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 Milecic (mmilcic@cs)
✦ Guest appearances:
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
  ➜ 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%)
  ➔ 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