CS 2121B/9643B DH 2221B – Data Structures and Algorithms

Course Description

The purpose of this course is to provide students with foundations in the basic concepts of data structures and algorithms. The main objective of the course is to teach the students how to select and design data structures and algorithms that are appropriate for problems that they might encounter. Students will be exposed to a variety of data structures, their advantages and disadvantages, and will learn when different data structures are useful. This course is also about ensuring that students understand basic algorithms for manipulating these data structures and using them in varying informatics and analytics domains.

Topics covered include:
- Objects
- Stacks
- Queues
- Recursion
- Algorithm analysis
- Trees
- Graphs
- Dictionaries and Hash tables
- Searching and Sorting

Prerequisites

CS 2120/9642 or DH 2220

Antirequisites

CS 2210, CS 2121. Software Engineering 2205A/B

Course Website

All relevant course content will be found on OWL.

Instructor

James Hughes
MC 27E
jhughe54@uwo.ca

Teaching Assistant(s)
TBD
TBD

Programing Tools
Download and install the (free) *Anaconda* **Python 3** distribution:
https://www.anaconda.com/download/

Textbook
How to think like a computer scientist (it's free):
http://openbookproject.net/thinkcs/python/english3e/

Class Time and Location
Tuesday	11:30am-1:30pm	UCC 41
Wednesday	03:30pm-4:30pm	UCC 41

Non-mandatory Labs
Wednesday	04:30pm-05:30pm	SSC 1032
Wednesday	05:30pm-06:30pm	SSC 1032

Student Evaluations (Tentative Dates)
Assignment 1	10%	Late-ish January
Assignment 2	15%	Middle-ish February
Assignment 3	15%	Middle-ish March
Assignment 4	20%	Early-ish April
Project 1	15%	Early-ish March
Project 2	25%	Late-ish March/Early-ish April

Assignments
- Assignments will contain conceptual programming parts.
- The solutions for the exercises **must** be typed.
- All assignments will be made available on OWL. The availability of assignments will be announced on class and/or via e-mail. Students are responsible for checking their e-mail on a regular basis.
- To be eligible for full marks, your programming assignments must run on the departmental computing equipment. You may develop assignments on your home computer using an alternative version of the software, but you must allow for time it will take to get the final product working on Computer Science's machines.
- Instructions for the submission of assignments will be posted on the course website. It is each student's responsibility to read and follow the instructions. Failure to follow the submission instructions may result in the assignment receiving a mark of zero.

- You will be required to submit each programming assignment electronically. Details will be given in the assignment descriptions. We reserve the right to use similarity detection software to detect possible cheating cases.
- **No submissions will be taken after the due date; there are no late submissions.** All submissions after the exact due date will result in a mark of zero and will not be evaluated.
- Assignments are marked by the Teaching Assistants, who follow marking schemes provided by instructors.
- A request for adjustment in an assignment mark must be made within 2 weeks of the date on which it was first available after marking. (Beyond that date, regrading will not be considered, regardless of whether you retrieved your assignment.) Such a request must be submitted to the course instructor in writing, and must include specific reasons why you believe you deserve more marks. The request must be accompanied by all materials that were originally handed in, as well as the original marker's grade summary sheet. The instructor will inform you by email when the reevaluation process is complete.
- It is each student's responsibility to keep up-to-date backups of assignment disk files in case of system crashes or inadvertently erased files. Students must keep disk copies of all material submitted, as well as the actual graded assignment, to guard against the possibility of errors in recording marks. It is not safe to discard these materials until you are satisfied that your final mark for the course has been computed properly.

Handling of Medical and Non-Medical accommodation

If a student has received an academic accommodation, missed course components will have updated due dates. The policy on Accommodations for illness can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

Checking Prerequisites

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Statement on Academic Offenses

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Use of Plagiarism-Checking Software

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system.

Use of Cheating-Analysis Software

All submitted work may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating (MOSS).

Registrar

A link to the website for Registrarial Services: http://www.registrar.uwo.ca/

Statement on Services for Students in Emotional/Mental Health Distress

Students who are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

The policy on Accommodation for Students with Disabilities can be found here: www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

The policy on Accommodation for Religious Holidays can be found here: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Learning-skills counsellors at the Student Development Centre (http://www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Additional student-run support services are offered by the USC, http://westernusc.ca/services.