

**The University of Western Ontario
London, Ontario, Canada
Department of Computer Science**

**CS 2208a - Introduction to Computer Organization and Architecture
Course Outline - Fall (September--December) 2019**

This course uses the Online Western's Learning (OWL) system (<https://owl.uwo.ca>)

A: Instructor

- Professor [Mahmoud El-Sakka](#)
Middlesex College, Room 419
Phone: 661-2111 x86996
Email: elsakka <at> csd.uwo.ca
Office hours: Monday from 1:30 pm to 2:15 pm (tentative)
Office hours: Tuesday from 1:30 pm to 2:15 pm (tentative)

B: Teaching Assistances

TBA

Teaching Assistances' Office hours: TBA

C: Lectures and Tutorials Schedule/Location

- Lectures Time & Place
Tuesday 12:30 pm - 1:30 pm at NS-7
Thursday 12:30 pm - 2:30 pm at NS-7
- Tutorials Time & Place
Monday 12:30 pm - 1:30 pm at NS-7

D: Course Description

The purpose of this course is to give students an understanding of *how a computer works (organization)* and *what a computer does (architecture)*. The course covers the internal representation of various data types, including characters, integers, and floating points. This course focuses on the architectural components of computers, how these components are interconnected, and the nature of the information flow between them. Assembly language will be used to reinforce these issues.

E: Topics To Be Covered During The Course

The course will address as many of the following topics as time will allow:

- Introduction to Computer Systems Architecture and Organization
- Computer Arithmetic
- Floating Point Numbers
- ARM Instruction Set Architecture
- ARM Assembly Language
- ARM Data Processing
- ARM Flow Control and Branching
- ARM Addressing Modes
- Subroutine Call and Return
- Data Storage and the Stack

- Data Processing and Data Movement
- Computer Performance

F: Prerequisites

- Computer Science 1027a/b, 1037a/b, or 2101a/b, with a grade of at least 65%

Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Students are assumed to be familiar with a high-level programming language, and with data structures such as stacks and queues.

G: Textbook

- Alan Clements, *Computer Organization & Architecture: Themes and Variations*, Cengage Learning, 2014, ISBN: 978-1-111-98704-6.

H: Course Website

The CS 2208a course uses the Online Western's Learning (OWL) system (<https://owl.uwo.ca>)

Course material and class information will be posted on this website. You are responsible for reading this information frequently.

Possessing (and even reading) lecture notes is not a suitable substitute for attending lectures.

I: Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x82147 for any specific question regarding an accommodation.

J: Computing Facilities

Each student will be given an account on the Computer Science Department undergraduate computing facility, GAUL. In accepting the GAUL account, a student agrees to abide by the department's [Rules of Ethical Conduct](#).

Note that: After-hours access to certain Computer Science lab rooms is by student card. If a student card is lost, a replacement card will not automatically open these lab rooms. In this case, the student must bring the new card to a member of the Systems Group in Middlesex College Room 346 to activate it.

K: Email Contact

We occasionally need to send email messages to the class or to students individually. Such emails are sent to the UWO email address as assigned to you by Information Technology Services (ITS), i.e. your email address @uwo.ca. It is your responsibility to read your email account on a frequent and regular basis, or to have it forwarded to an alternative email address if preferred. See the ITS website for directions on forwarding email.

However, note that the email at ITS (your UWO account) and other email providers may have quotas or limits on the amount of space they dedicate to each account. Unchecked emails may accumulate beyond those limits and you may be unable to retrieve important messages from your instructors. Losing emails is not an acceptable excuse for not knowing about the information that was sent.

L: Assignment Conduct

- There will be 5 equally weighted assignments.
- Tentative Assignment Schedule

Assignment no.	To be posted on	Due in	Due on
1	Monday September 23	6 days	Sunday September 29
2	Monday September 30	6 days	Sunday October 6
3	Thursday October 24	7 days	Thursday October 31
4	Thursday November 14	7 days	Thursday November 21
5	Monday November 25	7 days	Monday December 02

- Assignments are due 5 minutes before the midnight (23:55) of the due date.
- All submissions will be submitted electronically. Details will be given in the assignment descriptions. We reserve the right to use similarity detection software to detect possible cheating cases.
- Late assignments are strongly discouraged.
 - 10% will be deducted from a late assignment (up to 24 hours after the due date/time)
 - After 24 hours from the due date/time, late assignments will receive a zero grade.
- Assignments may involve concept questions (non-programming) related to the course material, and Assembly programming.
- Assignment descriptions will be posted on the course website by the dates listed above.
- Any changes, updates, and clarifications to assignments will also be posted on the website. It is your responsibility to monitor these pages closely.
- A program that produces the correct output is not necessarily a "working" program; it must also satisfy the specifications given in the assignment description. Other criteria in terms of which an assignment will be evaluated include coding style, comments, and efficiency.
- Your assignment solutions are expected to be your own individual work, not the products of group effort.
- It is your responsibility to keep up-to-date backups of assignment disk files in case of system crashes or inadvertently erased files. Retain disk copies of all material handed in, as well as the actual graded assignment, to guard against the possibility of lost assignments or errors in recording marks. You should keep these materials at least until you are satisfied that your final mark for the course has been computed properly.
- Assignments will be marked by the Teaching Assistant(s), who follow marking schemes provided by instructors.
- Every effort will be made to have assignments marked and handed back within 3 weeks after the hand-in date, preferably sooner.
- When assignment marking has been completed, you will be informed via the course website and/or email.
- You should direct any questions about marking in the first instance to your TA. If your discussion with the TA is not satisfactory, you may want to further discuss the issue with the course instructor.
- A request for an adjustment in an assignment mark must be made within 2 weeks following the first handed-back day. All assignment marks are considered to be final after that date.

