

# CSC236H1F 20229 (All Lecture Sections): Introduction to the Theory of Computation

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## Got A Question?

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Please do **NOT** use Quercus messaging!

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). 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. If your question is NOT already answered within this document or other parts of the Quercus site, then either:
  - start a new topic on [Ed](#) (the course discussion board), for all questions of *general interest* (whose answer could be useful to other students) that do **not** reveal any idea or part of a solution to an assessment; OR
  - send email **from your U of T email address** to [csc236-2022-09@cs.toronto.edu](mailto:csc236-2022-09@cs.toronto.edu) (<mailto:csc236-2022-09@cs.toronto.edu>), for all questions that are *personal* (whose answer is useful only to you) or that you cannot ask without revealing part of your solution to a course assessment.

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## Table of Contents

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. **In particular, make careful note of the unusual marking scheme we will be using this term!**

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## Overview

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All readings refer to the [required course notes](#). Use the links in the table below to access the [Problem Sets](#) page and the [Term Tests and Final Exam](#) page.

*Note that every “class week” in the table below starts on a Thursday and ends on the following Wednesday, to match with the start and end dates of the term. You can view a visual representation of this in the following [one-page term schedule](#) [↓ \(https://q.utoronto.ca/courses/278553/files/22008852/download?download\\_frd=1\)](https://q.utoronto.ca/courses/278553/files/22008852/download?download_frd=1).*

### Week-by-week overview of course activities

Dates & Topics	Readings & Materials	Assessments
Sep 08 –	Hadzilacos: Sec 1.2	<a href="#">Problem Set 1</a>
Sep 14	Liu: pp. 9–13	(0.5%)
Intro, Simple Induction	Week 1 slides [ <i>updated Sep 13</i> ]: <a href="#">1-up</a> <a href="https://q.utoronto.ca/courses/278553/files/22046280/download?download_frd=1">↓ (https://q.utoronto.ca/courses/278553/files/22046280/download?download_frd=1)</a> / <a href="#">2-up</a> <a href="https://q.utoronto.ca/courses/278553/files/22046282/download?download_frd=1">↓ (https://q.utoronto.ca/courses/278553/files/22046282/download?download_frd=1)</a> / <a href="#">4-up</a> <a href="https://q.utoronto.ca/courses/278553/files/22046283/download?download_frd=1">↓ (https://q.utoronto.ca/courses/278553/files/22046283/download?download_frd=1)</a>	

<b>Dates &amp; Topics</b>	<b>Readings &amp; Materials</b>	<b>Assessments</b>
Sep 15 – Sep 21 Complete Induction, Well- Ordering ( <b>Sep 21: last day to enrol</b> )	Hadzilacos: Sec 1.3, 1.1 Liu: pp. 14–15	<a href="#">Problem Set 2</a> (0.5%) <a href="#">Term Test 1</a> (10%)*
Sep 22 – Sep 28 Structural Induction	Hadzilacos: Ch 4 Liu: pp. 16–20	<a href="#">Problem Set 3</a> (0.5%)
Sep 29 – Oct 5 Algorithm Analysis	Hadzilacos: Sec 2.1–2.3 Liu: pp. 43–44	<a href="#">Problem Set 4</a> (0.5%) <a href="#">Term Test 2</a> (10%)*
Oct 6 – Oct 12 Iterative Correctness ( <b>Oct 10: holiday; no classes</b> )	Hadzilacos: Sec 2.4 Liu: pp. 47–51	<a href="#">Problem Set 5</a> (0.5%)
Oct 13 – Oct 19 Iterative Correctness	Hadzilacos: Sec 2.5–2.6 Liu: pp. 52–53	<a href="#">Problem Set 6</a> (0.5%) <a href="#">Term Test 3</a> (10%)*
Oct 20 – Oct 26 Recursive Correctness	Hadzilacos: Sec 2.7–2.8 Liu: pp. 44–46	<a href="#">Problem Set 7</a> (0.5%)
Oct 27 – Nov 2 Recursive Runtime, Divide-and- Conquer	Hadzilacos: Ch 3 Liu: Ch 3	<a href="#">Problem Set 8</a> (0.5%) <a href="#">Term Test 4</a> (10%)*
Nov 3 – Nov 16 Formal languages, Regex	Hadzilacos: Sec 7.1 7.2 Liu: pp. 59–63	<a href="#">Problem Set 9</a> (0.5%)

