

CSC 449-01 Term I 2003 OPERATING SYSTEMS

2:00-3:15 pm MW
Room: E 223

COURSE DESCRIPTION: Operating systems is an important software area because the design of an OS effects the overall function and performance of a computer. This course is more interested in how an OS operates and how it is designed rather than teaching the student key strokes or mouse commands utilized to run an operating system. The principles behind the designs of all OS are studied.

PREREQUISITES: CSC 172 and CSC 441.

INSTRUCTOR: Dr. M. S. Skaff Office: E204 Telephone: 993-3376
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OFFICE HOURS: 1:00-2:00 pm, 4:00-5:00 pm MW, and anytime my office door is open or by appointment.

TEXTBOOK: Operating Systems:A Modern Perspective by G. Nutt 2nd or latest edition, Addison Wesley Publisher, 2002, ISBN: 0-201-74196-2

COURSE OBJECTIVES: To understand the principles behind the designs of all operating systems, and also to see how those principles are put into practice in real operating systems. The course studies operating systems from both a theoretical and application point of view. These conceptual aspects of operating system principles are emphasized by examples, program code, algorithms, and computer simulation projects.

COURSE OUTCOMES: After taking this course, students will be able to understand:

1. The concept of abstraction and, in particular, resource abstraction.
2. The differences between operating system strategies involving batch and time sharing systems, personnel computers, workstations, process control and real-time systems, and networks.
3. The concepts of a process and thread.
4. Factors in operating system design.
5. Processor modes and kernels.
6. Von Neumann computer architecture; central processing unit (CPU), memory, device controllers and drivers, and interrupts.
7. Device management; direct I/O with polling, interrupt-driven I/O, memory mapped I/O, direct memory access, buffering, and device driver-CPU interactions.
8. Process management including process address space, process and resource abstraction.
9. Scheduling mechanisms involving voluntary and involuntary CPU sharing, non-preemptive and preemptive strategies.
10. Synchronization principles using semaphores and monitors, and inter-process communication.
11. Deadlocks and methods used for prevention, avoidance (Banker's algorithm), detection and recovery (reduction of graphs involving serially reusable and consumable resources).

COMPUTER PROJECTS. There will be two computer projects. These projects will be simulations of the concepts of process states in process management and synchronization using monitors. Students should be familiar with C++ or JAVA and in object-oriented programming concepts.

EXAMINATIONS: There will be **three (3) closed book examinations** to be taken using bluebooks. These bluebooks or exam booklets may be purchased at the book store in the student union. The three bluebooks must be submitted by **09/ 10/03**. Put your name, and CSC 449 on cover. No notes, books, computers, or dictionaries will be allowed on any examination.

All exams will be graded on a curve and each will be multiple choice. No makeup exams will be given. The final grade for the course will be based on the best 4 scores achieved during the term. One low score or missed exam or project will be dropped (see **GRADING** section below).

EXAM DATES: The three exams will be given on the following dates. Mark your calendars now!

EXAM 1. Wednesday September 24, 2003

EXAM 2. Wednesday October 22, 2003

EXAM 3. Wednesday November 19, 2003

There is no final exam for the course. However, there are two projects required.

PROJECTS: Two projects are required for the course. These projects are defined in the packet of material distributed with this syllabus.

Project 1: Project report sections 1-4 due by September 17, 2003

Final project report due by October 15, 2003

Project 2: Project report sections 1-4 due by November 5, 2003

Final project report due by December 3, 2003

Late projects will receive a lower score. Projects must follow rules for submission. Deviation from these rules will result in grade penalties.

GRADING: The best 4 out of 5 grades for all examinations and projects will be averaged for a course grade. If any examination or project is not submitted or missed, that score will be eliminated as the “dropped” grade. If more than two grades are missing, a grade of F will be given for the extra missing grades. No makeup exams or extra projects will be given or accepted.

IMPORTANT FACTS: Last day to withdraw with no W - September 26, 2003

Last day to withdraw with a W - November 17, 2003

ACADEMIC INTEGRITY: Everything submitted for grading is expected to be student’s own work. Anything suspected otherwise will be dealt with according to the College policy.

