CSC 139: Operating System Principles
Summer 2024

Time: Mon, Wed 9:00 AM – 12:30 PM

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Web site: https://www.csus.edu/faculty/s/ghassan.shobaki/
YouTube Channel: https://www.youtube.com/channel/UCthr5rA6EA4c1S0L2OOiygA
Personal Room on Zoom: https://csus.zoom.us/my/shobaki

Course Play List on YouTube:
https://www.youtube.com/playlist?list=PL6KMWPQP_DM-7tMNjUa7X2zGrc8jipPeI

Office Hours: 8AM-9AM Monday, Wednesday on Zoom
Extra office hours may be added as needed (usually before major exams).
Please check your email for any temporary office hour changes.

Textbook: "Operating System Concepts", 10th or 9th Edition, Silberschatz, Galvin & Gange, John Wiley and Sons

Credit Hours: 3 semester units
Course Type: Required
Prerequisites: CSC 60 and CSC 130, and either CSC 137 or CPE 185

Week(s)	Topics	Text Book Chapter(s)
1	**Introduction**	1
1	**Operating System Structures**	2
2	**Processes:** concept, operations, inter-process communication	3
3	**Threads:** concept, multicore programming, multithreading models, thread libraries, threading issues	4
3	**Process Synchronization:** critical-section problem, synchronization hardware, mutex locks, semaphores, classical synchronization problems, monitors.	5
4	**CPU Scheduling:** basic concepts, scheduling criteria, scheduling algorithms, thread scheduling, multi-processor scheduling, real-time scheduling.	6
4	**Deadlocks:** characterization, prevention, avoidance, detection, recovery	7
5	**Memory Management:** main memory swapping, allocation, segmentation, paging; virtual memory, replacement policies, frames, thrashing.	8, 9
6	**Storage Management:** disk structure and management, file system interface and implementation.	10, 12

Grading:
Assignments: 15%
Two short exams: 10% each
Midterm exam: 25%
Final exam: 40%
Although assignments are worth only 15%, exams will have questions that are directly or indirectly related to the assignments. Therefore, doing the assignments and thoroughly understanding them is practically necessary for passing this course.

Mapping numerical scores to letter grades:
A+ 95 (unofficial)
A 90
A- 85
B+ 75
B 70
B- 65
C+ 60
C 55
C- 50
D+ 45
D 40
F < 40
This mapping scheme is subject to minor adjustments that are guaranteed to be to the students' advantage, that is, the thresholds for some letter grades may be lowered but no threshold will be raised. **Important Note: You must get a passing sum in the exams (at least 42.5 out of 85) in order to pass the course. So, if the sum of your exam scores is less than 42.5 out of 85, the maximum letter grade that you can get in this course is D, no matter how high your scores in the assignments are.**

Definitions of Letter Grades:
A: Deep understanding of the material with strong analytical and problem-solving skills
B: Deep understanding of the material with good analytical skills
C: Basic understanding of the material
D: Weak or superficial understanding of the material
F: Failed to learn even the basic material

Resources and Method of Instruction
This course will be taught using the flipped-classroom method, which is based on active learning. **All exams will be held on Zoom with video turned on for proctoring**.

Synchronous sessions will be held twice a week on Zoom. There are certain recorded lectures that you must view and digest before each synchronous session. In each synchronous session, you will be given certain worksheets to work on during that session. Then, we will discuss the solutions, and you will be given the chance to ask questions. The worksheets consist of questions from past exams. The recorded lectures that you need to view before each synchronous session are listed in a separate document that has the complete schedule for this semester.

In the discussion sessions, I will ask review questions during the discussion of the worksheets. You will also be given the opportunity to ask questions. So, when you view the recorded lecture, write down any

questions that you may have so that you ask them in the discussion session. On the exams, you will be responsible for everything covered in the recorded lectures and in the Zoom sessions.

