Maharishi International University 1971-1995

MAHARISHI UNIVERSITY OF MANAGEMENT

Professional Excellence and Higher Consciousness

CS 465 DE

Operating Systems

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(Mar-Jul)

Operating Systems: Automation in Administration

GOAL

The goal of the course is to learn the concepts and terminology of operating systems in general. We will explore how OS works, and what are their limitations. This course will NOT make you an Operating System programmer, but will aid in becoming a better applications programmer by gaining a better understanding of how stuff works under the hood, so to speak. A secondary goal is to gain experience in writing OS related programs.

OBJECTIVES

- Gain familiarity and knowledge of the predominant operating system technologies and applications in use today, and the likely successors to these technologies.
- Understand how operating systems are implemented -- what sort of hardware is used, how it works, and how one implements the software that turns the hardware components into a useful system.
- Understand how application programs interface with and use operating system, and develop a series of simple programs that illustrate basic techniques of system software applications.
- Gain a deeper understanding of the flow of Creative Intelligence in our own awareness and as expressed in operating system design.

HOW TO BE SUCCESFUL

- Be regular in TM practice
- Try to allocate specific time for study and stay focused.
- Participate actively in the newsgroup (Share knowledge related to the course).

EVALUATION CRITERIA

Assignments and Labs	20
Quiz/Group Participation	10 + Bonus (Read about bonus points in the news group.)
Midterm Exam	35
Final Exam	35

GRADING SCALE

86-100	A’s
71-85	B’s
56-70	C’s
0-55	NC

Note: This scale is subject to change based on class performance.

COURSE TEXTBOOK AND COMPANION WEBSITES

We will use the following textbook for reading. Every student must have a copy.

Modern Operating Systems, 3rd (Third) Edition: by **Andrew S. Tanenbaum**, published by Prentice Hall Inc. 2001. **ISBN 13**: 9780136006633; **ISBN 10**: 0136006639. Publisher's URL: http://www.pearsonhighered.com/academic/product/0,3110,0130313580,00.html

Course Website: http://www.cs.mum.edu/courses/de/cs465

Simulators: http://www.ontko.com/moss/ (Required for labs. Read more in LABS section.)

LESSON SCHEDULE & ASSIGNMENTS

In addition to reading the text, viewing the slides and doing the exercises at the end of the chapters will help you prepare for the exams. Print it out for easy reference.

Weeks One & Two
Lesson 1: introduction to Operating Systems: Pure Knowledge has Infinite Organizing Power
Reading: Pages 1 – 7; 33 (bottom) – 44; 49 – 52; 62 – 71; Figure 1-31 on page 78. Page 79; http://en.wikipedia.org/wiki/Operating_systems
Assignment: See web app. (Assignment-Intro.txt)
Lesson 2: Processes and Threads: Sequential Unfoldment of Natural Law
Reading: Pages 83 - 113.
Assignment: See web app. (Assignment-Processes.txt)
Lessons 3: Inter-process Communication: Infinite Correlation in the Unified Field
Reading: Pages 117 – 130.

Weeks Three & Four
Lessons 4: Inter-process Communication Continued: Infinite Correlation in the Unified Field
Reading: Pages 130 – 134; 136 – 145 (middle). Skim page 135.
Assignment: See web app. (Assignment-IPC.txt)
Lesson 5: Process Scheduling: Spontaneous Right Action
Reading: Pages 145 - 172.
Assignment: See web app. (Lab1-Scheduling.txt)

Weeks Five & Six
Lesson 6: Memory Management & Virtual Memory: Collapse of Infinity to a Point
Reading: Pages 175 – 201
Assignment: See web app. (Assignment-VirtualMemory.txt)
Lesson 7: Memory management & Page replacement Algorithms: Infinity at a point
Reading: Pages 201 – 206; 207 (bottom) – 210; 211 – 216.
Assignments: See web app. (Lab2-Paging.txt)
Lesson 8: Design Issues for Paging Systems. Segmentation: Collapse of Infinity to a Point
Reading: Pages 216 – 224; 227 – 229; 231 – 232; 234 – 239 (line 2); 247 – 248.
Assignments: See web app.

Week Seven Lesson 9: Intro to File Systems: Nature is structured in layers
Reading: Pages 255 – 273
Assignments: See web app.

Weeks Eight : Review for Midterm course. Labs **1** and **2** are due by Sunday.

