CSC236H1F 20259 (All Lectures): Introduction to the Theory of Computation

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ATTENTION! You must enrol in a TUTORIAL section that you are available to attend in-person. Read the details below, in the section about **Tutorial Enrolment**.

Feeling Ill? Missed some work?

The **missed test policy** sub-section explains how we handle tests missed for unexpected reasons outside your control.
The **Special Consideration** section explains what you must do to request *any* form of special consideration (including requests for one-time (temporary) tutorial section changes).
Please read these sections *carefully*, and follow the instructions. Without special consideration, missed tests count as a mark of zero (0).

Contact your College Registrar (https://future.utoronto.ca/current-students/registrars) immediately if you miss the exam!
Course instructors cannot grant Special Consideration for Final Examinations; only your College Registrar can help — the process is explained in more detail on the **Sidney Smith Commons (https://sidneysmithcommons.artsci.utoronto.ca/i-cant-make-a-test-or-exam-what-do-i-do/)** .

Got a Question or Concern?

See below how to **contact us**. Do **NOT** use Quercus messaging! Do **NOT** send email directly to your instructor or TA!

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Overview

Use the table below as your starting point for all the materials in the course. In particular, the readings and lecture slides will tell you exactly what you are expected to read and know at each point in the course.

Here is a **one-page term schedule (https://q.utoronto.ca/courses/394977/files/38126494?wrap=1)** ⭳ **(https://q.utoronto.ca/courses/394977/files/38126494/download?download_frd=1)** that gives a visual overview of the

entire term.

Week-by-week overview of course activities

Dates	Materials / Activities	Assessments
Sep 02 – Sep 08	Readings: 01-tracing.pdf (https://q.utoronto.ca/courses/394977/files/38959410?wrap=1) (https://q.utoronto.ca/courses/394977/files/38959410/download?download_frd=1) ; 01-tracing-solutions.pdf (https://q.utoronto.ca/courses/394977/files/38959411?wrap=1) (https://q.utoronto.ca/courses/394977/files/38959411/download?download_frd=1) ; (see the Practice Problems for more) Slides: *TBA*	
Sep 09 – Sep 15 (**Sep 15:** *last day to enrol)*	Readings: *TBA* Slides: *TBA*	
Sep 16 – Sep 22	Readings: *TBA* Slides: *TBA*	Term Test 0 (***5%**** / *Sep 17)*
Sep 23 – Sep 29	Readings: *TBA* Slides: *TBA*	Term Test 1 (***12.5%**** / *Sep 24)*
Sep 30 – Oct 06	Readings: *TBA* Slides: *TBA*	
Oct 07 – Oct 13 (**Oct 13:** *Thanksgiving; no classes*)	Readings: *TBA* Slides: *TBA*	
Oct 14 – Oct 20	Readings: *TBA* Slides: *TBA*	Term Test 2 (***12.5%**** / *Oct 15)*
Oct 21 – Nov 03	Readings: *TBA* Slides: *TBA*	
Oct 27 – Oct 31	**Reading Week:** No lectures, no tutorials, office hours (if any) will be announced separately.	
Nov 04 – Nov 10	Readings: *TBA* Slides: *TBA*	Term Test 3 (***12.5%**** / *Nov 05)*
Nov 11 – Nov 17 (**Nov 11:** *last day to drop)*	Readings: *TBA* Slides: *TBA*	

Dates	Materials / Activities	Assessments
Nov 18 – Nov 24	Readings: *TBA* Slides: *TBA*	
Nov 25 – Dec 01	Readings: *TBA* Slides: *TBA*	Term Test 4 (***12.5%***[*] / *Nov 26)*
Dec 05 – Dec 23	(Final Exam schedule (https://www.artsci.utoronto.ca/current/faculty-registrar/final-exams) , from Arts & Science)	Final Exam **(45%)**[†]

[*] All Term Tests take place **during your regular tutorial time** — test rooms will be added to the Test & Exam Information table, and the Course Summary below has a detailed list of dates and times. TT0 is worth 5%, and for *all other tests*, your lowest mark is worth 5%, your second-lowest 10%, your second-highest 15%, and your highest mark is worth 20%.

[†] The Final Exam will be scheduled by the Faculty of Arts & Science. **In order to pass the course, you must earn at least 25% on the final exam.** In other words, if your final exam mark is strictly less than 25%, your final mark in the course will be reduced (if necessary) to no more than 45.

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This page contains LOTS of information, all in one place (to make it easier to search)! The following links may help you find what you are looking for a little faster, but **we strongly recommend that you read this entire syllabus at least once** (during the first week of term would be ideal), to make yourself familiar with the course organization and expectations.

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Logistics

- **This is an in-person course**, meaning that you must be available for in-person activities (lectures and tutorials) and assessments (term tests and final exam).
- All lectures, tutorials, and office hours begin *ten minutes past the hour*.
- You are welcome to attend office hours held by any instructor (or TA, if applicable).
- See the technical advice further below, for additional information about connecting to online office hours.
- Recordings will be generated automatically for some (maybe not all) of the lecture sections, and can be accessed through the OCCS Student App. **Tutorials will NOT be recorded.** *Remember that course videos and materials belong to your instructor and the University, and are protected by copyright.* You are permitted to download videos and materials for your own personal academic use, but *you may not copy, share, or otherwise distribute them* without explicit permission from the instructor.

