CSE 322 **Autumn 1999**

Introduction to Formal Models in Computer Science

General Description:

Introduction to the theory of computing through a study of *automata* (finite automata, push-down automata and Turing machines) and *formal languages* they capture (regular languages, context-free languages and decidable languages, respectively). Emphasis on understanding abstract models and on rigorous analytical arguments.

Prerequisites:

CSE 321 (Discrete Structures)

Instructor:

Rimli Sengupta
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Office hours: MWF 11:30 am – 12:30pm

Teaching Assistants:

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Yongshao Ruan (`ruan@cs.washington.edu`)
Office hours: TBA

Meetings:

MWF 10:30 am – 11:20 am (DEN 216)

Text:

Michael Sipser, *Introduction to the Theory of Computation*, PWS, 1997.

Courseweb and Mailing List :

Courseweb for CSE 322: `http://www.cs.washington.edu/education/courses/322/99au`. Check it regularly (several times a week). Announcements may be made there that are not made in class. Homeworks will be posted there. Instructions for subscribing to the class mailing list (`cse322@cs`) is on the courseweb. I will be using both the courseweb and the class mailing list to communicate with the class.

Assignments and Exams:

There will be regular homework assignments. Particularly difficult problems may be assigned as group work. Homeworks will generally be due a week after they are assigned. **Late homeworks will not be accepted**. My expectation is that there will be one in-class midterm and a final. I will inform the class if this changes.

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Grading:

Homework	50%
Midterm	15%
Final	35%

The above percentages are approximate. They will be used to compute a numerical score that will be used to determine final grades.

Course Outline:

The following is a (possibly incomplete) list of topics I plan to cover:

1. Introduction and mathematical background (chapter 0).
2. Regular languages: deterministic and non-deterministic finite automata, closure properties, regular expressions, pumping lemma (chapter 1).
3. Context-free languages: context-free grammars, Chomsky normal form, push down automata, pumping lemma (chapter 2).
4. Turing machines, decidability, the halting problem (chapters 3, 4).