CSC258H1 S

Computer Organization

Winter 2025 Syllabus

Course Meetings

CSC258H1 S

Section	Day & Time	Delivery Mode & Location
LEC0101	Monday, 11:00 AM - 12:00 PM Wednesday, 11:00 AM - 12:00 PM Friday, 11:00 AM - 12:00 PM	In Person: RW 110 In Person: RW 110 In Person: RW 110
LEC0201	Monday, 1:00 PM - 2:00 PM Wednesday, 1:00 PM - 2:00 PM Friday, 1:00 PM - 2:00 PM	In Person: WI 1016 In Person: WI 1016 In Person: WI 1016

Refer to ACORN for the most up-to-date information about the location of the course meetings.

Information pertaining to this course will be available on Quercus. The course website will have course announcements & materials, discussion boards, relevant readings, as well as assignment, lab & project details. Announcements will be made through the email registered on Quercus, but the site is required reading, and it is understood that you will check it multiple times a week.

Labs:

- The labs consist of hands-on lab exercises that take place in BA3145, BA3155 & BA3165. Lab exercises must be completed and shown to the TA before the end of the lab session.
- Pre-lab reports are mandatory for each lab, and must be submitted online before attending the lab session. Students who fail to do this will not be allowed to perform the in-lab exercises.
- Labs take place every week for two months, starting in the second week of class.
- Tutorial sessions will be used to discuss the upcoming lab work.

Project:

- A large assembly language project for the last month of the course. Marks are given for successful implementation of five milestones, with extra credit for innovation and creativity.
- Project demos are performed in the lab, with each milestone worth 3% each.

Students are required to work in pairs for the labs, but may work individually for the project.

Lateness is generally not accepted, except in cases of medical emergency. Lateness due to personal reasons must be brought to the instructor for consideration, as early as possible.

Course Contacts

Course Website: https://q.utoronto.ca/courses/379878

Instructor: Dr. Steve Engels
Email: sengels@cs.toronto.edu
Phone: 416-946-5454
Office Hours and Location: Mondays, Wednesdays and Fridays, 12pm-1pm
Additional Notes: Please write "CSC258" in the subject header of course-related emails.

Course Overview

Computer structures, machine languages, instruction execution, addressing techniques, and digital representation of data. Computer system organization, memory storage devices, and microprogramming. Block diagram circuit realizations of memory, control and arithmetic functions. There are a number of laboratory periods in which students conduct experiments with digital logic circuits.

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Course Learning Outcomes

By the end of this course, students should be able to do the following:

Circuit Creation

- Create combinational and sequential circuits from logic gates.
- Design circuits that implement Finite State Machines

Microprocessor Architecture

- Implement a basic arithmetic logic unit (ALU)
- Develop register files and memory units
- Construct and operate the processor datapath.

Assembly Language

- Encode and decode microprocessor instructions
- Translate between assembly and C programs

Prerequisites: (60% or higher in (CSC148H1/ CSC148H5/ CSCA48H3), 60% or higher in (CSC165H1/ CSC240H1/ MAT102H5/ MATA67H3/ CSCA67H3))/ 60% or higher in CSC111H1
Corequisites: None
Exclusions: CSC258H5, CSCB58H3
Recommended Preparation: None
Credit Value: 0.5

Course Materials

Recommended:	Mano, Kime, *Logic and Computer Design Fundamentals*, 4th ed., Prentice Hall, 2008
	Hamacher, Vranesic, Zaky, *Computer Organization*, 5th ed., McGraw Hill, 2002
Other texts:	Null, Lobur, *The Essentials of Computer Organization and Architecture,* 3rd ed.,
	Jones & Bartlett Publishing, 2012

Marking Scheme

Assessment	Percent	Details	Due Date
Midterm test	19%		2025-02-24
Lab 1	4%	Pre-lab exercise must be completed before attending the lab. Lab marks are awarded for demonstrating the correct operation of the pre-lab designs on the in-lab hardware.	2025-01-13,2025-01-15
Lab 2	4%	Pre-lab exercise must be completed before attending the lab. Lab marks are awarded for demonstrating the correct operation of the pre-lab designs on the in-lab hardware.	2025-01-20,2025-01-22
Lab 3	4%	Pre-lab exercise must be completed before attending the lab. Lab marks are awarded for demonstrating the correct operation of the pre-lab designs on the in-lab hardware.	2025-01-27,2025-01-29