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Course Staff & Office Hours (Sep 2 – Dec 1)

Who? (Role)	Where?	When?
François Pitt (Instructor)	Zoom Link (https://utoronto.zoom.us/j/89840227200) Meeting ID: 898 4022 7200 Passcode: 236236	Tue 09:00–10:00
	BA 3289	Thu 13:00–15:00
Gary Baumgartner (Instructor)	BA 3289 *(BA 5287 on Sep 9)*	Mon 16:30–18:00 Tue 13:30–15:00
Amir Reza Peimani (Instructor)	BA 3289	Wed 16:30–17:30

Who? (Role)	Where?	When?
Siddharth Agarwal (Lead TA)	*N/A*	*N/A*
Suhail Mughal (Support Staff)	*N/A*	*N/A*

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Lecture & Tutorial Schedule

(check on ACORN to confirm rooms and times)

What? (Section)	When? (Day & Time)	Where? (Room)	Who? (Instructor / TAs)
TUT 0101	Wed 11:00–12:00	**NF 003 on Sep 3** (ES 4000 later)	*TBA*
TUT 0102		**NF 003 on Sep 3** (BA 2145 later)	*TBA*
TUT 0103		**NF 003 on Sep 3** (UC 256 later)	*TBA*
TUT 0104		**NF 003 on Sep 3** (UC 87 later)	*TBA*
LEC 0101	Fri, Mon 11:00–12:00	UC 140	François Pitt
TUT 0201	Wed 12:00–13:00	**AH 100 on Sep 3** (BA 2195 later)	*TBA*
TUT 0202		**AH 100 on Sep 3** (BA 2145 later)	*TBA*
TUT 0203		**AH 100 on Sep 3** (UC 261 later)	*TBA*
TUT 0204		**AH 100 on Sep 3** (UC 256 later)	*TBA*
LEC 0201	Fri, Mon 12:00–13:00	MP 202	Gary Baumgartner
TUT 0301	Wed 13:00–14:00	**NL 6 on Sep 3** (BF 215 later)	*TBA*
TUT 0302		**NL 6 on Sep 3** (BF 323 later)	*TBA*
TUT 0303		**NL 6 on Sep 3** (SS 2125 later)	*TBA*

What? (Section)	When? (Day & Time)	Where? (Room)	Who? (Instructor / TAs)
TUT 0304		**NL 6 on Sep 3** (UC 244 later)	*TBA*
LEC 0301	Fri, Mon 13:00–14:00	WI 1016	François Pitt
TUT 0401	Wed 14:00–15:00	**BA 1180 on Sep 3** (ES 4000 later)	*TBA*
TUT 0402		**BA 1180 on Sep 3** (BF 215 later)	*TBA*
TUT 0403		**BA 1180 on Sep 3** (SU 444 later)	*TBA*
TUT 0404		**BA 1180 on Sep 3** (UC 244 later)	*TBA*
LEC 0401	Fri, Mon 14:00–15:00	MP 202	Gary Baumgartner
TUT 5101	Wed 18:00–19:00	**WI 1016 on Sep 3** (ES 4000 later)	*TBA*
TUT 5102		**WI 1016 on Sep 3** (BA 2165 later)	*TBA*
TUT 5103		**WI 1016 on Sep 3** (BA 2195 later)	*TBA*
TUT 5104		**WI 1016 on Sep 3** (BA 2175 later)	*TBA*
LEC 5101	Wed 19:00–21:00	WI 1016	Amir Reza Peimani

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Course Structure (Readings, Problems, Lectures, Tutorials)

Here is a brief description of how we recommend you make use of the weekly readings, the practice problems, the lectures, and the tutorials.

- Complete the weekly readings *before* your lectures. Ask questions on Ed or during office hours, and/or bring them to lectures. You'll get the most benefit if you've done the readings, attempted the activities, and looked at the answers before your lectures, but *there is NO formal "deadline"* for doing this. Find what works for you. And remember, *we **expect** you to look at the answers as you go*, especially if you're not sure what we're asking in some of the activities.
- Start looking at the corresponding practice problems at the same time, to make sure you understand the questions. You may have to wait until after the tutorials and lectures for everything to make sense, and to be able to start solving the problems. That's okay, and you can (and should) still ask questions on Ed and/or office hours to clarify your understanding. Again, *there is NO fixed deadline for the practice*

problems; however…

- Each tutorial will give you an opportunity to work on the practice problems (if you have not already), to ask questions about the practice problems **and** about their solutions. Since full solutions will be published, you will get the most benefit from the tutorials if you have already worked on the problems, compared your work with the solutions, and brought your questions with you. These can be questions about places where you got stuck, or about your solutions and how they compare, or about the published solutions, or anything else related to the relevant material.

Don't hesitate to ask if you have any question or comment about this structure.

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Tutorial Enrolment

You MUST enrol in a tutorial section that you are available to attend in-person (in particular, to write each term test).

You must do this directly on ACORN, separately from your lecture section. And you can only enrol in a tutorial section that matches with your lecture section. These constraints cannot be overridden by anyone (not by your course instructor, not by staff in our department, not by staff at your college). This is overall a good thing: the constraints ensure that there is room in all the tutorials for every student in a lecture section.

Note that attendance is NOT taken during lectures: they are provided to support *your* learning, and it is up to you to make appropriate use of this resource. In principle, you could attend a lecture section for which you are not enrolled — **as long as there is room for you to sit** (legitimately enrolled students have priority), **and that you check with the instructor first**.

However, *tutorial times will be used to write every term test* (and also to hold regular tutorials). Because tutorial room capacity is limited, each tutorial section will have only enough seats and test copies for the students formally enrolled in that section. This means that **you must be enrolled in a tutorial section that you can actually attend**, because there will be no room for you in any other.

If this is problematic, then you must work with advisors in the **CS Undergraduate Office** (https://web.cs.toronto.edu/undergraduate/academic-advising) (or with your College Registrar) to change your enrolment to a different lecture and tutorial section. If you are not available for matching lecture and tutorial times, **please prioritize enrolling in a section when you are available for TUTORIALS**. Then, you can simply attend a different lecture section (after you verify with the relevant instructor, of course).

