Overview

CS383 is an introduction to computational theory. The primary content of this course is the development and analysis of mathematical models of computation. In particular, we will formalize the notion of computation and examine three increasingly powerful models of computation. For each model, we will explore its capabilities, limitations and variants. The concepts in this course are intended to further develop your understanding abstraction, modeling, and formal mathematical reasoning. Furthermore, many topics in this course are directly related to other fields of computer science, including computer architecture, programming languages, compilers, and algorithms.

Core topics include finite automata and regular expressions, closure properties, non-determinism, context-free grammars and pushdown automata, Turing machines, undecidability, recursive and recursively enumerable set, and complexity classes.

Textbook and Website

We are using Kozen’s Automata and Computability, published by Springer.

Select handouts and announcements will be posted on the course webpage at


Course Requirements & Expectations

Ten written homeworks — expect to spend around 8 hours per week on each.

Two take-home tests — expect shorter versions of homeworks, to be worked on alone.

One final exam — expect a longer, cumulative test.

Daily attendance and participation — expect to be in class.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>60%</td>
</tr>
<tr>
<td>Tests</td>
<td>16%</td>
</tr>
<tr>
<td>Final</td>
<td>16%</td>
</tr>
<tr>
<td>Attendance and Participation</td>
<td>8%</td>
</tr>
</tbody>
</table>
Homework Policy

- Homeworks are due in class on the specified dates. Late homeworks are accepted within 24 hours of their deadline for half credit. After 24 hours no credit is given. The first late assignment (up to 24 hours) per student incurs no penalty.

- Your first three assignments are to be prepared with LaTeX, but after that you may hand-write your solutions if you choose. You may not use MSWord or other typesetting programs.

- Please hand in hard copies of your assignments (that is, do not email me your solutions).

Honor Code

I take the honor code very seriously, and will report any violations to the Honor Code Committee.

This is a class where working with your peers is not only allowed, it is encouraged. However, the assignments you hand in must be written up by yourself and represent your own thoughts and work. In particular, you may discuss ideas with your classmates, but do not write anything down. If you really understand the discussion, you should be able to reconstruct it on your own. You may not use the internet or other references other than the textbook, unless told otherwise.

If you do work with a friend or friends, please write your cohorts names on the top of your assignment. This is important, and I certainly think no less of you if you work with your classmates. Separate rules apply to your exams and tests, which will be explained at the appropriate time. Finally, you must write the honor code on every assignment, quiz, and exam, along with your signature. You know the drill by now. For the record, the honor code is

“**I affirm that I have adhered to the Honor Code in this assignment.”**

Teaching Assistant

Sam Taggart is a teaching assistant for this course; he is in charge of one peer learning session and two office hours per week. Whereas the office hours are individual question-asking periods, the peer learning sessions are group problem-solving sessions guided by the TA, on textbook problems related to the upcoming assignment. These outside-class meetings are not mandatory, but I will give bonus points for attendance at the peer learning sessions. Sam’s office hours are Tuesdays 7-8pm and Wednesdays 9:30-10:30pm, and the peer learning sessions are Sundays 7:30-8:30pm. Location tba.

Tutors

There are tutors available, provided by Oberlin College. If you think you’d like such a tutor, just contact me and I’ll get you set up. Don’t wait until it’s too late!

Student Disabilities

If you require special accommodation, please speak to me during the first week of class so that I have time to make suitable arrangements. You must be registered the office of Student Disabilities.