Assessment	Percent	Details	Due Date
Lab 4	4%	Pre-lab exercise must be completed before attending the lab. Lab marks are awarded for demonstrating the correct operation of the pre-lab designs on the in-lab hardware.	2025-02-03,2025-03-05
Lab 5	4%	Pre-lab exercise must be completed before attending the lab. Lab marks are awarded for demonstrating the correct operation of the pre-lab designs on the in-lab hardware.	2025-02-10,2025-02-12
Lab 6	4%	Pre-lab exercise must be completed before attending the lab. Lab marks are awarded for demonstrating the correct operation of the pre-lab designs on the in-lab hardware.	2025-03-03,2025-03-05
Lab 7	4%	Pre-lab exercise must be completed before attending the lab. Lab marks are awarded for demonstrating the correct operation of the pre-lab designs on the in-lab hardware.	2025-03-10,2025-03-12
Project	15%	The project consists of 5 milestones, worth 3% each.	2025-03-31,2025-04-02
In-Person Final Exam	38%		Final Exam Period

Late Assessment Submissions Policy

Lateness is generally not accepted, except in cases of medical emergency. Lateness due to personal reasons must be brought to the instructor for consideration, as early as possible.

Course Schedule

Week	Topics	Milestone(s)
Jan 6 – 10	Overview, transistors, basic logic gates	

Jan 13 – 17	Combinational circuit design, K-maps	Lab 1
Jan 20 – 24	Logical devices (muxes, adders, decoders)	Lab 2
Jan 27 – Jan 31	Latches & flip-flops	Lab 3
Feb 3 – 7	Registers, counters, finite state machines	Lab 4
Feb 10 – 14	Finite state machine design, midterm review	Lab 5
Feb 17 – 21	*-- Reading Week --*	
Feb 24 – 28	*ALUs, registers, memory*	*Midterm exam**
Mar 3 – 7	*Architecture & microprogramming*	*Lab 6*
Mar 10 – 14	Assembly language basics	Lab 7
Mar 17 – 22	Assembly language program design	
Mar 24 – 28	Advanced assembly language	Project demo #1
Mar 31 – Apr 4	Assembly functions & recursion	Project demo #2

Policies & Statements

Quercus Info (if using)

This Course uses the University's learning management system, Quercus, to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as sharing important announcements and updates. New information and resources will be posted regularly as we move through the term. To access the course website, go to the U of T Quercus log-in page at https://q.utoronto.ca. SPECIAL NOTE ABOUT GRADES POSTED ONLINE: Please also note that any grades posted are for your information only, so you can view and track your progress through the course. No grades are considered official, including any posted in Quercus at any point in the term, until they have been formally approved and posted on ACORN at the end of the course. Please contact me as soon as possible if you think there is an error in any grade posted on Quercus.

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Academic Integrity

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters (https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019). If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, please reach out to me. Note that you are expected to seek out additional information on academic integrity from me or from other institutional resources. For example, to learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at http://www.writing.utoronto.ca. Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see A&S Student Academic Integrity (https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity) and the University of Toronto Website on Academic Integrity (https://www.academicintegrity.utoronto.ca).

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As an extension of this, the use of generative artificial intelligence (AI) tools is prohibited in all course assessments unless explicitly stated otherwise by the instructor. This includes, but is not limited to, ChatGPT, GitHub Copilot, and open-source models that you have trained and/or deployed yourself. You may not interact with, nor copy, paraphrase, or adapt any content from any generative AI for the purpose of completing assignments in this course. Use of generative AI will be considered use of an unauthorized aid, which is treated as an academic offense by the university.

Assignment Submission Method

This item is listed here to remind you that if you have specific directives for your class about how they should submit assignments (e.g. electronically, in person, at the departmental office), you should spell those out clearly in your syllabus. Many departments have a protocol for students submitting assignments at the departmental office, and you should take those into account.

Assignment Submission Method

Pre-lab reports are mandatory for each lab, and must be submitted online on Quercus before attending the lab session. Students who fail to do this will not be allowed to perform the in-lab exercises.

Project milestones must also be submitted online on Quercus before attending the demo session in the lab.

Course Materials, including lecture notes

Course materials are provided for the exclusive use of enrolled students. These materials should not be reposted, shared, put in the public domain, or otherwise distributed without the explicit permission of the instructor. These materials belong to your instructor, the University, and/or other sources depending on the specific facts of each situation and are protected by copyright. Students violating these policies will be subject to disciplinary actions under the Code of Student Conduct.

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