M: Lab. Conduct

- There will be 7 equally weighted one-hour labs.
- 6 possible lab sections are scheduled each week.
- Tentative labs Schedule

Lab no.	Section 3 (Tuesday) 4:30 pm--5:30 pm HSB-13	Section 4 (Wednesday) 12:30 pm--1:30 pm HSB-16	Section 6 (Wednesday) 2:30 pm--3:30 pm HSB-13	Section 7 (Wednesday) 4:30 pm--5:30 pm HSB-16	Section 5 (Thursday) 4:30 pm--5:30 pm HSB-13
1	Tuesday October 15	Wednesday October 16	Wednesday October 16	Wednesday October 16	Thursday October 17
2	Tuesday October 22	Wednesday October 23	Wednesday October 23	Wednesday October 23	Thursday October 24
3	Tuesday October 29	Wednesday October 30	Wednesday October 30	Wednesday October 30	Thursday October 31
4	Tuesday November 12	Wednesday November 13	Wednesday November 13	Wednesday November 13	Thursday November 14
5	Tuesday November 19	Wednesday November 20	Wednesday November 20	Wednesday November 20	Thursday November 21
6	Tuesday November 26	Wednesday November 27	Wednesday November 27	Wednesday November 27	Thursday November 28
7	Tuesday December 03	Wednesday December 04	Wednesday December 04	Wednesday December 04	Thursday December 05

- Lab descriptions will be posted on the course website before the dates listed above.
- Any changes, updates, and clarifications to labs will also be posted on the website. It is your responsibility to monitor these pages closely.
- Labs act as practice sessions where you can solve a problem and interact with the TAs and other students.
- To be eligible for full marks, you must participate and complete at least 6 out of 7 labs (participating and completing all 7 labs is recommended).
- A request for an adjustment in an lab mark must be made within 2 weeks following the lab week. All lab marks are considered to be final after that date.

N: Ethical Conduct

Scholastic offences are taken seriously and students are strongly encouraged to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence.

All assignments are individual assignments. You may discuss approaches to problems among yourselves; however, the actual details of the work (assignment coding, answers to concept questions, etc.) must be an individual effort.

Assignments that are judged to be the result of academic dishonesty will, for the student's first offence, be given a mark of zero with an additional penalty equal to the weight of the assignment also being applied.

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Students are responsible for reading and respecting the Computer Science Department's policy on [Scholastic Offences](#) and [Rules of Ethical Conduct](#).

O: Tutoring

The role of tutoring is to help students understand course material. Tutors should **not** write assignments or tests for the students who hire them. Submitting an assignment that contains material written by a tutor is an academic offense.

Having employed the same tutor as another student is not a legitimate defense against an accusation of collusion, should two students hand in assignments judged similar beyond the possibility of coincidence.

P: Exam Schedule

- First midterm exam
 - Date: Thursday October 10, 2019
 - Time: from 12:30 pm to 2:00 pm
 - Location: EC-2130, EC-2155 and NS-7
- Second midterm exam
 - Date: Thursday November 14, 2019
 - Time: from 12:30 pm to 2:00 pm
 - Location: EC-2130, EC-2155 and NS-7

The marks of midterm exam will be available within 2 weeks of the exam at the latest.

- Final exam
 - Date: During December final exam period
 - Time: TBA (tentatively--three hours long)
 - Location: TBA

Electronic devices will not be allowed during examinations.

Q: Academic Accommodation for Medical Illness

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's office immediately. For further information, please see: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf and https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf.

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's office) for visits to Student Health Services. The form can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

For accommodation for work worth less than 10%, the student required to formally request accommodation via the self-reporting mechanism at the student's Dean's Office/Academic Counselling unit.

R: Support Services

Learning-skills counsellors at the Student Development Centre (<http://www.sdc.uwo.ca>) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Students who are in emotional/mental distress should refer to Mental Health at Western (<http://www.uwo.ca/uwocom/mentalhealth>) for a complete list of options about how to obtain help.

Students may refer to <http://westernusc.ca/your-services> for services provided by the USC.

Students may refer to <http://www.registrar.uwo.ca> for the Registrarial Services.

S: Student Evaluation

- Grades will be based on
 - Assignments worth a total of 15%
 - Labs worth a total of 6%
 - First midterm exam worth 17%
 - Second midterm exam worth 17%
 - Final exam worth 45%
 - If an assignment has to be cancelled for any reason, the remaining assignment weights will be prorated (scaled) to add up to 15%.
 - If a lab has to be cancelled for any reason, the remaining lab weights will be prorated (scaled) to add up to 6%.
 - **To be eligible to receive a passing grade in the course, your total marks on the two midterms and the final exams must be at least 50%.**
 - **To be eligible to receive a grade of C (60%) or higher (i.e., to be eligible for Honors Programs), your total marks on the two midterms and the final exams must be at least 60%.**
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