Finally, **please also make a concrete backup plan** in case this does not work out. Advisors in the **CS Undergraduate Office** (https://web.cs.toronto.edu/undergraduate/academic-advising) can help you think through the possibilities.

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Contact Us

Please do **NOT** use Quercus messaging! Please do **NOT** send email directly to your instructor or TA!

1. **Before you ask your question**, please *take a few minutes to see if it might already be answered* on this page (or pages linked from it, including Ed). You will get an answer faster (no need to wait), and it will make the course better for everyone by leaving us more time to answer other questions.
2. In particular, all course announcements will be posted here, on Quercus. *You are responsible for reading all announcements made by the course team (instructors / TAs / staff), and for being familiar with the entire content of this Syllabus*.
3. If your question is NOT already answered on the course website or discussion board, then either:
   - Start a new topic on **Ed** (https://edstem.org/us/join/7GcEm4) (the course discussion board — see below for more details), for all questions of *general interest* (whose answer could be useful to other students).

   or:
   - Send email **from your U of T email address, to the course email address** (`csc236-2025-09@cs.toronto.edu` (mailto:csc236-2025-09@cs.toronto.edu)), for all questions that are *personal* (whose answer is useful only to you). **Please include your UTORid (username) in the body of your message.**
4. In particular, please ask ALL questions about course content and problems directly on Ed. This also applies to questions about course administration / logistics, *except* for very personal questions that are relevant only to your unique situation, where you should use email.
5. **Do NOT post any message that reveals the questions or answers on one of our Term Tests, until at least TWO FULL DAYS (48 hours) AFTER the test has been written by EVERY student (including the evening section).**
6. We aim to respond to all email and Ed postings within 48 business hours (not counting weekends and holidays). However, it may take longer, especially near due dates or before the start of classes. If you do not hear back after four days, please do not hesitate to send a follow-up email, or come in person during office hours.

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Ed Discussion

Before you can access the Ed discussion board (from the navigation menu), you must **sign up for Ed** (https://edstem.org/us/join/7GcEm4) , using your UTOR email address (ending in `@utoronto.ca` or `@mail.utoronto.ca`).

Ed Discussion used to be supported directly by U of T, and does **not** share (or harvest) data for any third parties (for full details, see **Ed's Privacy Policy** (https://edstem.org/privacy)). We prefer it to the alternatives because we find that it provides a better UI on desktop and mobile devices, with unique features such as the ability to include "spoilers" in all posts or comments.

If you have any issue or question about signing up for Ed Discussion, please send email to the course address (as described above).

If you ask a question that has already been answered, it may be made Private and we may ask you to search for the answer. *We are NOT doing this to be "mean" or rude*, but to make it possible for us to help as many students as possible. Instead of having instructors (and maybe TAs) spend many hours searching for existing answers, or worse, answering the same questions multiple times, it is much more efficient for each student individually to spend a few minutes looking for the answers. The total amount of work is the same, but distributed among many more students, so each student only has to do a little bit of work. This frees up instructors and TAs to answer new questions, and helps us help everyone better! In many cases, it also allows you to find answers faster (because you don't have to wait).

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Textbooks & References

There is **no** required textbook for the course. Readings will be suggested from the following sources.

- Course-specific reference documents *TBA*
- Historical Course Notes by Prof. Vassos Hadzilacos (https://q.utoronto.ca/courses/394977/files/38185676?wrap=1) (https://q.utoronto.ca/courses/394977/files/38185676/download?download_frd=1) .
- Historical Course Notes by Prof. David Liu (https://q.utoronto.ca/courses/394977/files/38185674?wrap=1) (https://q.utoronto.ca/courses/394977/files/38185674/download?download_frd=1) .
- *(OPTIONAL)* Susanna Epp, *Discrete Mathematics with Applications*. Fifth Edition, Cengage Learning, 2020. (Contains many practice problems about induction and recurrences, but only a few about algorithm correctness and complexity, and formal language theory.)
  - U of T Library Holding (https://librarysearch.library.utoronto.ca/permalink/01UTORONTO_INST/14bjeso/alma991107278006806196) for the book.
  - Discrete Mathematics on the U of T Bookstore (https://www.uoftbookstore.com/adoption-search-results?ccid=7794055&itemid=38792) — there is also an eBook alternative available.
  - Discrete Mathematics on Cengage.ca (https://www.cengage.ca/c/discrete-mathematics-with-applications-5e-epp/9781337694193) — use coupon code `CengageW22592` for 10% off when you order directly from Cengage (the code is entered on the shipping and payment details page when you complete your order).
- CSC110H1 Course Notes (https://www.teach.cs.toronto.edu/~csc110y/fall/notes/) , for some of the prerequisite material.

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Marking Scheme and Course Activities

- Practice Problems, worth no direct credit.

- Five **Term Tests**, worth 55% in total: 5% for TT0, 5% for your lowest test mark *after TT0*, 10% for your second-lowest test mark *after TT0*, 15% for your second-highest test mark *after TT0*, and 20% for your highest test mark *after TT0*.
- One **Final Exam**, worth 45%. *You must earn a minimum of 25% on the exam in order to pass the course.*

See the **Course Summary** below for the exact dates and times of each term test.

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Practice Problems

Throughout the term, we will post practice problems with a range of difficulty levels, to help you deepen your understanding of the course material and its applications. *These will **not** be marked for direct course credit*. Feedback on your solutions will be provided through tutorials, office hours, and on the course discussion board. These problems directly embody the course Learning Outcomes: you must be able to solve them for yourself to succeed in the course, and in future courses that depend on CSC236H1. So they provide a very concrete way for you to self-assess your understanding.

