**CSC 139: Operating System Principles**

**Fall 2018**

**Time and Place:** Section 1: Mon, Wed, Fri 8:00 – 8:50 AM, RVR 1002

Section 2: Mon, Wed, Fri 9:00 – 9:50 AM, ARC 1011

Section 5: Mon, Wed, Fri 2:00 – 2:50 AM, RVR 1006

**Instructor:** Ghassan Shobaki, Riverside Hall 5020, (916) 278-7952, [Ghassan.shobaki@csus.edu](mailto:Ghassan.shobaki@csus.edu)

Web site: http://www.ecs.csus.edu/wcm/csc/faculty/shobaki/

**Office Hours:** Mon 12:50-1:50 PM, Wed 10-10:50 AM, Friday 12 noon-1:10 PM, or by appointment.

Extra office hours may be added as needed (usually before exams and assignment deadlines)

**Textbook:** “Operating System Concepts”, 9th Edition, Silberschatz, Galvin & Gange, John Wiley and Sons, 2013

**Credit Hours:** 3 semester units

**Course Type:** Required

**Prerequisites:** CSC 60 and CSC 130, and either CSC 137 or CPE 185

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| --- | --- | --- |
| **Week(s)** | **Topics** | **Text Book**  **Chapter(s)** |
| 1 | **Introduction** | 1 |
| 2 | **Operating System Structures** | 2 |
| 3, 4 | **Processes:** concept, operations, inter-process communication | 3 |
| 5 | **Threads:** concept, multicore programming, multithreading models, thread libraries, threading issues | 4 |
| 6, 7 | **Process Synchronization:** critical-section problem, synchronization hardware, mutex locks, semaphores, classical synchronization problems, monitors. | 5 |
| 8, 9 | **CPU Scheduling:** basic concepts, scheduling criteria, scheduling algorithms, thread scheduling, multi-processor scheduling, real-time scheduling. | 6 |
| 10, 11 | **Deadlocks:** characterization, prevention, avoidance, detection, recovery | 7 |
| 12, 13 | **Memory Management:** main memory swapping, allocation, segmentation, paging; virtual memory, replacement policies, frames, thrashing. | 8, 9 |
| 14, 15 | **Storage Management:** disk structure and management, file system interface and implementation, I/O systems. | 10, 11, 12, 13 |

**Grading:**

Assignments: 20%

Two short exams: 10% each

Midterm exam: 20%

Final exam: 40%

Although assignments are worth only 20%, exams will have questions that are directly 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 40 out of 80) in order to pass the course. So, if the sum of your exam scores is less than 40 out of 80, 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 understanding of the material

F: Must repeat the course

**Examination Policy:**

Exams will have a mix of basic questions, analytical questions and problem solving questions. Grading will be precise to maximize student benefit and fairness among 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 you are expected to solve *all* the problems in *all* the exams.

**Exam Schedule:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Exam | Week | Duration | Material Included | Points |
| First short exam | 4 | 25 minutes | Weeks 1, 2 and 3 | 10% |
| Midterm | 8 | 50 minutes | Weeks 1 through 7 | 20% |
| Second short exam | 12 | 25 minutes | Weeks 9, 10, 11 | 10% |
| Final exam | 16 | 2 hours | Weeks 1 through 15  Everything covered in the course,  including assignments | 40% |

**General Rules and Notes:**

1. No tutorial material will be distributed. So, make sure that you attend all lectures and take good notes. In the exams you will be responsible for all white-board illustrations, all the slides and the corresponding sections in the textbook.
2. No make-up exams will be given unless there is a **proven true emergency** (documented and unavoidable).
3. **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.
4. The code that you submit for the programming assignments **must work in our the standard ECS computing environment**, more specifically on Athena. If your code does not work on Athena, you will be given the chance to fix it and resubmit it, but there will be a penalty for that.
5. Appeals for regrading must be made **within a week** of receiving the graded exam or assignment.
6. Late submissions of assignments are accepted up to **3 days** after the deadline, with a penalty of 10% per late day.
7. Students must comply with the university academic policies, which can be found online at http://catalog.csus.edu/academic-policies/
8. You are eligible for taking this course only if you have taken all of its pre-requisites and have not taken it more than once before.
9. 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, 1008 Lassen Hall.
10. If at some point you wish to drop the course, please let me know as soon as possible.