COMP 330, Fall 2020

Course Information:

Session: Fall 2020	Time: Tuesday-Thursday 01:05 - 2:25pm
Room: Online	Web: http://www.cs.mcgill.ca/~ hatami/comp330-F2020

Instructor:

Instructor:	Hamed Hatami	Email:	hatami@cs.mcgill.ca
Office:	McConnell 308	Phone:	
Office Hours:	Tuesday Thursday 16:00 - 17:00		

Teaching Assistants: Albert Orozco Camacho, Julien Mounthanyvong, James Bodzay, Tal Elbaz, Tyler Kastner, Bera Sogut, Molly Sun

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Evaluation: 50 % homework, 40% Final exam, 10 % for participation in class and quizzes, plus 5% bonus for participation in the discussion groups.

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1 Course Description

This is the principal undergraduate course in theoretical computer science at the School of Computer Science (SOCS). It focuses on the central concepts that constitute the foundations of computer science.

- What kinds of problems can be solved mechanically?
- What does it mean that there is a process (algorithm) that solves a problem? What is an algorithm?

These important questions are raised in the early twentieth century (before the invention of the modern computers), and by the mid twentieth century satisfactory answers were provided by the contribution of great mathematicians such as Turing, Church, Hilbert, Godel, Tarski, Post, Markov, Kleene. Some of these results are now considered to be among the greatest scientific achievements in the twentieth century. To investigate these questions one has to introduce rigorous models of computations, and then study their capabilities and limitations. In this course we study models of computation of increasing power. We begin with finite automata and regular languages which are models of computations with very limited power. The next phase deals with context-free languages invented by linguistics and now an essential aspect of every modern programming language. Finally we explore the limits of computability with the study of Turing machines (the theoretical model for modern computers), recursive sets, enumerable sets, self-reproducing programs and undecidability theory. Be prepared to see lots of proofs and abstract mathematical concepts in this course. If you are used to rigorous mathematical proofs, then this course will be easy for you. But if not, then you need to familiarize yourself with such proofs, and this can only be achieved by solving a lot of problems.

2 Textbook

The textbook of the course is

Michael Sipser, Introduction to the Theory of Computation, (1st, 2nd, or 3rd edition).

3 Prerequisite:

COMP 251 and MATH 240.

4 Assignments

There will be 6 assignments. The due dates are going to be announced. The homework and the exams will be graded based on correctness rather than effort alone. Each assignment will be posted on the course web page. Your grades will be posted on mycourses.

Late homeworks can be submitted until 48 hours after the deadline. There will be a penalty of -10% for one-day delays, and -20% for two-day delays on late homeworks unless a valid reason is provided by the student. Some personal circumstances for which accommodation may be warranted include, but are not limited to: Student illness (mental/physical), Family/partner illness, Death in the immediate family or of a person with whom the student has a similarly close relationship, Religious Observances, Pregnancy, Delivery of a child, Parenting issues.

The following are reasons for which an extension request will normally NOT be granted: Employment reasons, Travel/vacation/social plans, Airline flights and schedules, Other assignments and exams due on or about the due date.

5 Grading

Your grade for assignments and exams will be based on the correctness of your solutions and not on the amount of time and effort spent on them.

6 Academic Integrity

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offenses under the Code of Student Conduct and Disciplinary Procedures (see http://www.mcgill.ca/integrity for more information). Most importantly, work submitted for this course must represent your own efforts. Copying assignments or tests from any source, completely or partially, allowing others to copy your work, will not be tolerated.

7 Submission of written work in French

In accord [sic] with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.