0203-326-01 Operating Systems (4-units) Fall 2004

Synopsis:

This course acquaints computer science undergraduates with general design principles, internal algorithms and data structures, and key application-interface features of modern multitasking operating systems (such as Windows or UNIX). It will give special emphasis to the Linux "Open Source" operating system and will employ the GNU assembler, C compiler, and program development tools.

The course will consist of lectures, labs, readings, discussions, demonstrations, consultations, independent design projects and scheduled exams, in addition to in-class programming exercises and experiments.

Students are presumed to have prior experience doing computer programming in at least one high-level language (such as C/C++/java), and to be familiar with basic operating system commands (e.g., as covered in CS 110, 112, 210, 245).

Class lectures will be presented in the Michael D. Kudlick interactive computer classroom (Harney Science Center, Room 235) which affords convenient opportunities for combining formal instruction with "hands-on" programming exercises. Additional laboratory sessions are held in the Harney-535 student lab. Each student will need to have an individual computer account set up for access during these meetings.

Learning Outcomes:

- You will gain an overview of how a computer system's components interact
- You will become familiar with standard OS algorithms and design issues
- You will acquire experience in writing and debugging UNIX system software
- You will understand what would be entailed in adding new system features
- You will be able to diagnose malfunctions, and to forestall bottlenecks
- You will lay the conceptual ground for understanding later CS courses

Course Prerequisites:

- Knowledge of Intel IA32 processor architecture and assembly language
- Ability to write computer programs using the C programming language
- Understanding of data-structures (linked-lists, trees, queues, hash-tables)
- Familiarity with basic login procedures and operating system commands

Instructor:

Dr. Allan B. Cruse, Professor of Computer Science and Mathematics
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Office Hours: Mon-Wed 2:45pm-3:15pm, Tue-Thu 1:30pm-2:30pm
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Textbooks:

William Stallings,
Operating Systems: Internals and Design Principles (5th Edition),
Pearson Prentice-Hall, Inc. (2005), ISBN 0-13-147954-7

Gary Nutt, ***Kernel Projects for Linux,***
Addison-Wesley Longman, Inc. (2001), ISBN 0-201-61243-7

Schedule of Readings:

Sep 01: Gary Nutt, Overview of Linux
Sep 08: Stallings, Computer System Overview
Sep 16: Stallings, Operating System Overview
Sep 22: Stallings, Process Description and Control
Oct 06: Stallings, Concurrency: Mutual Exclusion and Synchronization
Oct 13: Stallings, Concurrency: Deadlock and Starvation
Oct 20: Stallings, Memory Management
Oct 27: Stallings, Virtual Memory
Nov 03: Stallings, Uniprocessor Scheduling
Nov 10: Stallings, Multiprocessor and Real-Time Scheduling
Nov 17: Stallings, I/O Management and Disk Scheduling
Nov 24: Stallings, File Management
Dec 01: Stallings, Networking
Dec 08: Stallings, Security

Exam Dates:

Midterm Exam I will be Monday, October 4.
Midterm Exam II will be Monday, November 15.
Final Exam will be Tuesday, December 14 (NOON)

Grading Plan:

Class Participation	20%
Programming Projects	30%
Midterm Exams (2)	30%
Final Examination	20%

NOTE: Unprofessional conduct, such as an abuse of USF computer privileges (unauthorized access), or a violation of academic integrity (plagiarism or fraud), will result in the student receiving a failing grade.