- Practice Problem Questions:
  - **exercises0.pdf (https://q.utoronto.ca/courses/394977/files/38959422?wrap=1) ↓ (https://q.utoronto.ca/courses/394977/files/38959422/download?download_frd=1)**
- Practice Problem Solutions:
  - **exercises0-solutions.pdf (https://q.utoronto.ca/courses/394977/files/38959425?wrap=1) ↓ (https://q.utoronto.ca/courses/394977/files/38959425/download?download_frd=1)** *TBA*

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Term Tests and Final Exam

Test & Exam Information

*(see the **Overview** for dates and times)*

Test & Logistics	Coverage / Practice	Papers & Solutions
TT0 (Rooms *TBA*) [Marks *TBA*]	Review / Prerequisites *Topics: TBA*	*TBA*
TT1 (Rooms *TBA*) [Marks *TBA*]	Tutorials 1–2; Problems *NN–NN* *Topics: TBA*	*TBA*

Test & Logistics	Coverage / Practice	Papers & Solutions
TT2 (Rooms *TBA*) [Marks *TBA*]	Tutorials 3–4; Problems *NN–NN* *Topics: TBA*	*TBA*
TT3 (Rooms *TBA*) [Marks *TBA*]	Tutorial 5; Problems *NN–NN* *Topics: TBA*	*TBA*
TT4 (Rooms *TBA*) [Marks *TBA*]	Tutorials 6–7; Problems *NN–NN* *Topics: TBA*	*TBA*
Exam	Comprehensive: you are expected to be familiar with **all** the material covered in the course. **Old Exams Collection (https://myaccess.library.utoronto.ca/login?url=https://exams.library.utoronto.ca)**	Exam Cover Page *TBA*; Exam Reference Sheet *TBA*

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What to expect (in general terms)

We know tests are time-limited; we won't ask questions that require a lot of time to figure things out! For example, we are not likely to ask you to solve a completely new problem that requires significant creativity, because that might require you to spend too long thinking about various possibilities to find one that works. But we *could* give you a problem *similar* to a challenging practice problem, one where the key insight from the problem can be applied fairly directly. This would then be considered a reasonably easy question, because you wouldn't need to come up with any new ideas to solve it, just show that you can apply something you have already learned (assuming that you did learn it from working on the practice problem, of course).

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How to prepare

First review the materials listed above, starting with the practice problems. Make sure you understand how to solve each problem, and use this to decide what to review next — focus on the topics and problems that you have more difficulty with. Don't forget to compare your answers against sample solutions (when these are available).

Next, you can try questions from previous years' term tests — appropriate problems are included directly in

the **Practice Problems**. If you get your hands on a term test paper from a previous year, **please read the rest of this paragraph**! Keep in mind that questions on our test are more likely to be related to problems you have *already* worked on this term than to questions from previous tests. At the same time, these past test problems are a good way to practice your understanding. *For maximum benefit, we strongly suggest the following approach:* try these questions only **after** you have finished reviewing the rest of the materials from this term; **time yourself** to get the benefit of a real "test experience", as a way to verify not only your understanding, but also your ability to answer questions quickly (this will matter for the actual tests); and finally, *don't look at the solutions* until you have finished working on the questions as if it were a real test.

Make good use of the **Sidney Smith Commons' Exam Toolkit (https://sidneysmithcommons.artsci.utoronto.ca/exam-toolkit/)** . This contains many general resources to help you prepare for term tests and the final exams, including sections on "what to expect", "how to study", and "strategies".

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How to write tests (and the exam)

Read the questions! If you answer the wrong question, even if it's because you were nervous and you misread it, there is nothing that we can do. If something is unclear, *please ask*.

Manage your time! Be disciplined, to leave most of your time free for solving problems. In particular, it's fine to give point-form answers with the key elements, instead of spending time writing long, complete sentences.

Be precise! For this course in particular, it is very important to use the correct terms and notation. Say what you mean carefully and precisely.

Show what you know! Your strategy during the test should be:

- to identify the questions that you know how to answer (this means that you must read EVERY question **before** you start answering any of them);
- to answer those questions right away;
- to go back to the questions you're not sure about, and work on them;
- if you get stuck on a question, to move on to the next one and come back later (don't waste your time) — you can figure out ahead of time how much time to devote to each question (based on how much it's worth), and stick to that estimate as much as possible.

If you have an idea how to solve a question but no time to do it in detail, then of course you should write down your idea. You will get part marks for any question where you have the correct structure (i.e., clearly showing that you know what you are supposed to do), even if you cannot fill in the details. So it always pays off to take a minute to write down a correct outline for your answer — it's worth marks, even if you are unable to do more.

Explain what you're doing! When you give an answer, make sure that you give at least a short statement of what you're doing before giving us the answer: if your answer is incorrect, this can make the difference

between getting NO mark (because we can't tell if you understand what you're doing) or getting part marks (if we see that you have the right idea but simply made a small error, or that you have the wrong idea but wrote it up correctly).

Don't ramble! Write concise, to-the-point answers. If you ramble, or if you write an answer for a related (but different) problem with no adjustment or explanation, it gives us concrete evidence that you don't know the correct answer. Also, be aware that if you give us a correct answer followed by explanations that are clearly wrong or irrelevant, you will lose marks! So only write down what you know is correct: if you're not sure, either say so explicitly or don't say anything.

On the other hand, if you start writing down an answer and you realize that it's wrong, SAY SO! You'll get more part marks for showing that you understand your mistake, even if you're not sure how to fix it, than if you simply leave it like that (which demonstrates that you don't even realize that what you did was wrong).

On a related note, don't feel like you must fill all the available space: it is quite possible that a correct answer will require only part of the space for some questions.

