

OPERATING SYSTEMS DESIGN 198:416 FALL 2007

Lectures:

Sect 1-2 LECTURES: MonWed: *:8:10-9:30 HLL 116

Recitations

Sec 1 Mon 6:55-7:50 SEC 211
Sec 2 Wed- 6:55-7:50 ARC 205

Instructor

Prof. M. Paull
Room: Hill 361, Preferred Means Of Communication
Phone: x-3548, Preferred Means Of Communication
Course Website : <http://www.cs.rutgers.edu/~paull/>
Office Hours Wed 2-4PM: or by appointment. All are welcome

Teaching Assistants: *Settled*

Turgut, Begumhan Mon 6:55-7:50 SEC 211
bturgut@cs.rutgers.edu Hill 202

Le, Trung Kien Wed 6:55-7:50 ARC 205
X5 4634 lekien@cs.rutgers.edu office hrs THUR 12-2PM

Objectives

To convey an understanding of the basics of an operating system by study of techniques and algorithms used in developing the services they provide in a computer system., To understand their implementation, with examples from existing operating system(s) and a set of programming exercises.

Prerequisites

CS-211 , Eng 331. (Architecture)
CS-113 or Eng 252 or CS-314 (C lang)

Expected Work and Effect On Grade

HW ASSIGNMENTS ~1 per week. Assignments are from the book and elsewhere. (Good For Test Prep)

Grade Effect: Used in borderline cases

PROGRAMMING ASSIGNMENTS : 3 or more :

We will do programming in The UNIX environment, using many of the system calls it provides, including creation of, and communication amongst, multiple processes system. This requires a basic understanding of C. (An introduction to C will be given in recitation).

Grade Effect: 30%

MIDTERM EXAM:

Grade Effect: 30%,

FINAL EXAM:

Grade Effect: 40%

NOTE: THE OVERALL GRADE IS BASED ON THE PERCENTAGES ABOVE, BUT YOU MUST ALSO DO PASSING WORK ON THE PROGRAM ASSIGNMENTS AND THE EXAMS TO PASS THE COURSE

Course Text and Lecture Notes

Andrew S. Tanenbaum **MODERN OPERATING SYSTEMS (SECOND EDITION)**
Prentice Hall 2001 ISBN 0-13-031-358-0

Lecture Notes in the form of illustrations are available on my **website** before each lecture

Other Books Of Interest:

Programming:

Bach, J M, *The Design Of the UNIX Operating System*, Prentice Hall

Stevens, W. R., *Advanced Programming in the UNIX Environment*, Addison Wesley

Deitel, H.M and P.J., *C How To Program*, Prentice Hall

Miller L.H., Quilici, A.E., *The Joy Of C*, Wiley

General:

Silberschatz And Galvin, *Operating Systems* (Sixth Edition), Addison Wesley 2004

OUTLINE

Most, but not all, of Chapters 1 through 6 of the Text are covered in the order 1, 2, 3, 4, 6, 5. ALSO material in Chapt 10 which provide UNIX examples of the material in Chapters 1-6 will be covered. Parts of Chapt 8 and 9 on Multi-Processors and Security will also be included. All this material will be supported and in some cases augmented by the notes which will be distributed through my website.

Course Contents By Chapters:

Chapt 1 *HISTORY, HARDWARE REVIEW(211), BASICS CONCEPTS-*

Purpose of Operating System, Fork, Multi-Programming, Processes, Deadlock, Memory Management, Files, System Calls. Structure Of Implementations).

Chapt 2 *PROCESSES (THREADS-LATER) and SCHEDULING*

PROCESSES: IPC (Interprocess Communication)-Mutual Exclusion, Busy Waiting, Semaphors, Monitor, Message Passing; Examples-Consumer Producer, Classical IPC Problems; SCHEDULING: MM Replacements, MM Running; Batch; FCFS, SF, SN; Round Robin, Priority, etc.

Chapt 3: *DEADLOCKS (Problems Arrising When Many Processes Have Access To Many Resources)*

DEFINITION AND MODELLING Detection, Recovery, Avoidance, Prevention

Chapt 4: *MEMORY MANAGEMENT (With And Without Swapping,)*

Continuous storage, Paging, Segmentation, Virtual Memory, Page Replacement Algorithms, Their Models And Implementation,

Chapt 6: *FILE SYSTEMS*

Files -Naming, -Structure, -Type, Directories) Files On Disk Naming, Structure, Implementation, Protection. UNIX examples

Chapt 5: *INPUT/OUTPUT (Control In Hardware -in Software)*

Control in Hardware-Software , Disks, Clocks, Terminals, Power Management

Chapt 10 *CASE STUDY UNIX AND LINUX : The topics in chapters 1-6 are illustrated from systems described in this chapter*

ALSO We hope to cover some material in:

Chapt 9 *SECURITY*

Protection Matrix, Passwords, Cryptography

Chapt 2 *Threads*

Sketch Of Implementations

Chapt 8 *MultiProcessors*

Some Basics

