CS 2121B/9643B, DH 2221B:
Data Structures and Algorithms
2018−19 Course Outline

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 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.

Lecture and Instructor Information

Section	Time	Room	Instructor	Office	Office Hour	Email
001	Tu: 11:30−1:30 pm W: 3:30-4:30 pm	UCC 41	Dr. Robert Moir	MC 385	TBA	rmoir3@uwo.ca

If you are contacting your instructor, please use your Western email address.

Non-mandatory Labs

Section	Time	Room	Leader
002	W: 4:30-5:30 pm	SH 1310	Unsupervised
003	W: 5:30-6:30 pm	SH 1310	Unsupervised

Prerequisite Requirements

CS 2120/9642, DH 2220 or Integrated Science 1001X with at least 60%.

Beware of the following Dean's rule: Unless you have either the prerequisites for this course or written special permission from your Dean to enroll in it, you will 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.

Antirequisites

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

Course Materials

- How to Think Like a Computer Scientist (it's free):
  http://openbookproject.net/thinkcs/python/english3e/
- Data Structures and Algorithms Using Python (also free):
  http://home.ustc.edu.cn/~huang83/ds/Data Structures and Algorithms Using Python.pdf

Tools

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

Lecture Topics

- Objects
- Stacks
- Queues
- Recursion
- Algorithm analysis
- Trees
- Graphs
- Dictionaries and Hash tables
- Searching and Sorting

Evaluation (approximate due dates)

The overall course grade, out of 100, will be calculated as listed below.

Component	Notes	Value
5 Min Quizzes	Worth 1.25% each (in Tuesday class, announced previous Friday)	5%
Assignment 1	Due late January	8%
Assignment 2	Due mid-February	12%
Assignment 3	Due mid-March	15%
Assignment 4	Due early April	20%
Project 1	Due early March	15%
Project 2	Due late March or early April	25%

Notes:

- The four quizzes (5-10 minute duration) are single questions that test conceptual understanding, and will be scattered throughout the term.

Teaching Assistant

- Denis Derdach (dderkac@uwo.ca)   Office Hour: TBA

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 in class and/or via email.
- Students are responsible for checking their email 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.
- Assignments are marked by the Teaching Assistants, who follow marking schemes provided by instructors.
- 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.

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

Appeal of Assignment Marks

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 re-evaluation process is complete.

Late Assignment Policy

No submissions will be taken after the due date; there are no late submissions.

All submissions after the due date will result in a mark of zero and will not be evaluated.

If you have serious medical or compassionate grounds for an extension, you should take supporting documentation to the Academic Counseling office of your faculty, who will contact the instructor. Workload, exams, minor illnesses, and home computer problems are not valid reasons for being unable to complete an assignment within the allotted time (unless your academic councilor thinks otherwise).

Computing Facilities

Each student will be given an account on the Computer Science Department senior undergraduate computing facility, GAUL. In accepting the GAUL account, a student agrees to abide by the department's Rules of Ethical Conduct.

Accessibility

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

For more details see the policy on Accommodation for Students with Disabilities www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf.

Email Policy

In accordance with policy, http://www.uwo.ca/its/identity/activatenonstudent.html, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Tutoring

The role of tutoring is to help students understand course material. Tutors should not write part or all of an assignment. Having employed the same tutor as another student is not a legitimate defense against an accusation of collusion, should two or more students hand in assignments considered similar beyond the possibility of coincidence.

Ethical Conduct

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

Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offense. All assignments are individual assignments. You may discuss approaches to problems among yourselves; however, the actual details of the work (assignment coding, answers to concept questions, etc.) must be an individual effort. Assignments that are judged to be the result of academic dishonesty will, for the student's first offense, be given a mark of zero with an additional penalty equal to the weight of the assignment also being applied. You are responsible for reading and respecting the Department of Computer Science policy on Scholastic Offenses and Rules of Ethical Conduct. The University of Western Ontario may use software for plagiarism checking. Students may be required to submit their written work and programs in electronic form for plagiarism checking.

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).

Missed Course Components

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible.

If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in WSC 140, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is: https://www.uwo.ca/univsec/pdf/academic_policies/general/academic_counselling.pdf.

A student requiring academic accommodation due to illness must use the Student Medical Certificate (http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf) when visiting an off-campus medical facility.

For further information, please consult the university's medical illness policy at www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf.

Mental Health

Students who are in emotional/mental distress should refer to the Mental Wellbeing website: https://www.uwo.ca/health/mental_wellbeing/index.html and Healh website: https://www.uwo.ca/health/ for a complete list of options about how to obtain help.

Academic Accommodation for Medical Illness

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to your Academic Counseling office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed.

For further information please see: www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf.

Support Services

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.

Students who are in emotional/mental distress should refer to the Mental Wellbeing website: https://www.uwo.ca/health/mental_wellbeing/index.html and Healh website: https://www.uwo.ca/health/ for a complete list of options about how to obtain help.

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

The website for Registrarial Services is http://www.registrar.uwo.ca.