COURSE DESCRIPTION

This course is designed to give students an introduction to the basic concepts of operating systems such as CPU scheduling, memory, file management and security. Students investigate, differentiate, and critically evaluate various operating systems.

SPECIFIC OBJECTIVES

Upon successful completion of this course, students will be able to
1) demonstrate knowledge of the underlying architecture, concepts, and functionality of an operating system;
2) evaluate the suitability of different scheduling algorithms for their applicability in a given situation;
3) analyze and evaluate several operating systems in terms of their suitability for a given application or an enterprise; and
4) apply operating system concepts to related topics such as networking or concurrent programming design.

COURSE CONTENT

I. Operating Systems
   A. Related concepts
   B. History
   C. Types

II. Memory Management: Partitions
   A. Schemes
   B. Various memory allocation algorithms

III. Memory Management: Virtual Memory
   A. Paged
   B. Segmented
   C. Cached
   D. Page replacement algorithms

IV. Processor Management
   A. Control blocks and queues
   B. Scheduling algorithms
      i. Advantages
ii. Disadvantages

V. Deadlocks
   A. Conditions
   B. Models
   C. Handling algorithms

VI. Managing Concurrent Processes
   A. Multiprocessing configurations
   B. Synchronisation methods

VII. Device Management
   A. Types
   B. Components of the I/O System
   C. Algorithms to manage I/O requests

VIII. File Management
   A. Physical storage allocation methods
   B. Access strategies
   C. Data compression schemes
   D. Access control methods

IX. Networks
   A. Topologies and types
   B. Addressing conventions
   C. Routing strategies
   D. Conflict resolution strategies
   E. OSI reference model

X. Security
   A. Protection levels
   B. Backup and recovery methods
   C. System protection methods
      i. Authentication
      ii. Encryption

XI. System Management
   A. Evaluate an operating system
   B. Conduct monitoring
   C. Measure performance

ASSESSMENT
Assignments  20%
Tests       30%
Project     20%
Final Examination 30%
REQUIRED TEXT

SUPPLEMENTARY READINGS/MATERIALS

JOURNALS
ACM Computer Communication Review
ACM Operating Systems Review
ACM Transactions on Computer Systems
Cluster Computing
Distributed Systems/WWW Conferences and Journals.
IEEE Distributed Systems
IEEE Transactions on Computers
IEEE Transactions on Parallel and Distributed Systems
IEEE Communications
IEEE Journal of Selected Areas of Communication
IEEE Network
IEEE Transactions on Communications
IEEE/ACM Transactions on Networking

WEBSITE
http://web.cs.wpi.edu/~webbib/source-alpha.html