THE UNIVERSITY OF WINNIPEG

Applied Computer Science

Course Number: **ACS-2906-002, 072L, 073L**
Course Name: **Computer Architecture and System Software**
Course Webpage: **https://nexus.uwinnipeg.ca/d2l/home/67577**

Instructor Information

Instructor: Victor Balogun
Email: vi.balogun@uwinnipeg.ca
Class Room No: 3D01
Class Meeting Time: Friday 11:30 am – 2:30 pm
Lab Room No: 3C13
Lab Meeting Times:
Office Hours: T 12:00-1:00 pm
072 Th 2:45 PM - 4:00 PM
Office Hours Room No: 3D18
073 F 2:45 PM - 4:00 PM

Important Dates

First Class: Friday January 10, 2025
First Labs: 072 Thursday, January 16, 2025
073 Friday, January 17, 2025
Midterm Test: Friday February 14, 2025
Winter Reading Week: February 16 – 22, 2025 **(No classes)**

Withdrawal date w/o academic penalty*: Friday, March 14, 2025

Last Scheduled Class: Friday April 4, 2025
Last Labs: 072 Thursday, April 3, 2025
073 Friday, April 4, 2025
Final Examination Period: Final Exam Period: April 9-23, 2025
Final Examination (Comprehensive): TBD
The University is closed on the following dates (No Classes):

Louis Riel Day:	Monday, February 17, 2025
Good Friday:	Friday, April 18, 2025

*A minimum of 20% of the work on which the final grade is based will be evaluated and available to the student before the voluntary withdrawal date.

Course Objectives/Learning Outcomes

The course begins with discussions of the architecture of computer hardware and progresses to an examination of system software, including its relationship to the hardware, its structure and design, and its impact on application software, system developers, and end-users. Operating system concepts such as memory management, process management, and I/O sub-systems will be covered. Other topics include language processors, system utilities, security issues, and performance management. The course provides students a hands-on experience of

programming at different levels such as high level, assembly, and machine code.
ACS-2906L (Lab) must be taken concurrently.

Evaluation Criteria

Note*: The use of any AI tool (e.g., ChatGPT, Bing, Notion AI) is prohibited in this course for completing any of the following assessments*:

Assignments (20%)
There are 4 assignments, each worth 5% of your total grade. Submission instructions will be provided with each assignment. All submissions must be typed, and all source code must be commented and compile, or no credit will be given.

Laboratories (10%)
There will be 10 laboratories: each consisting of 1% of your final grade. Laboratories will be emailed to students on the morning of the scheduled section. Submission instructions will be given with each assignment. Multiple submissions are not permitted. All work submitted for evaluation must be typed, and all source code must be commented and compile, or no credit will be given. Late submissions will not be accepted.

Midterm Examination (20%)
There will be **one** midterm test.

Final Examination (50%)
The final examination is comprehensive.

Exam Requirements

- Photo ID is required
- You are expected to write the test/exam on the specified date.
- Unless a medical certificate is provided, no accommodation is made for missed deadlines or examinations
- No equipment (*e.g.* cell/smart phone, laptop, calculators, dictionaries, handheld devices, etc.) is authorized for use in tests/exams.
- Midterm and final examinations are closed-book.

Students should contact the instructor as soon as possible if extenuating circumstances require missing a lab, assignment, test or examination. A medical certificate from a practicing physician may be required before any adjustments are considered.

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are encouraged to contact Accessibility Services (AS) at 204-786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential. https://www.uwinnipeg.ca/accessibility-services

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work examinations without penalty. A list of religious holidays can be found in the 2024-25 Undergraduate Academic Calendar online at
http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf

Final Letter Grade Assignment

Historically, numerical percentages have been converted to letter grades using the following scale. However, instructors can deviate from these values based on pedagogical nuances of a particular class, and final grades are subject to approval by the Department Review Committee.

A+	90 – 100%	B+	75 – 79%	C	60 – 64%
A	85 – 89 %	B	70 – 74%	D	50 – 59%
A-	80 – 84%	C+	65 – 69%	F	below 50%

Required Textbooks

Main texts:

- Computer Systems: A Programmer's Perspective; 3rd Edition; Randel E. Bryant, David R. O'Hallaron; Prentice Hall 2010, ISBN: 978-0134092669.
- Besides the information contained in the main texts and course notes, I may also distribute papers, and discuss appropriate material and examples from other sources. For example, the assembly language component of the course is taught from supplementary material. Students are responsible for all material covered in the class.