Take care of yourself! You'll function much better if you are well-rested and relaxed than if you are tired or tense. Take some time to exercise (moderately), to burn off some of your body's stress, leaving you better able to manage your stress levels and better able to perform. Eat a nutritious meal (but not too much) so you're not hungry during the test. And get a good night's sleep the night before.

A related tip we learned from a student: trying to "force yourself to be calm" may not work well, or may even backfire, because you're trying to suppress your body's natural response to stress. Instead, trick your brain into thinking that what you're feeling is not stress — it's excitement! The two feelings are similar enough, you can think of it as looking forward to the challenge — the way a trained athlete is primed for a competition, and turning their nervousness into positive stress.

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Policy for missed term tests

To help stop the spread of respiratory viruses, including **Influenza (flu)** (https://www.ontario.ca/page/flu-facts) and **COVID-19** (https://www.ontario.ca/page/protection-covid-19-and-other-respiratory-illnesses), **anyone who feels sick should stay home** and complete the **self-assessment** (https://www.ontario.ca/self-assessment/) tool to learn more about what to do next. The number 1 precaution when you are sick is to wear a **well-fitted mask** (https://www.ontario.ca/page/protection-covid-19-and-other-respiratory-illnesses#section-3) in all public settings. [From the U of T Environmental Health & Safety's **Procedures for Respiratory Illnesses** (https://ehs.utoronto.ca/symptomatic-or-confirmed/).]

Keep in mind that **course instructors cannot grant Special Consideration for Final Examinations**! If you are unable to write the final exam, please contact your **College Registrar** (https://future.utoronto.ca/current-students/registrars) for the next steps — the process is explained in more detail on the **Sidney Smith**

Commons (https://sidneysmithcommons.artsci.utoronto.ca/i-cant-make-a-test-or-exam-what-do-i-do/) .

You are expected to write *every* test. In addition to providing us with a component of your final course mark, each test will provide *you* with valuable feedback on your understanding of a significant portion of the course material. If you are truly unable to write a test, we can make up for the missing marks easily enough (as described in the next paragraphs), but it is more difficult (and requires more work on your part) to make up for the lost learning opportunity. This places you at a disadvantage for the rest of the course, including the final exam. The policy described in the next paragraphs does NOT mean that you can simply "choose to skip a test". Rather, it is meant for *emergencies:* situations where you are truly **unable** to write the test with everyone else (not just when it is inconvenient). You have to judge whether your situation is an *inconvenience* — something that prevents you from performing at the top of your abilities but that is a result of some of your choices, or that has a limited impact on your performance — vs a *major disadvantage* — something that makes your performance *significantly* worse than normal and that was *NOT a result of your own choices*. We understand that sometimes, it can be difficult to make a clear distinction between these two types of situations. For your own sake, we ask that you be realistic about your expectations and that you only request Special Consideration when it is truly necessary.

*If you miss a test for unexpected reasons outside your control, please follow the instructions in the **Special Consideration** section.* **If you miss one or two tests *for approved reasons***, we will calculate a mark for each test you missed, based on your performance on the other tests *and on the final exam*, taking into account the class averages on every test and exam. We do this by calculating a combined z-score for your exam and other tests, where the exam has the *same weight* as each test (this provides a statistically accurate measure of the "distance" between your performance and the class average), then *calculating* a mark for each missed test that corresponds to the *same* z-score. This approach ensures that you are not unfairly penalized if the test you missed was easier, but also that you do not gain an unfair advantage if you missed a harder test: in every case, your performance relative to the rest of the class remains unchanged, and the mark we calculate for you is relative to the class average for the test(s) you missed. (This calculation is performed *before* we determine the lowest and highest test marks, when generating final course marks.) In this case, we *recommend* that you make an appointment with our department's **Learning Strategist** (https://q.utoronto.ca/courses/221753/pages/learning-strategy-support) to discuss your situation, but *this is **not** required* to receive special consideration for only one (or two) missed test(s).

If you miss more than two tests, we **require** that you make an appointment with our department's Learning Strategist, to put in place a concrete plan for the rest of the term, *before* we will approve any exception. This ensures that you are realistic about your ability to succeed in the course and that you have thought about how you will manage the risk: after all, missing more than two tests puts you in a situation where you would be taking the final exam with NO feedback on your performance on half (or more) of the material in the course. *We will require confirmation from our Learning Strategist* that you have met with them and that your approach to the rest of the term is realistic. This ensures that you make decisions based on concrete plans that are likely to lead to success, not based on need alone, or on "magical thinking" that everything will just work out fine. Once we receive confirmation that you have met with a learning strategist, we can easily put in place appropriate accommodations for all your missed work, using the z-score method described above.

At the limit, **we cannot approve special consideration for *every* test**. In other words, special consideration can be provided for missed tests **only if** you have written *at least* one test during the term. If you have faced circumstances disruptive enough to make you unable to write *every single test*, then NO special consideration can be provided, for ANY of your missed tests. In this scenario, it is unrealistic to expect that you have been able to learn the course material. If you have been unable to demonstrate your learning for the **entire** term, *please speak with your College Registrar to file a petition to drop the course, and make plans to take it again later.* We understand it can be terribly frustrating to want to engage with the course and be prevented from it by circumstances outside your control. But wishful thinking is not the same as actual learning… it's much better for you to engage with the support services in place within the university, and to work on a *realistic* alternative.

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Academic Integrity

All work you submit must be your own. It is an academic offence to copy the work of someone else — even if the other person is not a student — *unless you explicitly and clearly attribute the work to its original source*. This includes words, sentences, entire documents, and even ideas. Whether you copy or let someone else copy, it is an offence. Academic offences are taken very seriously and can have correspondingly serious consequences.

