Seneca | SCHOOL OF SOFTWARE DESIGN & DATA SCIENCE

Course Addendum

Semester**: Summer 2023** Subject Code: DSA456 Section**: ZCC/ZDD**
Subject Title: Data Structures and Algorithms

Professor: Dr. Razi Iqbal Office**: Online**
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Office Hours**: On-Demand**

Approved by: _____

Kathy Dumanski, Chair, School of Software Design and Data Science

Please read this addendum to the general course outline carefully. It is your guide to the course requirements and activities.

Please refer to the course outline for learning outcomes, course description and text and materials.

Please also visit sdds.senecacollege.ca for key information on courses, graduation requirements, transfer credit, and more from the School of Software Design and Data Science.

Please note that during the Fall semester for your hybrid course, the lecture meeting is online and the lab meeting is in-person.

Assessment Summary

- Assignment (3 assignments): 30%
- Labs: 10% (Top 6 of 7 X ~1.667% each)
- Test 1: 30%
- Final Assessment: 30%

Course Policies

In order to pass dsa456 you must:

- Satisfactorily complete all assignments**. Each assignment will have a clearly stated list of things tasks required in order for the assignment to be considered complete. You must fully meet these requirements for the assignment to be considered complete**
- Achieve a grade of 50% or better on the weighted average of the tests and final assessment.
- Grading Policy: http://www.senecacollege.ca/about/policies/grading-policy.html)

Academic Policies:

http://www.senecacollege.ca/about/policies/academics-and-student-services.html

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TENTATIVE WEEKLY SCHEDULE
Summer 2023

Week	Topic or Skill	Assessment Out	Assessment Due and Weight
Week 1 **May 8 to 12**	Introduction, Intro to Python	Lab 0	Lab 0 - 0%
Week 2 **May 15 to 19**	Analysis of Algorithms, and Asymptotic Notation	Lab 1	Lab 1 ~ 1.67%
Week 3 **May 22 to 26**	Recursion, Searching, and Sorting	Lab 2	Lab 2 ~ 1.67%
Week 4 **May 29 to Jun 2**	Searching and Sorting, and Lists	Lab 3	Lab 3 ~ 1.67%
Week 5 **Jun 5 to 9**	Lists, Stacks, and Queues	Lab 4	Lab 4 ~ 1.67%
Week 6 **Jun 12 to 16**	Tables	A1	A1 – 10%
Week 7 **Jun 19 to 23**	Cleanup, Review, and Test 1	Test 1	Test 1 - 30%
Study Week			
Week 8 **Jul 4 to 7**	Graphs		
Week 9 **Jul 10 to 14**	Graphs, and Trees	A2	A2 – 12%
Week 10 **Jul 17 to 21**	Heaps, and Heapsort	Lab 5	Lab 5 ~ 1.67%
Week 11 **Jul 24 to 28**	Binary search trees	Lab 6	Lab 6 ~ 1.67%
Week 12 **Jul 31 to Aug 4**	Augmented data structures	A3	A3 - 8%
Week 13 **Aug 7 to Aug 11**	Augmented data structures, and Complexity theory	Lab 7	Lab 7 ~ 1.67%
Week 14 **Aug 14 to 20**	Final Test		Final Test - 30%

Subject Notes:

https://seneca-ictoer.github.io/data-structures-and-algorithms/

Textbook (Optional - for Reference):

There are lots of data structures and algorithms texts around. These are two we are recommending

Data Structures & Algorithms Analysis in C++, 4th edition, Mark Allen Weiss, ISBN 013284737X Great book but it can be a bit hard to read because there are some implementational details that are implied, and it is structured more towards analysis. Not the easiest read but a great reference. Unfortunately, this book does not have an electronic version available through the library. There is a copy in the library but it's a hard copy.

Introduction to Algorithms, Third Edition, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, Ebook ISBN: 9780262270830 This book does not have language-specific implementations but is very good for the theoretical components. It is also available electronically. https://senecacollege-primo.hosted.exlibrisgroup.com/permalink/f/1e177uh/01SENC_ALMA5143611310003226

Labs

Labs are short programming, analysis, or long answer problems. Labs are meant to reinforce ideas and concepts covered. They typically should not require more than **two to four hours of work each**. Missed labs get a grade of 0. **Everyone will be allowed to miss one lab without penalty**. In other words, if there are 7 labs, only the top 6 grades will count toward your final mark. The lowest lab grade is always dropped. You do not need to ask permission or let us know. It will be automatic.

Labs have a grade of 0, 0.5, and 1. If they are correctly completed and submitted before the due date, the grade is 1. If there are significant errors and or missing components but the bulk of it is done, you may get a mark of 0.5. Note that for any coding lab, **a test verification is a MINIMUM requirement for any consideration of partial marks** If they are not submitted by the due date, the grade for the lab will be 0.

For analysis questions, most of your answers must be correct. The key is that you have tried to do it. Even if it is not correct, we are willing to help guide you through it. However, if you don't show your work, and there are simply random formulas that do not show your process, then you will get zero.

Assignments

Assignments are more complex assessments that are meant to develop deeper, professional skills. They are graded on the quality of the work (ie completion is a minimum requirement only, see assignment grading section). The quality of a piece of work includes many different aspects but can include:

- Documentation
- Consistent coding style and practices
- Correct Memory Usage
- Correctness of Code for edge cases
- Efficiency
- Correct mathematical and analytical statements for analysis
- Thorough, complete, and correct answers to the reflection question

Assignment Completion

Your assignment is only considered complete if every task listed under assignment completion for that assignment is done in a manner that does not violate the spirit of the assignment. Completion and grading are separate matters. You must complete every assignment; you do not have to pass every assignment. However, failure **to complete even 1 assignment will result in a failing grade for the course.**

Note that meeting the minimum completion standard does not mean that you will get full marks. It only means that the assignment will be considered completed. **It is entirely possible to still get 0 for a completed assignment.**

Completion of ALL assignments is a requirement for passing dsa456

Assignment Grading

In earlier programming courses, the focus was on solving a problem and writing code that was well-structured and well-documented. Those requirements are still in place for dsa456. However, dsa456 is about the analysis of source code. As such, simply making the code "work" and having well-structured, documented code will not be good enough for full marks on an assignment. Your code must not only work to spec but have an efficient implementation. This will apply to all codes for this course. If your solution is not algorithmically efficient, marks will be deducted. You may even need to resubmit your program if it is very far off from the correct solution. The implementation of data structures will be discussed in class so this will not be a mystery as to figuring out the efficiency of your code. The key is to think through the implications of how you write your program beyond simply getting it to work

Assignment/Lab Submission

Your assignments and labs will be submitted through a private GitHub repository. There will be one repository created for all labs (ie you use the same repo for submitting every lab). There will also be separate repositories for each of the assignments. Follow the instructions in lab 0 to create your repository for the labs (please just create 1). The same process will be used for creating repositories for your assignments, but the links to do the creation will be different. You will receive each of these with each assignment.

Missed Test Policy

If you miss a test, your mark for that test is automatically 0. However, if there was a well-documented reason for your missing the test, we may allow (at my discretion) you to use the final test grade as a substitute for the missed test.

Note: You must write and achieve a grade of 50% or better on the weighted average of the tests and final assessment to pass the course.

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