Syllabus **CS 490 Operating Systems** Spring 2001

Class Lecture Meeting Times: MW 12:45-2:05 pm (in TH N 324).

Instructor: Dr. Tim Newman
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Office: TH N 364
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Office Hours:
MW 8:15-9:30am
T 3:15-5:00 pm
Or phone or email for appointment

An additional half hour of office hours on Thursdays will be added shortly. The schedule for Thursday will be posted within the next two weeks. Please note that I try to reserve Fridays for research - please, no office visits or phone calls on Fridays.

Prerequisites: CS 513 (or, in place of 513: CS 308, CS 309, and CS 413). Please note that CS 207 is a pre-req for CS 308; if you don't have CS 207 (or equivalent), you should not take CS 490. You must be proficient in C or C++.

Course Objectives:

- To provide a thorough understanding of the underlying principles of operating systems, including fundamental concepts such as process and memory management.
- To gain some level of practical understanding of OS principles through study of their implementation in modern systems.
- To provide at least a minimal amount of practical experience in implementing OS theory and principles.
- To improve writing technically by developing a short technical paper that is concise, coherent, and in keeping with academic writing standards.

Text: *Operating Systems: Internals and Design Principles, Third Edition*, by William Stallings, Prentice Hall, 1998.

Grading: The final grade will be composed of the following weights. The instructor reserves the right to make changes to this system, including the addition of unannounced quizzes.

Activity	**Total Points**
Mid-term Exams (2)	200 pts. total
Final Exam	130 pts.
Programs, Projects, Homeworks	110 pts. total
Paper	55 pts. total
Participation	25 pts. total
Grand Total	520 pts.

The grading scale will be:

Above 470* pts.	for a 4.0;	Above 420* pts.	for a 3.0;
Above 370* pts.	for a 2.0;	Above 343 pts. (**66%**)	for a 1.0;
0-65.99%	for a 0.0		

* IN ADDITION, you must achieve over a 65% score on the paper to receive a 2.0 or better in the class. (If your overall point total is over 370 points, but your paper score is 65% or below, your course grade will be a 1.0.)

This course will utilize the plus/minus grading system for final grades. Note that a plus or minus grade doesn't effect GPA (e.g., a B+ is counted in GPA the same as a B or B-).

Exams: There will be two mid-term examinations, each worth 100 points. These exams are scheduled for **Monday, February 12** and **Monday, March 19**. The 130 point comprehensive final is **Wednesday, April 25**, from 11:30 am to 2:00 pm. Tests will cover lectures, assigned readings (textbook plus any assigned papers), programming assignments, projects, and homeworks.

Documented crisis or one week's prior notice required for *consideration* of exam make-up.

Programming Assignments: There may be 2-3 projects/programming assignments in the class in addition to a half dozen or more homeworks. All assignments are to be INDIVIDUAL work. For help, questions should be directed to the course TA or to the instructor.

All programs are expected to contain a reasonable amount of documentation. Programs are always due at the start of the class period. Late programs will receive a 10% penalty if they are up to 24 hours late. (Note that a program submitted after the start of the class period would be considered late and subject to the 10% late penalty.) Programs will not be accepted after 24 hours have elapsed from the start of the class in which they were due.

Homeworks: A few homeworks will be assigned throughout the term. Homeworks are due at the start of class on the due date. Sorry, no late homeworks will ordinarily be accepted.

Papers: A short, 4 page written paper (mini term paper) will be one requirement of the class. Papers are to be done on your own, using acceptable types of references that are properly acknowledged. Paper topics are to be selected from an instructor-approved list of operating systems-related topics. Details on the format of the papers will be discussed later. Submission requirements will also be discussed later. Please also refer to the class schedule for important due dates related to the papers. You must achieve better than 65% on the paper or your final grade in the course can be no better than a 1.0.

Turn-in Policy: Turn in all work to the instructor, preferably during class, otherwise during office hours. If you need to turn in your assignment at a different time during the day, you may turn it in to one of the department secretaries during regular working hours (be sure to ask the secretary to time stamp the assignment and to give the assignment to Professor Newman). It is your responsibility to ensure that the secretary time stamps the assignment and receives clear direction to give the assignment to the instructor. **Do not turn any work in to a lab TA!**

Quizzes: Short quizzes may be given at any time covering the lecture and reading material. This is to motivate you to keep up on the reading. Most terms I have not used pop quizzes, but I reserve the right to do so.

Absence and Participation Policy: Class attendance and effective, constructive participation is important to your performance in the course and makes up a portion of the grade. If you cannot make it to class on the date something is due, please make arrangements to have someone else bring your assignment to me before or at the start of class. Also note the exam absence policy mentioned earlier.

