



# 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/47973>

### Instructor Information

**Instructor:** Camilo Valderrama  
**E-mail:** [c.valderrama@uwinnipeg.ca](mailto:c.valderrama@uwinnipeg.ca)  
**Office Hours:** Wednesday 2:00-3:00 pm 3D06A  
**Class meeting time:** Fridays 01:00-4:00 pm 3D04  
**Lab time:** L-072 Fridays 4:00-5:15 pm 3D03  
L-073 Thursday 4:00-5:15 pm 3C13

### Important Dates

1. First Class: Friday, January 6, 2023
2. First Lab L-072: Friday, January 13, 2023
3. First Lab L-073: Thursday, January 12, 2023
4. Reading Week (no classes): February 19-25, 2023
5. Midterm Test: Friday, February 10, 2023
6. Final Withdrawal Date w/o academic penalty\*: Tuesday, March 14, 2023
7. Last Class: Friday, March 31, 2023
8. Last Lab L-072: Friday, March 31, 2023
9. Last Lab L-073: Thursday, March 30, 2023
10. Final Exam (Comprehensive): TBD
11. University closures: Louis Riel Day Monday, February 20, 2023  
Good Friday Friday, April 7, 2023

\*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.

This course introduces fundamental programming concepts using the Java programming language. Topics to be covered include primitive data types and their manipulation, control structures, classes, objects, methods, and array lists.

### **Evaluation Criteria**

#### **Assignments (20%)**

There are 4 assignments, each worth 5% of your total grade. Submission instructions will be provided with each assignment. The late penalty is 15% per day (for a maximum of 3 days). Multiple submissions are not permitted. 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.

### **Student Services and Information**

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams or during lectures/laboratories are encouraged to contact Accessibility Services (AS) at 204.786.9771 or <https://www.uwinnipeg.ca/accessibility-services/> to discuss appropriate options. All information about a student's disability or medical condition remains confidential.

All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found at <https://www.uwinnipeg.ca/respect/>.

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 or examinations without penalty. A list of religious holidays can be found in the 2020-21 Undergraduate Academic Calendar.

## **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, other material may be also distributed. 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.

## **Student Wellness**

The University of Winnipeg affirms the importance of student mental health and our commitment to providing accessible, culturally appropriate, and effective services for students. Students who are seeking mental health supports are encouraged to reach out to the Wellness Centre at [studentwellness@uwinnipeg.ca](mailto:studentwellness@uwinnipeg.ca) or 204.988.7611. For community-based mental health resources and supports, students are encouraged to dial 2-1-1. This program of United Way is available 24/7 in 150 languages.

## **Regulations, Policies, and Academic Integrity**

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

*Avoiding Academic Misconduct:* 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). Please note, in particular, the subsection of Student Discipline pertaining to plagiarism and other forms of cheating.

Detailed information can be found at the following:

- Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>

- UW Library video tutorial “Avoiding Plagiarism”  
<https://www.youtube.com/watch?v=UvFdxRU9a8g>

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.

*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/institutional-analysis/docs/policies/acceptable-use-of-information-technology-policy.pdf>
- Non-Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/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/docs/copyright\\_policy\\_2017.pdf](https://copyright.uwinnipeg.ca/docs/copyright_policy_2017.pdf)

### **Privacy**

Students have rights in relation of the collecting of personal data the University of Winnipeg:  
<https://www.uwinnipeg.ca/privacy/admissions-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 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**

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

Note: not all the above topics may be covered.

### **Course Readings**

Relevant textbook chapters and sections will be given during lectures.

### **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.**

*Note: A permitted or necessary change in 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.*