MATH 1107F, Linear Algebra I

Amir Nasr,
`amir.nasr@carleton.ca`

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1   Textbook

- Linear Algebra and its Applications, Sixth Edition, David C. Lay, Steven R. Lay, and Judi J. McDonald. Copies are available in the university bookstore.

2   Topics to be covered

Systems of linear equations; vector space of n-tuples, subspaces, bases; matrix transformations, kernel, range; matrix algebra and determinants. Dot product. Complex numbers (including De Moivre's theorem and n-th roots). Eigenvalues, diagonalization and applications.

3   Evaluation Scheme

- Ten online quizzes:...30%
- Two assignments: 20%
- One online midter exam: 20%
- One online final exam: 30%

Online quizzes: There will be ten 30-minute online quizzes happening every Mondays at 14:35 except Oct 12, Oct 26, and Nov 2.

Assignments: There will be two assignments. The first one given on Oct 2, **due:** Oct 9, 23:59. The second one given on Nov 27, **due:** Dec 4, 23:59.

Online midterm exam: There will be an 80-minute online midterm exam on Monday Nov 2 at 14:35.

Online final exam: There will be a 3-hour online final exam scheduled during the usual exam period. It is the responsibility of each student to be available at the time of the final examination.

4   Lectures, tutorials, and office hours

- Lectures: Lectures are scheduled to be on Mondays and Wednesdays 14:35-15:55. But all the lectures will be pre-recorded and available from 7 am till 23:59 each day. However, on Wednesdays at the time of the lecture there will be a live problem solving session.

- Tutorials: There will be live tutorial sessions on Mondays 13:35 - 14:25. They would also be problem solving sessions.

- Office hours: TBA

Pregnancy obligation

write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide.

Religious obligation

write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide

Academic Accommodations for Students with Disabilities:

The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test/exam requiring accommodation. After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exams.

5 Detailed Tentative Lecture Schedule

Week 1   Systems of Linear Equations

Week 2   Row Reduction and Echelon Forms Vector Equations, The Matrix Equation $Ax = b$

Week 3   Solution Sets of Linear Systems Linear Independence Introduction to Linear Transformations

Week 4   The Matrix of a Linear Transformation Applications of Linear Systems (if time permits)

Week 5   Matrix Operations, The Inverse of a Matrix Characterizations of Invertible Matrices

Week 6   Subspaces of R^n

Week 7   Dimension and Rank

Week 8   Fall Break

Week 9   Introduction to Determinants Properties of Determinants Cramer's Rule

Week 10   Eigenvectors and Eigenvalues The Characteristic Equation

Week 11   Diagonalization

Week 12   Complex Numbers

Week 13   Complex Eigenvalues Inner Product, Length and Orthogonality

Week 14   Orthogonal Sets (if time permits), Final Exam Review

The above class outline is subject to change depending on the progress of the course.
All the times given are in eastern time