Dates & Topics	Readings & Materials	Assessments
<b>(Nov 16: last day to drop)</b>		
Nov 7 – Nov 11	<b>Reading Week:</b> No lectures, but there will be regular instructor office hours.	
Nov 17 – Nov 23 DFA, NFA	Hadzilacos: Sec 7.3–7.4 Liu: pp. 64–67, 69–72	<a href="#">Problem Set 10 (0.5%)</a> <a href="#">Term Test 5 (10%)*</a>
Nov 24 – Nov 30 Closure	Hadzilacos: Sec 7.5–7.6	<a href="#">Problem Set 11 (0.5%)</a>
Dec 1 – Dec 7 Pumping Lemma, Review	Hadzilacos: Sec 7.7 Liu pp. 68	<a href="#">Problem Set 12 (0.5%)</a> <a href="#">Term Test 6 (10%)*</a>
Dec 8	<b>Make-Up Day:</b> Lectures for all sections that missed one hour on Oct 10.	
Dec 12 – Dec 20		<a href="#">Final Exam (40%)†</a>

\* Your lowest term test mark will be worth only 4%; the others will each be worth 10%.

† In order to pass the course, you must earn at least 25% on the final exam.

## Creating a Positive Learning Environment

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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 \(http://www.viceprovoststudents.utoronto.ca/publicationsandpolicies/codeofstudentconduct.htm\)](#).

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

As a courtesy to all your classmates (some of whom may live with immunocompromised individuals), we kindly ask that you wear a mask during lectures and tutorials. 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 illnesses), especially in indoor spaces where distancing is not possible.

## Accessibility Needs

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The University of Toronto is committed to accessibility. If you require accommodations for an ongoing disability or an acute issue such as an injury, you should register with [Accessibility Services \(https://studentlife.utoronto.ca/service/accessibility-services-registration-and-documentation-requirements/\)](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 \(https://ism.utoronto.ca/ats/\)](https://ism.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.

## Calendar Information

### Course Description

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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 undergraduate office about proceeding directly into CSC236H1 or CSC240H1.

*Prerequisites:* 60% or higher in **both** CSC148H1, CSC165H1; or 60% or higher in CSC111H1.

*Exclusions:* CSC240H1, CSC236H5, CSCB36H3.

### Learning Outcomes

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By the end of this course, you will be able to...

- (With respect to Mathematical Induction)
  - State the principles of simple induction, complete induction, and well ordering.
  - Write clear and correct proofs using simple induction, complete induction, and well-ordering.
  - State the principle of structural induction.
  - Write clear and correct proofs using structural induction.
- (With respect to Algorithm Analysis)
  - Define preconditions, postconditions, loop invariants, partial correctness, termination, and how each of these concepts relate to one another.
  - Write clear and correct proofs of loop invariants.
  - Generate correct and useful loop invariants for iterative algorithms.

- Write clear and correct proofs of partial correctness and termination of iterative and recursive algorithms.
- Generate correct and useful preconditions and postconditions for iterative and recursive algorithms.
- (With respect to Divide-and-Conquer Algorithms)
  - Set up and solve recurrence relations for the running time of recursive algorithms.
  - Use the Master Theorem to analyze the complexity of divide-and-conquer algorithms.
  - Write correct divide-and-conquer algorithms to solve simple problems.
- (With respect to Formal Language Theory)
  - Define standard terms used in formal language theory (alphabet, string, language).
  - Define Deterministic and Non-Deterministic Finite-State Automata (FSA).
  - Generate correct DFSA and NFSA for various languages.
  - Identify the language accepted by various DFSA and NFSA.
  - Define Regular Expressions.
  - Generate correct regular expressions for various languages.
  - Identify the language accepted by various regular expressions.
  - Define Regular Languages.
  - Write a clear and correct argument that a language is regular.
  - State various closure properties of regular languages.
  - Prove that certain languages are not regular.
  - Convert between DFSA, NFSA, and regular expressions. [Optional]

