Welcome to CSE 322: Intro. to Formal Models

- More popularly known as: Theory 101
- Instructor: Rajesh Rao (rao@cs.washington.edu)
- TAs:
  - Deepak Verma (deepak@cs)
  - Matthew Milcic (mmilcic@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/322/04sp/

◆ 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* (1997)
   ➪ By Michael Sipser (at MIT)
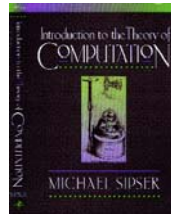
Today's Agenda

◆ 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

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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%)
- ➪ Monday, May 3, 2004 (in class during regular class time)

◆ Final exam (30%)
- ➪ Monday, June 7, 2004 from 8:30-10:20 a.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
   ➪ Relations
   ➪ 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