THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number: ACS-2947-001, L-070, L-071
Course Name: Data Structures and Algorithms
Course Webpage: https://nexus.uwinnipeg.ca/d2l/home/64676

Instructor Information

Instructor:	Val Massey		
E-mail:	v.massey@uwinnipeg.ca		
Office Hours:	Monday/Wednesday	2:30 - 3:30 pm	3C07
Class meeting time:	Monday/Wednesday	1:00 - 2:15 pm	3D01
Lab time:	L-070 Thursday	4:00 - 5:15 pm	3C13
	L-071 Friday	4:00 - 5:15 pm	3C13

Important Dates

1.	First Class:	Wednesday, September 4, 2024
2.	First Lab:	Thursday, September 5, 2024 (L-070)
		Friday, September 6, 2024 (L-071)
3.	Reading week (no classes):	October 13 – 19, 2024
4.	Midterm Test:	Wednesday, October 23, 2024
5.	Final Withdrawal Date without academic penalty*:	Wednesday, November 13, 2024
6.	Last Class:	Wednesday, December 4, 2024
7.	Last Lab:	Friday, November 29, 2024
8.	Final Exam:	TBD
9.	University closures: Truth and Reconciliation Day	Monday, September 30, 2024
	Thanksgiving	Monday, October 14, 2024
	Remembrance Day	Monday, November 11, 2024
10.	Make-up classes for holiday closures:	Tuesday, December 3, 2024
		Wednesday, December 4, 2024

*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

This course introduces the theory and implementation of data structures and algorithm design using Java. Students will learn elementary data structures such as linked lists, stacks, queues, lists, trees, and maps; algorithms for manipulating these data structures, and the basics of algorithm analysis.

Evaluation Criteria

Labs (10%)

- Based on best 7 of 8 submitted labs (worth ~1.5% each)
- Labs are to be completed during the lab period for each section
- No late lab submissions will be accepted

Assignments (20%)

- 4 assignments, worth 5% each
- Individual due dates will be posted on Nexus
- Assignments will be accepted up to 1 day late with a 20% penalty

Course IDE:
Various Java IDEs are available to install (e.g., IntelliJ, Visual Studio Code, NetBeans, BlueJ). Students may choose to work with any IDE or code editor that they are comfortable with.

Lab/assignment submissions:
All work is to be submitted electronically via Nexus. All coding is to be submitted in .java format, and any written work in PDF format. Further details and submission procedure will be stated in each assignment.

Students are responsible for backing up and protecting their lab and assignment work.

Midterm Test (20%)

- During the regular class time (see Important Dates)

Final Exam (50%)

- Cumulative

Test / Exam Requirements

- Photo ID is required for the final exam.
- The use of computers, calculators, phones, or other electronic devices is not permitted during exams.

- Midterm and final exams 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 the 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 Text Book / Reading List

- M.T. Goodrich and R. Tamassia: *Data Structures and Algorithms in Java (6th Edition)*, John Wiley & Sons, Inc., 2014. ISBN: 1118771338
- Course Notes will be available on Nexus

Prerequisite Information

- A grade of at least C in ACS-1904 or ACS-1905
- ACS-2947L (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: Students must follow principles of academic integrity (e.g., honesty, respect, fairness, and responsibility) in their use of material obtained through AI text-generating tools (e.g., ChatGPT, Bing, Notion AI). Use of AI Tools is prohibited in this course: students may face an allegation of academic misconduct if using them to do assignments.

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.

Topics to be covered (tentative)

- Object-oriented design
- Arrays
- Linked lists
- Big-O notation
- Stacks
- Queues
- Deques
- Array lists
- Positional lists
- Iterators
- Trees
- Binary trees
- Priority queues
- Heaps
- Maps
- Hash tables
- Sorting
- Graphs (time permitting)

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.