## Textbooks

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- **Required:** [Course Notes by Prof. Vassos Hadzilacos](#) [↓](https://q.utoronto.ca/courses/278553/files/21686220/download?download_frd=1) (https://q.utoronto.ca/courses/278553/files/21686220/download?download\_frd=1)
- **Recommended:** [Course Notes by Prof. David Liu](#) [↓](https://q.utoronto.ca/courses/278553/files/21686221/download?download_frd=1) (https://q.utoronto.ca/courses/278553/files/21686221/download?download\_frd=1). (A supplemental source of explanations, examples, and practice problems.)
- **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.)
  - [Discrete Mathematics eBook](https://www.campusebookstore.com/integration/AccessCodes/default.aspx?permalinkId=abe4a724-af2f-4e1b-a3bd-0ed5044b9828&frame=YES&t=permalink) (https://www.campusebookstore.com/integration/AccessCodes/default.aspx?permalinkId=abe4a724-af2f-4e1b-a3bd-0ed5044b9828&frame=YES&t=permalink), from the UofT Bookstore. You can also get print copies at the bookstore.
  - [Discrete Mathematics on Cengage.ca](https://www.cengage.ca/c/discrete-mathematics-with-applications-5e-epp/9781337694193) (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).

# Contact

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All course announcements will be posted here, on Quercus. You are responsible for reading all postings made by the instructor or the TAs, and for being familiar with the entire content of this Syllabus — *please take a few minutes at the beginning of the term to read through the entire Syllabus.*

For all questions of *general interest* (whose answers could be useful to other students, e.g., about the course material, problem sets, general questions about course logistics and administration), where you can ask the question while respecting the academic integrity of the course (without revealing any idea or part of a solution to a course assessment), please start a new topic directly on [Ed](#) (the discussion board), so that everyone can benefit from reading your questions and the associated answers. We will monitor Ed regularly, but feel free to answer questions from other students too! Helping someone else learn is one of the most effective ways of truly mastering a subject.

For *personal questions* (making appointments, remarking requests, extensions, missing class, etc.), please email [csc236-2022-09@cs.toronto.edu](mailto:csc236-2022-09@cs.toronto.edu) (<mailto:csc236-2022-09@cs.toronto.edu>) from your University of Toronto email address. **Do not email your instructor directly or use Quercus messaging** — we are using a separate email account to ensure that every email is properly recorded and answered as smoothly as possible. *Please include “CSC236” in the subject line, and your full name and UTORid in the body of your message.* Otherwise, your message might be marked as spam!

We aim to respond to all email and forum postings within 48 business hours (not counting weekends and holidays). However, it may take longer, especially near due dates. 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.

## Course Staff

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Who? (Role)	Where? (Office)	How? (Email)
François Pitt (Instructor)	BA 4264	
Harry Sha (Instructor)	N/A*	Please use the course email address: <a href="mailto:csc236-2022-09@cs.toronto.edu">csc236-2022-09@cs.toronto.edu</a> ( <a href="mailto:csc236-2022-09@cs.toronto.edu">mailto:csc236-2022-09@cs.toronto.edu</a> )
Siphelele Danisa (Instructor)	N/A*	
Amin Gillani (Support)	BA 4207	

Who? (Role)	Where? (Office)	How? (Email)
Staff)		

\* Harry and Sipehelele do *not* have an office where you can simply drop by; visit them during office hours (see below) or contact them by email (to the course address).

## Logistics

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- **This is an in-person course**, meaning that you must be available for in-person activities (lectures, tutorials, and office hours) 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.
- See the [technical advice](#) further below, for additional information about connecting to online office hours.
- TA office hours will NOT follow a regular schedule. The details will be posted here, usually the week before the office hours take place.

