# Math 314, Linear Algebra, Course Syllabus, Spring 2018

**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 |
|---|---|---|
| January 8 | 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, 4, 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 |
| January 15 | *January 15 is Martin Luther King Day* | |
| | 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, 9, 11, 12, 13, 15, 16, 20, 23, 24, 25, 40 |
| | *Friday, January 19 is the last day to file a drop to remove course from student's record* | |
| January 22 | 1.6 Applications | 3(a,b), 7, 14 |
| | 1.7 Linear Independence | 1, 3, 5, 7, 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, 37 |
| January 29 | 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 |
| February 5 | 2.3 Characterization of Invertible Matrices | 1–7(odd), 11, 12, 13, 16, 17, 19, 22, 33, 37 |
| | 2.5 Matrix Fractorizations | 3, 5, 9, 11, 19 |
| | Catch Up and Review | |
| February 12 | **Midterm Exam I is Monday, February 12** | |
| | 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 |
| February 19 | 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, 37 |
| | 4.3 Linearly Independent Sets; Bases | 1–19 (odd), 21–25, 31, 32 |
| February 26 | 4.4 Coordinate Systems | 1, 3, 5, 7, 8, 11, 13, 15, 16, 27, 28, 29 |
| | 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 |
| | *Friday, March 2 is the last day to change to P/NP* | |
| March 5 | 4.7 Change of Basis | 1–9 (odd), 11, 12, 13, 15 |
| | 4.9 Applications | 1, 3, 5, 9, 11 |
| | 5.1 Eigenvectors and Eigenvalues | 1–15 (odd), 19, 21, 22, 23, 24, 25, 27, 31, 33 |
| March 12 | 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 |
| | 5.4 Eigenvectors and Linear Transformations | 1, 3, 5, 8, 9, 11, 13, 19, 23, 27 |
| March 19 | *Spring Break is March 17-25* | |
| March 26 | 5.5 Complex Eigenvalues | 1, 5, 9, 13, 16 |
| | Catch Up and Review | |
| | **Midterm Exam II is Friday, March 30** | |
| April 2 | 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 |
| | 6.3 Orthogonal Projections | 1, 5, 7, 9, 11, 13, 15, 21, 22, 23, 24 |
| | *Friday, April 6 is the last day to withdraw from one or more courses* | |
| April 9 | 6.4 The Gram-Schmidt Process | 1, 5, 9, 11, 15, 17, 18, 19, 22 |
| | 6.5 Least-Squares Problems | 1, 3, 5, 7, 11, 15, 17, 18, 19, 21 |
| | 7.1 Diagonalization of Symmetric Matrices | 1–19 (odd), 23, 25, 26, 28, 29, 36 |
| April 16 | 7.4 Singular Value Decomposition | 1, 3, 5, 7, 9, 11 |
| | 7.4 Singular Value Decomposition | 12, 13, 17, 18, 23 |
| | Catch Up and Review | |
| April 23 | Dead Week: Catch Up and Review for Final Exam | |
| April 30 | Final Exam Week | |
| | **The Final Exam: 10:00 am – 12:00 pm, Thursday, May 3** | |

**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.**