CS 60-254
Data Structures and Algorithms

Course Outlines – Fall 2017

Instruction	Dr. Sherif Saad shsaad@uwindsor.ca
Office	Lambton Tower Room 5106, Office Hours Thursday 4:15 – 5:15 PM , Monday 10:30 –11:30 AM or by appointment
Lectures	Tuesday and Thursday (2:30-3:50 PM) - Room Erie Hall 3123
Labs	Monday (11:30 – 12:50 PM) - Room West Library 305 – Sec 51 Monday (2:30 – 3:50 PM) - Erie Hall Room 3119 – Sec 53 Wednesday (11:30 – 12:50 PM) - Room West Library 305 – Sec 52 Wednesday (2:30 – 3:50 PM) - Erie Hall Room 3119 – Sec 54

Commitment: 3 hours lecture, 1.5 laboratory hours a week, 5-7 hours self study per week

Prerequisite: 60-100 and 60-141

Course Web Page: Available at Blackboard website and GitHub

Course Objectives:

1. Teach fundamental data structures models and concepts.
2. Introduce the students to basic algorithm design and analysis techniques
3. Teach techniques to select appropriate data structure and algorithm design method for a specified application
4. Teach different algorithm design paradigms such as divide and conquer, greedy algorithms, dynamic programming.
5. Explain how to apply linear and nonlinear data structures to solve different problems
6. Expose the students to advanced data sorting and searching techniques.

Learning Outcomes: by the end of this course the students will be able to

1. Assess the pros and cons of using a specific data structure to solve a particular problem.
2. Implement basic operations like searching, insertion, deletion, traversing on various data structures.
3. Conduct basic algorithm time and space complexity analysis.
4. Apply different algorithm design paradigms such as (divide and conquer, greedy algorithms, dynamic programming, etc.) to implement effective solutions for complex problems.

SET

Student Evaluation of Teaching forms will be administered in the last two weeks of classes, in accordance with Senate policy.

Textbook

Data Structures and Algorithms in Java (2nd Edition), by Robert Lafore, 2002, ISBN-10: 0672324539 **(optional)**

Evaluation scheme:

5 Lab Assignments	30% (6% each)
Midterm	25% on **October 19, 2017**
Practical Lab Exam	10% on **November 27 and 29, 2017**
Final Exam	35% on **December 14, 2017**

Labs:

♦ Attending all labs is required
♦ Lab assignments must be submitted and marked during the labs. No assignments will be accepted by email or other means.
♦ Labs will run on Mon and Wed every week, and will start on Sep 18, and will finish on Nov 29.
♦ There will be 11 lab sessions. In each odd-numbered lab session (1, 3, 5, 7 and 9), the lab assignment will be explained, and students will start working on it.
♦ Lab assignments will be submitted in even-numbered lab sessions (2, 4, 6, 8 and 10).
♦ The 11th lab session will be a one hour practical lab exam that is worth 10% of the course grade.
♦ Each lab assignment is worth 6% of the course grade. If you finish earlier, namely in the corresponding odd-numbered session, you can submit the lab at that time and do not have to come to the next session (the corresponding even-numbered lab).

Grades A numeric (integer-valued) final grade out of 100 will be assigned to each student based on the evaluation scheme given above. Non-integer values will be rounded to the nearest integer. A final grade below 50 will be considered as a failure. More information is available at:
http://www.uwindsor.ca/secretariat/sites/uwindsor.ca.secretariat/files/grading_and_averages.pdf

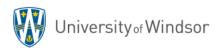Note: Grade curving may be applied.

