

Operating Systems

CSCI 311, Fall semester, 2006

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Class: Tuesday & Thursday 3:00-4:15 pm at LIB 141

Office Hours: Tuesday & Thursday 3:00-5:00 pm, Math&CS department

Online Course Website: <http://csci.biola.edu/csci311>

Course objectives:

- ✧ Explore the key components of modern operating systems: process management, memory management, file-system management, and networking services to understand in depth how the modern operating systems work and the underlying mechanisms to provide all the system services.
- ✧ Understand the key concepts of concurrent programming using semaphores and other mechanisms to deal with concurrency and synchronization and be able to reason and write correct concurrent programs
- ✧ Gain hands-on experiences of operating systems through a term project by experimenting with OS system APIs, constructing a prototype OS, tracing source code, or managing a prototype networking environment.
- ✧ Learn to be competent power users of both Windows and Linux platforms.

Textbook:

- ✧ Andrew S. Tanenbaum & Albert S. Woodhull, . *Operating Systems: Design and Implementation* (3rd Edition), Prentice-Hall, 2005.

Grading structure

1. Attendance & participation	10%
2. Weekly reading assignments	10%
3. Written & programming assignments	15%
4. Term research project	35%
5. Mid-term	15%
6. Final	15%

Your comments on reading assignments

For each reading assignment, please send me a paragraph of informal comments like new insight, confusion, questions, or else on the subject.

Term research project

For the project, you should conduct in-depth research on subjects like process management, memory management, the file system, or some other operating system issues by studying related articles or books, doing code tracing, system programming, and/or installations. By default, you'll be assigned to trace a portion of the MINIX implementation, but you can also search for a topic and propose your plan by the end of September. In the remainder of the semester, you shall give a couple of short presentations of your study and in the end of the semester and submit a term report documenting what you have done and learned.

Schedule

✧ Aug. 24	Overview & Background
✧ Sept. 1-15	Processes and Process management
✧ Sept. 16-30	Memory management
✧ Oct. 1-15	File system & I/O management
✧ Oct. 16-31	Project proposal, Take-home Midterm
✧ Nov.1-15	Concurrency: mutual exclusion & synchronization
✧ Nov. 16-30	Deadlock & starvation
✧ Dec.1-10	Threads & micro-kernels; Distributed Systems
✧ Dec.11-20	Term project presentation; Take-home final

References

1. Daniel P. Bovet & Marco Cesati, *Understanding the LINUX Kernel* (3rd Edition), O'Reilly, 2005.
2. Johnson M. Hart, *Win32 System Programming* (2nd Edition), Addison-Wesley, 2001.
3. David A. Solomon & Mark E. Russinovich, *Windows Internals* (4th Edition), Microsoft Press, 2005
4. Online Information & distribution of the MINIX operating system:
<http://www.cs.vu.nl/~ast/minix.html>
5. Online Linux website: <http://www.linux.org>.