At the same time, we want you to benefit from working with other students. For this course, you are allowed to discuss how to solve the practice problems with anyone you wish. The purpose of the practice problems is to ensure that **you** understand how to solve them. Even if you did not generate a solution yourself, you can still receive useful feedback on your work. (See the **Practice Problems** section for more details.)

You are also welcome to freely discuss course material and technology (such as LaTeX), and we encourage you to do so. For example, you may work through examples that help you understand course material or a new technology, or help each other configure your system to run a supporting piece of software.

Any collaboration on, or sharing of, term test solutions *or questions* is strictly forbidden!

Please take a few minutes to consult the **Academic Integrity at U of T (https://www.academicintegrity.utoronto.ca/)** website: it contains good information and concrete strategies to help support your learning in ways that follow the principles of academic integrity, in addition to references to formal policies and procedures.

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What about ChatGPT / Copilot / Gemini / etc.?

In this course, you may use generative artificial intelligence (AI) tools (ChatGPT, Copilot, Gemini, etc.) as learning aids and to help complete not-for-credit practice problems. *You will NOT be permitted to use generative AI on the term tests or final exam.* While some generative AI tools are currently available for free

in Canada, please be warned that these tools have not been vetted by the University of Toronto and might not meet University guidelines or requirements for privacy, intellectual property, security, accessibility, and records retention. Generative AI may produce content which is incorrect or misleading, or inconsistent with the expectations of this course. They may even provide citations to sources that don't exist — and submitting work with false citations is an academic offence. These tools may be subject to service interruptions, software modifications, and pricing changes during the semester.

Generative AI is NOT required to complete any aspect of this course, and we caution you to not rely on these tools to complete your coursework. Instead, we recommend treating generative AI as a supplementary tool only for exploration or drafting content — **always remembering to cite any resource you used to generate your answers**. Ultimately, you (and not any AI tool) are responsible for your own learning in this course, and for all the work you submit for credit. It is your responsibility to critically evaluate the content generated, and to regularly assess your own learning independent of generative AI tools. Overreliance on generative AI may give you a false sense of how much you've actually learned, which can lead to poor performance on the term tests or final exam, in later courses, or in future work or studies after graduation.

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Special Consideration

We support two types of requests: special consideration for missed term tests, and special consideration for one-time (temporary) tutorial section changes in order to write the test. Here are **examples** of the situations where each request type is most appropriate.

- You should submit a request for **Missed Term Test** when (for example) …
  - you get sick a few days before the test and are not feeling well enough to sit for 45 minutes and write the test;
  - you are struggling through a personal or family situation (for which you can get documentation) and are not feeling well enough to sit for 45 minutes and write the test;
  - you get sick on the morning of the test, **even if** you feel better before a later tutorial section, and ready to write later
    - (it is safer to submit a Missed Term Test request because we may not be able to confirm a change of tutorial section in time);
  - you encounter any other *emergency* situation (unexpected and outside your control).
- You should submit a request for **One-Time Tutorial Change** when (for example) …
  - you have a work shift during your enrolled tutorial time, but you are available earlier (or later) the same day;
  - you face any other situation that makes you unavailable during your enrolled tutorial time, and that you can report at least five business days in advance.
- You are **not** eligible for special consideration when (for example) …
  - you have a timetable conflict during your enrolled tutorial time, but you are available earlier (or later) the same day
    - (**you must change your tutorial enrolment as soon as possible**, see the **Tutorial Enrolment**

section for details);
- you did not study as much as you wanted and don't feel ready for the test (but you are not sick and have no conflict with your tutorial time)
  - (unfortunately, this does not represent an unexpected situation outside your control);
- you have a test in another course at the same time as your enrolled tutorial time
  - (tests scheduled during regular class time have precedence, so it is the responsibility of the other course to provide accommodation);
- you have a test in another course immediately before (or after) your enrolled tutorial time
  - (this is not considered a true conflict; you can ask but we must prioritize requests from students who have true conflicts).

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Missed Term Test

If you miss a test due to illness or other unexpected circumstances outside your control, **please get in touch with us *immediately* (don't wait) — *even if you do NOT have documentation***. Special consideration will be evaluated on a case-by-case basis and is not given automatically — we may be unable to grant you exactly the special consideration you seek, so please ensure we have time to discuss your situation.

In order to receive special consideration, you must fill out the **Missed Term Test Request Form** (https://forms.cloud.microsoft/r/EyK8XmhTZH) . Simply complete and submit the form online as soon as you can, **together with supporting documentation**. Accepted forms of documentation include Absence Declaration (via ACORN), or the University's Verification of Student Illness or Injury (VOI) form, or letters from your College Registrar or Accessibility Services. Remember that *Absence Declaration can be used at most ONCE PER TERM*, and for a maximum of seven consecutive days. If you have already used your Absence Declaration for the term, **please contact your College Registrar to obtain other acceptable documentation**. For more information on each type of documentation, including when and how to use it, please read all the details carefully on the **Student Absences** (https://www.artsci.utoronto.ca/absence) page from the Faculty of Arts & Science.

IMPORTANT: If you know that you will NOT be able to write a term test, just submit the request form as soon as you have obtained appropriate documentation, or right away if you have no documentation to submit, so that we may discuss your situation. It is NOT necessary to send email (or any other communication) for "simple" requests due to illness / injury or personal / family emergencies — just the form is sufficient. However, if your situation is particularly unusual or complex (for example, if you are unable to obtain appropriate documentation), please contact us by email at `csc236-2025-09@cs.toronto.edu` (mailto:csc236-2025-09@cs.toronto.edu)) to discuss the details. In that case, **please reach out as soon as you can** (even before you have obtained documentation): it is always easier to resolve situations earlier rather than later.

