COMP1805A (Fall 2019) – "Discrete Structures I"

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 2:35 – 3:55 Azrieli Theatre, Room 101	**Office Hours** Mondays 10:00 – 12:00 Herzberg Laboratories, Room 5326
Course Website **https://www.carleton.ca/culearn/**	**Course Forum** **https://www.carleton.ca/culearn/**

Recommended 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 **mandatory weekly tutorials** (beginning the week of September 9th), **four (4) assignments**, **four (4) quizzes**, and a **final examination** (scheduled by the registrar). Final grades 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 %

Every tutorial is 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 <u>not</u> be "dropped"**. You are expected to work on your assignments consistently once they are released (uploading your progress at least daily). As a result, **the instructor does not grant exemptions for the assignments**. **Under extenuating circumstances**, if you are seeking additional accommodations for your assignments (perhaps due to an ongoing medical issue, for instance), **you may petition the Associate Dean's office**.

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. **To clarify, even if you notice an error in one of your quiz, tutorial, or assignment marks, if you do not communicate it within two weeks then it will not be given consideration**.

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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 you 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 pdf files can be opened with Adobe Acrobat Reader** (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 (n.b., electronic submissions and/or photocopies will not be accepted)** 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 (2) tutorials or more than two (2) of the 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

In addition to the time spent **attending lectures** and **completing tutorials**, students can expect to spend **at least nine (9) 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.

Requests for 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

Please contact your instructor 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:
https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Religious Obligation

Please contact your instructor 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:
https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf

Academic Accommodations for Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC 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 your instructor as soon as possible to ensure accommodation arrangements are made.
https://carleton.ca/pmc

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and is survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit:
https://carleton.ca/sexual-violence-support

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor 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.
https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf

For more information on academic accommodation, please contact the departmental administrator or visit:
https://students.carleton.ca/course-outline