Welcome to CSE 322: Intro. to Formal Models

❖ More popularly known as: Theory 101

❖ Instructor: Rajesh Rao (rao@cs.washington.edu)

❖ TAs:
  ⇨ Ethan Phelps-Goodman (ethanpg@cs)
  ⇨ Peter-Michael Osera (psosera@cs)

❖ Guest appearances:

NOAM

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Syllabus and Course Information

❖ Browse class web page for syllabus and course information:
  ⇨ http://www.cs.washington.edu/education/courses/322/04au/

❖ 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)

Introduction to the Theory of COMPUTATION

MICHAEL SIPSER

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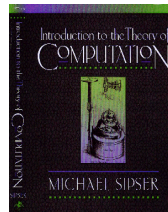
Today's Agenda

- ◆ 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%)
  ➪ Wednesday, November 3, 2004 (in class during regular class time)

◆ Final exam (30%)
  ➪ Mon, December 13, 2004 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
  ⮩ Relations
  ⮩ Strings
  ⮩ Languages

Next Class: Strings and Languages…

✦ Things to do:
  ⮩ Visit course website
  ⮩ Sign up for mailing list (instructions on website)
  ⮩ Read Chapter 0