APPLIED COMPUTER SCIENCE

Course Number: ACS-2947-001, 070L, 071L
Course Name: Data Structures and Algorithms
Course Webpage: http://courses.acs.uwinnipeg.ca/2947-001/ (Nexus)

Instructor Information

Instructor:	Jeanette Bautista		
E-mail:	je.bautista@uwinnipeg.ca		
Office Hours:	Thursdays	2:00-3:00 pm	via Zoom
Class meeting time:	Mondays/Wednesdays	11:30-12:45 pm	via Zoom
Lab time:	L-070 Mondays	4:00 – 5:15 pm	via Zoom
	L-071 Wednesdays	4:00 – 5:15 pm	via Zoom

Meeting info for office hours, class time and lab sessions will be posted on Nexus.

Important Dates

1. First Class: Wednesday, September 9, 2020
2. First Lab: Monday, September 14, 2020 (L-070)
                                                        Wednesday, September 16, 2020 (L-071)
3. Reading Week (no classes):   October 11-17, 2020
4. Midterm Exam: Wednesday, October 21, 2020
5. Final Withdrawal Date w/o academic penalty*:   Tuesday, November 17, 2020
6. Last Class: Tuesday, December 8, 2020
                                                        (Make-up day for Remembrance Day)
7. Last Lab: Monday, December 7, 2020 (L-070)
                                                        Tuesday, December 8, 2020 (L-071)
                                                        (Make-up day for Remembrance Day)
8. Final Exam (Comprehensive):   TBD
9. University closures: Thanksgiving   Monday, October 12, 2020
                         Remembrance Day   Wednesday, November 11, 2019

*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 provides an introduction to the theory, practice and methods of data structures and algorithm design. Students will learn elementary data structures such as linked lists, stacks, queues, lists, trees and maps in the Java language, and the algorithms designed for manipulating these data structures.

The objective of this course is to introduce students to both data structures and algorithm design. The goal of the lecture is twofold: 1) to discuss different data structures to represent real world problems and, 2) to study various ways to design algorithms to solve the problems. As an important part of the course, the Java programs that implement all the algorithms discussed will be analyzed and compared to develop deep knowledge on programming.

Remote Learning

All course material including lecture notes, slides, sample code, assignment and lab details will be available on Nexus.

Lectures and labs will be delivered live during the scheduled times via Zoom. No recordings will be posted or permitted.
- Students must display their real/full name
- Use of video is optional
- Participants must be muted when not speaking
- Students may interact via chat, voice or gestures

Students can find answers to frequently asked questions related to remote learning here: https://www.uwinnipeg.ca/covid-19/remote-learning-faq.html.

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.

Evaluation Criteria

1. Labs (5%)
   - 5-8 labs, evenly weighted
   - No late lab submissions accepted

2. Assignments (40%)
   - 4 assignments, worth 10% each
   - Assignments will be accepted up to 1 day late with a 25% penalty

   Course IDE:

Various Java IDEs ae available to install (e.g. NetBeans, IntelliJ, Visual Studio, and Eclipse). Students may choose to work with any IDE that they are comfortable with.

Lab/assignment submissions:
All work is to be submitted electronically. 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.

3. Midterm Exam (15%)
   • During the regular class time (see Important Dates)

4. Final Exam (40%)
   • Cumulative

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.

Test / Exam Requirements

- Photo ID is required for the final exam.
- Midterm and final exams will be delivered via Nexus and proctored via Zoom. Students must have video capability, and video must be turned on for the duration of the exam for proctoring.
- Midterm and final exams are open book.
  - o Students are permitted to view only the following authorized course material:
    - ▪ Class notes, slides, recordings, sample code, assignment descriptions and solutions posted by the instructor
    - ▪ Course textbook
    - ▪ Student's own course notes and assignment submissions
  - o Students may use an external tool such as a text editor or IDE to write answers to questions before entering them into the exam
  - o Students may contact the instructor to ask questions
  - o External resources (or any material not listed above) are NOT PERMITTED
  - o Communication with others (except the instructor) is NOT PERMITTED
  - o All work must be entirely the students' own. Collaboration or sharing of work is NOT PERMITTED.

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 2019-20 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 Textbook / Reading List

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

Prerequisite Information

- A grade of at least C in ACS-1904/3 or ACS-1905/3
- ACS-2947L (lab) must be taken concurrently

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

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.

More information:

- Zoom and Privacy: https://www.uwinnipeg.ca/privacy/zoom-privacy-notice.html
- Testing/Proctoring: https://www.uwinnipeg.ca/privacy/zoom-test-and-exam-proctoring.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.

Topics to be covered (tentative)

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