COMPUTER SCIENCE 475
OPERATING SYSTEMS

I. Introduction

A. Catalog description

The student will study the fundamental principles of modern operating systems. Topics include: input/output, concurrent processing, memory management, file systems, security, threads, and distributed systems. Students will study abstract models as well as actual examples of operating systems such as Windows NT and Linux. *Prerequisites: CSCI 361 - Algorithms and Data Structures.*

B. Objective

This course introduces the student to the fundamentals of operating systems and their implementation. The student will study the role of the operating system as an interface between the user and the computer hardware and as a resource manager of processes, memory and I/O devices. The student will analytically and empirically investigate various operating system concepts.

C. Prerequisites

CSCI 361 - Algorithms and Data Structures. A grade of C- or better is required in the prerequisite courses.

II. Required Topics

A. Historical perspective and classification

1. Evolution of operating systems
2. Classification of operating systems
3. Components of an operating system

B. Input/Output

1. Interrupts
2. Clocks
3. Disks

C. Concurrent processing

1. Process scheduling
2. Synchronization
3. Threads

D. Memory management

1. Paging
2. Segmentation
3. Virtual Memory
4. Page replacement algorithms

E. File systems

1. Device characteristics
2. Access methods

F. Security

1. Auditing
2. Cryptography
3. Worms and viruses

II. Required Topics (cont.)

G. Distributed systems

1. Network configurations
2. Communication
3. Synchronization

III. Optional Topics

A. Interprocess communication

B. Network protocols

IV. Bibliography

Deitel *Operating Systems*

Gary Nutt *Operating Systems: A modern Perspective, Second Edition*

Gary Nutt *Operating Systems for Windows NT*

Gary Nutt *Kernel Projects for Linux (Fall 2000)*

Silberschatz and Galvin *Operating System Concepts*

Singhal and Shavarati *Advanced Concepts in Operating Systems*

Tanenbaum *Distributed Operating Systems*

Tanenbaum *Modern Operating Systems*

Tanenbaum *Operating Systems: Design and Implementation*