CS2210B - Data Structures and Algorithms
Course Outline – Winter 2026

1. Course Information

Course Information

CS2210 B - Data Structures and Algorithms
Winter 2026

Section 1

Instructor:	Marios-Stavros Grigoriou
Office:	MC 215
Email:	mgrigori@uwo.ca
Lectures:	Monday 3:30 – 5:30, lecture hall [redacted]
	Wednesday 3.30 – 4:30, lecture hall [redacted]

List of Prerequisites

A list of the prerequisites for the course.
1. Prerequisite(s): Computer Science 1027A/B, Computer Science 1037A/B, the former Computer Science 2101A/B, Computer Science 2121A/B or Digital Humanities 2221A/B in each case with at least 65%; and 1.0 course with at least 60% in each from: Applied Mathematics 1201A/B, Numerical and Mathematical Methods 1411A/B, Numerical and Mathematical Methods 1412A/B, Numerical and Mathematical Methods 1414A/B, Calculus 1000A/B, Calculus 1301A/B, Calculus 1500A/B, Calculus 1501A/B, Mathematics 1600A/B, the former Applied Mathematics 1411A/B, the former Applied Mathematics 1412A/B, the former Applied Mathematics 1414A/B, the former Applied Mathematics 1413.

2. 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 prerequisites for this course or written special permission from the Department of Computer Science to enroll in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.

2. Instructor Information

Instructors	Email	Office	Office Hours
Marios-Stavros Grigoriou (Course Coordinator)	mgrigori@uwo.ca	[redacted]	TBD

TA Consulting Hours (To be posted on Brightspace)

Students must use their Western (@uwo.ca) email addresses when contacting their instructors. The first string on the subject line of all emails towards instructors or TAs must be the course number in brackets – "[**CS2210B**]" emails with a subject not starting with this string may or may not be answered as they will fall through the filtering process.

3. Course Syllabus, Schedule, Delivery Mode

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 the 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:

- Design and analysis of algorithms
- Time complexity and asymptotic notation
- Dictionaries and hash tables
- Trees, binary search trees, AVL trees, multi-way search trees, (2,4)-trees, and B-trees
- Graphs, graph traversals, and graph algorithms
- Sorting algorithms.

Course Learning Outcomes
- Compute the time and space complexity of an algorithm to predict the amount of time and memory that it will need when executed on a computer.
- Compare different data structures and algorithms to select the most appropriate one for a particular application.
- Design algorithms that correctly solve a problem
- Use hash tables, trees, and graphs to model and solve computational problems.
- Implement algorithms and data structures as Java programs.

Tentative lecture schedule

Week	Topic
Week1 (Jan 5 to 9)	Introduction
Week 2 (Jan 12 to 16)	Linear search and Binary search algorithms.
Week 3 (Jan 19 to 23)	Algorithm Design & Analysis, including the notion of complexity function and the asymptotic notation
Week 4 (Jan 26 to 30)	Recursive algorithms and how to compute their time complexity
Week 5 (Feb 2 to 6)	Dictionary ADT and Hash tables
Week 6 (Feb 9 to 13)	Trees and simple tree algorithms
Fall Reading week (Feb 14 to 22)	-------
Week 7 (Feb 23 to 27)	Ordered dictionary ADT and Binary Search Trees
Week 8 (Mar 2 to 6)	Binary Search Trees continued and AVL Trees
Week 9 (Mar 9 to 14)	Multiway Trees
Week 10 (Mar 16 to 20)	Multiway Trees continued
Week 11 (Mar 23 to 27)	Introduction to graphs
Week 12 (Mar 29 to Apr 3)	Graph traversal algorithms
Week 13 (Apr 6 to 9)	Advanced graph algorithms

4. Course Materials

OWL
All course material will be posted to OWL: https://westernu.brightspace.com).

Students are responsible for checking the course OWL site on a regular basis for course material, assignments, news and updates. This is the primary method by which information will be disseminated to all students outside the classroom.

If students need assistance, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

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

Textbook is **not** required, but students are encouraged to try to get a copy as it provides complementary material to those presented in class.

Lecture Notes
Lecture notes will be available in Brightspace.

