COSC/MATH 4P61: Theory of Computation

- Instructor: Ke Qiu, J 306
- Time: Tuesday, Friday, 12:30-2:00 pm.
- Location: AS 202
- Office Hours: (a) Thursday: 10:30 am – 12:30 pm. (b) By appointment.

General Objectives

Introductions to formal languages, automata, and their relation, and theory of computation. In particular, we will cover the following topics:

preliminaries: induction, proofs, sets, countability, Cantor's theorem, technique of diagonalization;

regular sets, languages, and their closure properties, regular, grammars, and finite state machines;

context free languages and their closure properties, context-free grammars, push-down automata, normal forms;

Turing machines and general introduction to computations: recursive and recursively enumerable languages, (un)decidability, etc.

The Chomsky Hierarchy: relations between different classes of languages.

Recommended Textbooks

Introduction to Automata Theory, Languages, and Computation, John E. Hopcroft, 3rd ed., Rajeev Motwani, and Jeffrey Ullman, Addison-Wesley Publishing Company. A useful link to the book:
http://infolab.stanford.edu/~ullman/ialc.html.

The first and original edition of this book (by Hopcroft and Ullman) is a classic and one of the best among the many books on this subject.

Other good books on the subject area include the following:

An Introduction to Formal languages and Automata by Peter Linz.

Exams

One in-class midterm test: Oct. 25, Friday.

One final exam.

Assignments

There will be a total of four (4) assignments. **No late assignment will be accepted.**

You may discuss assignments with your fellow students. But, please remember not to share solutions. The work you submit must be your own.

Cheating

Cheating and plagiarism as defined in the Academic Integrity section of the Calendar is strictly prohibited. *Cheating in any form will not be tolerated and will be dealt with severely.* A mark of 0 will be given to the offending assignment/exam. A second offence will result in a failing grade for the course. In both cases, the incident will be reported to the department and the registrar's office.

Marking Scheme

The marking scheme is as follows: 30% Assignments + 25% Midterm tests + 45% Final, or 30% Assignments + 10% Midterm + 60% Final, whichever is greater.