

EECS 376

Foundations of Computer Science

Fall 2012

General Information

This document contains answers to most questions about the course organization and requirements, so please read it carefully and retain a copy.

Times:

Lecture 001, 12:00-1:30 p.m. MW, 1013 Dow
Discussion 011, 2:30-3:30 p.m. Tu, 2315 GG Brown
Discussion 012, 8:30-9:30 a.m. Tu, 1006 Dow
Discussion 013, 4:00-5:00 p.m. Tu, 1200 EECS
Discussion 014, 5:00-6:00 p.m. Tu, 1005 Dow

Instructional Staff

Professor:

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GSI:

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Course Description

An introduction to computation theory: finite automata, regular languages, Turing machines, recursive languages and functions, and computational complexity

Required Textbook

Introduction to the Theory of Computation, 2nd ed., M. Sipser, Thomson.

Web Site

Go to <https://ctools.umich.edu/>

You must be registered to access this web site. This web site will be used to make announcements, distribute homework assignment and solutions, sample exams, etc., so check it regularly.

Course Policies

Class Sections

You must be registered for the lecture section and the discussion section for this course. The instructors (professor and GSI) for your lecture and discussion sections are responsible for grading and advising you.

Homework Policies

The lectures and discussion sections will be much more useful to students who have thought about the material in advance. The course schedule below indicates the sections of the textbook that will be discussed in class. Be sure that you have read the indicated text sections before each class meeting. Homework is not only a way of showing us that you are keeping up with the class on a regular basis—it is an important part of the learning process.

Homework will be assigned on Wednesdays and will be posted on the web. Completed homework is due on the following Wednesday *at the beginning of class*. **Late homework will not be accepted for any reason, because solutions will be posted on the Web the following day.**

There will be a total of nine homework assignments. Only the eight highest grades received will be used to compute your final course grade. In other words, the lowest grade received by each student (including a zero for at most one missed assignment) will be discarded. By throwing out the lowest score, we allow you to miss a homework assignment for reasons of illness, a death in the family, or any other reason. You should not squander this resource; if you miss an assignment early in the term because you do not feel like turning in the assignment, you may regret it later.

Doing the Homework

Please write your answers clearly and neatly to avoid problems when the grader is correcting your homework. Also answer the questions in the order they are assigned; that will help to prevent problems, such as questions left ungraded. Show all your work, and state any special assumptions you make.

You may consult with other students in the class when doing homework. *However, the version you turn in must be in your own words, written (or typed) in your own hand.*

To ease handling of homework, staple all your homework sheets. On the front page, top right corner provide the following items:

- Print your name
- Print the homework number.
- The result should then look like this:

Name: John P. Doe
Homework 4.

Submitting Homework

Homework will be collected in class by the GSI.

Regrading Homework

If there is a mistake in the grading of your homework, you have **one week** to request a regrade after the homework is returned to you. When requesting a regrade, attach a cover page to your homework explaining clearly which questions need to be regraded and why. Note that “I think I deserve more points for this question” is not a valid reason for a regrade. Homework regrades should be submitted to the GSI.

Project Policies

There will be one project that involves using the development tool Lex. This will be treated as a programming project and must be done on your own. You are not allowed to work with other students in the course. *If you are having difficulties with the project, you may consult the professor or GSI, but no one else.*

The Engineering Honor Code applies to the project. Suspected cases of cheating or other Honor Code violations will be reported to the Engineering Honor Council and will be dealt with severely. If you are unclear about these rules, contact the professor or GSI for clarification. Keep this in mind: If you are having trouble finishing an assignment, it is far better to do your own work and receive a low score than to go through an academic judiciary case and suffer the penalties, which may be severe.

What is cheating on a project?

- having someone else write your program, in whole or in part.
- copying a program someone else wrote, in whole or in part.
- collaborating with someone else to the extent that the programs are identifiably similar, in whole or in part
- utilizing program solutions from a previous semester (whether written by a student or the course instructor)

What is not cheating?

