Math 314 Linear Algebra
Course Syllabus, Spring 2024

Classroom: We will meet in Burnett 102 from 12:30PM-1:45PM every Tuesday and Thursday.

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

Grade Breakdown : Assignments 30%, 1st Midterm 20 %, 2nd Midterm 20%, and the final 30%

Office hours : Avery 336, 1:00PM–2:00PM on Mondays and Fridays and 2:00PM-3:00PM on Wednesday

The following is a tentative schedule. Please note that this is subject to change!

Week of	Section	Recommended Exercises
January 23	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
January 30	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
	1.6 Applications	3(a,b), 7, 14
	Friday, February 2nd is the last day to file a drop to remove course from student's record	
February 6	1.7 Linear Independence	1, 3, 5, 7, 9, 13, 14, 15, 17, 19, 21, 22, 23, 24, 28, 30
	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, 33
February 13	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
	1.8 Introduction to Linear Transformations	1, 2, 3, 5, 7, 9, 11, 13–16, 19, 21, 22, 32, 33, 34
February 20	1.9 The Matrix of a Linear Transformation	1, 5, 7, 8, 13, 15, 17, 22–25, 38
	Catch Up and Review	
	Midterm Exam I	
February 27	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
	4.1 Vector Spaces and Subspaces	1–15, 17, 19, 21, 23, 24, 25, 27
March 5	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
	4.4 Coordinate Systems	1, 3, 5, 7, 8, 11, 13, 15, 16, 27, 28, 29
March 12	**Spring Break**	
March 19	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
	Friday, March 22 is the last day to change to P/NP	
March 26	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
	5.2 The Characteristic Equation	1, 3, 7, 9, 11, 13, 17, 21, 22, 23, 24
April 2	5.3 Diagonalization	1, 3, 5, 7, 11, 15, 19, 21, 22, 23, 24, 25, 27, 29
	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
April 9	Catch Up and Review	
	Midterm Exam II	
	6.1 Inner Product, Length and Orthogonality	1–19 (odd), 20, 25–31
April 16	6.2 Orthogonal Sets	1, 5, 9, 11, 13, 15, 17, 23, 24, 27–29
	6.3 Orthogonal Projections	1, 5, 7, 11, 13, 15, 21, 22, 23, 24
	6.4 The Gram-Schmidt Process	1, 5, 11, 15, 17, 18, 19, 22
	Friday, April 19 is the last day to withdraw from one or more courses	
April 23	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
	7.2 Quadratic Forms	1–13 (odd), 21, 22, 23, 24
April 30	7.4 Singular Value Decomposition	1,3,5,7,9,11,12,13,17,18, 23
	Catch Up and Review	
May 7	Dead Week: Catch Up and Review for Final Exam	
May 17	Final Exam from 10:00AM-12:00PM in Burnett 102	
	The Final Exam schedule can be found in `https://registrar.unl.edu/academic-calendar/final-exam/`	

Assignments: Assignments are 30% of your grade and will consist of two main components, which are Homework and In-class worksheets. More infomration on both can be found below.

Homework: The homework in this class will be due, roughly, every week. Please submit your work to me on canvas as a PDF. You may type your homework up using LaTeX (for more info on this, feel free to ask me) or you may nicely write up your work; either is acceptable, but you must submit a PDF in canvas. Homework will be difficult, so I encourage you to start all your assignments as soon as possible. You are, also, encouraged to utilize office hours and to collaborate with your classmates. That being said, every student must submit their own write-up.

In-class worksheets: Occasionally there will be an in-class worksheet in place of a lecture. You will be expected to collaborate with your class mates on the worksheets. Despite being called an in-class worksheet, their due dates will be later than the day they are assigned.

Late Work Policy: In general late work is not accepted. However, if an unusual circumstance arises that inhibits you from completing an assignment in time, please send me an email as soon as possible and we can discuss options.

Midterms: There will be two midterms. There are tentative dates for both midterms in teh above calender; however, the dates may change. I will provide a reasonable notice for when the midterms will occur. Both midterms are worth 20%; they will be closed book and closed notes.

