Course Outline Template

COMP 1805D for Winter 2024 (Preliminary Version)

Discrete Structures I

Course Information

Instructor: Svetlana Obraztsova
Contact: svetlanaobraztsova@cunet.carleton.ca
Classroom: Please, check Carleton Central for most up-to-date information.
Lectures: Tuesdays & Thursdays, 14:35 - 15:55 (in person)
Tutorials: Check your schedule on Carleton Central
Course Website: https://brightspace.carleton.ca/d2l/home/220913

For information about Carleton's academic year, including registration and withdrawal dates, see Carleton's Academic Calendar.

Teaching Assistants

A list of teaching assistants and their contact/office hours information will be posted once the course starts.

Course 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.
Precludes additional credit for MATH 1800.
Prerequisites: one Grade 12 university preparation mathematics course.
Lectures three hours a week, tutorial one hour a week.

Required Textbook(s) and Other Resources

David Liben-Nowell's *Connecting Discrete Mathematics and Computer Science*. A free PDF version is https://cs.carleton.edu/faculty/dln/book/.

SCS Laptop Requirement (only applies to on-campus courses)

Every student that has been enrolled in a 1000-level (i.e., first year) course offered by the School of Computer Science after the 2020/2021 school year is required to have a laptop. This includes COMP1001, COMP1005, and COMP1006. For more information, please visit https://carleton.ca/scs/scs-laptop-requirement/ and then review the requirements at https://carleton.ca/scs/scs-laptop-requirement/laptop-specs/.

Topics Covered and Learning Outcomes

Week	Dates	Topics	Tutorials	Problem Set	Tests
1	8 Jan - 12 Jan	Introduction, direct proof, disproof by example, proof by cases, pigeonhole principle, introduction to sets			
2	15 Jan - 19 Jan	Set operations	Tut1	PS1	
3	22 Jan - 26 Jan	Proof by contradiction, propositional logic, proof by contrapositive	Tut2	PS2	
4	29 Jan - 2 Feb	Introduction to predicate logic, proofs in predicate logic, introduction to functions	Tut3	PS3	MSQ1
5	5 Feb - 9 Feb	Functions, proofs by construction	Tut4		Test1
6	12 Feb - 16 Feb	Proofs by induction, proofs by strong induction	Tut5	PS4	
Winter Break					
7	26 Feb - 1 Mar	Proofs by structural induction, introduction to graphs	Tut6	PS5	
8	4 Mar - 8 Mar	Paths, cycles, trees, special graphs, graph colouring	Tut7	PS6	MSQ2
9	11 Mar - 15 Mar	Binary relations	Tut8		Test2
10	18 Mar - 22 Mar	Equivalence relations, partial and total orders	Tut9	PS7	
11	25 Mar - 29 Mar	Introduction to Asymptotic Analysis (Big-Oh), properties of Big-Oh, introduction to sums of sequences	Tut10	PS8	MSQ3
12	1 Apr - 5 Apr	Examples of sums of sequences, algorithms analysis, worst-case runtime analysis, asymptotic analysis of recursive algorithms	Tut11	PS9	
13	8 Apr -12 Apr				Final Test

Assessment Scheme

All tests and MCQ (tests are 45 min length, MCQ are 15 min length) will take place during the **Thursday lecture slot of the respective week** (see table).

Problem sets will become available on Tuesdays and their deadlines will be one week after the publication. More precicesly, next **Monday midnight** (00:01, night from Monday to Tuesday). Late submissions will not be graded. Solutions of problem sets should be submitted in PDF format. No other formats will be accepted.

Course Grade=40% from tests+18% from MCQ+42% from Problem Sets.

2 best tests out of 3 will be part of the final course grade. For example, imagine a student who has 50 points out of 100 in the first test, 78 in the second and 81 in the final test. Then, only the second and the final test will be taken into account, and total points from this component will be ((78+81)/2)*0.4=31.8 out of 40 points maximum available for this component.

2 best MCQ out of 3 will be part of the course grade.

6 best Problem Sets will be part of the course grade.

There will be no make up tests/MCQ nor deadline extensions for problem sets. It is advised that students attempt all problem sets/MCQs/tests. Do not voluntarily "drop" a problem set/test/MCQ. Missing any assignment should only be triggered by an exogenous, unforeseen emergency.

Undergraduate Academic Advisors

The Undergraduate Advisors for the School of Computer Science are available in Room 5302HP; or by email at scs.ug.advisor@cunet.carleton.ca. The undergraduate advisors can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit and the remaining requirements for graduation. The undergraduate advisors will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services and Writing Tutorial Services.

SCS Computer Laboratory

Students taking a COMP course can access the SCS computer labs. The lab schedule and location can be found at: https://carleton.ca/scs/tech-support/computer-laboratories/. All SCS computer lab and technical support information can be found at: https://carleton.ca/scs/tech-support/. Technical support staff may be contacted in-person or virtually, see this page for details: https://carleton.ca/scs/tech-support/contact-it-support/.

University Policies:

- **Academic Accommodations**

Carleton is committed to providing academic accessibility for all individuals. Please review the academic accommodation available to students here: https://students.carleton.ca/course-outline/.

- **Academic Integrity**

Student Academic Integrity Policy. Every student should be familiar with the Carleton University Student Academic Integrity policy. A student found in violation of academic integrity standards may be sanctioned with penalties which range from a reprimand to receiving a grade of F in the course, or even being suspended or expelled from the University. Examples of punishable offences include plagiarism and unauthorized collaboration. Any such reported offences will be reviewed by the office of the Dean of Science. More information on this policy may be found on the ODS Academic Integrity page: https://carleton.ca/registrar/academic-integrity/.

Plagiarism. As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offences will be reviewed by the office of the Dean of Science. More information and standard sanction guidelines can be found here: https://science.carleton.ca/students/academic-integrity/.

Unauthorized Collaboration. Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be completed on an individual basis".