

## CS 360: Introduction to the Theory of Computation

**Lectures:** TTh 11:30 - 12:50 (MC 4064)

**Webpage:** [www.cs.uwaterloo.ca/~breic/cs360](http://www.cs.uwaterloo.ca/~breic/cs360)

**Instructor:** Ben Reichardt ([breic@cs](mailto:breic@cs)) DC 2113 and RAC 2113, x38616

**Office Hours:** Tuesdays after class in DC 2113, or by appointment

**TA:** Jalaj Upadhyay ([jkupadhy@cs](mailto:jkupadhy@cs)) DC 3324, x33419, O.H. TBA

**Course Outline:** We will cover the following topics from the textbook *Introduction to Automata Theory, Languages, and Computation*, by Hopcroft, Motwani & Ullman:

1. *Finite-state machines:* Deterministic and nondeterministic finite state automata, regular expressions and languages.
2. *Context-free languages:* Context-free grammars, parse trees, push-down automata.
3. *Turing machines:* Power of Turing machines
4. *Undecidability and basic complexity theory:* Recursive and recursively enumerable languages, universal Turing machines, undecidable problems, NP-completeness.

**Grading and homework policy:** The final grade will be a weighted average of:

Homework	35%	Take-home midterm	15%	Final Exam	50%
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**Homework:** Homeworks are due on Thursday before the end of the lecture. All homeworks must be submitted either in class or during office hours. Your worst homework grade will be *omitted* while computing your overall homework grade. *Late homework will not be accepted.* Homework solutions must be concise; incoherent and long-winded solutions may be penalized. Illegible solutions will not be graded. You are welcome to collaborate on your homework, so long as you indicate with whom you worked. You are responsible for understanding and being able to explain all of the statements in your homework and exam solutions. *Most importantly, the solutions must be written up independently of the other students.*

**Examinations:** Any credit not obtained on the midterm transfers automatically to the final. *One 8.5 x 11" page of notes*, both sides, will be allowed for the examination.