DOUGLAS COLLEGE

COMMERCE AND BUSINESS ADMINISTRATION
COURSE INFORMATION AND SCHEDULE

CSIS 3475 Data Structures and Algorithms

Instructor:	Michael Hrybyk	Semester:	Fall 2019
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Office:	N6218	Course Times:	Thurs 930am-1220pm
Office Hours:	Wed/Thu 1230-1pm	Class Location:	N5107

COURSE MATERIALS

Required Text:

Data Structures and Abstractions with Java, 5th Edition
Authors: Frank M. Carrano, University of Rhode Island
Timothy M. Henry, New England Institute of Technology
Copyright: 2019
Publisher: Pearson
ISBN: 9780134831691

https://www.pearson.com/us/higher-education/program/Carrano-Data-Structures-and-Abstractions-with-Java-5th-Edition/PGM1912010.html?tab=order

Digital Edition (semester use only):

https://www.pearson.com/us/higher-education/product/Carrano-Data-Structures-and-Abstractions-with-Java-Instant-Access-5th-Edition/9780134872667.html

Resources:
https://media.pearsoncmg.com/bc/abp/cs-resources/products/product.html#product,isbn=0134831691

Video Notes:
https://media.pearsoncmg.com/ph/esm/ecs_carrano_dsabjava_5/cw/

Software:

Eclipse IDE will be used as the Java editor and programming environment for the course. The software can be found at https://www.eclipse.org/downloads. You may install the latest version on your home machine. Please note that the classroom labs may have an earlier version of Eclipse installed but this will not appreciably different from the latest version.

The Java Development Kit (JDK) is also required, which contains the Java compiler and other tools. Java Platform Standard Edition (JavaSE) contains these, and can be downloaded and installed from https://www.oracle.com/technetwork/java/javase/downloads/index.html. Install version 11 (latest) or version 8 (Java SE 8u192). Version 8 is installed in the classroom labs.

There is no cost for any of the software.

Blackboard will be used for all course materials, assignment and final project submission, and exams. Use of online materials via a browser or other files is expressly forbidden during exams, and use of such will be considered cheating.

USB drives (min 2 GB) or use of Microsoft OneDrive are required for all classes and assignments. These will be used to save in-class work and assignments.

Student laptops and desktops running the Windows operating system may also be used in class or for assignments, but must have the latest version of Eclipse and the JDK. Other operating systems must not be used, and are not supported for the purposes of this course. Laptops and USB drives may not be used for exams. Students should therefore have some experience with using the lab computers for class and assignments.

CALENDAR COURSE DESCRIPTION

The purpose of this course is to provide the students with solid foundations in the basic concepts of programming: data structures, data abstraction and algorithms. The main objective of the course is to teach the students how to select, design and implement data structures, abstract data types and algorithms that are appropriate for problems that they might encounter. This course offers the students a mixture of theoretical knowledge and practical experience. It also develops skills of the modular approach to produce maintainable, documented and tested Java applications. Java is the programming language used for implementation.

COURSE CONTENT

- Review of Java including Classes, Interfaces, Inheritance, Exception handling and Text I/O
- Introduction to Data Structures and Algorithms using Java
- Algorithm Analysis
- Recursion and efficiency
- Search and Sorting Algorithms
- Generics, Abstract Data Types and the Java Collection Framework
- Lists and Linked Lists
- Stacks and Queues

- Trees, Binary Trees, Binary Search Trees and AVL trees
- Priority Queues and Heaps
- Hashing and Dictionary
- Graph Algorithms
- Algorithm Design Techniques

LEARNING OUTCOMES

The student will be able to:

- Discuss the fundamentals of algorithmic complexities;
- Carry out an elementary analysis of algorithms;
- Determine the space and time complexity of an algorithm;
- Identify and select the appropriate abstract data types such as queues, stacks for a small but realistic problem;
- Demonstrate more in-depth applications of other data types such as trees and graphs;
- Design and implement different Java programs using appropriate data structures;
- Apply problem solving approaches such as “divide and conquer” in designing algorithms;
- Explain and compare some of the fundamental searching and sorting techniques and algorithms;
- Develop the skills of the modular approach to produce maintainable, documented, and tested software of a realistic size using Java.