## TA Office Hours

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(background colours identify each TA)

Day and Time	TA	Room or Zoom
TBA	TBA	TBA

## Instructor Office Hours (Ongoing)

Instructor	Day & Time	Location
François Pitt ( <b>NO</b> office hour on Sep 8)	Tue 09:30–11:00	<i>Online only:</i> <a href="https://utoronto.zoom.us/j/86576861925">https://utoronto.zoom.us/j/86576861925</a>
	Thu 09:30–11:00	<a href="https://utoronto.zoom.us/j/86576861925">https://utoronto.zoom.us/j/86576861925</a> Meeting ID: 865 7686 1925 Passcode: 2360930
Harry Sha	Tue 13:10–15:00	<i>In-person only:</i> BA 4290
	Mon 09:10–11:00	<i>In-person only:</i> BA 2283
Sipehelele Danisa	Tue 18:10–20:00	<i>In-person only:</i> BA 2283



## Lecture and Tutorial Schedule

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<b>What? (Section)</b>	<b>Who? (Instructor/TAs)</b>	<b>When? (Day &amp; Time)</b>	<b>Where? (Room)</b>
LEC 0101	François Pitt	Fri 11:10–12:00	MP 103
		Mon 11:10–12:00	MP 203
TUT 01..	Mohammad Mozaffari	Wed 11:10–12:00	KP 113
	Vedic Sharma		WB 119
	Joseph Hung		BA 1230
	Leon Xu		BA 1240
LEC 0201	François Pitt	Fri 12:10–13:00	MP 103
		Mon 12:10–13:00	MP 103
TUT 02..	Austin Cheng	Wed 12:10–13:00	BF 323
	Hamidreza Kamkari		SS 1086
	Gal Gross		AB 107
	Joseph Hung		BA 1230
LEC 0301	Harry Sha	Fri 13:10–14:00	WB 116
		Mon 13:10–14:00	WB 116
TUT 03..	Aida Ebrahimi	Wed 13:10–14:00	BA 2165
	Michael Tisi		ES 4000
	Andrew Li		BF 323
	Gal Gross		AB 107
LEC 0401	François Pitt	Fri 14:10–15:00	LM 162
		Mon 14:10–15:00	LM 162
TUT 04..	Andrew Li	Wed 14:10–15:00	BF 323
	Tyler Kastner		BA 2145
	Bogdan Pikula		BA B024
	Ray Wu		UC 244
LEC 5101	Siphelele Danisa	Wed 18:10–20:00	LM 161
TUT 51..	Kevin Gao	Wed 20:10–21:00	BA 2185
	Fateme Sadat Haghpanah		BA 2175
	Haoyan Jiang		BA 2165
	Amir Peimani		BA 2159

# Marking Scheme

## Summary of course assessments

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Item	Date(s)	Weight
Research survey and weekly problem sets	Every week on Thursday before 21:00	6% (0.5% for each problem set; 1% for the research survey)
Term Test 1	<b>During your regular tutorial time</b> on Sep 21	10% ( <i>see second note below</i> )
Term Test 2	<b>During your regular tutorial time</b> on Oct 5	10% ( <i>see second note below</i> )
Term Test 3	<b>During your regular tutorial time</b> on Oct 19	10% ( <i>see second note below</i> )
Term Test 4	<b>During your regular tutorial time</b> on Nov 2	10% ( <i>see second note below</i> )
Term Test 5	<b>During your regular tutorial time</b> on Nov 23	10% ( <i>see second note below</i> )
Term Test 6	<b>During your regular tutorial time</b> on Dec 7	10% ( <i>see second note below</i> )
Final Exam	Exam Period (Dec 12–20)	40%

- Your combined mark on the research survey and problem sets may exceed 6% (if you complete the survey and every problem set). This can be used to offset marks lost in other work, but your final course mark cannot exceed 100%!
- Your lowest term test mark will be worth only 4%; the others will each be worth 10%.
- In order to pass the course, you must earn a mark of at least 25% on the final examination. In other words, if your mark on the final exam is less than 25%, your final mark in the course will be reduced below 50.

## Problem Sets

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Every week, you'll complete a problem set to review what we covered in lecture and consolidate your understanding. For maximum learning benefit, these *should* be completed before your tutorial, but they *must* be submitted before *the following Thursday at 21:00* to receive credit. This provides you with some flexibility for situations when you might be unable to complete them before your tutorial.

