CS250 – Theory of Computation **Spring 2017**

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Office Hours:

9:30 - 10:30 M
1:00 - 2:00 T
9:00 - 10:00 Th
others by drop in or appointment

Text: An Introduction to Formal Languages and Automata 6^{th} Edition by Linz

Course web page http://phoenix.goucher.edu/~jillz/cs250

Course Description:
We will discuss the theoretical foundations of computer science, stressing formal models. We will introduce formal computational complexity and alternate models of computation. Topics include finite state machines, regular expressions, grammars, pushdown automata, Turing machines, computability and the halting problem, and hierarchies of computational classes.

This is a mathematically and theoretically oriented course and will require extensive problem solving and class participation. We will cover almost all of the text.

The goal of the course will be to understand the underlying foundations of computational theory. You will become familiar with the major models of computation and the relationships between them.

Course Objectives:
After successful completion of this course you will be able to

- construct and use mathematical models of computation
- formulate logical arguments to reason about what a model can and can not accomplish

Course Resources
We will be using an application JFLAP to build computation models. This application is freely available for download and is also installed on the phoenix server.

Course Mechanics:
I expect you to bring your textbook to class every day and be prepared to be an active learner. You will need to read the relevant chapters of the text ahead of time and I will be posing questions and have you vote using socrative.com (room 44772).

Additionally you will have lab assignments and written worksheets which you will work on in class. All assignments are to be done individually but discussions with your classmates about concepts and approaches are strongly encouraged. The rule of thumb is that you may discuss work but when it comes time to writeup the work, it needs to be done by you alone.

Course Schedule:

Topics	Due Dates
Chapter 2.1 Deterministic Finite Automata - Lab 1	Jan 26
Chapter 2.2,2.3 Nondeterministic Finite Automata - Lab 2	Feb 2
Chapter 3.1 Regular Expressions - Lab 3	Feb 7
Chapter 3.2 Equivalence of FAs and REs - Lab 4	Feb 9
Chapter 4.1, 4.2 Properties of Regular Languages - Lab 5	Feb 14
Chapter 4.3 Regular Pumping Lemma - Lab 6	Feb 21
Chapter 3.3 and Chapter 5 Grammars - Lab 7	Feb 28
Exam 1	Mar 2
Chapter 61, 6.2 Context Free Grammar Normal Forms - Lab 8	Mar 7
Chapter 7.1 Pushdown Automata - Lab 9	Mar 9
Chapter 7.2 Equivalence of CFL and PDAs - Lab 10	Mar 21
Chapter 8.1 Context Free Pumping Lemma - Lab 11	Mar 28
Chapter 8.2 Properties of Context Free Languages - Lab 12	Mar 30
Chapter 9.1, 10.1-10.3 Turing Machines - Lab 13	Apr 6
Chapter 10.4 A Universal Turing Machine - Lab 14	Apr 11
Chapter 11.1 Recursive and Recursively Enumerable Languages - Lab 15	Apr 18
Exam 2	Apr 20
Chapter 12.1, 12.2 Undecidability - Lab 16	Apr 27
Chapter 13 Other Models - Lab 17	May 2
Chapter 14 - Computational Complexitiy - Lab 18	May 4
Final	TBA

Academic Dishonesty:
Turning in work that was produced by someone else is cheating and will be subject to an Honor code violation. I will give you a lot of opportunity to collaborate with your fellow students and ask me for assistance, but if you violate that trust and cheat by submitting work that is not your own you will be hurting yourself and others in the following ways:

1. You would be failing to engage in the authentic learning and mastery of the academic material and thus harming your own education.
2. You would be reducing the enjoyment of accomplishments earned through genuine effort.
3. You would b creating an environment of broken trust, which then limits the ability of students to work together meaningfully and collaboratively.
4. You would be harming your reputation and face serious consequences.

Grading:
Your course grade will be based on the following:

Lab and Homework Assignments	40%
2 Exams (20% each)	40%
Comprehensive Final Exam	20%
Total	100%