- talking to someone in general about topics and concepts involved.
- asking someone for help with a specific bug or error message in your program.
- getting help with the specifics of Lex syntax.

- utilizing information given to you by the teaching staff of the course, for example copying a paragraph describing the program from the assignment write-up we provide to you, copying parts of code from handouts used this course

Exam Policies

The Engineering Honor Code applies to the exam.

There will be three in-class exams. All exams will be closed book. On each exam, you will be allowed to bring one 4" by 6" file card (or paper cut to these dimensions) with anything you like written on it (you can use both sides), but no other material. *Do not bring a blue book.* If you cannot take an exam at the scheduled time, notify your instructor at least one week in advance so that alternative arrangements can be made.

The exams will be on the following days.

Exam 1: Wed., Oct. 3

Exam 2: Wed., Nov. 7

Exam 3: Fri., Dec. 14, 1:30- 3:30 p.m.

If there is a mistake in the grading of your midterm, you have one week to request a regrade after the exam is returned in class (not necessarily a week after *you* pick up your exam).

Course Grade Distribution

Exam 1:	20%
Exam 2:	20%
Exam 3:	25%
Project:	10%
Homeworks:	25%
<u>Total:</u>	100%

Course Schedule

Lect	Disc	Date	Topic	Page Numbers
1		Sep. 5	Intro, finite automata, HW 1 assigned	31-37
2		Sep. 10	Formal definitions of finite automata	37-43
	1	Sep. 11	HW 1 discussion	
3		Sep. 12	Regular operations, nondeterminism, HW 1 due, HW 2 assigned	44-52
4		Sep. 17	Equivalence of NFAs and DFAs	53-58
	2	Sep. 18	HW 2 discussion	
5		Sep. 19	Closure under regular ops, HW 2 due, HW 3 assigned	58-64

6		Sep. 24	Equivalence of regular expressions, finite automata	64-70
	3	Sep. 25	HW 3 discussion	
7		Sep. 26	The Pumping Lemma, HW 3 due, Sample Exam 1 distr.	71-82
8		Oct. 1	Lex and lexical analyzers, Project assigned	
	4	Oct. 2	Sample Exam 1 discussed and review	
9		Oct. 3	Exam 1(in class)	
10		Oct. 8	Context-free grammars	99-109
	5	Oct. 9	Exam 1 returned	
11		Oct. 10	Pushdown automata, Project due, HW 4 assigned	109-127
12		Oct. 17	Turing machines, HW 4 due, HW 5 assigned	137-147
13		Oct. 22	Variants of Turing machines, Turing's thesis	148-154
	7	Oct. 23	HW 5 discussion	
14		Oct. 24	Decidable problems, HW 5 due, HW 6 assigned	165-174
15		Oct. 29	Diagonalization, the Halting Problem	174-182
	8	Oct. 30	HW 6 discussion	
16		Oct. 31	Turing unrecognizable languages, HW 6 due, Sample Exam 2 distributed	187-192
17		Nov. 5	Computation histories	192-197
	9	Nov. 6	Sample Exam 2 discussion and review	
18		Nov. 7	Exam 2 (in class)	
19		Nov. 12	Reductions and complexity	206-210 245-250
	10	Nov. 13	Exam 2 returned	
20		Nov. 14	The class P, HW 7 assigned	250-264
21		Nov. 19	NP and NP-completeness	264-276
	11	Nov. 20	HW 7 discussion	
22		Nov. 21	Cook's Theorem, HW 7 due, HW 8 assigned	276-283
23		Nov. 26	NP-complete problems	283-291
	12	Nov. 27	HW 8 discussion	
24		Nov. 28	NP-complete problems, HW 8 due, HW 9 assigned	291-294
25		Dec. 3	Space complexity, Savitch's Theorem	303-307
	13	Dec. 4	HW 9 due, Sample Exam 3 distributed	
26		Dec. 5	The classes L and NL	
27		Dec. 10	Review	
	14	Dec. 11	Sample Exam 3 discussed	
		Dec. 14	Final Exam, 1:30- 3:30 p.m.	