or they will find it very difficult to keep up. All work in the course (e.g., self-study questions, reviews, homework/programming assignments, and exams) will be due by **noon** or **midnight** CT on the date noted on the class calendar. Assignments may be submitted up to two days late with a **50 POINTS** penalty per day. Students should reach out to their instructor immediately to discuss any concerns or to submit documentation of university-excused lateness.

All due dates and times in this course are specified in Central Time. For example, assignments are due no later than **noon** or **midnight** Central Time, not your local time. If you prefer, you can set Canvas to display dates and times adjusted for your local time zone. See the following URL for more information:https://community.canvaslms.com/docs/DOC-10622-4212717410

Program Policies

Citation Expectations

All research work submitted should be properly cited using the ACM Style Guide (https://www.cs.ucy.ac.cy/~chryssis/specs/ACM-refguide.pdf). For more information and tools to assist you in writing and research, refer to the citation management tools provided through the Ralph Brown Draughon Library.

Faculty Communication and Feedback

At the beginning of each course, make sure that you understand the instructor's preferred mode of communication and any specific communication protocol. For self-study questions, reviews, and all questions of interest for your classmates you **MUST U**se **Piazza** (**UP!**). **Questions of interest to other fellow classmates MUST be public (you can be anonymous)**. Use email ONLY for private logistics questions/issues. One of the best ways to be effective as a student is to understand the instructor's expectations and operate within those boundaries. Students should give the instructor 48 hours to get back to them on any communication, and one week for grading turnaround time on major assignments. If students have concerns about communication or feedback, they should always go to the professor first. Students should *courteously* explain their concerns as clearly as possible without judgment or emotion. Effective communication is an important skill, and every interaction in this program is an opportunity to develop this skill.

Online Student Learning Expectations

You are also expected to have all the equipment and software needed to be successful in the course.

All students are expected to contribute to their own learning as active and well-prepared participants. Weekly modules will provide various opportunities for reading, reflection, applied experiences, and writing. Since these activities are woven through the entire week and generally do not require your "electronic presence" at any particular time or day, there should be no need to "miss" class. You should plan on spending the same amount of preparation and "in class" time on this course as you would if you were taking the course face-to-face. Try to spread the assignments throughout the week. Try to complete self-study questions and reviews by Thursday. **Slow,..... but Steady**.

Be Patient and Courteous. Stay Calm!

Problems with technology will inevitably arise. Don't worry and just keep smiling. Some answer keys (rarely) may turn out unclear, incomplete or wrong. They may appear as tricky. The objective of the instructor is NOT to trick you. The objective is to draw attention and stress on some aspects of the lecture. Take these incidents as opportunities to discuss them on Piazza. In any case, your score will always be promptly adjusted, if justified. Please be **patient** and **courteous** with your instructor and your instructor will be **prompt** and **courteous** with you. Your instructor will always take technical problems into account if the situation warrants it.

Logging On

The learning activities for each week are carefully sequenced and offered in small chunks so you can accomplish reasonable amounts throughout the week. You should log on to the course website regularly to work through course materials and participate in Piazza discussions.

Posting Responses

Interaction between students is an important part of this course and requires prompt postings and responses. In an attempt to be efficient with our time and considerate of everyone's schedules—beyond the requirements of this course—we will operate under a consistent time structure for posting assignments and responses to Piazza discussions.

Submitting Assignments

You will submit all other types of individually written assignments by strictly following the turn in instructions spelled out in the assignment. Unless otherwise noted, assignments will be due by 11:59 **AM** or **PM** CT (check on Canvas) on the date noted on the class calendar. **ADVICE**: always download and check your submissions to insure that you submitted the RIGHT version. We grade what IS submitted, NOT what SHOULD have been submitted. Should you submit the wrong version, lateness penalty will be applied with no exception.

Academic Integrity

Auburn University has adopted an Honor System proposed by its students and faculty to promote academic integrity and has enacted the following code:

"We, the faculty, instructors, and students of the (University course here) pledge to fulfill our mutual responsibilities to each other and the academic community at large with honor and integrity in order to build and maintain a climate of respect and trust that will enhance our research, teaching, and learning. We will support the Honor System of the School, and will not tolerate activities that undermine academic integrity."

Academic dishonesty is an offense that will be reported to the Academic Honesty Committee. Please refer to the following document for further information regarding academic honesty:

- Auburn University Student Academic Honesty Code

Accessibility

Students who need accommodations are asked to electronically submit their approved accommodations through AU Access and to arrange a meeting during office hours the first week of classes, or as soon as possible if accommodations are immediately needed. If you need accommodations but have not established them, make an appointment with the Office of Accessibility, 1228 Haley Center, 334-844-2096.