- You must submit all problem sets individually. More precisely, you may freely discuss the problems and their answers with your classmates, and with TAs and instructors, but **you MUST write up and submit your own unique document**. See the section on [Academic Integrity](#) for

details of exactly what is allowed and what is not.

- On weeks when there is a tutorial, your TA will discuss solutions to the problem sets for current and previous weeks. Attempting the problem set before your tutorial will help you self-assess your level of understanding of the course concepts, so that you can be best prepared for the following week's term test.
- Problem sets must be submitted online through MarkUs *before* the due date. If you haven't used MarkUs before, give yourself plenty of time to figure it out, and ask for help if you need it! The following [Documentation for Students](https://github.com/MarkUsProject/Markus/wiki/Student-Guide) [\\_ \(https://github.com/MarkUsProject/Markus/wiki/Student-Guide\)](https://github.com/MarkUsProject/Markus/wiki/Student-Guide) may also be useful if you have never used MarkUs before.
- The link to connect to [MarkUs](https://markus.teach.cs.toronto.edu/2022-09) [\\_ \(https://markus.teach.cs.toronto.edu/2022-09\)](https://markus.teach.cs.toronto.edu/2022-09) has been added to the navigation for the course. When you click on it, you will be taken to a login page where you can use your UTOR username and password OR your Teaching Lab username and password (both will work). Once you have logged in, you will see a page with one tile for each course from this term that is using MarkUs — just click on the tile for `csc236`.
- You may type your answers or hand-write them *legibly*, on paper or using a tablet and stylus. We encourage you to use [L<sup>A</sup>T<sub>E</sub>X](#) if you have the time (it's a good opportunity to practice), but *this is NOT required*.
- You may write your answer directly on the question paper (if there is room), or on another piece of paper/document.
- You **must** submit your answers as a **single document in PDF**. **Other formats** (e.g., Word documents, LaTeX source files, ZIP files) **are NOT accepted** — you must **export, compile, convert** and/or **combine** documents into **ONE** PDF submission.
- Your submitted file should not be larger than 19MB. This may happen particularly if you combine multiple photos into one PDF without any sort of compression; if it does, you should use a PDF compression tool to make your PDF smaller, although please make sure that your PDF is still legible before submitting it. ([PDFSAM](https://pdfsam.org/) [\\_ \(https://pdfsam.org/\)](https://pdfsam.org/) is a good tool for this; it is free, open source, and runs on multiple platforms.)
- You can submit your work more than once — and are encouraged to do so! — the most recent version submitted within the deadline is the version marked.
- All problem sets are due by 21:00:00 on their due date. We recognize that unexpected problems sometimes make it difficult to submit problem sets on time, *including* technical issues. For this reason, problem set submissions will be accepted *up to one week late with NO penalty* and *up to two weeks late for a -50% penalty* — **except for the last two problem sets, which CANNOT be submitted once the final exam period begins on Dec 12**. Submissions later than two weeks will receive no credit. Remember that since problem sets are marked only for completeness, not for correctness, you can easily receive full marks even if you are unable to solve the problems!

Visit the [Problem Sets](#) page for more information about the purpose and contents of the problem sets, as well as copies of the handouts and sample solutions.

## Term Tests and Final Exam

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There will be six (6) term tests, taking place every two weeks, in addition to one comprehensive final exam. Every term test will take place in-person, during your regularly scheduled tutorial, and in your regular tutorial room. The exact date and time for the final exam will be announced by the Faculty of Arts & Science partway through the term.

**If you miss a term test** due to unexpected circumstances outside your control, we will calculate a mark for the 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 the exam. This 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 the test you missed was harder. **You must submit a Request for Special Consideration** to receive this accommodation — see below for the details.

Visit the [Term Tests and Final Exam](#) page for general advice and more information on each term test and the final exam (like what material will be covered).

## Academic Integrity

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**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 files, words, and even ideas. Whether you copy or let someone else copy, it is an offence. Academic offences are taken very seriously.