Final Exam: The final exam is worth 30% of your grade. It will also be cumulative, closed book and closed notes. It will be held: Friday, May 17th from 10AM-12:00PM in our classroom.

Participation: Your physical and mental presence in class are important for your success in the course. You are expected to attend each class period as your health permits and actively participate during class. You are also strongly encouraged to ask questions as they come. Please do not hesitate to do so!

Attendance: It is important that you attend class. Mathematics can be a difficult subject, so it is in your best interest to attend class. However, I realize that there may be external circumstances preventing you from attending class. These include but certainly are not limited to illness and mental health issues. *If anything arises that prevents you to coming to class, please email me right away, so that I can help in any way that I can.*

Finding extra help: Getting stuck is part of learning mathematics. How can you get past this? Here are some options:

- Take a break! Put the problem away for awhile and do something else. Then come back to it later.

- Phone a friend. Reach out to a classmate or two and discuss the problem with them.

- Look at our textbook or the online lecture notes; they are here for you to use.

- **Meet with me during office hours or if my office light is on!** If the time for the office hours don't work for you, let me know and we can make an appointment.

Preparing for exams: Since exam scores are worth 70% of your grade, I want to help you do your best. Here are some useful things to keep in mind when it comes to studying for our exams.

- Homeworks: Our homeworks will provide an excellent review of the material that will be on exams.

- In-class assignments

- Study groups.

- In-class reviews. During each test week, prior to the exam, one class period will be spent reviewing material to help you get ready and answer any lingering questions.

Instructional Continuity Plan (in case of inclement weather): If in-person classes are canceled, you will be notified of the instructional continuity plan for this class by blackemail via Canvas as an announcement as well as to your husker email. To view UNL's full policy visit https://bf.unl.edu/policies/inclement-weatherpolicy-statement.

Study Spaces: Study spaces on campus are available for students to attend Zoom classes, access remote course materials, and collaborate on small group projects while staying safe and physically distant. Students can drop into areas listed at https://go.unl.edu/study on a first-come-first-served basis. In addition, the University Library has study spaces

listed on its website and the university has a WiFi outdoor map for students who want to study outside.

Diversity and Inclusion: The University of Nebraska-Lincoln does not discriminate on the basis of race, ethnicity, color, national origin, sex (including pregnancy), religion, age, disability, sexual orientation, gender identity, genetic information, veteran status, marital status, and/or political affiliation. Students from all diverse backgrounds are welcome and appreciated in this class. The variety of perspectives and experiences diverse groups bring to the course are a resource from which we all can learn. Please let me know if there are ways I can improve your learning experience or the experience of other individuals or groups.

Academic Honesty: Your homework and papers must be entirely your own written work unless otherwise directed. Brief quotations or researched facts must properly attributed to their source. You may also be permitted to discuss an assignment with classmates, provided you note the names of anyone you talked with at the end of the paper. Anything less counts as plagiarism. A first instance of plagiarism will result in a 0 for the assignment and a note in your university record. Any subsequent incidents will result in a reduction of one letter grade for the course. Please ask or review the university's Student Code of Conduct if you have questions about what constitutes academic dishonesty. You have the right to appeal any decision.

Department Grading Appeals Policy: The Department of Mathematics does not tolerate discrimination or harassment on the basis of race, gender, religion or sexual orientation. If you believe you have been subject to such discrimination or harassment in this or any math course, please contact the department office. If, for this or any other reason, you believe that your grade was assigned incorrectly or capriciously, appeals should be made to (in order) the instructor, the department chair, the departmental grading appeals committee, and the college grading appeals committee.

Course Evaluation: The Department of Mathematics Course Evaluation Form will be available through your Canvas account during the last two weeks of class. You will 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.

University-Wide Syllabus Statements: The following link redirects to university-wide course policies and resources: https://executivevc.unl.edu/academic-excellence/teaching-resources/course-policies

This page includes statements on...

- Attendance Policy

- Academic Honesty Policy

- Services for Students with Disabilities

- Mental Health and Well-Being Resources

- Final Exam Schedule (15th Week Policy)

- Emergency Procedures (On Campus)

- Diversity & Inclusiveness

- Title IX Policy