

**The University of Western Ontario**  
**Department of Computer Science**  
**CS 2214: Discrete Structures for Computing**  
**Fall 2012**

**Course Description**

This course presents an introduction to the mathematical foundations of computer science, with an emphasis on mathematical reasoning, combinatorial analysis, discrete structures, applications and modelling, and algorithmic thinking. Problems addressed may include “How many ways are there to choose a valid password on a computer system?”, “How can a wireless discussion be private?”, “What is the shortest path between two cities in a given transportation network?”, “How many steps are required to sort a list of integers in an increasing order?” .

**Prerequisites:** Computer Science 1027A/B, 1037A/B, or Computer Science 2101A/B, in each case with at least 65%, and one full course or equivalent chosen from the following, with at least 60% in each: Applied Mathematics 1201A/B or the former Calculus 1201A/B, Applied Mathematics 1413, Calculus 1000A/B, 1100A/B, 1301A/B, 1500A/B, 1501A/B, Mathematics 1600A/B or the former Linear Algebra 1600A/B, or permission of the Department. Unless you have either the requisites 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.

**Anti-requisites:** Mathematics 2151A/B, Mathematics 2155A/B, former Software Engineering 2251A/B.

**Instructor:**

Professor Lila Kari  
Office: Middlesex College 385

Office hours: TBA  
Phone: 519-661-2111 ext. 868934  
Email: lilacsd.uwo.ca

**Course Materials:** The recommended textbook is *Discrete Mathematics and Its Applications*, 7th Edition, Kenneth Rosen, McGraw-Hill.

**Schedule of Lectures:** Three lecture hours and one laboratory session per week: Monday 1:30pm - 3:30pm, P & A 106, Wednesday 2:30pm - 3:30pm KB 203, Wednesday 3:30pm - 4:30pm, KB 203. Laboratory sessions will typically involve in-class solving of problems by students or review work.

**Course Website:** The course website is

<http://www.csd.uwo.ca/~lila/discrete.html>

and announcements will be posted on this website. You are responsible for reading this information frequently.

**Topics may include:**

- Sets, Functions, and Relations (set operations, growth of functions, sequences and summations,  $n$ -ary relations and their applications, closure of relations, equivalence relations, partial orderings)
- Fundamentals of Algorithms, Integers, and Matrices (complexity of algorithms, integers and algorithms, applications of number theory, matrices)
- Mathematical Reasoning (methods of proof, mathematical induction, recursive algorithms, program correctness)
- Counting (the pigeonhole principle, permutations and combinations, probability theory, recurrence relations, divide-and-conquer relations)
- Graphs (graph terminology, representing graphs and graph isomorphism, connectivity, Euler and Hamilton paths, graph colouring, trees)

## **Student Evaluation**

- 5 in-class quizzes, each worth 1%, the sum of which will constitute 5% of the final grade;
- 5 assignments, each worth 4%, the sum of which will constitute 20% of the final grade;
- in-class midterm exam worth 25%;
- the final exam worth 50%.

Late assignments cost 10% of the assignment per day late unless an extension has been granted. After a week has passed from the due-date no assignments will be accepted for marking. To obtain a passing grade in the course, a student must obtain at least 50% on the final exam.

If for any reason the assignment and quiz schedules given below cannot be adhered to, the marks will be pro-rated. (For example, the 5 assignments are worth 20% of the overall mark for the course. If an assignment has to be cancelled for any reason, the remaining assignment weights will be pro-rated to add up to 20%.)

Every effort will be made to have assignments marked and handed back within 2 weeks of the hand-in date, preferably sooner. Midterm exam marks will be available within 2 weeks of the exam at the latest.

## **Schedule (tentative) and Exam Rules**

- The quizzes and assignments are given in alternate weeks (the assignments will be posted on the web). See detailed schedule below.
- The Midterm Exam is an 1hr45min written in-class exam. The 3-hour written Final Exam will be scheduled during the exam period.
- All exams and quizzes are close-book. A letter-size hand-written reference sheet (both sides, no flaps) is allowed for the exams, but not for the quizzes.
- No electronic devices of any kind, including cell phones, are allowed during the quizzes and exams.
- 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 above. If accommodation is approved by your Dean's office, your Final Exam mark will be

reweighted to include the weight of the Midterm Exam.

- There will be no make-up for the quizzes, except in the situations described above for the Midterm Exam.

- In case of questions regarding the marks, please note that no quizzes or exams will be accepted for re-marking later than two weeks after they have been marked. We reserve the right not to re-mark quizzes or exams that have been written in pencil.

- All students are expected to attend all classes. A student found to be missing a large number of classes without acceptable reasons (see the Calendar for these) risks being denied a passing grade.

	Given	Due
Quiz 1	Mon. Sep.17	
Assgn. 1	Mon. Sep.24	Wed. Oct.3
Quiz 2	Mon. Oct 1	
Assgn. 2	Mon.Oct.8	Wed. Oct 17
Quiz 3	Mon.Oct.15	
Midterm Exam	Mon. Oct.22	
Assgn.3	Mon. Oct.29	Wed. Nov.7
Quiz 4	Mon. Nov.5	
Assgn.4	Mon. Nov.12	Wed. Nov. 21
Quiz 5	Mon. Nov.19	
Assgn.5	Mon. Nov.26	Wed. Dec. 5
Final Exam	TBA	

### Assignments

**Submission of Assignments:** Electronic or hard-copy, details TBA.

**Late Assignment Policy:** See Student Evaluation.

**Extensions:** Extensions may be granted only by the course instructor. If you have serious medical or compassionate grounds for an extension, you should follow the procedure for Academic Accommodation for Medical Illness below.

### 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 Dean's 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. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see:

*[http://www.uwo.ca/univsec/handbook/appeals/accommodation\\_medical.pdf](http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf)*

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found at:

*[https://studentservices.uwo.ca/secure/medical\\_document.pdf](https://studentservices.uwo.ca/secure/medical_document.pdf)*

**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.

**Email Contact:** We occasionally need to send email messages to the class or to students individually. Email is sent to the UWO email address as assigned to you by Information Technology Services (ITS), i.e. your email address @uwo.ca. It is your 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, note that email at ITS (your UWO account) and other email providers may have quotas or limits on the amount of space they dedicate to each account. Unchecked email may accumulate beyond those limits and you may be unable to retrieve important messages from your instructors. Losing email is not an acceptable excuse for not knowing about the information that was sent.

**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.

## **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/handbook/appeals/scholoff.pdf>*

**Plagiarism:** 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 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 writing, answers to concept questions, etc.) must be an individual effort.

The standard departmental penalty for assignments that are judged to be the result of academic dishonesty is, for the student's first offence, a mark of zero for the assignment, 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 and Rules of Ethical Conduct.

The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their written work and programs in electronic form for plagiarism checking.

**Tutoring:** The role of tutoring is to help students understand course material. Tutors should not write assignments or take-home tests for the students who hire them. Having employed the same tutor as another student is not a legitimate defense against an accusation of collusion, should two students hand in assignments judged similar beyond the possibility of coincidence.