

Linear Algebra MATH 3328.02 Fall 2017

Instructor: Ryan Aguirre

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Class Meetings: Lucas 114: Mon/Wed/Fri 11:30 am - 12:25 pm.

Office Hours: I will be available at my office (Lucas 111) 12:30 - 2:00 pm on Mon/Wed. You do not need an appointment to attend. If you cannot meet with me during these times, please speak with me or e-mail to make an appointment.

Textbook: Elementary Linear Algebra with Applications, Hill, 3rd ed.

Prerequisites: Grade of C or better in MATH 2413 or its equivalent.

Catalog Description: A first course in linear algebra, including vector and matrix arithmetic, solutions of linear systems and eigenvalue-eigenvector problem, elementary vector spaces, and linear transformation theory.

MATH3328 Learning Outcomes: Upon completion of this course, students will:

- (1) Solve systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion;
- (2) Carry out matrix operations, including inverses and determinants;
- (3) Demonstrate understanding of the concepts of vector space and subspace;
- (4) Demonstrate understanding of linear independence, span, and basis;
- (5) Determine eigenvalues and eigenvectors and solve problems involving eigenvalues;
- (6) Apply principles of matrix algebra to linear transformations;
- (7) Demonstrate application of inner products and associated norms;
- (8) Find the LU decomposition of a matrix and use this decomposition to solve a linear system;
- (9) Find the column space, row space, or null space of a matrix;
- (10) Determine the coordinates of a vector with respect to an ordered basis and find a change of basis matrix from one basis to another;
- (11) Use the least square method to find the closest solution to an inconsistent system;
- (12) Use the Gram-Schmidt process to find an orthogonal or orthonormal basis for a vector space.

Course Overview: In this course, I will introduce various topics of study, and we will discuss them. Then, you will explore them and practice working with them in more depth in assignments outside of class. Each class meeting we will cover one or more topics from the text accompanied by example problems. It is recommended that all students review the material covered each day before the next class meeting as many topics build on previously encountered material.

You will have exams in class over the course of the semester and a comprehensive **final exam Monday, December 11, 11:30 am - 12:25 pm**. Since the final is comprehensive, it will also be used to replace your lowest in-class exam grade (if you have not missed any). You will not be penalized if your score on the final is lower than each of your in-class exams; the final only counts twice if this is to your benefit.

Grading Policy: Students with an average of 90% or greater will be awarded an A, 80% for a B, 70% for a C, 60% for a D, and an F for those with averages less than 60%. All assignments are due at the time class is designated to begin on the due date. No points will be earned for late work. Grades will be calculated in the following manner.

- Assignments/Quizzes/Attendance/Projects/Other (20%)
- In-class exams (60% distributed equally)
- Final Exam (20%)

Attendance: All students are expected to attend each class meeting. If you must miss a class for any reason, you are responsible for any material discussed during that session. **No make-up exams** will be given unless there are extraordinary circumstances, as the final gives students the opportunity to be tested on the material and replace a missed exam. If, for some reason, you miss multiple exams, a make-up will only be given in the event that each absence is determined to be excusable. It is essential that you notify me in advance if you must miss an exam, *especially* if you have already missed one previously. Failure to do so will result in a score of 0 for the exam.

Other: You do not need to ask permission to leave class for personal reasons, just do your best to avoid causing any disruption on your way out. **No computers, cell phones, or calculators are permitted** unless otherwise indicated; furthermore, use during quizzes or exams constitutes academic dishonesty unless otherwise specified. If there is an exam being administered, no student may begin testing after another student has turned in the exam, and you must turn in your exam before leaving or you will receive a score of 0.

Changes: While I have made sincere efforts to ensure that this syllabus is correct, changes may be required. Any substantive changes will be announced during a regularly scheduled class. If you find an error or omission, please advise me at once so that the other members of the class may be notified.

Students with Disability Policy: Lamar University is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is located in the Communications building, room 105. Office staff collaborate with students who have disabilities to provide and/or arrange reasonable accommodations.

- If you have, or think you may have a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact the DRC at 409-880-8347 or drc@lamar.edu to arrange a confidential appointment with the Director of the DRC to explore possible options regarding equitable access and reasonable accommodations.
- If you are registered with DRC and have a current letter requesting reasonable accommodations, we encourage you to contact your instructor early in the semester to review how the accommodations will be applied in the course.

