

Western University
Department of Computer Science
COMPSCI 2210B – Data Structures and Algorithms
Course Outline – Winter 2019

Lectures: January 7, 2019 to April 9, 2019, Mondays 3:30PM - 5:20PM, Wednesdays 4:30PM - 5:20PM, NSC 7.

Prerequisites

- Course Requirements: one of either
 - Integrated Science 1001X with a grade of at least 60%;
 - Computer Science 1027A/B, Computer Science 2101A/B, Computer Science 1037A/B, or Digital humanities 2221 A/B with a grade of at least 65%, **and** one full-course from the following, with at least 60% in each: Applied Mathematics 1201, Applied Mathematics 1413, Calculus 1000A/B, Calculus 1301A/B, Calculus 1500A/B, Calculus 1501A/B, Mathematics 1600A/B.
- **Knowledge of Java.** If you do not know Java, you must be aware that you will need to spend extra time learning this language as all programming assignments are in Java.

Students who have been admitted to this course without the normal prerequisite of Computer Science 1027 or 1037 may not have been exposed to the background material expected for this course; it is the responsibility of these students to gain familiarity with this material on their own.

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.

Instructor Information

Mr. Daniel Page

Office: MC22

Email: dpage6@uwo.ca

Office Hours: 1:30PM - 3:00PM Mondays, 2:30PM - 4:00PM Wednesdays.

Instructor E-mail Policy: Students must use their Western (@uwo.ca) e-mail addresses when contacting the instructor. It is recommended to write/add COMPSCI 2210, CS2210, or something similar within the subject line (, e.g. “[CS2210] Assignment X Question”, “2210 Question”). Before sending an e-mail to an instructor, students should check the course website to see if the requested information is already there.

Student Responsibilities: Do not skip lectures, and be on time for class. I will post news items, assignments, supplementary materials, and any important announcement on the course website. The materials posted on the course website are not a substitute for complete lecture notes nor the contents of the lectures.

Course Description

The purpose of this course is to provide the students with solid foundations in the basic concepts of programming: 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. This course is also about showing the correctness of algorithms and studying their computational complexities. This course offers the students a mixture of theoretical knowledge and practical experience.

The study of data structures and algorithms is carried out within an object-oriented framework. When implementations are considered, the Java programming language is used. Topics covered in this course include:

- analysis of algorithms;
- dictionaries, hash tables;
- trees, binary search trees, AVL trees, multi-way search trees, (2,4)-trees, B-trees;
- graphs, graph traversals, graph algorithms;
- sorting.

Optional Textbook

Data Structures and Algorithms in Java, sixth edition. Michael T. Goodrich, Roberto Tamassia, and Michael Goldwasser. John Wiley & Sons Inc., 2014.

Course Website

The COMPSCI 2210B website is accessible through OWL: <https://owl.uwo.ca/portal>. Announcements, assignments, supplementary materials, marks, and other course-related information will be posted on this website. It is the responsibility of the student to check this website often.

TA Consulting Hours (To be posted on course's website, to be announced)

E-mail Contact and OWL

We may need to send e-mail messages to the whole class or to students individually. E-mail will be sent to the UWO e-mail address assigned to students by Information Technology Services (ITS) (username@uwo.ca). It is the responsibility of the student to read this e-mail and check the course website on OWL on a regular basis.

Student Evaluation

The course marks will be distributed as follows.

- 4 Assignments (40%), more information is given on the next page:
 - 2 Concept Assignments (each worth 8%)
 - 2 Programming Assignments (each worth 12%)
- 2 Term Tests [in class February 13, ~~March 20~~ **March 18**]: 20% (each worth 10%)
- Final Exam [date will be scheduled by the Registrar]: 40%

This course is an important prerequisite for COMPSCI 2212A/B and most third-year Computer Science courses. The following rules are designed to ensure that students

progressing in honours programs, and those planning to take further CS courses, meet certain minimum standards:

- To be eligible to pass this course, a student must receive a weighted average of at least 45% on taken term tests and final exams, and a weighted average of at least 45% on the assignments.
- To be eligible to receive an overall grade of 60% or higher in the course, a student must receive a weighted average of at least 55% on marks dedicated to the term tests and the final exam, and a weighted average of at least 55% on the assignments. Otherwise, the maximum overall mark you can receive is 58%.

If for any reason the assignment schedule given below cannot be adhered to, the assignment marks will be prorated. The assignments are worth 40% of the overall mark for this course. If an assignment must be cancelled for any reason, the remaining assignment weights will be prorated to add up to 40%. If for any reason one or more of the term tests are cancelled, the final exam will be worth its previous total (40%) plus what each term test is worth (i.e., if one term test is cancelled the final exam will be worth 50%, and if both term tests are cancelled the final exam will be worth 60%).

Schedule (Tentative)

All the assignments are due by 11:55PM on the date indicated.

