

CSCE 311: OPERATING SYSTEMS

Catalog Description:

311—Operating Systems. (3) (Prereq: CSCE 245, CSCE 210 or 212, MATH 374) Operating system structure and function; process implementation, scheduling and synchronization; memory management; security; naming protection; resource allocation; network file systems.

Prerequisite(s) By Topic:

Introductory programming and data structures

Computer organization

Assembly language programming

Textbook(s) and Other Required Material:

Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne, *Operating Systems Concepts*, 7th Edition, John Wiley & Sons, Inc., New York, NY, 2005.

Michael Kifer and Scott Smolka, *OSP: An Environment for Operating System Projects*, Pearson Addison-Wesley, Boston, MA, 1991.

Computing Platform: Windows XP, Unix

Course Objectives: {Assessment Methods Shown in Braces}

1. Describe the major components of an operating system and state their functions and purpose. {tests}
2. Implement and use algorithms for the management and programming of concurrent processes {programs, assignments, tests}
3. Implement and use algorithms for resource allocation and management in computer systems {programs, assignments, tests}
4. Explain the fundamental concepts and structures of computer networks {tests}

Topics Covered:

1. Introduction (2 hours)
2. Processes and process management (4 hours)
3. CPU scheduling (5 hours)
4. Process synchronization (6 hours)
5. Memory management (6 hours)
6. I/O management (6 hours)
7. Distributed systems (6 hours)
8. Protection and security (3 hours)
9. Reviews, examinations, etc. (4 hours)

Laboratory Projects: Several programming assignments using an operating system instructional environment are required.

Syllabus Flexibility: Low. The Undergraduate Committee approves the syllabus and textbook.

Relationship of Course to Program Outcomes:

The contribution of each course objective to meeting the program outcomes is indicated with the scale: 3 = major contributor, 2 = moderate contributor, 1 = minor contributor. Blank if not related.

Course Objectives	Program Outcomes										
	1. Logic & Math	2. Computing Fundamentals	3. Apply Computing Principles	4. Work on teams	5. Communicate Effectively	6. Liberal arts & Soc. Sciences	7. Basic Science and Lab Procedures	8. Learn New Tools & Processes	9. Employed upon Graduation	10. Application Area	11. Electronics and Digital Sys Design
1. Describe the major components of an operating system and state their functions and purpose		3	2		2				2		
2. Implement and use algorithms for the management and programming of concurrent processes			3		2				2		
3. Implement and use algorithms for resource allocation and management in computer systems			3		2				2		
4. Explain the fundamental concepts and structures of computer networks		3	2		2				2		

Estimated Computing Category Content (Semester hours):

Area	Core	Advanced	Area	Core	Advanced
Algorithms		1	Data Structures		
Software Design			Programming Languages		1
Computer Architecture	1				

Estimated Information Systems Category Content (Semester hours):

Area	Core	Advanced	Area	Core	Advanced
Hardware and Software		1	Networking and Telecommunications		1
Modern Programming Language			Analysis and Design		
Data Management			Role of IS in an Organization		
Quantitative Analysis		1	Information Systems Environment		

Oral and Written Communication:

Reports for all programming projects are required. In addition, an oral report must be given.

Social and Ethical Issues:

Computer security

Theoretical Content:

Concurrency

Analysis and Design:

Comparison of algorithm performance

Class/Laboratory Schedule:

Lecture: 3 periods of 50 minutes or 2 periods of 75 minutes per week

Course Coordinator: John Rose

Modification and Approval History

Prepared based upon previous description for CSCI 411 (April 1998, June 2001).

Modified February 2002 to include an oral and written communication component.

Modified June 2005 by Caroline Eastman with input from John Rose to include changes in prerequisites, texts, and projects