THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number: ACS-2947-050, 070L
Course Name: Data Structures and Algorithms

1   Instructor Information

Instructor:	Jeanette Bautista	**E-mail:**	je.bautista@uwinnipeg.ca
Office Hours:	Thursdays 17:00 – 18:00	**Office:**	3C07
Class Meeting Time:	Thursdays 18:00 – 21:00	**Room No:**	3D04
Lab Time:	Fridays 13:30 – 14:45	**Room No:**	3D03

2   Important Dates

1. First class: Thursday, January 5, 2017
2. First lab: Friday, January 13, 2017
3. Midterm exam: Thursday, February 16, 2017
4. Reading week: February 19-25, 2017 (no classes)
5. Last class   Thursday, March 30, 2017
6. Final exam: Thursday, April 11, 2017
7. Final withdrawal date (without academic penalty): Wednesday, March 1, 2017
   A minimum of 20% of the work on which the final grade is based will be evaluated and available to the student before this date.

3   Additional Course Related Information

1. When it is necessary to cancel a class due to exceptional circumstances, instructors will make every effort to inform you via uwinnipeg email, as well as the departmental assistant and Chair/Dean so that class cancellation forms can be posted outside classrooms.
2. Your uwinnipeg email address will normally be used for course related correspondence.
3. 3. Please note that withdrawing before the VW date does not result in a fee refund.
4. 4. Class make-up days are scheduled at the end of term for courses that conflict with holidays.

4   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 stacks, queues, linked lists, sequences, trees and graphs in 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.

5 Evaluation Criteria

1. Labs (5%)
   - 10 weekly labs
   - No late lab submissions accepted
2. Assignments (20%)
   - 4 assignments
   - Assignments will be accepted up to 1 day late with a 25% penalty
3. Midterm Exam (25%)
   - The midterm exam will be during the first half of the scheduled class on February 16. Regular class will recommence in the second half.
   - see #4 below
4. Final Exam (50%)
   - Should illness prevent participation in a test or examination, a medical certificate from a certified physician must be supplied before any adjustments are considered.

   Students should contact the instructor as soon as possible if extenuating circumstances require missing a class, assignments, tests or examination.

6 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 – 90 %	B	70 – 74%	D	50 – 59%
A-	80 – 84%	C+	65 – 69%	F	below 50%

7 Exam Requirements

Photo ID is required in final exam.

The use of computers, calculators, phones, or other electronic devices is not permitted on tests or exams. Midterm and final exams are closed book.

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 786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential.
http://www.uwinnipeg.ca/accessibility.

Students facing a charge of academic or non-academic misconduct may choose to contact the University of Winnipeg Students' Association (UWSA) where a student advocate will be available to answer any questions about the process, help with building a case, and ensuring students have access to support. For more information or to schedule an appointment, visit our website at http://www.theuwsa.ca/academic-advocacy/ or call 204-786-9780.

We ask that you please be respectful of the needs of classmates and instructors/professors by avoiding the use of unnecessary scented products while attending lectures. Exposure to scented products can trigger serious health reactions in persons with asthma, allergies, migraines or chemical sensitivities. Please consider using unscented necessary products and avoiding unnecessary products that are scented (e.g. perfume).

8   Required Text Book / 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 at http://www.acs.uwinnipeg.ca/2947-050/

9   Prerequisite Information

- A grade of at least C in ACS-1904/3 or ACS-1905/3
- Co-Requisite: MATH-1401/3

10   Misuse of Computer Facilities, Plagiarism, and Cheating

Academic dishonesty is a very serious offense and will be dealt with in accordance with the University's discipline bylaw. Be sure that you have read and understood Regulations and Policies #8, starting on page 27, in the 2016-2017 UW Undergraduate Academic Calendar or http://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf

11   List of 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
Search trees
Merge-sort
Quick-sort
Selection
Graphs