

Linear Algebra

Mathematics 250 — Fall 2022

Prof. Weibel (640:250:05)

Contents: Vectors in n -space, systems of linear equations, Gaussian elimination, span and linear independence of a set of vectors, matrix algebra, determinants, subspaces of n -space, basis and dimension, eigenvalues and eigenvectors, diagonalization of a matrix, geometry of vectors, projections, orthogonal sets of vectors, symmetric matrices, and applications.

Prerequisites: Precalculus (Math 115 or 111-112) or placement into calculus.

Text: *Elementary Linear Algebra* (2nd ed.), by Spence, Insel and Friedberg, Prentice Hall, 2003 ISBN 978-0-13-187141-0.

- Lectures W2 (10:20-12:40 and F5 (3:50-5:10PM) in TIL 116)
- Weibel's [Office hours](#): Hill 218, Tuesday 1:40-3:00 PM; Friday 10:00-11:30 AM
- TA-at-large office hours: Thursday 1-3PM [on Zoom](#)

Tentative Course Syllabus

Week	Lecture dates	Sections	topics
1	9/7, 9 (WF)	Chapter 1	Matrices, Systems of linear equations
2	9/14 (T), 16 (F)	Chapter 1	Gauss elimination, Span of a set
3	9/21, 23	Chapter 1	Linear dependence, matrix multiplication
4	9/28, 30	Chapter 2	Invertibility, elementary matrices
5	10/5, 10/7	Chapter 2	Inverse of a matrix, Linear transformations
6	10/12, 10/14	Ch. 1—2	Review and Exam 1
7	10/19, 10/21	Chapter 3	Determinants and their properties
8	10/26, 10/28	Chapter 4	Subspaces and bases
9	11/2, 11/4	Chapter 5	Eigenvalues/eigenvectors
10	11/9, 11/11	Chapter 5	Characteristic polynomial, diagonalizability
11	11/16, 11/18	Catch up and Review	Chapter 5
12	11/23 (Wed)	Exam 2	Ch. 3—5
13	11/30, 12/2	Chapter 6	Vectors and Geometry, Gram-Schmidt
14	12/7, 12/9	Chapter 6	Projections and Least Squares
15	12/14 (W)	Catch up and Review	Ch. 1—6
16	December 20 (Tuesday)	8-11 AM	Final Exam in TILLET 257

Homework Assignments

HW Due	HW Problems (due Wednesdays)
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Sept. 16	1.1 #3,9,17,25,75; 1.2 #9,29,39, 75
Sept. 23	1.3 #3,45,46; 1.4 #5,6,12,36,44
Sept. 30	1.6 #14,22,26; 1.7 #16,24,33,64; 2.1 #6,8,10,12
Oct. 7	2.3 #4,6,18,22; 2.4 #6,10,22,28; 2.5 #6,14
Oct. 14	Midterm Exam 1
Oct. 21	3.1 #5,13,17,19,25,29
Oct. 28	3.2 #3,12,29; 4.1 #12,20,31
Nov. 4	4.2 #4,19; 4.3 #9,33 ; 5.1 #7,17,34
Nov. 11	5.2 #7,14,29,39; 5.3 #2,11,16,21;
Nov. 18	5.3 #3,7,14; 5.4 #23,24
Dec. 2	6.1 #4,21; 6.2 #4,13,14,22; 6.3 #5,13
Dec. 7	6.5 #2,6,10,14,24,37,39

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Course grade: 2 Midterms (20% each); Final Exam (40%); HW (10%); Quizzes (10%).

Self-Reporting Absence Website: Students are expected to attend all classes; if you expect to miss one or two classes, please use the University's [absence reporting website](#) to indicate the date and reason for your absence. An email is automatically sent to me.

Academic integrity policy: All students in the course are expected to be familiar with and abide by the [academic integrity policy](#). Violations of the policy are taken very seriously.

Disabilities policy: Rutgers is fully committed to compliance with the Americans with Disabilities Act; see [policies and procedures](#).

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The following language is required by SAS to appear on all syllabi:

Student-Wellness Services:

Counseling, ADAP & Psychiatric Services (CAPS) (848) 932-7884

17 Senior Street, New Brunswick, NJ 08901/ <http://health.rutgers.edu/medical-counseling-services/counseling/> CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA) (848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/ The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services (848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/> Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

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