Technical Requirements to take this course

- A computer or tablet able to run a recent version of a web browser, Java, and a Java Integrated Development Environment,
- A webcam and microphone in case the course delivery needs to be moved online, and
- Reliable high-speed internet connection

In addition to the technology requirements associated with this course, you should also possess a set of computer skills that include installing software, security, and virus protection on your computer, managing files/folders on your computer, using the internet, using a web browser, write, compile, debug, and execute programs in Java.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:

Concept Assignments (2)	6% (3% each)
Programming Assignments (3)	36% (12% each)
Midterm Test (1)	24%
Final Exam (1)	34%

This course is an important prerequisite for CS 2212a/b and most third year Computer Science courses. The following rules are designed to ensure that students progressing in honors programs, and those planning to take further CS courses, meet certain minimum standards:

- To be eligible to receive an overall passing grade of 50%, a student must receive a weighted average of at least 45% on the midterm and final exams, and a weighted average of at least 45% on the assignments. If these conditions are not met, the maximum mark that you will receive is 48%.
- 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 the midterm and final exams, and a weighted average of at least 55% on the assignments. If these conditions are not met, the maximum mark that you will receive is 58%.

If for any reason the assignment schedule given below cannot be adhered to, the assignment marks will be pro-rated. The assignments are worth 42% of the overall mark for the course. If an assignment must be canceled for any reason, the remaining assignment weights will be prorated to add up to 42%. If for any reason the midterm examination must be canceled, the final exam will be worth 58% of the final mark.

Schedule (*Tentative, some of these dates might change to dates closer to the start of term*)
All assignments are due through Gradescope at 11:55pm on the date indicated.

- Assignment 1 (concept) due on **February 6th**, 2026
- Assignment 2 (programming) due on **February 27th**, 2026
- Assignment 3 (concept) due on **March 6th,** 2026
- Assignment 4 (programming) due on **March 13th**, 2026
- Assignment 5 (programming) due on **April 2nd**, 2026
- A 2-hour midterm exam (Scheduled for **March 7th**, 11:30-13:30, 2026)
- A 3-hour final exam will be scheduled by the Registrar's Office. (TBD)

There will be **no makeup** Midterm Exam, except for students requesting a Special Midterm Exam for **religious reasons**. These students must have notified the course instructor and filed documentation with their Dean's office at least 2 weeks prior to the Midterm Exam.

If you miss the midterm exam for any other reason, follow the procedure for Academic Accommodation for Medical Illness given below. If accommodation is approved, your final exam mark will be re-weighted to include the weight of the midterm exam.

Concept 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. The solutions for the exercises should be neatly written or typed. All answers should be submitted to Gradescope.
Inability to submit concept assignment due to extenuating circumstances: If a student is unable to complete a concept assignment and has an approved academic consideration for it, then the weight of the concept assignment will be reweighted to the final exam.

Programming Assignments
The programming assignments require you to write Java programs related to the data structures and algorithms discussed in lectures.

To be eligible for full marks, your programming assignments must pass all auto-grader tests run on it on Gradescope. You may develop assignments on your home computer, but you must allow for the amount of time it will take to get the final programs working on Computer Science's machines and Gradescope's autograder. All students must be able to compile and run java source code on a command line or terminal to thoroughly test their code before submission. Each student may perform an unlimited number of submissions until the final deadline.
Inability to submit programming Assignment due to extenuating circumstances: If a student cannot submit a programming assignment within the given timeframe due to extenuating circumstances they will be given an individual extension of 4 days after the end of an approved consideration period to submit without incurring a late penalty. This academic consideration can be both with or without documentation.

All programming assignments must be submitted through Gradescope. In order for assignments to be graded they must pass all tests that will only be run on Gradescope. If an assignment does not pass the tests, the assignment will only be graded on completeness of the implementation and on coding style, however, correctness and runtime performance will not be graded.

Students are responsible for checking their e-mail on a regular basis.

Late Policy
Concept assignments must be handed in by the due dates. **There will be a 3 day no-late-penalty late submission period after the initial due date to submit the Concept assignment, after the additional 3 days have elapsed no additional submissions will be accepted as the solutions are set to automatically release then.**

The programming assignments have a 4 days no-late-penalty period, after which no further submissions will be accepted as the solutions will be automatically released to the class by the end of the 4 day grace period.

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

Appeals of Assignment Marks
Appeals of assignment marks must be **addressed first to the T.A**. who marked your work. If you and the T.A. cannot agree, then please discuss the situation with the instructor.
Appeals **must occur within 1 week** from the first day that the marked assignments were made available to students. After that 1-week period has gone by, no more appeals will be considered.

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 the following Web site: 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 (including an AI bot), 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 offence.

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 be penalized and the Department of Computer Science and the Dean's office will be informed of this offence. Notice that the Department or the Dean's office might impose additional penalties. You are responsible for reading and respecting the Computer Science Department's policy on Scholastic Offences and Rules of Ethical Conduct
https://www.csd.uwo.ca/undergraduate/current/policies/ethical_conduct.html

We will use the plagiarism checking software called MOSS to compare student program submissions.

Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Email Contact and OWL
Students should check the course's OWL site on a regular basis for news and updates. This site is the primary method by which information will be disseminated to all students outside the classroom. **Students are responsible** for checking OWL and their email messages on a regular basis.

Email messages will be sent to the UWO email address assigned to students by Information Technology Services (ITS), i.e., your email address @uwo.ca. It is each student's responsibility to read this email on a frequent and regular basis, or to have it forwarded to an alternative email address if preferred. See the ITS website for directions on forwarding email. However, you should note that email at ITS (your UWO account) and other email providers such as hotmail.com or yahoo.com may have quotas or limits on the amount of space they can use. If you let your email accumulate there, your mailbox may fill up and you

may lose important email from your instructors. Losing email that you have forwarded to an alternative email address is not an excuse for not knowing about the information that was sent.

Students must use their Western (@uwo.ca) email addresses when contacting the instructor. If you send email to the instructor from a commercial account, send a carbon copy (cc) to your UWO email address. The instructors will respond to your UWO address.

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

6. Student Absences

General information about missed coursework

Students must familiarize themselves with the University Policy on Academic Consideration – Undergraduate Students in First Entry Programs, posted on the Academic Calendar: https://uwo.ca/univsec//pdf/academic_policies/appeals/academic_consideration_Sep24.pdf,

This policy does not apply to requests for Academic Consideration submitted for attempted or completed work, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult Accessible Education.

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage: https://registrar.uwo.ca/academics/academic_considerations/

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request without supporting documentation in this course. However, the following assessments are excluded from this and, therefore, always require formal supporting documentation:

· Examinations scheduled during official examination periods (Defined by policy)

· Midterm/Presentation/Group Project (Designated by the instructor as the one assessment that always requires documentation when requesting Academic Consideration)

When a student mistakenly submits their one allowed Academic Consideration request without supporting documentation for the assessments listed above or those in the Coursework with Assessment Flexibility section below, the request cannot be recalled and reapplied. This privilege is forfeited.

Evaluation Scheme for Missed Assessments

In case of a missed assessment covered by an approved documented academic consideration the of the missed assessment will be automatically reweighted to the final. In case of a missed assessment because of a conflict with events considered as scheduling conflicts by the Faculty of Science, an alternate opportunity to take the assessment will be provided in consultation with the affected students.

Coursework with Assessment Flexibility

Deadline with a No-Late-Penalty Period

Assignments. Students are expected to submit each of the assignments by the deadline listed. Should extenuating circumstances arise, students do not need to request Academic Consideration and they are permitted to submit their assignment up to (e.g., 48, 72 hours) past the deadline without a late penalty. Should students submit their assessment beyond (48 or 72 hours) past the deadline, a late penalty of XX% per day will be applied. Academic Consideration requests may be granted only for extenuating circumstances that started before the deadline and lasted longer than the No-Late-Penalty Period (48 or 72 hours). (Alternatively, the instructor may deny all requests, give them a zero mark, and let students follow the Request for Relief pathway to ask for an exception. Note that instructors may not ask for medical documentation for privacy protection, but the student can voluntarily share information.)

Absences from Final Examinations

If you miss the final exam, please contact your Faculty's Academic Counselling Office as soon as you can 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 (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

6. Accommodation and Accessibility

Religious Accommodation

When a recognized religious holiday or observance conflicts with an examination, test, or other scheduled academic obligation, students must request accommodation via the University's Student Absence Portal (SAP). This request should identify the conflict and specify which course component(s) (e.g. test, midterm, exam) are affected.

Students are encouraged to submit the SAP request as early as possible, but no later than two weeks before any examination, or one week before any mid-term test or quiz, to allow sufficient time for adjustment.

The SAP request serves as official notification to both the course instructor and the Academic Advising Office, in accordance with University policy: https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

The Faculty of Science considers religious accommodations as scheduling conflicts. Instructors should provide either a make-up exam or an earlier sitting of the same exam to accommodate the student.

For more information on recognized religious holidays, please visit the Diversity Calendar posted on the Equity, Diversity & Inclusion website - https://www.edi.uwo.ca

Accommodation Policies
Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf.

7. Academic Policies

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

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

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 their official university address is attended to in a timely manner.

No electronic devices will be allowed during the exams.

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.

8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/.

Students who are in emotional/mental distress should refer to Mental Health@Western (https://uwo.ca/health/) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

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 Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (https://learning.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.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/.

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