

Math 314, Matrix Theory, Course Syllabus, Fall 2016

Textbook: *Linear Algebra and Its Applications*, by David C. Lay, S. R. Lay, J. J. McDonald, 5th Ed.

The following table shows the material expected to be covered and the corresponding tentative problem assignments for each week of the semester. Note that what is shown here is approximate; please be alert for changes throughout the semester.

Week of	Section	Recommended Exercises
August 22	1.1 Systems of Linear Equations	1, 3, 5, 9, 10, 11, 15, 18, 19, 20, 23, 24, 25, 31
	1.2 Row Reduction and Echelon Forms	1, 3, 7, 11, 13, 15, 17, 19, 21, 22, 23, 24, 25, 26
	1.3 Vector Equations	1, 3, 5, 7, 9, 11, 13, 14, 15, 17, 18, 19, 23, 24, 25, 28
August 29	1.4 The Matrix Equation $A\mathbf{x} = \mathbf{b}$	1, 3, 7, 9, 11, 13, 14, 15, 17–24
	1.5 Solution Sets of Linear Systems	2, 5, 6, 7, 8, 9, 11, 12, 13, 15, 16, 20, 23, 24, 25, 40
	1.6 Applications	3(a,b), 7, 14
	<i>Friday, September 2 is the last day to file a drop to remove course from student's record</i>	
September 5	<i>September 5 is Labor day, student and staff holiday</i>	
	1.7 Linear Independence	1, 3, 5, 7, 8, 9, 13, 14, 15, 17, 19, 21, 22, 23, 24, 28, 30
	1.8 Introduction to Linear Transformations	1, 2, 3, 5, 7, 9, 11, 13–16, 19, 21, 22, 32, 33, 34
September 12	1.9 The Matrix of a Linear Transformation	1, 5, 7, 8, 13, 15, 17, 22–25, 38
	2.1 Matrix Operations	1, 3, 5, 7–11, 15, 16, 19, 22, 24
	2.2 The Inverse of a Matrix	1, 3, 5, 7, 8, 9, 10, 13, 20, 21, 23, 24, 29, 31, 32, 33
September 19	2.3 Characterization of Invertible Matrices	1–7(odd), 11, 12, 13, 16, 17, 19, 22, 33, 37
	2.5 Matrix Factorizations	3, 5, 9, 11, 19
	Catch Up and Review	
September 26	Midterm Exam I is Monday, September 26	
	3.1 Introduction to Determinants	1–13 (odd), 39, 40
	3.2 Properties of Determinants	1–8, 11, 15, 18, 19, 25, 27, 28, 31
October 3	4.1 Vector Spaces and Subspaces	1–15, 17, 19, 20, 21, 23, 24, 25, 27
	4.2 Null Spaces, Column spaces	1, 2, 3, 5, 7, 11, 12, 15, 17, 19, 20, 21, 25–28, 30, 35
	4.3 Linearly Independent Sets; Bases	1–19 (odd), 21–25, 31, 32
October 10	4.5 The Dimension of a Vector Space	1–5, 7–17 (odd), 19, 20, 21, 29, 30, 31
	4.6 Rank	1, 3, 4, 5–15 (odd), 17, 18, 19, 21, 25, 27–29
	4.7 Change of Basis	1–9 (odd), 11, 12, 13, 15
	<i>Friday, October 14 is the last day to change to P/NP</i>	
October 17	<i>October 17–18 is Fall Break</i>	
	4.9 Applications	1, 3, 5, 9, 11
	Catch Up and Review	
October 24	5.1 Eigenvectors and Eigenvalues	1–15 (odd), 19, 21, 22, 23, 24, 25, 27, 31, 33
	5.2 The Characteristic Equation	1, 3, 7, 9, 11, 13, 17, 21, 22, 23, 24
	5.3 Diagonalization	1, 3, 5, 7, 11, 15, 16, 19, 21, 22, 23, 24, 25, 27, 29
October 31	5.4 Eigenvectors and Linear Transformations	1, 3, 5, 8, 9, 11, 13, 19, 23, 27
	5.5 Complex Eigenvalues	1, 5, 9, 13, 16
	Catch Up and Review	
November 7	Midterm Exam II is Monday, November 7	
	6.1 Inner Product, Length and Orthogonality	1–19 (odd), 20, 25–31
	6.2 Orthogonal Sets	1, 5, 9, 11, 13, 15, 17, 23, 24, 27–29
	<i>Friday, November 11 is the last day to withdraw from one or more courses</i>	
November 14	6.3 Orthogonal Projections	1, 5, 7, 9, 11, 13, 15, 17, 21, 22, 23, 24
	6.6 Applications	1, 3, 7a, 9
	6.4 The Gram-Schmidt Process	1, 5, 9, 11, 15, 17, 18, 19, 22
November 21	6.5 Least-Squares Problems	1, 3, 5, 7, 11, 15, 17, 18, 19, 21
	Thanksgiving vacation is November 23–November 27	
November 28	7.1 Diagonalization of Symmetric Matrices	1–19 (odd), 23, 25, 26, 28, 29, 36
	7.2 Quadratic Forms	1–13 (odd), 21, 22, 23, 24
	7.4 Singular Value Decomposition	1, 3, 5, 7, 9, 11, 12, 13, 17, 18, 23
December 5	Catch Up and Review for Final Exam	
December 12	The Final Exam is 7:30–9:30 am Monday, Dec 12	

Ace Outcome 3: This course satisfies ACE Outcome 3: “Use mathematical, computational, statistical, or formal reasoning (including reasoning based on principles of logic) to solve problems, draw inferences, and determine reasonableness.” Your instructor will provide examples, you will discuss them in class, and you will practice with numerous homework problems. The exams will test how well you’ve mastered the material. The final exam will be the primary means of assessing your achievement of ACE Outcome 3.

ADA Notice: Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office [www.unl.edu], 132 Canfield Administration, 472-3787 voice or TTY.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Blackboard account during the last two weeks of class. You’ll get an email when the form becomes available. Evaluations are anonymous and instructors do not see any of the responses until after final grades have been submitted. Evaluations are important—the department uses evaluations to improve instruction. Please complete the evaluation and take the time to do so thoughtfully.

Departmental Grading Appeals Policy: Students who believe their academic evaluation has been prejudiced or capricious have recourse for appeals to (in order) the instructor, the departmental chair, the departmental appeals committee, and the college appeals committee.

You are not allowed to have on your person during exams any device that can access the internet or communicate in any way. Cellphones, Apple watches, etc. should be put away in backpacks/purses.