
Course Outline

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.

Course Information
Instructor Name
Contact Information
Robert Collier
robert.collier@scs.carleton.ca
Lecture Hours
 Mondays and Wednesdays
 10:05 – 11:25
 University Center, Room 231

Office Hours
 Mondays and Tuesdays
 11:30 – 13:00
 Herzberg Laboratories, Room 5326

Course Website
<https://www.carleton.ca/culearn/>
Course Forum
<https://www.carleton.ca/culearn/>

Required Textbook

There is one (1) **recommended** textbook: **Lehman, E., et al. (2013). Mathematics for Computer Science.**

*(n.b., **this textbook is not required** and it is available to download for free from cuLearn)*

Assessment Scheme

Your performance in this course is assessed using several components. These include a collection of **six (6) mandatory weekly tutorials** (beginning the week of January 15th), **four (4) assignments**, **four (4) quizzes**, and a **final examination** (to be scheduled by the registrar). The grades you achieve will be determined using the scheme described below, and **no extra credit assignments will be provided under any circumstances.**

Tutorials (2% each)	12 %	Assignments (3.5% each)	14 %
Quizzes (6% each)	24 %	Final Examination	50 %

Tutorials are mandatory and **attendance is recorded** at the beginning. You must **attend the tutorial in which you are registered** – you will receive zero if you attend a tutorial other than the one in which you are registered. You may not work on an assignment during the tutorial, and **anyone not working on the tutorial will be asked to leave and will receive zero.** You are **not permitted to work on the tutorial in advance.**

Assignments are mandatory and you will **use cuLearn to submit your assignments.** The assignment component of your final grade is computed from the score you receive on each assignment; **the lowest assignment grade will not be "dropped"**. You are expected to work on your assignments consistently once they are released (uploading your progress at least daily). As a result, **you will never be granted an exemption from an assignment, even for a legitimate medical reason.**

Quizzes are held during your weekly tutorials. They are **mandatory** and will always be **closed-book.**

It is your responsibility to ensure that your quiz, tutorial, and assignment marks posted to cuLearn are correct within two weeks of the date the marks were released. Concerns or complaints about the grading of must be communicated (first to the teaching assistant, then, if the result is unsatisfactory, to the instructor) within that time. **After those two weeks, all marks are considered final and will not be changed under any circumstances.**

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Learning Outcomes

If a student attends every lecture and completes every assignment and tutorial, then by the end of this course that student should be able to:

- Construct arguments and formal proofs using multiple different techniques
- Solve expressions using arithmetic, propositional and predicate logic, and set theory
- Perform asymptotic analyses to describe the performance of different algorithms
- Explain the following topics:
 - conjunction, disjunction, negation, implication, existential/universal quantification
 - union, intersection, functions, relations, countability, and the universe(s) of discourse
 - time complexity, asymptotic analysis, "Big O", "Big Ω ", and "Big Θ "
 - sequences, sums, and graphs

Important Considerations

You must achieve a minimum grade of C- in COMP1805 before you will be allowed to take COMP2804.

Late assignments are never accepted for any reason. Assignments submissions are handled electronically (i.e., through cuLearn) and there is no "grace period" with respect to a deadline - an assignment submitted even one minute after the deadline is late and will receive a mark of zero.

Technical problems do not exempt you from this requirement, so if you wait until the last minute and then have issues with your connection, you will still receive a mark of zero. Consequently, you are advised to:

- periodically upload your progress (i.e., upload your progress at least daily)
- attempt to submit your final submission at least one hour in advance of the due date and time

For each assignment, you will be submitting exactly one (1) pdf file created using Microsoft Office, Google Docs, or LaTeX. Handwritten submissions (including those that have been scanned or photographed) are not acceptable will receive a mark of zero. Compressed files (e.g., "zip", "rar", etc.) or documents in another format (e.g., "doc", "rtf", etc.) will be penalized and may receive a mark of zero.

If any of the files you submit cannot be opened it will receive a mark of zero. Consequently, after you upload your submission to cuLearn you must re-download it immediately and ensure that:

- your submission is the correct type of file and has the correct filename
- each of your source code files can be run from the terminal on our official virtual machine
- each of your source code files can be viewed in a text editor (for marking purposes)

You are expected to show all of your work (i.e., include every step) on everything you submit for marks in this course; a solution that is technically correct will still receive a mark of zero if it is not accompanied by the work required to reach it.

Students with an illness on the day of a quiz or tutorial might be granted an exemption only if they provide an original hardcopy of the Carleton University Medical Certificate (http://carleton.ca/registrar/wp-content/uploads/med_cert.pdf) that has been completed and signed by a physician. Please note that a student cannot, for any reason, be exempted from more than two quizzes. Furthermore, because assignment specifications are posted well in advance of their due dates, illness does not excuse a student from completing an assignment. No provision is made for missed assignments, and no extra credit assignments will be available.

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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 or 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.

You must also read:

<http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/>

Additional Notes

Including the time spent **attending lectures** and **completing tutorials**, students can expect to spend **at least ten (10) hours per week on this course**. **Students are responsible for all course materials**, including lecture notes, tutorial exercises, and all materials discussed in class and on any of the official discussion boards.

Students are asked to **pose all questions related to course content using the official discussion boards** on cuLearn; **students should not email** the instructor directly **unless the question contains confidential information** or is of a personal nature.

The instructor will **attempt to answer every student email received within three business days** of the time the message was received, **unless the email requests information already posted** on cuLearn or in the course outline. To ensure that all announcements are received, **students are expected to check their email on a daily basis**.

All materials created for this course (including, but not limited to, lecture notes, in-class examples, tutorial exercises, assignments, examinations, and posted solutions) **remain the intellectual property of the instructor**. These materials are intended for the personal and non-transferable use of students registered in the current offering of the course. **Reposting, reproducing, or redistributing any course materials**, in part or in whole, without the written consent of the instructor, **is strictly prohibited**.

Plagiarism Policy

There is a separate plagiarism policy document for this course that is located on cuLearn. **Students must read this document thoroughly** and **must agree to adhere to this policy** (and to all policies stated in this course outline) **before the assignment resources will be made available**.

In the event that a student has been **found to have committed an instructional offence**, a penalty will be applied to that student's final grade. **If the penalty applied** by the Office of the Associate Dean is **less than the total value of the assignment**, the **remaining weight is shifted onto the weight of the final exam**. Consider the following example: if the course has an assignment worth 10% and a final worth 40% and a student plagiarizes and receives a 50% deduction to his or her assignment, their final exam would be worth 45% of the final mark and the **plagiarized assignment would be worth nothing**. To clarify, 50% of the 10% allocated to the assignment was lost and the remaining 50% of the 10% allocated to the assignment was shifted to the final.

Students are invited to discuss any concerns with the instructor at the earliest opportunity.

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University Policies

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 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

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.

Unauthorized Co-operation or 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". Please refer to the course outline statement or the instructor concerning this issue.

Academic Accommodations for 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 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/>

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/form>