At the same time, we want you to benefit from working with other students. For this course, you must write up your own individual submission to every problem set — you cannot submit the same document as another student — but you are allowed to discuss how to solve the problems with anyone you wish. The purpose of the problem sets is to ensure that **you** understand how to solve the problems. Even if you did not generate a solution yourself, you can still receive full credit for writing up a solution in your own words, together with a list of the sources (textbooks, web pages) and other students with whom you discussed the problem.

You are also welcome to freely discuss course material and technology (such as [L<sup>A</sup>T<sub>E</sub>X](#)) related to assignments, 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.

## Special Consideration

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If you are unable to complete course work or if you miss a test due to major illness or other circumstances outside of your control, please get in touch with us **immediately**. 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 a [Request for Special Consideration Form](https://forms.office.com/Pages/ResponsePage.aspx?id=JsKqeAMvTUuQN7RtVsVSEnpRVW02RFZNh7QEvoBPBk5UMzU3QUdVSVVCNE) (<https://forms.office.com/Pages/ResponsePage.aspx?id=JsKqeAMvTUuQN7RtVsVSEnpRVW02RFZNh7QEvoBPBk5UMzU3QUdVSVVCNE>). Simply complete and submit the form online as soon as you can, together with any supporting documentation.

For illness or injury, including cold or flu-like symptoms and self-isolation, please *self-declare your absence through the Absence Declaration tool on ACORN* (the tool can be found in the Profile and Settings menu). You should record each day of your absence as soon as it begins, up until the day before you return to classes or other academic activities. For this term, you are **NOT** required to complete the U of T's Verification of Student Illness or Injury ("VOI") form as supporting documentation. To learn more, you may access relevant information [here](http://www.illnessverification.utoronto.ca/) (<http://www.illnessverification.utoronto.ca/>).

**IMPORTANT:** Notify us as soon as possible if you find yourself in such a situation. You can contact us (by email using [csc236-2022-09@cs.toronto.edu](mailto:csc236-2022-09@cs.toronto.edu) (<mailto:csc236-2022-09@cs.toronto.edu>)) even before you have your documentation ready to submit; we won't be able to tell you at that point what accommodation you may receive, but can answer other questions and offer advice. It is always easier to resolve situations earlier rather than later.

If you face a situation that is particularly disruptive and likely to have an impact on more than one course, please contact your [College Registrar](https://future.utoronto.ca/current-students/registrars/) (<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.

## Remark Requests

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If you believe there was an error in the marking of a test, you may request that it be remarked. Please complete and submit a Remark Request **directly on MarkUs** (no separate form or email message required). You must give a specific reason for the request, referring to a possible error or omission by the marker.

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 regrade 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.

## Technical Requirements

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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: simply log on to [utoronto.zoom.us](https://utoronto.zoom.us) (<https://utoronto.zoom.us/>) with your UTORid and password to activate your free U of T Zoom account.
- *Already have a Zoom account?* You can use it, but you may not have access to all the same functionality.
- 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 type and submit problem sets.
- To attend online office hours, this computer must have a **microphone**, optionally a webcam, as well as a **reliable, high-speed internet connection**.

## L<sup>A</sup>T<sub>E</sub>X help

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L<sup>A</sup>T<sub>E</sub>X is a standard typesetting program used in computer science, and we encourage you to learn how to use L<sup>A</sup>T<sub>E</sub>X as part of your work — though this is **not necessary** to submit work in this course. The important thing is that you submit PDF documents only, no matter how you generated them. In this section, we provide some resources to help you get started with L<sup>A</sup>T<sub>E</sub>X.

**Overleaf** (<https://www.overleaf.com/>) is an online application that allows you to edit and compile L<sup>A</sup>T<sub>E</sub>X files right in your browser, and even collaborate with others. It also provides some **tutorials** (<https://www.overleaf.com/learn>) on the basics of using L<sup>A</sup>T<sub>E</sub>X.

