Computer Science 124
Mathematical Foundations of Computer Science
SYLLABUS
Fall 2001

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Course Goals: This is an introductory course to the mathematical foundations of computer science. A successful completion of the course is crucial to the preparation of more advanced courses in the computer science curriculum

Textbook:

- Kenneth H. Rosen, *Discrete Mathematics and its Applications, Fourth Edition*, 1999, McGraw-Hill.
- The Companion Web Site: http://www.mhhe.com/rosen (Consult page xix in the book for more information)
- Student Solutions Guide

Other References:

- John G. Michaels and Kenneth H. Rosen, *Applications of Discrete Mathematics*, 1991.
- More suggested reading: Consult Appendix B-1 in the textbook.

Course Content: The content of the course includes the following:

- The Foundations: Logic, Sets and Functions;
- The Fundamentals: Algorithms, Elementary Number Theory and Matrices;
- Mathematical Reasoning: Read, Comprehend and Construct Mathematical Arguments, Proof-writing and Basics in Program Correctness;
- Combinatorial Analysis: Counting, Recurrence Relations, Discrete Probability and Analysis of Algorithms;
- Introduction to Discrete Structures: Sets, Permutations, Relations, Graphs, Trees, Boolean Algebra, Finite-State Machines;
- Algorithmic Thinking: Master the usage of pseudocode in describing algorithms;
- Writing Skills: Practice communicating effectively in mathematics and computer science through proof-writing, wording solutions in mathematical notations, computer science terminology as well as proper English.

Classes*:* Students are expected to attend all classes and are responsible for all material covered in class as well as any changes made in the schedule regarding homework, problem sets and other dates. Class attendance and consistent preparation for class will determine the success or failure the student realizes in this course. Missing more than three classes without legitimate reasons will result in appropriate academic penalty.

Homework: (100 points) A homework assignment is due almost every day of class at the end of class. Generally all that will be recorded is whether the assignment was done. However, persistently shoddy work will be brought to the attention of the student and may be factored into the homework portion of the grade. The student must be present in class to turn in the homework. Late homework will not be accepted. Collaboration is allowed and encouraged. Working in groups can be an effective learning tactic. However, each student must write his or her own solutions.

Solutions to homework will be put on reserve in the library.

Problem sets: (200 points) Eight sets (worth 25 points each) of challenging problems will be handed out. Usually a week will be allowed for completion of the problems. Students should begin the problem sets on their own, but they may collaborate with each other. A student may collaborate only with other students currently taking this course. He or she may not seek help from tutors, other professors or anyone else not enrolled in this course. The final written solutions must be in the student's own words. Style and reasoning will be important factors in grading.

Tests: (560 points) Four tests (140 points each) will be given on the following days:

Test 1: Wednesday, September 26
Test 2: Friday, October 26
Test 3: Monday, November 19
Test 4: Friday, December 7

Each test will have an in-class part (80 points) and a take-home part (60 points). Both parts are closed book. Further instructions will be given on each test. The student is expected to take all in-class tests at the scheduled times, and hand in the take-home parts on the due date. Excuses deemed legitimate by the instructor will be handled according to the individual circumstances. For legitimate excuses arrangements will be made to take an in-class test **prior to** the testing time or extend the due date for the take-home part appropriately. **There will be no make-up tests given after the test time.**

Students with disability concerns verified by the Disability Services at the University should approach the instructor as early as possible in the semester to ensure proper accommodations.

Review sessions will be scheduled outside of class.

Final Exam: (140 points) A cumulative final exam will be given at the time scheduled by the Registrar.

Written Style: Thoughts are expressed by sentences. Your written work must in complete sentences. Use mathematical symbols and computer science notations wherever appropriate; do not use a lot of words. Your work should be neat, orderly and legible. Pay attention to how the problems are worked out in the textbook.

HONOR CODE: THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT. ALL SUCH WORK WILL BE PLEDGED TO BE YOURS AND YOURS ALONE. THIS IS THE CASE WHEN YOU PLACE YOUR NAME ON WORK SUBMITTED.

Grading:

Homework (almost every class day)	100
Problem sets (8 sets @ 25 points each)	200
Tests (4 tests @ 140 points each)	560
Final exam	140
Total	1000

The following scale will be used to assign letter grades:

A:	900 – 1000	points
B:	800 – 899	points
C:	700 - 799	points
D:	600 - 699	points
F:	Below 600 points	

Grades of A-, B+, B-, C+, C-, D+ may be assigned for sums of points near the above cutoffs in total points.

Topics to be covered:

A detailed weekly outline will be handed out in class. The outline will include a description of topics to be covered, sections to study, homework assignment and reminders of important dates.

Handouts will be put on Learnlink Conference to supplement the textbook and lectures.

Chapter	Sections
1	1.1-1.8
2	2.1-2.6
3	3.1-3.5
4	4.1-4.4, 4.7
5	5.1,5.3,5.5
6	6.1-6.3, 6.5
7	7.1-7.5
8	8.1-8.4
9	9.1-9.4
10	10.1-10.5

Some suggestions:

The main suggestion to a student is to **take the responsibilities**. The following is an incomplete list of advice a student should start with.

- Prepare for and attend the lectures, participate in discussions.
- Spend some time on studying the course every day.
- Form study groups.
- Ask questions.
- Review before the tests, Reflect after the tests.
- A class conference for this course on Learnlink will be created and announced. Students are responsible to check the conference regularly for information, announcements and discussions. Students are strongly encouraged to participate in the conference. Please make the conference appear on your Learnlink desktop, so that you will be aware of any new messages.