Prerequisite Information (This information can be found in the UW General Calendar)

Requisite courses: ACS-1904 or ACS-1905 with a minimum grade of C.
ACS-2906L (lab) must be taken concurrently.

Regulations, Policies, and Academic Integrity

Students are encouraged to familiarize themselves with the Academic Regulations and Policies found in the University Academic Calendar at:
https://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf

Particular attention should be given to subsections 8 (Student Discipline), 9 (Senate Appeals) and 10 (Grade Appeals).

Avoiding Academic Misconduct: Academic dishonesty is a very serious offense and will be dealt in accordance with the University's policies.

Detailed information can be found at the following:

- Academic Misconduct Policy and Procedures: https://www.uwinnipeg.ca/policies/docs/policies/academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/policies/docs/procedures/academic-misconduct-procedures.pdf
- About Academic Integrity and Misconduct, Resources and FAQs: https://library.uwinnipeg.ca/use-the-library/help-with-research/academic-integrity.html
- Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves "aiding and abetting" plagiarism. Students who do this can be charged with Academic Misconduct.

Academic Integrity and AI Text-generating Tools: The use of any AI tool (e.g., ChatGPT, Bing, Notion AI) is prohibited in this course for completing any of the assessments. Students will face an allegation of academic misconduct if using them to do assignments. In rare cases when the professor explicitly permit the use of AI tools, students must cite them. According to the MLA (https://style.mla.org/citing-generative-ai/), writers should

- Cite a generative AI tool whenever you paraphrase, quote, or incorporate into your own work any content (whether text, image, data, or other) that was created by it
- acknowledge all functional uses of the tool (like editing your prose or translating words) in a note, your text, or another suitable location
- take care to vet the secondary sources it cites

Non-academic misconduct: Students are expected to conduct themselves in a respectful manner on campus and in the learning environment irrespective of platform being used. Behaviour, communication, or acts that are inconsistent with a number of UW policies could be considered "non-academic" misconduct. More detailed information can be found here:

- Respectful Working and Learning Environment Policy https://www.uwinnipeg.ca/respect/respect-policy.html ,
- Acceptable Use of Information Technology Policy · https://www.uwinnipeg.ca/policies/docs/policies/acceptable-use-of-information-technology-policy.pdf
- Non-Academic Misconduct Policy and Procedures: https://www.uwinnipeg.ca/policies/docs/policies/student-non-academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/policies/docs/procedures/student-non-academic-misconduct-procedures.pdf

Copyright and Intellectual Property: Course materials are the property of the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides—irrespective of format. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the instructor/presenter before, for example, photographing, recording, or taking screenshots of slides, presentations, lectures, and notes on the board. Students found to be in violation of an instructor's intellectual property rights could face serious consequences pursuant to the Academic Misconduct or Non-Academic Misconduct Policy; such consequences could possibly involve legal sanction under the Copyright Policy: https://copyright.uwinnipeg.ca/basics/copyright-policy.html

Privacy

Students have rights in relation of the collecting of personal data the University of Winnipeg - Student Privacy: https://www.uwinnipeg.ca/privacy/admissions-privacy-notice.html - Zoom Privacy: https://www.uwinnipeg.ca/privacy/zoom-privacy-notice.html

Class Cancellation, Correspondence with Students and Withdrawing from Course

When it is necessary to cancel a class due to exceptional circumstances, the course instructor will make every effort to inform students via UWinnipeg email and Nexus.

Students are reminded that they have a responsibility to regularly check their UWinnipeg e-mail addresses to ensure timely receipt of correspondence from the University and/or the course instructor.

Please let the course instructor know if you plan on withdrawing from the course. Note that withdrawing before the VW date does not necessarily result in a fee refund.

Course Topics(tentative)

- Representing and Manipulating Info
- Integer Arithmetic
- Floating Point Arithmetic
- Assembly Language programming
- Memory Hierarchy
- Virtual Memory
- GPUs

***Note**:A permitted or necessary change in the mode of delivery may require adjustments to important aspects of course outlines, like class schedule and the number, nature, and weighting of assignments and/or exams.*

Recommended Study Habits

Students who do well in this class attend lectures, take notes, submit all deliverables, regularly ask questions, and tend to spend an extra 3-5 hours per week doing the following:

- Read course notes and handouts
- Read the textbook before coming to class
- Attempt the problems and exercises at the end of the chapters
- Form study groups to study for the midterm and exam

Advice: Students who fall behind find it very hard to catch up.