

The University of Western Ontario
Department of Computer Science
CS 2214A: Discrete Structures for Computing
Fall 2016-2017

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. Problems addressed 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 system?”, “What is the probability of winning the lottery?”, “How can I identify spam e-mail messages?”.

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*
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Phone: 519-661-2111 ext. 86894
Email: lila.kari at uwo.ca

Course Materials: The recommended textbook is *Discrete Mathematics and Its Applications*, 7th Edition, 2012, Kenneth Rosen, McGraw-Hill.

Schedule of Lectures: Three lecture hours and one laboratory session per week: Monday 1:30pm - 3:30pm, SH3345, Wednesday 2:30pm - 4:30pm SH3345. Laboratory sessions will typically involve in-class solving of problems by students or review work.

Course Website

Students should check OWL (<http://owl.uwo.ca>) as well as the course website

<http://www.csd.uwo.ca/~lila/discrete16-17.html>

on a regular basis for news and updates. These are the primary method by which information will be disseminated to all students in the class. The missing of critical information due to your failure to check the course website or OWL cannot be used as a basis for appeal.

Topics include:

- Foundations: Logic and Proofs
- Basic Structures: Sets, Functions, Sequences, Sums and Matrices
- Number Theory and Cryptography (divisibility and modular arithmetic, integer representations, primes and greatest common divisors)
- Induction and Recursion
- Counting (basics of counting, Pigeonhole principle, permutations and combinations)
- Discrete Probability (introduction to discrete probability, Bayes' Theorem)
- Relations (equivalence relations, partial orders)
- Graphs (graphs and graph models, connectivity, Euler and Hamiltonian paths)

Evaluation

The overall course grade, out of 100, will be calculated as follows:

- 5 in-class quizzes, each worth 1%, the sum of which constitute 5% of the course grade;
- 5 assignments, each worth 4%, the sum of which constitute 20% of the course grade;
- 1 in-class Midterm Test worth 25%;
- Final Exam worth 50%.

None of the components will be dropped, and it is not possible to have the components reweighted unless they were legitimately missed.

It is Faculty of Science policy that a student who chooses to write a test or exam deems themselves fit enough to do so, and the student must accept the mark obtained. Claims of medical, physical, or emotional distress after the fact will not be considered.

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

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

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.

Every effort will be made to have assignments, quizzes and tests marked and handed back within 2 weeks of the hand-in date.

Assignment, Quiz and Test Schedule and Other Test and Exam Rules

- If for any reason the assignment and quiz schedules given below cannot be adhered to, the marks will be pro-rated.
- The submission of assignments is electronic or hard-copy, details TBA.
- No electronic devices may be in your possession during tests and exams.
- The Midterm Test is an 1hr45min written in-class exam. The 3-hour written Final Exam will be scheduled during the exam period.
- All exams, tests and quizzes are close-book. A letter-size hand-written reference sheet (both sides, no flaps, and no fully-worked out examples) is allowed for the the Midterm Test and Final Exam, but not for the quizzes.
- 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 risks being denied a passing grade.

	Given	Due
Quiz 1	Wednesday, Sept. 21	
Assignment 1	Wednesday, Sept. 21	Wednesday, Sept. 28
Quiz 2	Wednesday, Oct. 5	
Assignment 2	Wednesday, Oct. 5	Wednesday, Oct. 12
Quiz 3	Wednesday, Oct. 19	
Midterm Test	Wednesday, Oct. 26	
Assignment 3	Wednesday, Nov. 2	Wednesday Nov. 9
Quiz 4	Wednesday, Nov. 16	
Assignment 4	Wednesday, Nov. 16	Wednesday, Nov. 23
Quiz 5	Wednesday, Nov. 30	
Assignment 5	Wednesday, Nov. 30	Wednesday Dec. 7
Final Exam	TBA	

Missed Test or Final Exam

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 191, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is

http://www.uwo.ca/sci/undergrad/academic_counselling/index.html.

A student requiring academic accommodation due to illness must use the Student Medical Certificate:

https://studentservices.uwo.ca/secure/medical_document.pdf

when visiting an off-campus medical facility.

For further information, please consult the university's medical illness policy at:

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

There are no make-up tests or quizzes. If your faculty's Academic Counselling Office has approved your circumstances, the value of the missed test or quiz will be reallocated.

If you miss the Final Exam, contact your faculty's Academic Counselling Office as soon as possible. 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:

http://www.registrar.uwo.ca/examinations/exam_schedule.html

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.

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 Mental Health@Western:

http://www.health.uwo.ca/mental_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/services>.

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