Mid-Term Exams (Primary and Secondary)

Weeks Nine & Ten
Lesson 10: File System Implementation: Infinite Correlation in Pure Intelligence
Reading: Pages 273 - 285 (one third down the page); 288 - 290; 292; 304 - 308; 312 - 313; 324 - 325 (top).
Assignments: See web app. (Lab 3-Filesystems.txt)
Lesson 11: Input / Output Hardware and Software: Do less and accomplish more
Reading: Pages 329 – 347; Page 29 (middle) – 30 (bottom).

Weeks Eleven & Twelve
Lesson 12: Input / Output Continued: Principle of Least Action in Nature
Reading: Pages 348 – 360; 388 (middle) – 396.
Extra Reading (Optional): 361 – 388 (middle); 399; 415 – 417.
Assignments: See web app. (Assignment-IO.txt)
Lesson 13: Deadlocks: Principle of Second Element
Reading: Pages 433 – 461.
Assignments: See web app. (Lab4-Deadlock.txt)

Weeks Thirteen & Fourteen
Lesson 14: Multiple Processor Systems: From Individual to Cosmic Computing
Reading: Pages 523 – 526; 534 – 539; 541 – 550; 555 – 563; 565 – 566 (one third down); 567 – 568.
Extra Reading (Optional): Pages 526 – 529; 533 – 534.
Lesson 15: Multiple Processor Systems Continued: From Individual to Cosmic Computing
Reading: Pages 568 – 575; 70 – 71 (top one third); 580 – 583; 590 – 597; 603
Assignments: See web app. (Assignment-MultiProcessor.txt)

Week Fifteen: Review for Final Exam. Labs **3** and **4** are due by Sunday.

Final Exams (Primary and Secondary)

LAB WORK

The labs have been designed very carefully to give you hands on experience with basic concepts, yet not spending too much time on understanding and programming. You need to download the simulators for all the labs from http://www.ontko.com/moss/ and follow the instructions given in the lab instruction file available on the DE web app.

Lab 1:
CPU Scheduling - Read the user guide for the Scheduling Simulator at http://www.ontko.com/moss/sched/user_guide.html and do the suggested two exercises.
Extra Credit: The “To Do” section referenced above
Lab 2:
Memory Management - Read the user guide for the Memory Management Simulator at http://www.ontko.com/moss/memory/user_guide.html and do the suggested exercises
Extra Credit: The “To Do” section referenced above
Lab 3:
File System Simulator – Read the user guide for the File System Simulator at http://www.ontko.com/moss/filesys/user_guide.html and do exercises 1 and 2
Lab 4:
Deadlock Simulator – Read the user guide for the Deadlock Simulator at http://www.ontko.com/moss/deadlock/user_guide.html and do the suggested exercises.

CLASS PARTICIPATION
Class participation is essential to the success of the course. Class participation includes regular interaction with fellow students and faculty through the course newsgroup and sharing your own experience and insight from the course.

PROFESSIONAL ETIQUETTE
Proper etiquette is essential to our personal and professional success, and the college years are an ideal time to cultivate these values. To give attention and importance to this, several fundamental values of etiquette are built into the grading system. The components of professional etiquette are quality of communication with the faculty and DE office (timeliness, respectfulness), timely delivery of labs and assignments, punctuality in exams.

ACADEMIC HONESTY
The purpose of our homework and lab assignments is to give each student practical experience in applying the knowledge gained from lectures and readings. This hands-on experience is needed to learn the details of how to apply the knowledge. Therefore, it is against academic policy to copy, or share with others, any homework or lab projects that are assigned as individual work.

You may discuss the course material, concepts, or ideas with other students. You may review together the relevant topics from lectures or readings to help understand the principles required to start a programming assignment. You can prepare for the exam together, discussing and working on various problems and expected questions. In essence, you can collaborate freely in any course-related work that is not required for submission and evaluated by the instructor.
Under no circumstances should you post your lab or homework solutions on a course newsgroup, send via email, or in any other way distribute to others. Every student is expected to work individually on his or her own lab project, exams, and anything else being evaluated as part of the course grade.

If you are found to have violated this policy for a quiz, homework or lab assignment, then you will receive no credit for the assignment. If the violation occurs for an exam, you will receive no credit for the course, and be subject to disciplinary measures by the Dean of Students, with possible dismissal from the graduate program.

Do your own work, and enjoy the process of learning. Jai Guru Dev!