If you face a situation that is particularly disruptive (especially if it is likely to affect more than one course), please also contact your **College Registrar** (https://future.utoronto.ca/current-students/registrars) — they

are best equipped to provide you with general advice and support that goes beyond a single course. They can also help you document your situation and contact each of your course instructors on your behalf, to simplify the process of requesting accommodations.

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One-Time (Temporary) Tutorial Change

If you are unable to write a term test during your enrolled tutorial time, due to a direct timetable conflict or other circumstance outside your control, we may be able to allow you to write the test with a different tutorial section (at a different time) on the day of the test. **This is not guaranteed**, especially when each lecture and tutorial section is full: there may not be room in a particular section for additional students. *If you are making an emergency request, please use the **Missed Term Test** request form instead!*

In order to request a one-time tutorial section change, you must fill out the **Term Test Tutorial Change Request Form (https://forms.cloud.microsoft/r/4WipS68w5m)** . Simply complete and submit the form online as soon as you can. You do **not** have to submit any documentation, but you must provide the contact information (name and email or phone number) of someone who can verify that you have a conflict with your enrolled tutorial time on the day of the test.

IMPORTANT: **You CANNOT use this form to request a tutorial change for EVERY test!** If you have an ongoing timetable conflict, you must work with advisors in the **CS Undergraduate Office (https://web.cs.toronto.edu/undergraduate/academic-advising)** to change your enrolment. See the information about **Tutorial Enrolment** earlier in this Syllabus for more information. Also note that according to Arts & Science rules, tests that take place during regular class time *have precedence* over tests that are scheduled outside class time. It is the responsibility of courses that schedule out-of-class tests to provide alternatives.

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Remark Requests

If you believe there was an error in the marking of your work — or if you just have questions about how your work was marked — you may request that it be remarked. Please complete and submit a Remark Request **directly on MarkUs** (no separate form or email message is required). You must give a specific reason for the request, referring to possible errors or omissions by the marker, or asking specific questions about the feedback (or lack of feedback) you received.

Remark requests must be received within **two weeks** of when the item was returned.

Please note that when we receive a remark request, we may remark the entire submission, though we will generally focus on the questions that are the subject of your request. Your mark may go up or down as a result of the remark. *This is not meant to discourage you from submitting remarking requests!* Just to acknowledge the reality that errors can be made in both directions in the initial marking: it's possible that TAs misunderstand your solution and penalize it more than appropriate, but it's also possible that TAs forget or

miss some mistakes in your solution and do not apply appropriate penalties. When we remark, we correct both types of marking errors.

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Creating a Positive Learning Environment

We are committed to creating a respectful learning environment in computer science courses for all students and expect that you will adhere to the University of Toronto's **Code of Student Conduct (https://governingcouncil.utoronto.ca/secretariat/policies/code-student-conduct-december-13-2019)** . Please be mindful of how your behaviour influences the atmosphere in our learning community, not just in classes, but also in computer labs, in online forums, and anywhere that you interact with other students and members of the department.

About Masks

If you feel sick (even if you have not tested positive for COVID-19), we kindly ask that you wear a mask during lectures and in-person office hours, as a courtesy to all your classmates (some of whom may live with immunocompromised individuals). Wearing a mask is a simple, non-invasive way to be considerate to your community by reducing the risks of transmission of COVID-19 (and other airborne illnesses), especially in indoor spaces where distancing is not possible.

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Accessibility

The University of Toronto is committed to accessibility. If you require accommodations for an ongoing disability or an acute issue such as an injury, please register with **Accessibility Services (https://studentlife.utoronto.ca/service/accessibility-services-registration-and-documentation-requirements)** (AS). The process of accommodation is both confidential and private. AS provides the information necessary to implement an accommodation and no more, e.g., what is listed in a Letter of Accommodation. Your instructors and other university staff will not reveal that you are registered with AS.

Students who require accommodations for term tests (or the final exam) must register with **Accommodated Testing Services (https://lsm.utoronto.ca/ats)** (ATS). We will only be providing test accommodations sent to us through that official channel. This helps to guarantee that accommodations are provided in a fair and consistent manner for everyone.

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Course Description

The application of logic and proof techniques to Computer Science. Mathematical induction; correctness

proofs for iterative and recursive algorithms; recurrence equations and their solutions; introduction to automata and formal languages. This course assumes university-level experience with proof techniques and algorithmic complexity as provided by CSC165H1. Very strong students who already have this experience (e.g., successful completion of MAT157Y1) may consult the CS Undergraduate Office about proceeding directly into CSC236H1 or CSC240H1.

Prerequisites: (60% or higher in CSC148H1, 60% or higher in CSC165H1) / (60% or higher in CSC111H1)

Exclusions: CSC240H1, CSC236H5, CSCB36H3

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Technical Requirements

Some course activities (office hours) may be offered online, through Zoom.

- To join online office hours, you must be signed in to your U of T Zoom account.
- "*What U of T Zoom account?*" Glad you asked: log into the **U of T Zoom portal** (https://utoronto.zoom.us/) to claim your *free* Zoom education license.
- You will have a much better experience if you use the most recent version of the desktop client for Zoom, instead of accessing it through a web browser.
- More generally, to fully participate in all course activities, you require reliable access to a **full computer** (*not just a smartphone*) on which you can browse web pages, read lecture slides, and (potentially) type and submit practice problems.
- To attend online office hours, this computer must have a **microphone**, optionally a webcam, as well as a **reliable, high-speed internet connection**.

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LaTeX help

LaTeX is a standard typesetting program used in computer science, and we encourage you to learn how to use LaTeX as part of your work — *though this is **not necessary** to submit work in this course*. In this section, we provide some resources to help you get started with LaTeX.

