

Introduction to Linear Algebra

Class #: 3000

Class Schedule: MW 4:00pm—5:15 pm

Room: NS 212E

Instructor: Dr. Jiaxu Li

Office: NS 224

Office Hours: 2:30–4:00pm MW or by appointment

Office Phone: 502-852-6828

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Required Textbook: *Linear Algebra and Its Applications*, 4th ed., by David C. Lay

Prerequisites: Thorough knowledge of College Algebra, in particular solving systems of linear equations and differential and integral Calculus of functions of one variable.

Course Content: This course covers matrix algebra, systems of equations, linear independence, vector spaces, linear transformations, eigenvalues and eigenvectors, and orthogonality, which include the following sections
1.1–1.8, 2.1–2.3, 3.1–3.2, 4.1–4.7, 5.1–5.5, 6.1–6.7, and if time allowed 4.8, 5.6, 5.7 or 6.8

Learning Outcomes: Students who complete this course will be expected to master:

1. the concepts of linear algebra;
2. the skills in critical thinking and writing proofs; and
3. skills in solving problems geometrically, numerically and algebraically.

Learning outcomes will be assessed through quizzes and exams.

Student Responsibilities: Students are expected to read the material before classes, attend each class, participate in discussions, work on problems (on board when asked), review the materials after classes, do exercises, hand in things on time, comply with Codes of Student Conduct, Rights and Responsibilities, do not cheat, and ultimately learn something. Attendance may be randomly recorded and be reflected in your final grades, which is subject to the instructor. In case of absence, let me know as soon as possible by email or phone, and you are responsible for any announcements made in class and catching up the course schedule. If a make-up is permitted, it will need to be taken in the Testing Center at the student's expense. Late work will NOT be accepted. Let me know as soon as possible if you have special requirements based on assessment from the Disability Resource Center or due to Athletic Events. In class meetings students are expected to turn off all of their electronic devices except simple calculators.

Calculators: You may not use graphing calculators on quizzes or exams. The use of non-graphing scientific calculators will vary between quizzes and exams. Calculator policies will be announced on a case-by-case basis. Cell phones may not be used as calculators under any circumstances.

Homework: A list of recommended exercises will be assigned after each class. It is very important to complete the exercises for each section as soon as possible after the section has been covered in class so that you do not fall behind. Homework assignments will be collected biweekly and selectively graded. Make sure your writing legible and neat otherwise will be graded as zero. Late homework will not be accepted.

Quizzes: There could be short quizzes in class occasionally without announcement. The quizzes will be similar to the recommended exercises so it is important to have each week's assignment completed before next class. Missed quiz will not be allowed to make up.

Grades: There is a total of 500 points available. The point values of the quizzes and exams are given as follows:

Homework and Quizzes	=	100 points
Four Exams at 100pt/ea	=	400 points

Your final grade will be assigned according to the following standard scale:

A: 90% or better; B: 80% or better; C: 70% or better; D: 60% or better; F: < 60%

Do not assume any curving on the final grades. Your class attendance and performance might be used to curve your total average, which is completely determined by the instructor.

Important Dates:

Classes start	Jan. 9 (Mon)
Last day of registration	Jan. 9 (Mon)
Last day to drop/add	Jan. 13 (Fri)
Martin Luther King holiday	Jan. 16 (Mon)
Last day to withdraw	Mar. 9 (Th)
Spring break	March 13-19 (Mon–Sun)
Last day of classes	April 24 (Mon)
Reading day	April 25 (Tue)

Make-up work: Make-up exams will be given only in the case of a pre-arranged medical procedure, university sanctioned event, or clearly documented emergency. If you know in advance that you must miss an exam, please let me know right away. In case of an emergency, please make every reasonable effort to notify me within 24 hours. Exams may not be taken early. All make-ups must be scheduled through University Testing Services (852-6606). Missed quiz will not be allowed to make up.

Students with disabilities: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact the Disability Resource Center (852-6938).

Schedule: The following schedule is a tentative guideline for the pace of this class.

Weeks 1 – 4	Chapter 1, 2, 3, Exam 1 (Feb. 1)
Weeks 4 – 9	Chapter 3, 4, 5, Exam 2 (Mar. 1)
Weeks 9 – 13	Chapter 5, 6, Exam 3 (March 29)
Weeks 13 – 16	Chapter 6, Review, Exam 4 (April 24)

Title IX/Clery Act Notification Sexual misconduct (including sexual harassment, sexual assault, and any other nonconsensual behavior of a sexual nature) and sex discrimination violate University policies. Students experiencing such behavior may obtain **confidential** support from the PEACC Program (852-2663), Counseling Center (852-6585), and Campus Health Services (852-6479). To report sexual misconduct or sex discrimination, contact the Dean of Students (852-5787) or University of Louisville Police (852-6111).

