COURSE DESCRIPTION

Dept., Number	CSci 423	Course Title	Introduction to Operating Systems
Semester hours	3	Course Coordinator	P. Tobin Maginnis, Associate Professor

Current Catalog Description

Study of the basic concepts of operating systems, including user interfaces, process management, state saving, interprocess communication, input/output, device drivers, timing services, memory management, file management, and system abstractions.

Textbook

Claudia Salzberg Rodriguez, Gordon Fischer, Steven Smolski, *The Linux Kernel Primer: A Top-Down Approach for x86 and PowerPC Architectures*, Prentice Hall, 2006.

References

Class website: http://pix.cs.olemiss.edu/csci423/

Course Outcomes

Upon successful completion of this course, the students are able to:

1. describe the background, difference, and design tradeoff between proprietary and public-knowledge software;

2. write C language programs using pointers;

3. describe a control-of-flow model for operating systems;

4. describe how process management creates and maintains multitasking, multi-threading, and multiuser features in an operating system;

5. describe how the file manager, in addition to its conventional role of file naming and file protection, provides system abstractions for status, direct device access, and virtual devices;

6. explain how the memory management unit provides unique views of physical memory for each process in the operating system, as well as, allows dynamic linked object modules;

7. describe the concept of device independence and the role of operating system look-up tables;

8. describe the Linux operating system bootstrap and task initialization process.

Relationship between Course Outcomes and Program Outcomes

This is a course taken primarily by undergraduate computer science students; it is sometimes taken by MIS students as one of the requirements for their degree program.

Course outcomes contribute to the program outcomes as follows: (1) to (a), (b), and (g); (2) to (a), (b), (c), and (i); (3) to (a), (b), (c), and (j); (4), (5), (6), and (7) to (a), (b), and (c).

Prerequisites by Topic

1. Basic data structures and algorithms (CSci 112, 211)
2. Fundamental computer architecture concepts (CSci 223)

Major Topics Covered in the Course

1. Proprietary versus public-knowledge software (1 hour)
2. C programming language (2 hours)
3. Operating system models (2 hours)
4. Analysis of state management implementation and the "block move" problem (3 hours)
5. Process management (2 hours)
6. Logical memory drivers (1 hour)
7. Timing service (1 hour)
8. Process duplication and creation (4 hours)
9. Memory management (4 hours) and data/file caching (2 hours)
10. Open call (4 hours)
11. Name service (3 hours)
12. Read, write, and close calls (3 hours)
13. System bootstrapping and task initialization (3 hours)

Assessment Plan for the Course

A comprehensive, 30-question exam constructed by a faculty committee is administered to each offering of CSCI 423. Student performance is analyzed question-by-question to identify needed adjustments in the textbook, lectures, or assignments. Faculty who regularly teach the class and the class participate in the evaluation, in the selection of textbooks, and in formulating a response appropriate to the assessment results.

How Data in the Course are Used to Assess Program Outcomes (unless adequately covered already in the assessment discussion under Criterion 4)

The standard exam administered in CSci 423 (see the previous item) is included in the curriculum–wide outcome assessment described in Chapters 2, 3, and 4 of the Self–Study.

Estimate Curriculum Category Content (Semester hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms			Software design		1
Data structures		1	Concepts of programming languages		1