COURSE DESCRIPTION
INTRO TO LINEAR ALGEBRA
MA 260-OU
SUMMER 2025

DEPARTMENT OF MATHEMATICS
UNIVERSITY OF ALABAMA AT BIRMINGHAM

Course Instructor: Professor Nikita Selinger
Office: UH 4016
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Office Hours: After class, drop-in, or email for appointment.

Course Info

Meeting times: TuTh, 8-10
Meeting location: UH 4002
Required Textbook: *Elementary Linear Algebra* 12th Edition by Howard Anton and Chris Rorres, Sections: 1.1-1.8, 2.1-2.3, 3.1-3.3, 4.1-4.6, 5.1-5.2, 7.1-7.2

Important Dates

First day of our class: June 3, 2025
Last day to drop without paying full tuition: June 9, 2025
Juneteenth Holiday: June 19, 2025
Independence Day Holiday: July 4, 2025
Last day of our class: August 7, 2025
Final Exam Date: Tuesday, August 12 8:00 AM – 10:30 AM

Course Policies

- Please make sure that you are able to receive e-mail through your Blazer-ID account.
- If your are contacted by the Early Alert Program, you should consider taking advantage of the services it offers.
- If you wish to request a disability accommodation please contact DSS at 934-4205 or at *dss@uab.edu*.

Course Description

linear systems, gaussian elimination, determinants, vector spaces, eigenvalues and eigenvectors, diagonalization, singular value decomposition, and applications in image compression, graph theory, population dynamics and computer graphics

Date: May 5, 2025.

Course Content

- Linear Equations: Gaussian Elimination
- Matrices: Matrix Operations and Properties, Invertible Matrices and Inverses
- Determinants: Cofactor Expansion, row Reduction, Cramer's Rule
- Euclidean Vector Spaces: Vectors, Norm, Dot Product and Distance, Orthogonality
- General Vector Space: Real Vector Spaces, Subspaces, Linear Independence, Basis, Dimension
- Eigenvalues and Eigenvectors
- Diagonalization: Symmetric Matrices, Orthogonal Diagonalization
- Selected Additional Topics: Singular Value Decomposition and Applications in Image Analysis, Graph Theory, Biology

Learning outcomes

By the end of the course, students will be able to:

- Solve a system of linear equations by Gaussian Elimination
- Perform various matrix operations and find inverses
- Compute determinants
- Understand Euclidean vector spaces
- Understand general vector spaces
- Compute eigenvalues and eigenvectors of a matrix
- Comptute, when exists, a diagonalization of a matrix

Class Management via Canvas

- Homework problems will be posted in canvas (`http://www.uab.edu/online/canvas`). Other class materials (class announcements, codes, grades and etc.) will be posted in canvas. Students should log in to canvas at least once a day!
- Homework assignments, projects and activities will only be collected on canvas.

Assessment Procedures

- Student achievement will be assessed by the following measures:
  - **Weekly class activity.** Class activity contributes 10% to the course average.
  - **Weekly homework.** Homework will be due weekly. There will be no extension of deadlines for any reason. Homework contributes 20% to the course average.
  - **Midterm exam.** There will be two midterm exam. Each midterm exam contributes 20% to the course average.
  - **Final exam.** The final exam contributes 30% to the course average.

  Grading Scheme: 30% class activity/hw, 40% midterm exams, 30% final exam

- Your final grade is determined according to the following table:

Course performance:	88-100	75-87	62-74	50-61	below 50
Final Grade:	A	B	C	D	F

Title IX Statement

The University of Alabama at Birmingham is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit (`https://www.uab.edu/titleix/`) for UAB's Title IX, UAB's Equal Opportunity, Anti-Harassment, Duty to Report, and Non-Retaliation policies.

Academic Honor Code

The University of Alabama at Birmingham expects all members of its academic community to function according to the highest ethical and professional standards. Academic misconduct undermines the purpose of education. Such behavior is a serious violation of the trust that must exist among faculty and students for a university to nurture intellectual growth and development. Academic dishonesty and misconduct includes, but is not limited to, acts of abetting, cheating, plagiarism, fabrication, and misrepresentation. Candidates are expected to honor the UAB Academic Honor Code as detailed in the most current UAB Student Catalog. Please consult this resource (`https://www.uab.edu/students/one-stop/policies/academic-honor-code`) for additional information regarding the specific procedures to be undertaken when a student violates the UAB Academic Honor Code.

Non-harassment, Hostile Work/Class Environment

The UAB College of Arts and Sciences expects students to treat fellow students, their Course Instructors, other UAB faculty, and staff as adults and with respect. No form of hostile environment or harassment will be tolerated by any student or employee.