Emergency Procedures: Many types of emergencies can occur on campus; instructions for severe weather or violence/active shooter, fire, or chemical release can be found at:

<http://www.lamar.edu/about-lu/administration/risk-management/index.html>

Following are procedures for the first two:

Severe Weather:

- Follow the directions of the instructor or emergency personnel.
- Seek shelter in an interior room or hallway on the lowest floor, putting as many walls as possible between you and the outside.
- If you are in a multi-story building, and you cannot get to the lowest floor, pick a hallway in the center of the building.
- Stay in the center of the room, away from exterior walls, windows, and doors.

Violence/Active Shooter(CADD):

- **CALL** - 8-3-1-1 from a campus phone (880-8311 from a cell phone). Note: Calling 9-1-1 from either a campus phone or cell phone will contact Beaumont City Police Dispatch rather than University Police.
- **AVOID** - If possible, self-evacuate to a safe area outside the building. Follow directions of police officers.
- **DENY** - Barricade the door with desks, chairs, bookcases or any other items. Move to a place inside the room where you are not visible. Turn off the lights and remain quiet. Remain there until told by police it is safe.
- **DEFEND** - Use chairs, desks, cell phones or whatever is immediately available to distract and/or defend yourself and others from attack.

Academic Continuity: In the event of an announced campus closure in excess of four days due to a hurricane or other disaster, students are expected to login to Lamar University's homepage (www.Lamar.edu) for instructions about continuing courses remotely.

Lamar University expressly prohibits intimidation and harassment of students, faculty, staff, or applicants. <http://students.lamar.edu/academic-support/code-of-conduct.html>

Drop Policy: Please make note of the three dates indicated in this drop policy. Any drop will be your responsibility; I will not drop a student from the course.

September 13, 2017: (Census Date-Six Drop Rule does not apply) A student may drop or withdraw without consulting with the instructor. The Six Drop Rule does not apply to a drop before 5:00 pm.

September 29, 2017: (Six Drop Rule applies) A student may drop or withdraw from the course without academic penalty and receive a Q, however, the Six Drop Rule applies. The student will consult with the instructor and the Records Office to initiate a drop.

November 3, 2017: (Six Drop Rule applies) Last day to drop or withdraw with academic penalty; the student must be passing the course at the time of the requested drop in order to receive a Q. The drop form, including all required signatures, must arrive in the Records Office by no later than 4:00 pm. No drop is allowed after this date except in extreme extenuating circumstances. Any "late drop" must be approved by the instructor, department chair, college dean, and provost.

Academic Integrity: Students are expected to maintain complete honesty and integrity in their academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. Students are specifically warned against all forms of cheating and plagiarism. The Lamar University Student Handbook clearly reads: Any student found guilty of academic dishonesty in any phase of academic work will be subjected to disciplinary action. Punishable offenses include, but are not limited to, cheating on an examination or academic work which is to be submitted, plagiarism, collusion, and the abuse of source materials. One aspect of the Handbooks definition of cheating includes purchasing or otherwise acquiring and submitting as ones own work any research paper or other writing assignment prepared by an individual or firm. Plagiarism is defined as the appropriation and the unacknowledged incorporation of anothers work or ideas into ones own and submitted for credit. Faculty members in the College of arts and Sciences investigate all cases of suspected plagiarism. Any student who is found cheating in this course will receive a course grade of F. <http://students.lamar.edu/student-handbook.html>

Incomplete Grades: The grade of "I" may be given when any requirement of the course, including the final examination, is not completed. Arrangements to complete deficiencies in a course should be made with the instructor prior to the end of the semester or term. Incomplete work must be finished during the next long semester or the Records Office will change the "I" to the grade of "F." While the extension may be granted by the instructor with the approval of his/her Department Chair and Academic Dean, once the "I" is changed to an "F" it cannot be changed back to an "I." In this case, either a "change of grade" procedure must be initiated or the course must then be repeated if credit is desired. The instructor may record the grade of "F" for a student who is absent from the final examinations and is not passing the course.

Course Evaluations: You will have an opportunity to evaluate all aspects of this course in a formal process to be completed online near the end of the term. You will receive an email reminder through your LU account.