Your primary resources for this class will be the recorded lectures, the slides (already on Canvas) and the in-class worksheets, which are taken from past exams. To pass this course, you will need to view and comprehend the recorded lectures and actively participate in the synchronous sessions by actually doing the worksheets. **Reading the slides without viewing the recorded lectures or doing the in-class worksheets will not be enough to pass this course**. Exam questions will test the depth of your understanding, and that's something that you won't find in the slides. The depth and the explanations are found in the recorded lectures and in the worksheets. **The teaching of this course emphasizes depth, precision and detail orientation, which are desirable qualities of a good engineer.**

Examination Policy:
Exams have questions at various levels of difficulty, with a mix of basic questions, analytical questions and problem-solving questions. Grading will be precise to optimize student learning and ensure fairness to *all* students. **In order to get an A in this course you must demonstrate the ability to solve *some* thinking problems that are different from any problem solved in class**. Note that this does not mean that getting an A requires solving *all* the problems in *all* the exams.

Exam Schedule:

Exam	Week	Date	Duration	Material Included	Points
First short exam	3	Wed 6/12	25 minutes	Weeks 1, 2	10%
Midterm	4	Wed 6/19	50 minutes	Weeks 1, 2 and 3	25%
Second short exam	5	Wed 6/26	25 minutes	Deadlocks	10%
Final exam	6	Wed 7/3	2 hours	Everything covered in the course, including all recorded lectures, all worksheets and all assignments	40%

All exams will be conducted on Zoom with video turned on

General Rules and Notes:
1. You are required to attend all the synchronous sessions and view the assigned recorded lectures before attending each session.
2. Important information, such as deadline extensions or temporary office hour changes, will be communicated by email. You are expected to check your Sac State email once a day at the very least.
3. The grade that you will receive in this course will be strictly based on your learning. The grade is not an overall judgement of you as a person or as a citizen. So, if you don't learn enough of this subject, you will receive a failing grade regardless of the cause that prevented you from learning. Failing the class means that you did not learn enough; it does not mean that you are a bad person.
4. The grade that you will receive in this course will depend on many factors, including your level of interest, your attendance and participation in class, the time and effort that you put into studying, your analytical skills and your problem-solving skills.
5. No make-up exams will be given unless there is a **proven illness or true emergency**. No make-up exam will be given if you make a personal choice to be elsewhere. If you choose to travel for business or family reasons in the middle of the semester, then that trip is of a higher priority for you than your education.

6. The exam schedule in this syllabus may have to be changed if unforeseen circumstances necessitate a change. If you make travel plans based on this schedule, and then the exam date gets changed, that won't qualify for a make-up exam.
7. **There are no group projects in this course.** All the work that you submit in this course must be your own work. Students must honor the university academic honesty principles. No cheating or plagiarism will be tolerated. In the exams, you will be tested on the assignments that you submit. If you fail the exam questions that test you on a given assignment, you may not get credit for that assignment. So, your assignment grades will not be finalized until the exams have been graded.
8. **Learning** from external resources, including the web, is OK, but copying code from the web is **cheating.** Google does text matching; it is not a mind reader. Therefore, if Googling your code results in a match with a GitHub repository, that will be considered **cheating** not "learning from an external resource". If you only learn ideas and concepts, Google won't detect anything.
9. Don't submit JAVA JAR files.
10. The code that you submit for the programming assignments **must compile and run in our standard computing environment at Sac State**. If your code does not compile or does not run on a standard Sac State machine, you will be given the chance to fix it and resubmit it, but there will be a penalty for that. With your submission, you must specify the machine that you have tested your program on.
11. Appeals for regrading must be made **within a week** of receiving the graded exam or assignment.
12. Late submissions of assignments are accepted up to **3 days** after the deadline, with a penalty of 10% per late day. If I have to disclose an assignment's solutions on the due date to prepare students for a test, I will not be able to accept late submissions (this will be announced when the assignment is given). Five days of lateness may be accepted for the very last assignment in the semester with a maximum lateness penalty of 50%.
13. If you become ill or placed under quarantine, please let me know as soon as possible so that I can make the right accommodation.
14. If you have disability and require any kind of accommodation, please let me know as early as possible. You will need to provide disability documentation to the Services to Students with Disabilities (SSWD) office.
15. Students must comply with the university academic policies, which can be found online at http://catalog.csus.edu/academic-policies/. These policies define letter grades as follows:

A: Exemplary achievement of the course objectives. In addition to being clearly and significantly above the requirements, work exhibited is of an independent, creative, contributory nature.

B: Superior achievement of the course objectives. The performance is clearly and significantly above the satisfactory fulfillment of course requirements.

C: Satisfactory achievement of the course objectives. The student is now prepared for advanced work or study. Note: The letter grade "C" does not imply satisfactory achievement at the graduate level.