To generate nice-looking transition diagrams in LaTeX, here is a sample file that shows how to use the `tikz` package, along with the results of typesetting it using a recent installation of TeXLive:

[diagrams.tex](#) ↓ ([https://q.utoronto.ca/courses/278553/files/21960305/download?download\\_frd=1](https://q.utoronto.ca/courses/278553/files/21960305/download?download_frd=1)) /




[diagrams.pdf](#) ↓ ([https://q.utoronto.ca/courses/278553/files/21960304/download?download\\_frd=1](https://q.utoronto.ca/courses/278553/files/21960304/download?download_frd=1)).










More generally, you may find the following links helpful.

- A detailed, yet simple and accessible online L<sup>A</sup>T<sub>E</sub>X tutorial (**a great place to start**): <https://www.latex-tutorial.com/> (<https://www.latex-tutorial.com/>).
- Download L<sup>A</sup>T<sub>E</sub>X on the official L<sup>A</sup>T<sub>E</sub>X 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 L<sup>A</sup>T<sub>E</sub>X (**highly recommended, but long**): <http://ctan.mirror.rafal.ca/info/lshort/english/lshort.pdf> (<http://ctan.mirror.rafal.ca/info/lshort/english/lshort.pdf>).
- A L<sup>A</sup>T<sub>E</sub>X wiki (most Google searches lead here): <https://en.wikibooks.org/wiki/LaTeX> (<https://en.wikibooks.org/wiki/LaTeX>).
- An amazing application of machine learning; use it to find L<sup>A</sup>T<sub>E</sub>X commands based on the symbol: <http://detexify.kirelabs.org> (<http://detexify.kirelabs.org>).
- A graphical L<sup>A</sup>T<sub>E</sub>X editor (requires downloading and installing the software): <https://www.lyx.org/> (<https://www.lyx.org/>).
- A forum for asking L<sup>A</sup>T<sub>E</sub>X-related questions (**highly recommended**): <https://tex.stackexchange.com/> (<https://tex.stackexchange.com/>).










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## Course Summary:

Date	Details	Due
	 <b>Test 1 (LEC0101)</b> <a href="https://q.utoronto.ca/calendar?event_id=555822&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555822&amp;include_contexts=course_278553</a>	11am to 12pm
Wed Sep 21, 2022	 <b>Test 1 (LEC0201)</b> <a href="https://q.utoronto.ca/calendar?event_id=555823&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555823&amp;include_contexts=course_278553</a>	12pm to 1pm
	 <b>Test 1 (LEC0301)</b> <a href="https://q.utoronto.ca/calendar?event_id=555824&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555824&amp;include_contexts=course_278553</a>	1pm to 2pm

Date	Details	Due
	 <a href="#">Test 1 (LEC0401)</a> <a href="https://q.utoronto.ca/calendar?event_id=555825&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555825&amp;include_contexts=course_278553</a>	2pm to 3pm
	 <a href="#">Test 1 (LEC5101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555826&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555826&amp;include_contexts=course_278553</a>	8pm to 9pm
	 <a href="#">Test 2 (LEC0101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555831&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555831&amp;include_contexts=course_278553</a>	11am to 12pm
	 <a href="#">Test 2 (LEC0201)</a> <a href="https://q.utoronto.ca/calendar?event_id=555832&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555832&amp;include_contexts=course_278553</a>	12pm to 1pm
Wed Oct 5, 2022	 <a href="#">Test 2 (LEC0301)</a> <a href="https://q.utoronto.ca/calendar?event_id=555833&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555833&amp;include_contexts=course_278553</a>	1pm to 2pm
	 <a href="#">Test 2 (LEC0401)</a> <a href="https://q.utoronto.ca/calendar?event_id=555834&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555834&amp;include_contexts=course_278553</a>	2pm to 3pm
	 <a href="#">Test 2 (LEC5101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555835&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555835&amp;include_contexts=course_278553</a>	8pm to 9pm
	 <a href="#">Test 3 (LEC0101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555836&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555836&amp;include_contexts=course_278553</a>	11am to 12pm
Wed Oct 19, 2022	 <a href="#">Test 3 (LEC0201)</a> <a href="https://q.utoronto.ca/calendar?event_id=555837&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555837&amp;include_contexts=course_278553</a>	12pm to 1pm



