Computer Science 323/ Computational Science and Engineering 323
Operating Systems Design

The organization and structure of modern operating systems and concurrent programming concepts. Deadlock, virtual memory, processor scheduling, and disk systems. Performance, security, and protection.

Course Objectives
This course discusses the design of modern computer operating systems and concurrent programming.

General Education Requirement
No

Prerequisite
CS 225 and CS 232 or ECE 291

Credit
3 hours, or 3/4 or 1 unit

Format
3 hours of lecture per week

Semester
Usually offered fall and spring; timetable

Course Web Site
www-courses.cs.uiuc.edu/~cs323/

Recent Textbook
Required:
Modern Operating Systems, 2nd edition;
by Tanenbaum; Prentice Hall; 0-13-031358-0
**updated to reflect Spring 2003 selections

Laboratory Work
Computer programming on Sun Sparc workstations.

Hours	Topics
14	Processes and concurrent programming. Basic concepts: states, transitions. Mutual exclusion, synchronization, semaphores, monitors, Ada rendezvous. Deadlock and indefinite postponement; prevention, avoidance, detection, recovery.
14	Operating system components. Real and virtual memory; paging and segmentation; fetch, placement, and replacement algorithms; thrashing. Processor scheduling; disk space management and allocation; seek and rotational optimization; blocking and buffering. File systems; directory structures; access methods; access control.
15	Advanced topics. Performance evaluation. Distributed and parallel operating systems. Object orientation. Security and protection; encryption. Case Studies.

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