

Washington University  
Department of Computer Science  
CS422: Operating Systems Organization  
Spring 2000

## Meeting Times

Monday and Wednesday 5:30 to 7:00pm, Cupples II room 217

## Instructor

Fred Kuhns  
fredk@cs.wustl.edu  
502D Bryan Hall  
(314) 935-6598 Office Hours: Tuesday 4:00 - 5:00pm

## Grader/TA

Charles Schweizer, Email: cbs2@cec.wustl.edu Office Hours: Sunday 2:30 to 4:30 Lopata 409  
Richard Unger, Email: rbu1@cec.wustl.edu Office Hours: Thursday 2:00 to 4:00 Lopata 409  
Greg Kinasewitz, Email: gtk1@cec.wustl.edu Office Hours: Friday 2:00 to 4:00 Lopata 409  
Kevin Goodier, Email: bkg2@cec.wustl.edu Office Hours: Sunday 2:30 - 4:30 Lopata 409

## Work Involved

- **Programming Projects**

There will be 5-6 programming projects. Projects will involve programming in C or C++ in the UNIX environment and will be done individually by each student. Students are assumed to be competent in C or C++ and familiar with the UNIX operating system. Students not familiar with these tools will have to learn them outside of class since C/C++ and UNIX will *not* be taught as part of this course.

The programs will be graded using the following criteria:

40%execution correctness  
30%problem insight (*e.g.*, understand issues, elegant solution, etc.)  
20%program structure (*e.g.*, modularization, information hiding, etc.)  
10%Consistent style (*e.g.*, capitalization, indenting, etc.)  
10%appropriate commenting

There will be a mandatory **5** point deduction (out of a possible **100** points) for each day that your program is late after the deadline. Moreover, I will not accept programs that are turned in later than two days after the due date. It is *absolutely* crucial to keep up with the programming assignments in the class.

- **Homework and Quizzes**

Each week you will either be assigned homework questions or given a short graded quiz. The homework problems will be assigned on Wednesdays to be turned in the following Monday. Typically these problems will be assigned from the required text.

Periodically short graded quizzes will be given rather than a homework assignment. The quizzes will be given at the end of class. The quizzes will be based on material presented in class.

It is essential that you attend class in order to receive homework assignments and to prepare for the quizzes and exams. There will be no “makeup” quizzes unless you ask permission from me before the quiz.

- **Exams**

There will be two in-class exams: a mid-term and a final. Each is worth 20% of your grade. Material tested on the final exam will be comprehensive.

## **Grading**

The relative weighting of each portion of the course is presented below (note that I reserve the right to change the weights during the course of the semester):

- 40% Exam
- 40% Programming projects
- 20% Homework and Quizzes

## **Detailed Topic Outline**

<b>Topic</b>	<b>Book Section</b>
Introduction	1
Computer-System Structures	2
Operating-System Structures	3
Processes and IPC	4
Threads	5
CPU Scheduling	6
Process Synchronization	7
Deadlocks	8
Memory Management	9
Virtual Memory	10
File-System	11
I/O Systems	12
Secondary-Storage Structure	12
Networking	14
Network Structures	15 and class notes
Sockets and STREAMS	Class notes
the UNIX kernel, putting it all together	21 and class notes

## **Textbooks**

- **Required**

*Applied Operating System Concepts*, Silberschatz, Galvin and Gagne, Wiley 2000.

- **Recommended**

*Modern Operating Systems*, Andrew Tanenbaum, Prentice Hall, 1992.

*Distributed Operating Systems*, Andrew Tanenbaum, Prentice Hall, 1994.

*Operating System Concepts*, 4<sup>th</sup> edition, Silberschatz and Galvin, Addison Wesley, 1994.

*Operating Systems: Internals and Design Principles*, 3<sup>r</sup>d edition, William Stallings, Prentice Hall, 1998.

*Advanced Concepts in Operating Systems*, Mukesh Singhal, Niranjana G. Shivaratri, McGraw Hill, 1994.

*UNIX Internals: The New Frontiers*, Uresh Vahalia, Prentice Hall, 1996.

*The Design and Implementation of the 4.4 BSD Operating System*, M.K. McKusick and K. Bostic and M.J. Karels and J.S. Quarterman, Addison-Wesley, 1996.

*The Design and Implementation of the 4.3 BSD UNIX Operating System*, S. J. Leffler and M.K. McKusick and M.J. Karels and J.S. Quarterman, Addison-Wesley, 1989.

*The Design of the UNIX Operating System*, Maurice J. Bach, Prentice Hall, 1986.

*Inside Windows NT*, 2<sup>n</sup>d edition, David Solomon, Microsoft Press, 1993.

*Advanced Programming in the UNIX Environment*, W. Richard Stevens, Addison-Wesley, 1992.

*UNIX Network Programming*, 2<sup>n</sup>d edition, W. Richard Stevens, Prentice Hall, 1998.

*UNIX System V Network Programming*, Steve Rago, Addison-Wesley, 1993.

*The C Programming Language*, 2<sup>n</sup>d edition, Kernighan and Ritchie, Prentice Hall, 1991.

*The C++ Primer: Second Edition*, Stan Lippman, Addison-Wesley, 1991.

*The C++ Programming Language: Second Edition*, Bjarne Stroustrup, Addison-Wesley, 1991.

*Effective C++*, Scott Meyers, Addison-Wesley, 1992.