- Assignment 1 (concept) due on January 30, 2019.
- Assignment 2 (programming) due on February 24, 2019.
- Assignment 3 (concept) due on March 13, 2019.
- Assignment 4 (programming) due on March 31, 2019.

The two term tests will be completed during the two lectures at the dates stated above, each will be allotted 50 minutes to be completed (Note: the 2nd of these two term tests will take place within the first hour of the two-hour lecture time slot). The final exam will be a 3-hour examination and will be scheduled by the Registrar. More information is provided under the Exams section on the next page.

Assignments

There are two types of assignments, concept and programming assignments.

- Two **concept** assignments will be assigned in this course. Each assignment consists of a set of exercises related to the material covered in class. All solutions prepared should be neatly written or typed.
- The **programming** assignments require you to write Java programs related to the data structures and algorithms discussed during lecture.
 - 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 alternate version of Java, but you must allow for the amount of time it will take to get the final programs working on Computer Science's machines.
 - All programming assignment must be electronically submitted via OWL, to be described in class and on the course website.

All assignments will be made available on the course website. The availability of assignments will be announced in class and/or via e-mail. Students are responsible for checking their e-mail and the course website on a regular basis.

Assignment due dates: The date and exact time assignments are due will be given in the assignment specifications. **Late assignments will not be accepted, and zero marks will be given for late assignments.** No extensions will be given for assignments; however, if a student has serious medical or compassionate grounds, they should take supporting documentation to the Office of the Dean of their faculty and the instructor will be contacted.

Assignment marking:

- Assignments are marked by the teaching assistants, who follow marking schemes provided by the instructor.
- A request for the adjustment of an assignment mark or a term test must be made **within 1 week** of the date on which it was first available after marking; beyond that date, regrading will not be considered. Student must request regrading for assignments from the TA first and should only contact the instructor about regrading in case of either a refusal by the TA to regrade or a regrading appeal.
- **It is each student's responsibility to back up their work. Losing an assignment for any reason is not grounds for accommodation.**

Exams

- There are two term tests and a final exam. All examinations are closed book. No electronic devices will be permitted on term tests and the final exam.
- Students must bring their UWO identification to all examinations.
- **There will be no makeup term tests**, except for students requesting a special term test for University recognized reasons. These students must have notified the course instructor and filed documentation with their Dean's Office at least 2 weeks prior to a term test. **If there are other serious medical or compassionate grounds for missing a term test, please take supporting documentation to the office of the Dean of your faculty, who will contact the instructor.** In such cases, then the weight of the mark associated with the missed term test is given to the final exam (resulting in a final exam worth 50%). Furthermore, in such cases if applicable to both term tests, then the weight of the term tests together (20%) will be shifted to the final exam, which would then be worth 60% of your final grade. **Do not request accommodation from the instructor directly. All accommodation requests must be made via your faculty's Dean's Office.**
- Students are advised to not make travel plans until they have consulted the final exam schedule.

Accommodation and Accessibility

Note that if documentation (medical or otherwise) is required, it can only be collected by the student's Dean's Office/Academic Counselling unit.

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 NCB 280, and can be contacted at scibmsac@uwo.ca.

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

If a student receives academic accommodation, depending on the circumstances the instructor will determine whether the missed components will be excused (so that the completed components will be re-weighted) or if deadlines will be extended for submitting the missing academic work. Accommodation for any work missed should be requested to the student's Dean's Office/Academic Counselling unit.

If you miss the final exam, please contact your faculty's Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam). You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

Ethical Conduct

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:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Students must write their 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 properly referencing such as footnotes or citations. Plagiarism is a major academic offence.

All assignments are individual assignments. You may discuss approaches to problems among yourselves; however, the actual details of the work (answers to concept questions, assignment coding, etc.) must be an individual effort. Assignments that are judged to be the result of academic dishonesty will, for the student's first offence, 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 Computer Science Department's policy on Scholastic Offences

http://www.csd.uwo.ca/current_students/undergraduate_students/scholastic_offences.html and Rules of Ethical Conduct

http://www.csd.uwo.ca/current_students/undergraduate_students/rules_of_ethical_conduct.html

We will use plagiarism-checking software called MOSS to compare student program submissions on programming assignments.

No electronic devices will be permitted on term tests and the final exam.

Computing Facilities

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

<http://www.csd.uwo.ca/UnderGrad/ethical.shtml>.

Note: after-hours access to Computer Science lab rooms is by student card. If a student card is lost, you will need to visit the Student Services Building to obtain a replacement. More information is available at http://www.registrar.uwo.ca/general-information/western_onecard.html.

Students enrolled in Computer Science courses will be granted access to the labs within seven days of enrolment. If you do not have access to the labs after seven days, please open a ticket with Science Technology Services at <https://helpdesk.sci.uwo.ca>.

Support Services

Please contact the course instructor if you require 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.

The policy on Accommodation for Students with Disabilities can be found here: http://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.