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:
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