EVALUATION

A final course grade will be determined based on the following instruments and their corresponding weighted percentages:

Assignments (4)	20 %
Quizzes (2)	10 %
Midterm examination	35 %
Final examination	35 %

In order to pass the course, students must, in addition to receiving an overall course grade of 50%, also achieve a grade of at least 50% on the combined weighted examination components (including quizzes, tests, exams). Given that Quizzes and Exams comprise 80% of the grade, you must score more than half of this to pass the course (> 40%).

For example, if your Quizzes, MidTerm Exam and Final Exam total to 30%, and you get a perfect mark of 20% for Assignments, your grade will total 50%, **but you will still receive a FAILING MARK of F** for the course.

Assignments are due at the specified date and time and are to be submitted to the instructor directly via Blackboard as directed. An incomplete assignment, including missing files / folders, will end up with zero mark. Late submissions for assignments are not permitted.

Since this is a computer systems course, all students are expected to have attained a minimum level of knowledge in mathematics and logical thinking. This course also requires a fair amount of typing both in class and at home. If a student requires special accommodations as deemed necessary by the college's Student Services, he/she must contact the instructor and the Center for Students with Disabilities in the beginning of the semester so that the proper arrangements can be made with Student Services.

REGULATIONS FOR STUDENTS

Any student who hands in an assignment or project that is similar in style as submitted by another student(s) in the same or previous semesters will be considered as cheating in exam / assignment. College policy on academic dishonesty will be applied against all those students involved, including the one who gives out a copy of an assignment, lab or project to others.

Attendance and Participation: Students are expected to prepare for, attend and actively participate in all class sessions and exercises, to sit the required tests and final examination, and to submit assignments as and when required. A student missing 30% or more of classes will receive an UN as the final grade regardless of his/her performance in the course.

Plagiarism and Cheating: Douglas College in common with other educational institutions condemns cheating or attempted cheating within its community. Reprimands and appeals will be exercised according to official college policy. Regarding the details of the policy on Academic Dishonesty, please refer to the official college calendar.

Student Conduct: College students, employees, and users are entitled to engage in the educational process, or the provision of educational services, free from disruptive or inappropriate behaviors. For details, please refer to the official college calendar.

Missed tests or final examination: Tests and final examination will be offered only during the scheduled date and time of sitting. NO make-up exam or test will be provided in any situation. It is the responsibility of the student to inform the College and the instructor prior to the exam or test. Otherwise, the student will receive a ZERO mark for any missed test(s) and will receive an UN as the final course grade for missing the final examination. Please do not make any travel arrangement until you have found out the exam dates and are sure that you do not have any time conflict with the exams.

Extra Copies of Assignment: Students are required to keep extra copies (i.e. file backups) of their assignments in case of any possible misplacement by the instructor. If such incident does occur, the student will be allowed to submit the extra copy for grading.

Assignment Submission: In general, students will be required to submit their assignments to the instructor via Blackboard on or before a specified date/time. If students are asked to submit their assignments in person, then they must do so before the class starts.

Late / Incomplete assignments: Late / Incomplete assignments will be given a ZERO MARK with the exception of extraordinary circumstances or prior arrangements made with the instructor.

Late Policy: Students are expected to be present for the start of class. Attendance will be taken at the beginning of each class.

Use of Cell Phone: During class/lab time, students are not allowed to use cell phones except in special circumstances. If a student must use a cell phone, he/she is required to leave the lab before communicating with another party.

Internet Access: During class/lab time, students are not allowed to access the Internet unless they are instructed to do so by the course instructor.

See Douglas College Academic Integrity Policy https://www.douglascollege.ca/~/media/27C599ABC76048A0A713648565906273.ashx, which will be followed.

COURSE SCHEDULE (Subject to Change)

