

Faculty of Science Course Syllabus
Department of Mathematics & Statistics
Math 3330-Applied Graph Theory
Fall 2019

Instructor(s): Mayada Shahada (mayada.shahada@dal.ca)

Lectures: MWF 9:35am-10:25am, LSC C216

Office Hours: Monday 11:30-12:30 in Chase 106. I am very happy to meet with you at other times so please feel free to email for an appointment.

Course Description

This course offers an introduction to graph theory, with an emphasis on applications and modelling. Topics include: paths and cycles, shortest route problem, connectivity and trees, minimum spanning trees, network flow, planar graphs, matchings, assignment problem, graph colouring and applications to scheduling, Hamilton cycles, and the Travelling Salesman Problem.

Course Prerequisites

MATH 2112.03 or MATH 2030.03

Course Objectives/Learning Outcomes

Students will learn basic graph concepts, be able to state and prove main theorems in the field, be able to run algorithms on graphs, and be able to model real world problems with graphs.

Course Material

Textbook: No assigned text. This makes it extra important to attend every lecture as the notes you take in class will be one of your most valuable resources. I may post various open source textbooks/lecture notes that I've found helpful although these unfortunately usually come with a different set of notations.

Course website: see Brightspace.

Course Assessment

Component	Weight (% of final grade)	Date
<i>Midterm</i>	25%	October 18 during normal class time
<i>Final exam</i>	50%	Scheduled by the registrar
<i>Assignments</i>	25%	Weekly (approximately)

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D	(50-54)
A (85-89)	B (73-76)	C (60-64)	F	(<50)
A- (80-84)	B- (70-72)	C- (55-59)		

Course Policies*Assignments*

- There will be assignments almost every week.
- Assignments are **due at the beginning of class**.
- Assignments will be ready on Brightspace at least 5 days before they are due.
- I encourage you to work with others on assignments. However, each student should write out his or her own written assignment. Copying is strictly prohibited. See the Dalhousie academic integrity policy for details.
- **Late assignments will not be accepted.**

Midterm and Exam

- The midterm will take place in class during normal class hours from 9:35-10:25 on Friday October 18.
- Only writing utensils and erasers are to be used on exams.
- No makeup midterm will be given.
- The final exam will be a 3 hour exam scheduled by the registrar. Please do not make travel plans until after the exam schedule has been posted.

Attendance

- Attendance to lectures is expected. I will be drawing from many sources to produce the lecture material so it is very important that you attend the lectures.
- You are responsible for any material, announcements, changes to the syllabus, etc. that occur during class. For example, the excuse that you were not in class for a certain topic not covered in the posted resources on Brightspace is not valid.

Course Content (*Tentative*)

Additional topics may be added as time permits and certain topics listed may be omitted. The order listed here is not necessarily the order we will follow.

1 Introduction**2 Paths, Cycles, and Connectivity****3 Trees and Spanning Trees****4 Matchings****5 Colourings****6 Planar Graphs****7 Special Topics (Graph Polynomials)**

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: <https://dsu.ca/dsas>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Research Lab Safety

https://www.dal.ca/content/dam/dalhousie/pdf/dept/safety/lab_policy_manual_2007.pdf

Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>