

Computer Science 124
Mathematical Foundations of Computer Science
SYLLABUS
Fall 2002

Instructor: Fang Chen
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Office Hour: To be announced or by appointment

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.

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, Analysis of Algorithms;
- Introduction to Discrete Structures: Sets, Permutations, 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.

Course Resources:

- Course Web Page: A course web page will be constructed as the course proceeds. A student may reach it through the instructor's personal web page:
<http://www.learnlink.emory.edu/~fchen2>
- Course Learnlink Conference: A Learnlink class conference for this course has been created and the name is CS124. 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.
- Library Reserve: The hardcopies of solutions to homework and tests will be on reserve in the library.

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 at the end of almost every 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 will 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: (480 points) Three tests (160 points each) will be given on the following days:

Test 1: Wednesday, September 25

Test 2: Friday, October 25

Test 3: Wednesday, December 4

Each test will have an in-class part (80 points) and a take-home part (80 points). The in-class part is closed book. You may use your textbook, and class notes for the take-home part, but no other reference material. You may not use calculators, computers, or any other computing device for either the in-class or the take-home part. You may not consult another person. The tests should represent your work alone.

Further instructions will be given at 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 in class. 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.

Writing Project: (80 points) A writing project will be assigned in November for which the students are given about three weeks to complete a 3-5 page essay on a selected topic related to the course. Details will be provided at the time of assignment.

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 (3 tests @ 160 points each)	480
Writing Project	80
Final exam	140
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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.

How to succeed?

The main suggestion to a student is to take the responsibilities:

- Prepare for and attend the lectures, participate in class discussions.
- Spend some time in studying the course every day and keep up with the homework.
- Form study groups.
- Check Course Web Page regularly for material and information posted.
- Ask questions. (Learnlink Conference)
- Review before the tests, Reflect after the tests.