Department of Mathematics and Statistics
Concordia University

MATH 252
Linear Algebra II
Winter 2024

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Office Hours: TBA.

Text: Linear Algebra Done Wrong, by Sergei Treil. Online link.

Assignments: Given weekly. No late assignments will be accepted.

Test: There will be one midterm in the seventh week. There will be no make-up test.

Final Exam: The final examination will be three hours long. It covers material from the entire course.

Final Grade: The final grade will be based on the higher of (a) or (b) below:
a) 20% for the assignments, 30% for the midterm, and 50% for the final.
b) 100% for the final examination.

If the grading scheme for this course includes graded assignments, a reasonable and representative subset of each assignment may be graded. Students will not be told in advance which subset of the assigned problems will be marked and should therefore attempt all assigned problems.

Calculators: Only calculators approved by the Department (with a sticker attached as proof of approval) are permitted for the class test and final examination.
For a list of Approved calculators see
http://www.concordia.ca/artsci/math-stats/services.html

Prerequisite: MATH 251: in particular, the notions of Vector spaces over **R** or **C**, matrix of a linear transformation, change of coordinate matrix, etc. will be assumed as familiar to the student and not reviewed. For the student interested in reviewing those topics, they are covered in Chapter 1 and Section 2.8 of the suggested reference.

Week	Section	Topics
1	4.1	Eigenvalues and Eigenvectors
	4.2	Diagonalization
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	5.1	Inner product spaces
3	5.2	Orthogonality. Orthogonal/normal bases.
	5.3	Projections and Gram-Schmidt process
4	5.4	Least squares
	5.5	The adjoint of a Linear Operator
5	5.6	Isometries: unitary and orthogonal matrices
	5.7	Rigid motions in $\mathbf{R}^n$
6		**Review**
		Midterm Test
7	6.1	Schur triangular representation
	6.2	Normal and Self-Adjoint Operators
8	6.3	Polar and singular values decompositions
	6.4	Applications of SVD
9	7.1	Bilinear and quadratic forms.
	7.2	Diagonalization of Quadratic Forms
10	7.4	Positive definite forms and Sylvester criterion
	9.1	The Cayley-Hamilton Theorem.
11	9.4	The Jordan Canonical Form I
	9.5	The Jordan Canonical Form II
12		**REVIEW**

Academic Integrity and the Academic Code of Conduct
This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: https://www.concordia.ca/conduct/academic-integrity.html" *[Undergraduate Calendar, Sec 17.10.2]*

Behaviour
All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

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