Date	Details	Due
	 <a href="#">Test 3 (LEC0301)</a> <a href="https://q.utoronto.ca/calendar?event_id=555838&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555838&amp;include_contexts=course_278553</a>	1pm to 2pm
	 <a href="#">Test 3 (LEC0401)</a> <a href="https://q.utoronto.ca/calendar?event_id=555839&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555839&amp;include_contexts=course_278553</a>	2pm to 3pm
	 <a href="#">Test 3 (LEC5101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555840&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555840&amp;include_contexts=course_278553</a>	8pm to 9pm
	 <a href="#">Test 4 (LEC0101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555841&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555841&amp;include_contexts=course_278553</a>	11am to 12pm
	 <a href="#">Test 4 (LEC0201)</a> <a href="https://q.utoronto.ca/calendar?event_id=555842&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555842&amp;include_contexts=course_278553</a>	12pm to 1pm
Wed Nov 2, 2022	 <a href="#">Test 4 (LEC0301)</a> <a href="https://q.utoronto.ca/calendar?event_id=555843&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555843&amp;include_contexts=course_278553</a>	1pm to 2pm
	 <a href="#">Test 4 (LEC0401)</a> <a href="https://q.utoronto.ca/calendar?event_id=555844&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555844&amp;include_contexts=course_278553</a>	2pm to 3pm
	 <a href="#">Test 4 (LEC5101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555845&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555845&amp;include_contexts=course_278553</a>	8pm to 9pm
Wed Nov 23, 2022	 <a href="#">Test 5 (LEC0101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555846&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555846&amp;include_contexts=course_278553</a>	11am to 12pm

Date	Details	Due
	 <a href="https://q.utoronto.ca/calendar?event_id=555847&amp;include_contexts=course_278553">Test 5 (LEC0201)</a> <a href="https://q.utoronto.ca/calendar?event_id=555847&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555847&amp;include_contexts=course_278553</a>	12pm to 1pm
	 <a href="https://q.utoronto.ca/calendar?event_id=555848&amp;include_contexts=course_278553">Test 5 (LEC0301)</a> <a href="https://q.utoronto.ca/calendar?event_id=555848&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555848&amp;include_contexts=course_278553</a>	1pm to 2pm
	 <a href="https://q.utoronto.ca/calendar?event_id=555849&amp;include_contexts=course_278553">Test 5 (LEC0401)</a> <a href="https://q.utoronto.ca/calendar?event_id=555849&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555849&amp;include_contexts=course_278553</a>	2pm to 3pm
	 <a href="https://q.utoronto.ca/calendar?event_id=555850&amp;include_contexts=course_278553">Test 5 (LEC5101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555850&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555850&amp;include_contexts=course_278553</a>	8pm to 9pm
Wed Dec 7, 2022	 <a href="https://q.utoronto.ca/calendar?event_id=555851&amp;include_contexts=course_278553">Test 6 (LEC0101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555851&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555851&amp;include_contexts=course_278553</a>	11am to 12pm
	 <a href="https://q.utoronto.ca/calendar?event_id=555852&amp;include_contexts=course_278553">Test 6 (LEC0201)</a> <a href="https://q.utoronto.ca/calendar?event_id=555852&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555852&amp;include_contexts=course_278553</a>	12pm to 1pm
	 <a href="https://q.utoronto.ca/calendar?event_id=555853&amp;include_contexts=course_278553">Test 6 (LEC0301)</a> <a href="https://q.utoronto.ca/calendar?event_id=555853&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555853&amp;include_contexts=course_278553</a>	1pm to 2pm
	 <a href="https://q.utoronto.ca/calendar?event_id=555854&amp;include_contexts=course_278553">Test 6 (LEC0401)</a> <a href="https://q.utoronto.ca/calendar?event_id=555854&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555854&amp;include_contexts=course_278553</a>	2pm to 3pm
	 <a href="https://q.utoronto.ca/calendar?event_id=555855&amp;include_contexts=course_278553">Test 6 (LEC5101)</a> <a href="https://q.utoronto.ca/calendar?event_id=555855&amp;include_contexts=course_278553">https://q.utoronto.ca/calendar?event_id=555855&amp;include_contexts=course_278553</a>	8pm to 9pm