

# Computer Science 2214B

## Winter 2020 Course outline

### 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 modeling, and algorithmic thinking. Topics may include sets, functions, relations, algorithms, number theory, matrices, mathematical reasoning, counting, graphs and trees. Tentative list of specific topics includes:

- 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)

### 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 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. Anti-requisites: Math 2151A/B, Math 2155A/B, former Software Engineering 2251A/B.

## Instructor

Dinesh Valluri  
Email: [dvalluri@uwo.ca](mailto:dvalluri@uwo.ca)  
Office: Middlesex College 364  
Office hours: TBD

## Policies regarding email and contact

For all questions related to the course materials (lectures, assignments, tutorials and exams) students **must use the forum** of the OWL web site instead of contacting the instructor or the TAs by email. Indeed, a question about the lectures or an assignment problem is likely to be of interest to many students in the class. Writing to the instructor or the TAs should only be done for handling a personal matter, like illness the day of the Final Exam.

## Course Materials

The recommended textbook is **Discrete Mathematics and Its Applications, 7th Edition, 2012, Kenneth Rosen, McGraw-Hill**. Course lecture notes will be made available in PDF on OWL. They are provided as a courtesy by the course instructor. Possessing (and even reading) these notes is not a suitable substitute for attending lectures.

## Course Website

Students should check the OWL website on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

## Class Schedule

Mondays and Wednesdays, from 11:30 to 13:30, in AHB-1R40.

## Methods of Evaluation

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

- 5 assignments, each worth 4%, the sum of which will constitute 20% of the final grade;
- One midterm exam worth 35%,
- The final exam worth 45%.

None of the components will be dropped, and it is not possible to have the components re-weighted unless they were legitimately missed. The Midterm is a written exam that will last 2 hours. It will take place on February 28, 2020 7:00-9:00 PM. The 3-hour written Final Exam will be scheduled during the exam period. NOTE: if your mark for the Final exam is better than your mark for the Midterm then your Midterm mark will be automatically raised to the Final mark. 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 Offense, at this website:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_undergrad.pdf](https://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. After a week has passed from the due-date no assignments will be accepted for marking. No extensions will be given for any assignment. If there is an academic accommodation approved by the Dean's office (see Accommodations section below) the corresponding assignment will be dropped and its weight will be added to the other assignments. Similarly, no make-up Midterm will be given. If you miss the Midterm for any reason (with or without an academic accommodation), then your Final mark will automatically have 80% weights for your overall mark in this course (this is consistent with the previously mentioned rule on automatic raising of the Midterm mark to the Final exam mark if the latter is higher). The Final exam will cover the material of the whole course. To obtain a passing grade in the course, a student must obtain at least 50% on the final exam and the weighted average on the assignments and final exam. Every effort will be made to have homework assignments and exams marked and handed back within 2 weeks of the hand-in date. If we are unable to comply with our intended return dates, revised dates will be posted on the course website.

## **Additional assignment and Exam rules**

- Assignment descriptions will be posted on the course website at least one week before the due date.
- Any changes, updates, and clarifications to assignments will also be posted on the website. It is your responsibility to monitor these pages closely.
- The submission of assignments is electronic using OWL. Assignments must be typed using a text editor and submitted in PDF format.
- When a student submits an assignment for evaluation, this student automatically certifies that the material she/he has handed in is exclusively her/his own work.

- No electronic devices may be in the possession of students during the Midterm and the Final Exams.
- The Midterm and the Final Exams are close-book. A reference sheet (provided by the instructor) is allowed for the Midterm and the Final Exams
- In case of questions regarding the marks, please note that no exams will be accepted for re-marking later than one week after they have been marked.
- It is your responsibility to keep up-to-date backups of assignment disk files in case of system crashes or inadvertently erased files. Retain disk copies of all material handed in, as well as the actual graded assignment, to guard against the possibility of lost assignments or errors in recording marks. It is not safe to discard these materials until you are satisfied that your final mark for the course has been computed properly.

## Lecture attendance

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.

## Missed Test or Final Exam

If you are unable to meet a course requirement (final exam or assignment due date) 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. The University Policy on Accommodation Consideration for Student Absences can be found **here**.

If you are a science student, the Academic Counselling Office of the Faculty of Science can be contacted at 519-661-3040 or scibmsac@uwo.ca. See their web site.

A student requiring academic accommodation due to illness must use the Student Medical certificate when visiting an off-campus medical facility.

For further information, please consult the university's medical illness policy and the University' policy on academic accommodation for student with disabilities.

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", follow this link.

## 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.

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 your individual effort. Assignments that are judged to be the result of academic dishonesty will, for the student's first offence. You are responsible for reading and respecting the Computer Science Department's policy on Rules of Ethical Conduct and Scholastic Offences.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com.

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.

## **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 accessibility at 661-2111 ext. 82147 if you have questions regarding accommodation.

## **Mental Health**

All students who are in emotional/mental distress should refer to Mental Health@Western for a complete list of options about how to obtain help.

## **Support Services**

Learning-skills counsellors at the Student Development Centre 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. See also the services provided by the University Students Council.

The website for Registrarial Services.