There is no general "course template" for LaTeX documents. Time permitting, we may try to post samples here if people run into difficulties generating certain types of content (e.g., graph pictures). Also, you can always ask questions on Ed, where we will be happy to help.

Otherwise, you may find the following links helpful.

- **Overleaf** (https://www.overleaf.com/) is an online application that allows you to edit and compile LaTeX files right in your browser, and even collaborate with others — *always while following Academic Integrity requirements, of course*. It also provides some **tutorials** (https://www.overleaf.com/learn) on the basics of using LaTeX.

- A detailed, yet simple and accessible online LaTeX tutorial **(a great place to start):** https://www.latex-tutorial.com/ (https://www.latex-tutorial.com/) .
- Download LaTeX on the official LaTeX webpage: https://latex-project.org/ (https://latex-project.org/) (click on “Get” in the top menubar and select an appropriate distribution to download).
- A relatively comprehensive introduction to LaTeX **(highly recommended, but long):** https://ctan.mirror.rafal.ca/info/lshort/english/lshort.pdf (https://ctan.mirror.rafal.ca/info/lshort/english/lshort.pdf) .
- A LaTeX wiki (most Google searches lead here): https://en.wikibooks.org/wiki/LaTeX (https://en.wikibooks.org/wiki/LaTeX) .
- A fantastic application of machine learning; use it to find LaTeX commands based on the symbol: https://detexify.kirelabs.org (https://detexify.kirelabs.org) .
- A graphical LaTeX editor (requires downloading and installing the software): https://www.lyx.org/ (https://www.lyx.org/) .
- A different graphical editor (also requires downloading and installing software): https://texmacs.org/ (https://texmacs.org/)
- A forum for asking LaTeX-related questions **(highly recommended)**: https://tex.stackexchange.com/ (https://tex.stackexchange.com/) .

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Course Summary:

Date	Details	Due
Tue Sep 16, 2025	Prep/Review Quiz 1 (https://q.utoronto.ca/courses/394977/assignments/1555469)	due by 11:59pm
Wed Sep 17, 2025	TT0 LEC0101 (https://q.utoronto.ca/calendar?event_id=1069902&include_contexts=course_394977)	11am to 12pm
	TT0 LEC0201 (https://q.utoronto.ca/calendar?event_id=1069903&include_contexts=course_394977)	12pm to 1pm
	TT0 LEC0301 (https://q.utoronto.ca/calendar?event_id=1069904&include_contexts=course_394977)	1pm to 2pm
	TT0 LEC0401 (https://q.utoronto.ca/calendar?event_id=1069906&include_contexts=course_394977)	2pm to 3pm

Date	Details	Due
	TT0 LEC5101 (https://q.utoronto.ca/calendar?event_id=1069907&include_contexts=course_394977)	6pm to 7pm
Wed Sep 24, 2025	TT1 LEC0101 (https://q.utoronto.ca/calendar?event_id=1069908&include_contexts=course_394977)	11am to 12pm
	TT1 LEC0201 (https://q.utoronto.ca/calendar?event_id=1069909&include_contexts=course_394977)	12pm to 1pm
	TT1 LEC0301 (https://q.utoronto.ca/calendar?event_id=1069910&include_contexts=course_394977)	1pm to 2pm
	TT1 LEC0401 (https://q.utoronto.ca/calendar?event_id=1069911&include_contexts=course_394977)	2pm to 3pm
	TT1 LEC5101 (https://q.utoronto.ca/calendar?event_id=1069912&include_contexts=course_394977)	6pm to 7pm
Wed Oct 15, 2025	TT2 LEC0101 (https://q.utoronto.ca/calendar?event_id=1069913&include_contexts=course_394977)	11am to 12pm
	TT2 LEC0201 (https://q.utoronto.ca/calendar?event_id=1069914&include_contexts=course_394977)	12pm to 1pm
	TT2 LEC0301 (https://q.utoronto.ca/calendar?event_id=1069915&include_contexts=course_394977)	1pm to 2pm
	TT2 LEC0401 (https://q.utoronto.ca/calendar?event_id=1069916&include_contexts=course_394977)	2pm to 3pm
	TT2 LEC5101 (https://q.utoronto.ca/calendar?event_id=1069917&include_contexts=course_394977)	6pm to 7pm

Date	Details	Due
Wed Nov 5, 2025	TT3 LEC0101 (https://q.utoronto.ca/calendar?event_id=1069919&include_contexts=course_394977)	11am to 12pm
	TT3 LEC0201 (https://q.utoronto.ca/calendar?event_id=1069920&include_contexts=course_394977)	12pm to 1pm
	TT3 LEC0301 (https://q.utoronto.ca/calendar?event_id=1069921&include_contexts=course_394977)	1pm to 2pm
	TT3 LEC0401 (https://q.utoronto.ca/calendar?event_id=1069922&include_contexts=course_394977)	2pm to 3pm
	TT3 LEC5101 (https://q.utoronto.ca/calendar?event_id=1069923&include_contexts=course_394977)	6pm to 7pm
Wed Nov 26, 2025	TT4 LEC0101 (https://q.utoronto.ca/calendar?event_id=1069924&include_contexts=course_394977)	11am to 12pm
	TT4 LEC0201 (https://q.utoronto.ca/calendar?event_id=1069925&include_contexts=course_394977)	12pm to 1pm
	TT4 LEC0301 (https://q.utoronto.ca/calendar?event_id=1069926&include_contexts=course_394977)	1pm to 2pm
	TT4 LEC0401 (https://q.utoronto.ca/calendar?event_id=1069927&include_contexts=course_394977)	2pm to 3pm
	TT4 LEC5101 (https://q.utoronto.ca/calendar?event_id=1069928&include_contexts=course_394977)	6pm to 7pm