Disclosure to **University faculty or instructors** of sexual misconduct, domestic violence, dating violence, or sex discrimination occurring on campus, in a University-sponsored program, or involving a campus visitor or University student or employee (whether current or former) is **not confidential** under Title IX. Faculty and instructors must forward such reports, including names and circumstances, to the University's Title IX officer.

Note: Out of consideration for the instructor and your fellow students, please **turn off** all cell phones and pagers when you come to class. Should such a device interrupt the class, the instructor reserves the right to ask you to leave the class. For the same reasons, do **NOT** bring food or drink into the classroom; again you may be asked to leave the class.

Standard Disclaimer: All content in this syllabus is subject to change. Occasionally circumstances outside anyone's control (earthquakes, windstorms, ice storms, floods, etc.) will necessitate class cancellations and changes to the syllabus. Any revisions to the syllabus will be announced in class and/or all changes will be posted on Blackboard.

Recommended Exercises:

All Practice Problems in each section are HW problems and should be done before following problems.

* - optional

^ - challenging

Section 1.1	1-10 odd, 13, 14, 15, 17, 18, 19, 21, 23, 24, 26, 29, 31
Section 1.2	1-13 odd, 17-22, 23-31
Section 1.3	3, 5, 6, 7, 9-21, 22^, 24, 27, 32^
Section 1.4	2, 4, 5, 7, 9, 10, 11, 13, 14, 15, 16, 17-20, 21, 23, 24, 25, 26, 27, 29-36
Section 1.5	5-11 odd, 13, 14, 15, 17, 18, 19-23 odd, 24, 25, 26, 27, 35-36 (do not use paper and pencil), 37-40.
Section 1.6	1, 2, 7, 13
Section 1.7	(Practice Problems 3^) 1, 5, 8, 9, 11, 12, 15-20, 21-30, 31-32, 33-38, 39^, 40^
Section 1.8	2,3,6,7,8,10,12,13-16,17,18,19,20,21,22,23,24^,25, 30,31,32-36.
Section 1.9	(added) 1, 2, 5, 10, 13, 15, 17, 19, 21, 23-24, 25, 27, 29-30, 35
Section 2.1	1, 4, 6, 7, 8, 9, 10 , 12, 13, 15-16, 17-26, 27, 28 , 29^-30^, 31, 32, 33*, 34*
Section 2.2	1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13-, 22, 23 , 24 , 27, 29-32, 35
Section 2.3	1-8, 11-12, 13 , 14 , 15-28
Section 3.1	1-14 odd, 15-18, 19, 22, 24, 25-30, 31-32, 33-36, 37-38, 39-40, 41-42
Section 3.2	1-4, 5-10 odd, 11, 13, 15-20 even, 21-23, 24, 26, 27-28, 29, 30, 31-36, 37-43, 44*
Section 4.1	1-4, 9, 11, 12, 13-14, 15, 17, 20^, 21, 23-24, 25-29 , 31, 32
Section 4.2	1,2,3,5,7-13 odd,15,16,17,19,21,23,25-26, 27, 28, 34, 35
Section 4.3	1-5 odd, 9-19 odd, 21-24, 26, 29-32
Section 4.4	1-8 odd, 9-10, 11, 13, 14, 15-16, 17-22, 27, 29, 31
Section 4.5	1, 3, 11, 13, 15-17, 19-20, 21, 25-27, 29-30, 31-32
Section 4.6	1, 2, 5-16, 17-18, 19-25 odd, 27-36
Section 4.7	To be determined
Section 5.1	1-8 odd, 9-16 odd, 17-20, 21-22, 23-30, 35-36
Section 5.2	1-17 odd, 19-20, 21-22, 23-24, 26
Section 5.3	1, 3-6, 7-20 odd, 21-22, 23-32 odd
Section 5.4	To be determined
Section 5.5	To be determined
Section 6.1	1-18 odd, 19-20, 21-25, 27, 29, 30, 31
Section 6.2	1-10 odd, 11-12, 13, 15, 17-22 odd, 23-24, 25, 26, 27, 29, 31, 33
Section 6.3	To be determined
Section 6.4	To be determined
Section 6.5	To be determined
Section 6.6	To be determined