

CSE 5342/7342 Spring 2009
Concepts of Language Theory and Their Applications
MW 12:30pm-1:50pm, 307 SIC

Dr. Michael Hahsler

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1. Course Outline

Formal languages and their relation to automata. Introduction to finite state automata, context-free languages and Turing machines. Theoretical capabilities of each model, and applications in terms of grammars, parsing, and operational semantics. Decidable and undecidable problems about computation. Computational intractability (P vs. NP).

Prerequisite: CSE 3342 or permission of the instructor.

2. Textbook

Hopcroft, Motwani, and Ullman, "Introduction to Automata Theory, Languages and Computation", 3rd edition, Addison-Wesley, 2006.

3. Course Work and Grading

The course work consists of assignments, a project and exams.

- Weekly assignments based on the textbook exercises (30% of grade).
- A programming project using C, C++ or Java (20%).
- A mid-term exam (20%) and a final exam (30%).

The letter grade is roughly given as follows: A (90-100), B (75-90), C (60-75), and D/F (less than 60).

It is expected that each student will keep up with the reading as outlined in the syllabus below. Additional materials may be referenced in class as needed.

All material submitted by students is to be their own work. No joint projects or homework solutions will be allowed. ANY STUDENT FOUND PLAGIARIZING WILL RECEIVE AN AUTOMATIC GRADE OF 0 ON THAT ASSIGNMENT. A SECOND INSTANCE OF CHEATING BY THAT STUDENT WILL RESULT IN A GRADE OF F FOR THE COURSE.

4. Tentative Course Schedule

Week	Date	Topics	Reading	Homework due
1	1/21	Introduction	Chapter 1	
2	1/26, 1/28	Finite automata	2.1-2.3	
3	2/2, 2/4	Finite automata	2.4-2.5	2/2 Assignment #1
4	2/9, 2/11	Regular expressions/languages	3.1-3.5	2/9 As. #2
5	2/16, 2/18	Regular expressions/languages	Chapter 4	2/16 As. #3
6	2/23, 2/25	Context-free grammars	5.1-5.2	2/23 As. #4
7	3/2 3/4	Discussion of projects Mid-term exam		
8		Spring break (March 9-14)		
9	3/16, 3/18	Context-free grammars (CFG)	5.3-5.4	3/16 As. #5
10	3/23, 3/25	Push-down automata	6.1-6.2	3/23 As. #6
11	3/30, 4/1	Push-down automata	6.3-6.4	3/30 As. #7
12	4/6, 4/8	Properties of CFG	7.1-7.2	4/6 As. #8
13	4/13, 4/15	Properties of CFG	7.3-7.4	4/13 As. #9
14	4/20, 4/22	Turing Machines	8.1-8.4	4/20 As. #10
15	4/27, 4/29	Undecidability and intractable problems	9.1-9.3 10.1-10.2	4/29 Project due
16	5/4	Project discussion		
	TBD	Final exam		

5. Additional Information

Disability Accommodations: Students needing academic accommodations for a disability must first contact Ms. Rebecca Marin, Coordinator, Services for Students with Disabilities (214-768-4557) to verify the disability and establish eligibility for accommodations. Then schedule an appointment with me to make appropriate arrangements. (See University Policy No. 2.4.)

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify me in writing at the beginning of the semester, and should discuss with her, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities: Students participating in an officially sanctioned, scheduled University extracurricular activity will be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with me prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)