

Welcome to CSE 322: Intro. to Formal Models

- ◆ More popularly known as: Theory 101
- ◆ Instructor: Rajesh Rao (rao@cs.washington.edu)
- ◆ TAs:
 - ⇒ Ioannis Giotis (giotis@cs)
 - ⇒ Quang Tran (qtd@cs)
- ◆ Guest appearances:

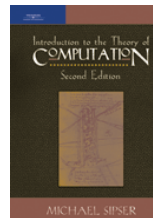
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Syllabus and Course Information

- ◆ Browse class web page for syllabus and course information:
 - ⇒ <http://www.cs.washington.edu/education/courses/322/06wi/>
- ◆ Lecture slides will be made available on the website
- ◆ Add yourself to the mailing list → see the web page
- ◆ Textbook
 - ⇒ *Introduction to the Theory of Computation 2nd Ed.* (2005)
 - ⇒ By Michael Sipser (at MIT)



Today's Agenda

- ◆ Course Topics
- ◆ Course Goals
- ◆ How do I get an A? Homework, exams, etc...
- ◆ Review of Selected Topics from Chapter 0
 - ⇒ Sets and Mathematical Notation
 - ⇒ Functions and Relations
 - ⇒ Strings and Languages

Course Topics

- ◆ Mathematical Preliminaries (Chap. 0)
- ◆ Regular Languages and Finite Automata (Chap. 1)
- ◆ Context-Free Languages and Pushdown Automata (Chap. 2)
- ◆ Turing Machines and the Church-Turing Thesis (Chap. 3)
- ◆ Decidable and Undecidable Languages (Chap. 4)
- ◆ Selected topics from Chap. 5

Course Goals

- ◆ General Goals:
 - ⇒ Learn to mathematically express and analyze a problem or statement about computation
 - ⇒ Learn to prove mathematical theorems about computation
 - ⇒ Hone your analytical skills for your future career!

Course Goals

◆ Specific Goals:

- ⇒ Understand how problems can be classified as computationally “easy” or “hard” using *abstract computational “machines”*
- ⇒ Learn about **regular expressions, finite automata, context-free grammars, and Turing Machines**
- ⇒ Discover their *applications* in string searching, compilers, hardware design, programming languages, and algorithmic analysis

How do I get an A in this class?

- ◆ Answer: *Practice, Practice, Practice* (solving problems)
- ◆ **Weekly homework assignments (50%)**
 - ⇒ Total of about 7 assignments
 - ⇒ Collaborative/group work is encouraged but *only after you have tried to solve each problem by yourself first*
 - ◆ No copying of solutions – explain in your own words!!
 - ◆ See Course Policies regarding this on the Web
 - ⇒ No late submissions: due at the *beginning of class* on due date
- ◆ **Midterm exam (20%)**
 - ⇒ Friday, February 10, 2006 (in class during regular class time)
- ◆ **Final exam (30%)**
 - ⇒ Monday, March 13, 2006 from 2:30-4:20 p.m. (in same classroom)

Okay, time to wake up...



Let's begin with some basics...

- ◆ Review of things you probably already know:
 - ⇒ Sets and mathematical notation
 - ⇒ Functions
 - ⇒ Strings
 - ⇒ Languages

Next Class: Proving things – how and why...

- ◆ Things to do:
 - ⇒ Visit course website
 - ⇒ Sign up for mailing list (instructions on website)
 - ⇒ Read Chapter 0