

Faculty of Science Course Syllabus

Department of Mathematics and Statistics

Math 2040

Matrix Theory and Linear Algebra II

Winter 2020

Instructor

Instructor	E-mail Address	Office Location
Rob Noble	rnoble@mathstat.dal.ca	CHASE 205

Lectures

Days	Time	Location
MWF	9:35 AM – 10:25 AM	LSC 236

Course Description

This course is a continuation of MATH 1030/2030. Topics include: vector spaces and linear transformations, complex numbers, inner product spaces, orthogonal and unitary transformations, quadratic forms, diagonalization of symmetric and hermitian matrices, the solution to linear differential equations, and various applications in mathematics, physics and computer science.

Course Prerequisites

One of MATH 1030/2030 and one of Math 1000/1500/1215.

Course Objectives/Learning Outcomes

Students will learn advanced concepts of linear algebra, including real and complex vector spaces, inner product spaces, linear transformations, and orthogonality. Possible applications to be considered include the use of vectors in representing and manipulating data, including image data, audio data, and statistical data, in addition to compression, coding theory, and cryptographic applications.

Course Materials

- Textbook: We will use Peter Selinger's open source textbook "Matrix Theory and Linear Algebra", which will be made available on Brightspace. We will be starting the course with Chapter 9.

Resources

- Math & Stats Student Resource Centre (Room 119, first floor of the Chase Building). A tutor will be available on weekdays and evenings on a first come, first served basis, free of charge. There are large tables where you can work together (on Math or Stats only, please). To see the current schedule, please visit the Resource Centre's webpage <http://www.dal.ca/faculty/science/math-stats/about/learning-centre.html>.

Course Assessment

The Final Grade will be computed as the maximum of the grades obtained from the following two schemes:

Scheme I:

Component	Weight (% of final grade)	Date
Midterm Exam	30%	March 9, 2020 (In class)
Final Exam	50%	(Scheduled by Registrar)
Online Assignments	20%	Recurring

Scheme II:

Component	Weight (% of final grade)	Date
Final Exam	80%	(Scheduled by Registrar)
Online Assignments	20%	Recurring

Warning: It is strongly recommended that you prepare yourself to be graded on the first scheme; the second scheme is included in order to accommodate students who fail to perform up to their ability on the midterm due to circumstances beyond their control.

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

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

Course Policies

- A missed midterm or final exam can be made up for documented illness or upon receipt of equivalent proof of inability to write at the scheduled time.
- Calculators will NOT be allowed during the midterm or the final examination. In fact, only writing utensils (pencils, lead, erasers, pens, white-out) will be allowed.
- Information about the course may be given during class. It is the responsibility of the students to ensure that they are made aware of what occurs during classes.

Course Content

The material to be covered consists of the contents of Dr. Selinger's text book, starting with Chapter 9.

University Policies and Statements

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

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>