Tentative Class Schedule

Week			
Week-01	September 5, 2017	September 7, 2017	Course Overview
	Introduction To DS and Algorithms		
Week-02	September 12, 2017	September 14, 2017	Linear Data Structure
	Arrays and Linked Lists		
Week-03	September 19, 2017	September 21, 2017	
	Stacks		
Week-04	September 26, 2017	September 28, 2017	
	Queues		
Week-05	October 3, 2017	October 5, 2017	Non-linear Data Structure
	Trees		
Week-06	October 10, 2017	October 12, 2017	
	Trees & Graph		
Week-07	October 17, 2017	October 19, 2017	
	Graph	Midterm Exam	
Week-08	October 24, 2017	October 26, 2017	Applying Data Structures
	Searching and Sorting		
Week-09	October 31, 2017	November 2, 2017	Algorithm Design Paradigms
	Algorithm Desing Techniques		
Week-10	November 7, 2017	November 9, 2017	
	Divide and Conquer		
Week-11	November 14, 2017	November 16, 2017	
	Greedy Algorithm	Back Tracking	
Week-12	November 21, 2017	November 23, 2017	
	Dynamic Programming		
Week-13	November 28, 2017	November 30, 2017	Algorithm Analysis
	Complexity Classes		
Week-14	December 5, 2017	December 7, 2017	Course Conclusion
	Review		

Course Regulations

1. No student is allowed to take a course more than twice without permission from the Associate Dean.
2. Midterm tests, which are missed for any reason whatsoever, cannot be made up.
3. In the exceptional case that a student misses a midterm test for a valid reason, i.e. supported by appropriate documentation (see below), the mark for that test will be carried over to the final. In case of a Doctor's note, the student must submit a Student Medical Certificate signed by a Medical Doctor and the note must specifically state that the student was incapable of writing the exam on the day of the test.

4. If the final exam is missed (for a valid reason), a makeup exam will be arranged. The makeup will be scheduled either at the end of the winter term or along with the final exam of the subsequent offering of the course (i.e., intersession term).
5. If a student is sick, s/he must inform the instructor about his/her illness within 7 days, and with a supporting doctor's note which clearly states s/he is not able to attend the exam/test/assignment.
6. If a student has a medical condition, which may cause problems during the term, s/he must inform the instructor in writing with supporting documents before the last day of classes. No consideration will be made afterwards, except for the final exam.
7. No extensions to the labs will be allowed, and no make-ups will be considered. If a student misses a lab assignment, the corresponding mark will be carried over to the next lab(s) or final exam accordingly.
8. If a student is caught adopting unfair means (e.g. plagiarism), that student will face serious consequences including official disciplinary procedures (see policies below).

Policy on Misconduct

The instructor will put a great deal of effort into helping students to understand and learn the material in the course. However, the instructor will not tolerate any form of cheating. The instructor will report any suspicion of cheating to the Director of the School of Computer Science. If sufficient evidence is available, the Director will begin a formal process according to the University Senate Bylaws. The instructor will not negotiate with students who are accused of cheating but will pass all information to the Director of the School of Computer Science. The following behaviour will be regarded as cheating (this list is not exhaustive – more examples in Appendix A, Senate Bylaws 31:

1. Copying assignments or labs or presenting someone else's work as your own
2. Allowing another student to copy an assignment/project from you and present it as their own work
3. Copying from another student during a test or exam
4. Referring to notes, textbooks, etc., during a test or exam (unless otherwise stated)
5. Talking during a test or exam
6. Not sitting at the pre-assigned seat during a test or exam
7. Communicating with another student in any way during a test or exam
8. Having access to the exam/test paper prior to the exam/test
9. Explicitly asking a proctor for the answer to a question during an exam/test
10. Modifying answers after they have been marked
11. Any other behaviour which attempts unfairly to give you some advantage over other students during the grade-assessment process
12. Refusing to obey the instructions of the officer in charge of an examination

Several University of Windsor students have been caught cheating during the last few years. In most cases the evidence was sufficient to invoke a disciplinary process which resulted in various forms of punishment including letters of censure, loss of marks, failing grades, and expulsions. As an example, a student who copied a project from another student and presented it as his own was expelled from the university. Another student who was caught copying in a midterm was suspended for one year. Do not cheat, if you are caught and found guilty, you could be expelled from the university and will have to explain why when you search for a job.

Exam Content Confidentiality

Examinations, quizzes, assignments and projects given in this course are protected by copyright. Reproduction or dissemination of examinations or the contents or format of examinations/quizzes in any manner whatsoever (e.g., sharing content with other students), without the express permission of the instructor, is strictly prohibited. Students who violate this rule or engage in any other form of academic dishonesty will be subject to disciplinary action under Senate Bylaw 31: Student Affairs and Integrity