General

Theory of Automata

MATH4805/5605 COMP4805, Fall 2019
School of Mathematics and Statistics, Carleton University

Instructor:
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General Information

Textbook:
Four books will be on reserve at the library for this course. They will be

- Finite Automata by Mark V. Lawson
- Formal Languages and Their relation to Automata by Hopcroft and Ullman.
- Introduction to the Theory of Computation by Sipser.
- An introduction to formal languages and automata by Linz.

There are also resources available on the internet:

- Marvin Nakayama's notes for CS 341.
- Introduction to Logic and Automata
- Introduction to Theory of Computation

Prerequisites:
MATH3106, MATH3158, MATH3855, equivalents, or permission.

Classes:
Tuesday 10:05-11:25, Thursday 10:05-11:25.
Room: SA 505.

Office hours: Thursdays 12:00-13:00 or by appointment.


Term mark: There will be two assignments, a midterm and an exam. MATH5605A students will have an addition presentation to the class. The tentative schedule is:

<table>
<thead>
<tr>
<th>Item</th>
<th>Due Date</th>
<th>4805</th>
<th>5605</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework 1</td>
<td>Oct. 28</td>
<td>20%</td>
<td>20%</td>
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<tr>
<td>Midterm</td>
<td>Oct. 17</td>
<td>25%</td>
<td>20%</td>
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<tr>
<td>Homework 2</td>
<td>Dec. 05</td>
<td>20%</td>
<td>20%</td>
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<tr>
<td>Exam</td>
<td>TBD</td>
<td>35%</td>
<td>20%</td>
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<tr>
<td>Presentation</td>
<td>last week of classes</td>
<td>20%</td>
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Students enrolled in MATH4805 or COMP4805 who would like to do a presentation may discuss this option with me.

Emergencies recognized by the University Regulations with verifiable supporting documentation, will be the only excuses accepted for any missed term work. Students who miss writing a test or submitting an assignment should bring appropriate documentation and contact the instructor as soon as possible to make arrangements.
Plagiarism and Cheating:

Plagiarism is defined in the undergraduate calendar as an instructional offense that occurs when a student uses or passes off "as one's own idea or product, work of another without expressly giving credit". This includes plagiarism involving material lifted from the Internet. Plagiarism is a serious offense. The penalties for students who have been found to have plagiarized are a failed grade at the least sever and suspension, expulsion or notation on transcripts for serious or repeated cases. Plagiarism is just one form of Cheating. All forms of cheating are taken very seriously and will be dealt with swiftly and severely.

Withdrawal: The last day for withdrawal from the course is 2019-12-06. Only withdrawals before 2019-09-30 get 100% refund, there is NO refund after this date.

Academic Accommodation You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

- **Pregnancy obligation**: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide
- **Religious obligation**: write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide
- **Students with disabilities** requiring academic accommodations in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability-related needs. Documented disabilities could include but are not limited to mobility/physical impairments, specific Learning Disabilities (LD), psychiatric/psychological disabilities, sensory disabilities, Attention Deficit Hyperactivity Disorder (ADHD), and chronic medical conditions. Registered PMC students are required to contact the PMC, 613-520-6608, every term to ensure that I receive your Letter of Accommodation, no later than two weeks before the first assignment is due or the first in-class test/midterm requiring accommodations. If you only require accommodations for your formally scheduled exam(s) in this course, please submit your request for accommodations to PMC by the deadlines published on the PMC website.

List of Topics Covered: regular languages, finite state automata, non-determinism, Kleene's Theorem, Pumping Lemma, Minimization and algorithmic problems. Additional topics that might be covered include: grammars, push down automata, context-free languages, transducers, the algebraic theory of automata, semigroups, Turing machines, Schutzenberger's theorem.

These topics are subject to change