CS 2210 Data Structures and Algorithms
2019

Instructor

Roberto Solis-Oba
Lecture times: Tu 1:30-3:30 pm and Th 2:30-3:30 pm, AHB 1R40
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Course’s Web Page:
http://www.csd.uwo.ca/Courses/CS2210a

Lecture Notes
Notes will be available on the course’s web site.
Middlesex College Building
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Course Description

The objectives of this course are to provide the students with

- Solid foundations in the basic concepts of programming: data structures and algorithms
- Criteria for selecting and designing data structures and algorithms appropriate for particular problems
- Tools for analyzing and proving the correctness of algorithms.
Topics

- Analysis and design of algorithms. Time and space complexity. Asymptotic notation.
- Dictionaries, hash tables.
- Trees, binary search trees, AVL trees, multi-way search trees.
- Graphs, graph traversals, graph algorithms.
- Sorting.
Prerequisites

- Either Integrated Science 1001X with a grade of at least 60%, or
  - 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.
Textbook


Supplementary Texts

Data Structures

– Data Structures and Algorithms with Object Oriented Design Patterns, B. Preiss, Wiley.
– Data Structures, Algorithms, and Applications in Java, Sahni.
– Data Structures and Algorithm Analysis in Java, Weiss, Addison Wesley.
– Data Structures and Algorithm Analysis in Java, Shaffer, 2012 (free online edition).
Java

– *Java, an Object Oriented Approach*, Arnow and Weiss, Addison-Wesley.
– *Java how to Program*, Deitel and Deitel, Prentice Hall.
– *Core Java*, Cornell and Horstmann, Prentice Hall.
Student Evaluation

Grades will be based on:

• 2 concept assignments, each worth 3% of the final mark
• 3 programming assignments, each worth 10% of the final mark
• a midterm exam, worth 29% of the final mark
• a final exam, worth 35% of the final mark

If an assignment has to be cancelled for any reason, the remaining assignment weights will be prorated to add up to 36%.

If for any reason the midterm examination has to be cancelled, the final exam will be worth 64% of the final mark.
Student Evaluation (cont.)

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 the course, 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.

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.
Tentative Schedule

All assignments are due at **11:59 pm** on the date indicated.

- Assignment 1 (concept) due on September 27
- Assignment 2 (programming) due on October 17
- Assignment 3 (concept) due on October 24
- Assignment 4 (programming) due on November 15
- Assignment 5 (programming) due on December 4

- A 2-hour midterm exam might take place on Tuesday, October 29 during class.

- A 3-hour final exam will be scheduled by the Registrar.
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, and present valid documentation to the Dean’s office, your Final Exam mark will be re-weighted to include the weight of the Midterm Exam.
Concept and Programming Assignments

Concept Assignments

– Each concept assignment consists of a set of 5-10 exercises.

Programming Assignments

– The programming assignments require you to write Java programs.
– To be eligible for full marks, your programming assignments must run on the departmental computing equipment.
– All programming assignments must be handed in using electronic submission procedures, to be described later.

All assignments will be made available on the course’s web site. 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.
Late Policy

- Concept assignments must be handed in on the due date. No late concept assignments will be accepted.

- The late penalty for programming assignments is

\[2.5^i,\]

where \(i > 0\) is the number of days you are late.

So if you hand in your assignment 1 day late, you will be penalized 3%, a delay of 2 days will decrease your grade by 6%, 3 days is penalized 16% and 4 days takes 39% off your grade.

You cannot be more than 4 days late.

For computing the late penalty, Saturday and Sunday count as one day.

Extensions will be granted only by the course instructor. If you have serious medical or compassionate grounds for an extension, you should take supporting documentation to the office of the Dean of your Faculty, who will contact the instructor.
Appeals of Assignment Marks

Appeals of assignment marks should be addressed to the T.A. first. If you and the T.A. cannot agree then the student should talk with the lecturer.

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.
Academic Accommodation for Medical Illness

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. For further information, please consult


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.

If you miss the final exam, you must contact your faculty’s Academic Counselling Office.
Ethical Conduct

- **All assignments are individual assignments.**

- 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. A second offence normally means failing the course.

- 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](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](http://www.csd.uwo.ca/current_students/undergraduate_students/rules_of_ethical_conduct.html)).

- We use sophisticated software (MOSS) that will examine your code against everyone else in the class and report any incidents of copying.
Email Contact

• We will frequently send email messages
• Email will be sent to your UWO email address.
• If you send email to instructors from a commercial account, send a carbon copy (cc) to your UWO email address. The instructors will respond to your UWO address.

Computing Facilities

Each student will be given an account on the Computer Science Department senior undergraduate computing facility.
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.

Support Services

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.

Please consult the Web site for Registrarial Services (http://www.registrar.uwo.ca), and for USC (http://westernusc.ca/services) for a list of student support services and programs.