

Lecture Hours: Tuesday 14h10-16h00 and Thursday 15h10-16h00 UC 161
Prof's Office Hours: Tuesday 16h10-17h00 BA 6124
Tutorial Hours: Thursday 16h10-17h00 or 17h10-18h00 UC 244
Teaching Assistant: Narges Alipourjeddi n.alipourjeddi@mail.utoronto.ca

Required text: Douglas B West. *Introduction to Graph Theory. 2nd Edition.* Pearson 2018.
ISBN Number: 978-0131437371 (paperback) or 978-0131437372 (hardcover)
Also recommended: Chartrand and Zhang. *A First Course in Graph Theory.* Dover 2012.
Benjamin, Chartrand and Zhang. *The Fascinating World of Graph Theory.* PUP 2015.

- 1 FUNDAMENTAL CONCEPTS: graphs, models, paths, cycles, vertex degrees
 - 2 TREES AND DISTANCE: spanning trees and optimization
 - 3 MATCHINGS AND FACTORS: matching and covers, algorithms and applications
 - 4 CONNECTIVITY AND PATHS: cuts, connectivity, network flows
 - 5 COLORING OF GRAPHS: vertex colorings, k -chromatic graphs, counting
 - 6 PLANAR GRAPHS: Euler's formula, dual graphs, characterizations of planarity, applications
 - 7 EDGES AND CYLES: line graphs, edge coloring, Hamiltonian cycles
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COURSE OBJECTIVES

The primary goal of this course is 1) to become familiar with and competent using the language, techniques, results and applications of the mathematical theory of discrete graphs.

The secondary goals are 2) to develop logical reasoning skills, and become proficient at understanding, producing, checking, debugging and communicating rigorous proofs — the gold standard by which mathematical facts are established — and 3) to improve mathematical problem solving skills through regular practice.

GRADING SCHEME

- 10 % Weekly quizzes in tutorial (equally weighted; no aids of any kind permitted)
- 15 % Assignments (due electronically by 3 pm on Thursdays Sept 20, Oct 4, 18, Nov 1, 22; Dec 6)
- 25 % Midterm test (110 minutes in class on Tuesday Oct 23; no aids of any kind permitted)
- 50 % Final Exam (Faculty scheduled 3 hour exam; no aids of any kind permitted)

Assignments will be accepted up to a maximum of 7 days late, at a penalty of 3% per day late (up to a maximum penalty of 21% of the marks earned). After 7 days the grade will be zero.

Missed quizzes receive a grade of zero. However, if a justified absence is suitably documented, the instructor may, at his discretion, substitute the term average for a missed quiz or assignment.

A missed midterm test will contribute a grade of zero. However, in case of justified absence documented in writing to the satisfaction of the instructor he may, at his sole discretion, substitute the term average for the missed test or administer a makeup test, which the instructor may choose to take either oral or written form.

Missed exams contribute a grade of zero unless petitioned through your Colleges Registrars' office by the appropriate deadline (usually one week after the end of the final examination period).

TUTORIAL OBJECTIVES

The tutorials represent an opportunity for you to see more worked examples, take up problems from past assignments, and have a moderated discussion about questions you and other students

have about the course material with the TA. Some tutorial time may also be devoted to discussing assigned questions with other students in small groups. You will derive the most benefit from such discussions if you have already spent time thinking about the assigned questions yourself. Most tutorials will include a quiz, intended to give you a chance to show that you are attending lectures, keeping up with the course material, and your mastery of the topics covered.

INTEGRITY: The University treats cases of academic misconduct very seriously. Academic integrity is a fundamental value of learning and scholarship at the UofT. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that your UofT degree is valued and respected as a true signifier of your individual academic achievement.

The University of Toronto's Code of Behaviour on Academic Matters outlines the behaviours that constitute academic misconduct, the processes for addressing academic offences, and the penalties that may be imposed. You are expected to be familiar with the contents of this document. Potential offences include, but are not limited to:

On assignments: Using someone else's ideas or words without appropriate acknowledgement. Obtaining or providing unauthorized assistance on any assignment (this includes working in groups on assignments that are supposed to be individual work). If you work on an assignment question with others, please indicate whom. If you consult a source, please indicate which. However, before you consult or reach for other sources it is best to try doing the assignments on your own: the more you practice solving problems without relying on other sources, the more resourcefulness you'll develop for solving problems on tests and exams! In any case, the actual write-up of the solution to a problem should be done in isolation from others, without copying from notes or other sources. This ensures that your solution is truly your own, and that you understand the course material, and that your grade reflects your own understanding.

On tests and exams: Using or possessing any unauthorized aid, including a cell phone. Looking at someone else's answers. Letting someone else look at your answers. Misrepresenting your identity. Submitting an altered test for re-grading.

Misrepresentation: Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes. Falsifying institutional documents or grades. All suspected cases of academic dishonesty will be investigated following the procedures outlined in the Code of Behaviour on Academic Matters. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me.

DIVERSITY AND ACCOMMODATIONS

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or Accessibility Services at (416) 978-8060; accessibility.utoronto.ca

COMMUNICATIONS POLICY

Course material will be posted at the website www.math.toronto.edu/mccann/332 and are not to be reproduced or distributed without written permission of the instructor.

Questions concerning the subject matter of the course should be brought to lectures, tutorials, or office hours. Administrative concerns including documentation justifying absences should go by e-mail to the TA n.alipourjeddi@mail.utoronto.ca or myself mccann@math.toronto.edu as appropriate. All re-grading concerns should be raised with the TA. Please include the course number MAT 332F in the subject heading. I will endeavour to respond to emails within 72 hours.

The university requires students to be informed that all course marks are tentative until approved by the Department chair and Dean's office, and recorded by the faculty registrar.