If you need Help! I have scheduled a liberal amount of office hours and I want to help you learn the material and to succeed in the course. Please seek my assistance if you have any questions or concerns. The course TA also will have office hours and you are free to consult him during his hours.

Academic Honesty: The University policy on academic honesty, discussed in the Code of Student Conduct, is strict. The instructor's academic honesty policy is very strict; instances of academic dishonesty will be penalized, ordinarily by at least failure on the assignment and likely failure in the course (in addition to any University penalties). Unless otherwise stated, all work is to be individual work. Violations of the individual work policy will be regarded as instances of academic dishonesty.

Collaboration with other students on programming assignments will be regarded as academic dishonesty. Copying code (even a portion of some code or following an approach similar to that followed in the code of others) is plagiarism. It is inappropriate no matter what the source of the code - whether the code was from email, from the net, from a friend, from a book, or from any other source. Please, do NOT use other's code in your program unless you have received clear instructor approval in advance AND you document your source. In short, if you don't receive my explicit approval for a particular scenario of collaboration, you should assume that if you engage in the collaboration, you have committed academic dishonesty.

If you are not sure if some form of collaboration is allowed, please contact me.

On the papers, directly borrowed or heavily paraphrased wording must be included in quotes and be properly referenced. Whenever you are using someone else's material, you need to both quote all of what is borrowed/paraphrased and to issue a citation in your paper. All usage of other's ideas and findings must also be properly referenced within the text of the paper (each time someone else's ideas are used in the paper, there must be a reference). Papers which do not follow these standards will receive a failing grade; such papers are **unoriginal work**.

Spring 2001 CS 490(01) Schedule

Date		Topic	Reading Assignment	Special Comments
Mon.	1/8	Computer Systems Overview	Ch. 1	
Wed.	1/10	Operating Systems Overview	Ch. 2 (through 2.3)	
Mon.	1/15	NO CLASS		
Wed.	1/17	OS I: Process Management	Ch. 3	
Mon.	1/22	Process Management (cont'd)	Ch. 3	
Wed.	1/24	Introducing Parallelism	Ch. 4 (4.1, 4.2, 4.4, 4.5)	
Mon.	1/29	Introducing Parallelism (cont'd) and (start) Concurrency	Ch. 4 and 5	
Wed.	1/31	Concurrency - Mut. Excl. and Semaphores	Ch. 5 (Sect. 1-7)	
Mon.	2/5	Concurrency - Monitors, Mess. Pass., and App.s	Ch. 5	
Wed.	2/7	Concurrency (cont'd) and Deadlock	Ch. 5 and 6 (Sect. 1-2)	
Mon.	2/12	**TEST 1**	Ch. 1-5, 6.1, 6.2	**TEST 1**
Wed.	2/14	Deadlock cont'd	Ch. 6 (Sect. 2-6)	
Mon.	2/19	Deadlock Detection and Recovery	Ch. 6	
Wed.	2/21	Deadlock and OS II: Memory Management Functions	Ch. 6 and 7 (7.1, 7.2)	
Mon.	2/26	Memory Management (Paging and Seg.)	Ch. 7 (7.3, 7.4)	
Wed.	2/28	Modern Memory Management	Ch. 7 and 8 (8.1)	
Mon.	3/5	Modern Memory Management	Ch. 8 (8.2, 8.3, 8.4)	
Wed.	3/7	Modern Memory Management - Case Studies	Ch. 8	
Mon.	3/12	OS III: Scheduling and Resources - Uniprocessor	Ch. 9	
Wed.	3/14	Scheduling and Resources, Test Review	Ch. 9 and 10	
Mon.	3/19	**TEST 2**	Ch. 6-10	**TEST 2**
Wed.	3/21	Scheduling and Resources - Multiprocessor	Ch. 10 (10.1-10.3)	
Mon.	3/26	NO CLASS		
Wed.	3/28	NO CLASS		
Mon.	4/2	Real-time Scheduling, Case Studies, and Resource Management	Ch. 10 (10.3, 10.4) and 11	
Wed.	4/4	Resource Management	Ch. 11	
Mon.	4/9	Resource Mgmt., Disk, Files, Case Studies	Ch. 11	
Wed.	4/11	File Organization and Structure	Ch. 12 (12.1-12.4)	
Mon.	4/16	Secondary Storage, Unix/NT Mgmt., Dist. Proc.	Ch. 12 (12.5-12.8)	
Wed.	4/18	Catch-up and Distributed Processing	Ch. 13	**PAPERS DUE**
Mon.	4/23	Distributed Processing and Review	Ch. 13	LAST CLASS
Wed.	**4/25**	**FINAL**	Ch. 1-13	**FINAL 11:30-2:00**