DALHOUSIE UNIVERSITY

Faculty of Science Course Syllabus

Math 1030, Matrix Theory and Linear Algebra I
Winter 2019

Instructor: Peter Selinger, Chase 303
Email: selinger@dal.ca (please mention "1030" in the subject line)

Lectures: MWF 9:35-10:25, Chemistry 125

Tutorials: 10 Tutorials, 50 minutes each

Course Description

This course is a self-contained introduction to Matrix Theory and Linear Algebra. Topics include: subspaces, linear transformations, determinants, eigenvalues and eigenvectors, systems of linear equations.

Course Prerequisites

Nova Scotia advanced Mathematics 11 or 12

Course Objectives/Learning Outcomes

Students will learn the basic concepts of linear algebra, including vector operations, lines and planes in n-dimensional space, the qualitative and quantitavite solution of linear systems, matrix operations and matrix algebra, rank and determinant, linear transformations, eigenvalues and eigenvectors, linear independence and dependence, subspaces and spanning sets, bases and dimension.

Course Materials

- *Textbook: "Matrix Theory and Linear Algebra" by Peter Selinger. This is an open textbook available for free download on Brightspace.*
- *Course website on Brightspace is accessed through dal.brightspace.com*

Course Assessment

Quizzes	*5%*	*In the tutorials.*
Homework	*15%*	*Online, accessed via Brightspace.*
Midterm 1	*20%*	*(tentative date and time) Monday, February 11, 7-9pm.*
Midterm 2	*20%*	*(tentative date and time) Tuesday, March 19, 7-9pm.*
Final Exam	*40%*	*3 hours – Scheduled by the Registrar. Must pass final exam to pass the course.*

Other course requirements

Tutorial attendance is mandatory. Tutorials start on January 18. Reading assignments will be given and will be tested in the quizzes.

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

A+ [90-100]	**B+** [77-80)	**C+** [65-70)	**D** [50-55)
A [85-90)	**B** [73-77)	**C** [60-65)	**F** [0-50)
A- [80-85)	**B-** [70-73)	**C-** [55-60)	

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Course Policies

1. Students can get help with this course in the Mathematics Learning Centre which is located in Room 119 on the 1st floor of the Chase Building. Tutors are available Monday–Friday 12–5pm on a first come, first served basis, free of charge. The Learning Centre also has large tables where you can work together. During the study break, Feb 19–22, the hours are 1–4pm. The Learning Centre is closed on the holidays, Feb 1, Feb 18, and Apr 19.
2. You will also be given reading assignments from the textbook.
3. Calculators, textbooks, and notes are not allowed for Midterm Tests or the Final Examination.
4. Late homework will not be accepted except with the instructor's prior permission.
5. A missed midterm cannot be written at another time. If you miss the midterm without prior permission, then it will count as a 0. Exceptions are made in two cases: (1) if you obtain the instructor's prior permission to miss a midterm, or (2) if you have an officially valid excuse such as a medical doctor's note. In these cases, the weight of the missed midterm will be shifted to the final exam (e.g., the final exam will then count 60% instead of 40%). There is no make-up option for the final exam except in cases of an officially valid excuse such as a medical doctor's note.
6. Student Declaration of Absence forms will be accepted for missed homework and quizzes, but not midterms or the final exam. To miss a midterm or final exam, you must always have a doctor's note signed by a medical professional.
7. Students are encouraged to study in groups, but each student must complete their own online homework, quizzes, and exams.

Course Content (dates are approximate)

January 7–11	1.1–1.4 Systems of linear equations
January 14–18	1.5–1.8 Systems of linear equations, Fields JANUARY 18 – TUTORIALS START
January 21–25	2.1–2.5 Vectors in R^n
January 28–30	2.6–2.7 Projections, cross product FEBRUARY 1 – MUNRO DAY (NO CLASS)
February 4–8	FEBRUARY 4 – LAST DAY TO DROP WITHOUT "W" 3.1–3.2 Lines and planes
February 11–15	FEBRUARY 11, MONDAY – FIRST MIDTERM, 7–9pm (date and time to be confirmed) 4.1–4.9 Matrix arithmetic, inverses
February 18–22	STUDY BREAK (NO CLASS)
Feb 25–Mar 1	5.1-5.2 Span and linear independence
March 4–8	5.3–5.5 Subspaces and basis
March 11–15	MARCH 11 – LAST DAY TO DROP WITH "W" 6.1–6.4 Linear transformations
March 18–22	MARCH 19, TUESDAY – SECOND MIDTERM, 7–9pm (date and time to be confirmed) 7.1–7.5 Determinants
March 25–29	8.1–8.4 Eigenvectors and eigenvalues, diagonalization
April 1–5	8.5–8.9 Applications APRIL 5 – LAST DAY OF TUTORIALS
April 8	Review

University Policies and Statements

See Brightspace for Part B of this syllabus, "University Policies and Statements".