CLASS	TOPICS AND ACTIVITIES	READINGS AND ASSIGNMENTS
1 Sep 5	Course Overview and Logistics Review of Course Outline Use of Blackboard Eclipse IDE Review of Java: Basics, Classes and Interfaces Naming Conventions	Supplement 1: Java Basics Appendix A: Documentation Appendix B: Java Classes Appendix C: Creating Classes from Other Classes Prelude: Designing Classes
2 Sep 12	Abstract Data Types (ADTs) Bags Algorithm Efficiency Java Exceptions and Generics	Chapters 1,2,3 Bags Chapter 4 Algorithm Efficiency JI 1 and 2
3 Sep 19	Stacks	Chapters 5,6
4 Sep 26	Queues	Chapters 7,8
5 Oct 3	Lists Java Iterators	Chapters 10,11,12 JI 4 Quiz 1 Assignment 1 Due
6 Oct 10	Lists (continued) Recursion Java Generics	Chapters 9,14 JI 5
7 Oct 17	Sorting and Searching Inheritance and Polymorphism	Chapters 15,16,17,18,19 JI 7 Assignment 2 Due
8 Oct 24	Mid-Term	Covers Classes 1-6
9 Oct 31	Dictionaries More Generics Nov 3 – Last day to drop the course	Chapters 20,21 JI 8
10 Nov 7	Hashing	Chapters 22,23
11 Nov 14	Trees Binary Search Trees	Chapters 24,25,26 Assignment 3 Due Quiz 2
12 Nov 21	Trees (continued) Heaps Balanced Search Trees	Chapter 27,28
13 Nov 28	Graphs	Chapters 29,30 Assignment 4 Due
Dec 4 – Dec 16	Final Exam	

The Final Examination period is Dec 4 – Dec 16. Please check the examination schedule as soon as it becomes available for potential scheduling conflicts.

RULES (applied to CB&A)

1. If you are repeatedly LATE for the class, you will be warned by the instructor and will NOT be allowed to enter the classroom as you will be interrupting the class in progress. In that case, you may only enter the classroom during the natural break. If such a person still enters the classroom after the class has started, he/she will be considered disturbing the class. This individual will be escorted out by the security guard and will be given a warning for misconduct. A subsequent offense will result in possible suspension from the College.

2. Unless otherwise stated, all the assignments MUST be submitted in person at the beginning of the class BEFORE the lecture begins. Any assignment submitted after the lecture has started will be considered LATE and will be given a ZERO mark except for extraordinary circumstances or prior arrangements with the instructor.

3. If you are going to miss a scheduled test or examination, make sure that you inform your instructor (by phone or via e-mail) ON THE SAME DAY; otherwise, you will be given a ZERO mark for that evaluation even though you may have a valid reason. In the case of illness, a doctor's note MUST be shown to your instructor as proof before or during the next class that you attend.

4. If you DO NOT write the midterm or final examination, you will be given a final grade of UN regardless of your achieved percentage up to that point. A UN grade will be assigned a 0.00 GPA.

5. If you DO NOT submit assignments or write quizzes with a combined weight of 30% or more, you will be given a final grade of UN regardless of your achieved percentage up to that point. A UN grade will be assigned a 0.00 GPA.

6. If you are caught cheating, you will receive a ZERO mark for that evaluation and a written warning for the first offense. However, if you are caught for a subsequent offense, you will be expelled from the College.

7. You will receive handouts (if any given out by your instructor) ONLY if you show up in class. If you cannot attend the class, make sure that you inform your instructor so that he can save you a set of the handouts; otherwise, you will NOT receive anything from your instructor. Also, you may NOT take any extra handouts for your friends who do not attend the class.

8. If you talk loudly during the class, you will be given a warning for disturbing your classmates. Any subsequent offense will result in possible suspension from the College.

9. All cellular phones and pagers MUST be turned OFF BEFORE you enter the classroom.

10. Your assignment title page is considered part of the assignment; therefore, it will also be graded. Also, the student will lose marks for EACH spelling mistake made in any assignment.

11. You MUST do all the assignments on your own or with your team in this course. Anyone involved in copying another student's answers on any assignment, project, quiz or exam will be given a ZERO mark for such activity and a warning for academic dishonesty.

12. You are NOT allowed to use any calculators, language translators or dictionaries during any quiz or examination in this course.

GRADING

Douglas College Grading Chart
(Effective March 2009)

Official version is on the college website.

Grade	Numerical Value	Achievement Level	Description
A+	4.33	95% and above	
A	4.00	90% to 94%	Outstanding Achievement
A-	3.67	85% to 89%	
B+	3.33	80% to 84%	
B	3.00	75% to 79%	Good Achievement
B-	2.67	70% to 74%	
C+	2.33	65% to 69%	
C	2.00	60% to 64%	Satisfactory Achievement
C-	1.67	55% to 59%	
P	1.00	50% to 54%	Marginal Achievement
F	0.00	49% and below	Unsatisfactory Achievement
UN	0.00		Student completed less than 70% of the total evaluation of the course, or missed more than 30% of the classes where the instructor's Course Outline specifies that attendance is a course requirement.