COURSE DESCRIPTION

Dept., Number	**CS 4375 Required**	Course Title	Theory of Operating Systems
Semester hours	45 hours	Course Coordinator	Eric Freudenthal

Current Catalog Description

Process and thread management, concurrency, memory management, processor scheduling, I/O management and disk scheduling, and file management.

Textbook:

Tannenbaum, "*Modern Operating Systems*", 2nd or 3rd Edition.

Other References

Kerningham, Brian W & Ritchie, Dennis M. "*The C Programming Language*, Second edition," Prentice Hall, ISBN: 0-13-115817-1.
Android app "*Programmer Mental Math*" by Joel Jurix.

Course Outcomes:

Level 1: Knowledge and Comprehension
Level 1 outcomes are those in which the student has been exposed to the terms and concepts at a basic level and can supply basic definitions. The material has been presented only at a superficial level.

Upon successful completion of this course, students will have been introduced to:

a. Windows NT operating system
b. UNIX operating system
c. distributed processing, client/server, an clusters
d. distributed process management

Level 2: Application and Analysis
Level 2 outcomes are those in which the student can apply the material in familiar situations, e.g., can work a problem of familiar structure with minor changes in the details.

Upon successful completion of this course, students will be able to apply:

a. file management (file organization, directories, and sharing), record blocking, secondary storage management
b. multiprocessor and real-time scheduling
c. I/O management and disk scheduling

Level 3: Synthesis and Evaluation
Level 3 outcomes are those in which the student can apply the material in new situations. This is the highest level of mastery.

Upon successful completion of this course, students will be able to apply the following in new situations:

a. operating system objectives and functions
b. process definition/description and control/management

c. threads, symmetric multiprocessing, microkernels
d. mutual exclusion and synchronization (software and hardware approaches)—semaphores, monitors, message passing, readers/writers problem
e. concurrency: deadlock and starvation—principles of deadlock, deadlock prevention, avoidance, and detection
f. dining philosophers problem
g. memory management—paging, segmentation
h. virtual memory—hardware and control structures scheduling algorithms

Student Outcomes

Student Outcomes: 1, 2, 3, 9, 10

Prerequisites by Topic

CS 3320 with a grade of C or better