COMP 1805A - Fall 2015

Discrete Structures I

Course Outline : August 27, 2015 (subject to change)

People

Instructor	M. Jason Hinek (contact info)
Teaching Assistants	tba (see https://www.carleton.ca/culearn/)

Course Information

Classroom	Building: River Building Room: 2200
Class Times	Days: Tuesday & Thursday Time: 11:55pm - 12:55pm
Course Website	http://people.scs.carleton.ca/~mjhinek/COMP1805/
Course Discussion Group	https://www.carleton.ca/culearn/
cuLearn	https://www.carleton.ca/culearn/

Calendar Description

Introduction to discrete mathematics and discrete structures. Topics include: propositional logic, predicate calculus, set theory, complexity of algorithms, mathematical reasoning and proof techniques, recurrences, induction, finite automata and graph theory. Material is illustrated through examples from computing.

Learning Outcomes

By the end of this course, a successful student will,

- Be able to communicate in the language of discrete mathematics. This includes reading, writing and understanding mathematical problems of a discrete nature that involve any of the course topics from the course calendar.
- Be able read and follow reasonably complex mathematical proofs. This includes direct proofs, indirect proofs, and induction.
- Be able to construct mathematical proofs for discrete mathematical problems. This includes direct proofs, indirect proofs and induction.
- Be familiar with and able to use big-O notation. This includes determining the big-O runtime (or space requirement) of an algorithm and being able to compare algorithms based on their big-O complexity.

And time permitting, a successful student will,

- Be able to draw finite state machines given their mathematical description and write a mathematical description of a given finite state machine.

Prerequisites

One Grade 12 university preparation mathematics course. Precludes additional credit for MATH 1800.

Textbooks

There is no required textbook for this course. Throughout the semester links to (free) online resources for various topics covered in the course will be posted to the course website.

Evaluation

30%	Four in-tutorial tests (week of Sept 21, Oct 5, Oct 19, Nov 9) (lowest of the four is dropped)
10%	One in-class test (Nov 24)
5%	Five assignments each worth 1%
55%	Final Exam (scheduled by the university)
100%	

Tests: Each test is 45 minutes long and worth 10% of your final grade. For in-tutorial tests, you must write the test in the tutorial you are registered in. Your best 3 (of the 4) will be used for your final grade determination. **There are no make-up tests**. If you miss a test for a valid (and documented) reason, the weight of that test will be moved to the final exam.

Assignments: There will be five assignments. Your grade for each assignment will be solely based on effort (and not correctness). Your grade for each assignment will be either 0 or 1. To receive a 1, your submission must have a reasonable attempt for at least 75% of the questions on the assignment. You may collaborate as much as you want on the assignments without penalty. (If you are working together with other students, be sure to list all contributing members on each assignment. Always give credit where credit is due!) You will not receive feedback about the quality of your solutions for the assignments but solutions will be posted.

Final Exam: The final exam will be three hours long. The time and location will be determined and announced by the university.

Appeals: Test appeals must be made within two weeks from the date that the test was returned to the class in tutorials. If you wish to appeal a test grade first compare your solution with the posted sample solutions. If you still wish to appeal you grade, download an appeal form from the course webpage, fill it out, staple it to the front of your test and submit it to the instructor either in office hours or before class starts.
Appeals made after the two week period will be returned without consideration. (Simple arithmetic errors are the only exception to this rule. These will always be corrected no matter when they are reported.)

Grades: Marks will be posted on cuLearn. It is your responsibility to check cuLearn frequently (after each test is graded, for example) and make sure that your marks are correctly recorded. All marked assignments and tests should be retained by students as proof of completion and in case your grades appear differently on cuLearn.

Collaboration Policy

★ The is absolutely no collaborating allowed for the tests and final exam. You are free to collaborate as much as you wish for the assignments but give credit where it is due.

Tentative Schedule (Coarse Overview)

Introduction	Lecture 1
Propositional Logic	Lectures 1, 2, 3
Predicate Calculus	Lectures 3, 4
Proofs	Lectures 5, 6, 7
Sets	Lectures 8, 9
Functions	Lectures 10, 11
Sequences and Sums	Lectures 12, 13
Algorithms and big-O	Lectures 13, 14, 15, 16
Induction	Lectures 17, 18, 19
Graphs	Lectures 19, 20, 21, 22
In class test (Test 5)	November 24 (Start of class)
Finite automata	Lecture 23

Test topics:

Test 1	Propositional logic and predicate calculus
Test 2	Proofs
Test 3	Sets and Functions
Test 4	Sequences, Sums, Algorithms and Big-O
Test 5	Induction and Graphs

Note: Even though each test will cover specific topics, they are also cumulative. For example, Test 2 might involves proofs using propositional logic, Test 3 might involve proving things with sets, or Test 5 might involve an inductive proofs using sums or functions.

Undergraduate Academic Advisor

The Undergraduate Advisor for the School of Computer Science is available in Room 5302C HP, by telephone at 520-2600, ext. 4364 or by email at `undergraduate_advisor@scs.carleton.ca`.

The undergraduate advisor can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisor will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and the Writing Tutorial Services.

University Policies

Full academic regulations are found in the University's calendar (link). Some excerpts are below.

Academic Integrity

Every student should be familiar with the Carleton University student academic integrity policy. A student found in violation of academic integrity standards may be awarded penalties which range from a reprimand to receiving a grade of F in the course or even being expelled from the program or University. Some examples of offences are: plagiarism and unauthorized co-operation or collaboration. Information on this policy may be found in the Undergraduate Calendar.

Plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own. Plagiarism includes reproducing or paraphrasing portions of someone else's published or unpublished material, regardless of the source, and presenting these as one's own without proper citation or reference to the original source.

In cases where an investigation determines that a violation of the Academic Integrity Policy has occurred, sanctions may be applied by the Faculty Dean, the Provost and Vice President (Academic), or by Senate Executive.

Sanctions may include but are not limited to completion of a remediation process, a written reprimand, assignment of a failing grade, withdrawal from a course, suspension from a program, suspension or expulsion from the university.

Students with Disabilities

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision.

If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable).

After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable) at
http://www2.carleton.ca/pmc/new-and-current-students/dates-and-deadlines/

Religious Obligations

Carleton University accommodates students who, due to religious obligation, must miss an examination, test, assignment deadline, laboratory, or other compulsory event. The University has a Senate-approved policy on religious accommodation that forms part of its Human Rights Policy, available at: http://www2.carleton.ca/equity/

Accommodation will be worked out directly and on an individual basis between the student and the instructor(s) involved. Students should make a formal written request to the instructor(s) for alternative dates and/or means of satisfying requirements. Such requests should be made during the first two weeks of any given academic term, or as soon as possible after a need for accommodation is known to exist, but in no case later than the penultimate week of classes in that term.

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 visit the Equity Services website: http://www2.carleton.ca/equity/

Medical Certificate

The following is a link to the official medical certificate accepted by Carleton University for the deferral of final examinations or assignments in undergraduate courses. To access the form, please go to
http://www.carleton.ca/registrar/forms/
