Lamar University

Department of Mathematics

MATH 3328-03 Linear Algebra
Spring 2015 Syllabus
TR 09:35-10:55, Lucas 118, 3 credits

Instructor:	Dr. Mohsen Maesumi
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Contact:	maesumi@gmail.com, 409-880-8766
Office Hours:	TR 11:00-12:00 MWF 12:30-1:30 Other times available by appointment.
Text:	Elementary Linear Algebra, Richard Hill, 3ed, ISBN 0030103479, optional.
Prerequisites:	Grade of C or better in Calculus I Math 2413 or its equivalent.

Catalog Description: A first course in linear algebra, vector and matrix arithmetic, solution of linear systems, LU factorization, Eigen-analysis, elementary vector spaces, linear transformations, application to differential equations and Markov processes, singular value decomposition.
Prepares for: MATH 3301, 3321, 4315, 4318, 4330. Offered: Fall, Spring, Summer.

Learning Outcomes: Upon successful completion of this course, students will be able to:

1. Describe applications to sciences and engineering.
2. Perform basic arithmetic on matrices, find inverses, determinants, LU decomposition, and solve systems of linear equations with free variables.
3. Identify vector spaces and subspaces and find the basis of a vector space and the null space of a matrix. Identify row and column space, if time permits.
4. Understand linear transformations and find the matrix associated with a linear transformation.
5. Use Least Squares to find the closest solution to an inconsistent system.
6. Use the Gram-Schmidt process to find an orthonormal basis for a vector space.
7. Find the eigenvalues and eigenvectors of a matrix and use them to diagonalize a matrix.
8. Find the exponential of a matrix and apply it to solve a first order ODE system.
9. Find the square root of a matrix and apply it to solve a second order ODE to describe the motion of a coupled oscillator.

Core Curriculum Outcomes: Upon completion of this course, the student will demonstrate his or her abilities to think critically, communicate quantitative information, and apply mathematical concepts:
1. Critical Thinking: Develop a logical, consistent plan to solve a problem, recognize consequences of the solution, and articulate a reason for choosing solution method.
2. Communication Skills: Use and present quantitative information in connection with an argument or problem solution and explicate it in an effective format.
3. Empirical and Quantitative: Construct and present a detailed problem statement with evidence of relevant contextual factors and possible approaches for solving the problem, then implement a solution and review the results.

Lectures/Discussions: We will have traditional lectures augmented by online resources as found in http://www.math.lamar.edu/faculty/maesumi/mathexpo.html
http://www.math.lamar.edu/faculty/maesumi/mathexpo.pdf. (This is to be viewed on Internet Explorer or Adobe Reader.) The course topics, sections, and homework list are posted separately.

Exams and Grading Policies: This information is subject to change.
There will be four sectional tests each counting for 25% of the total.
Approximate dates: Thursdays Feb 12, March 10, April 16, May 7. (No cumulative final test.)
Time extension on tests: If all students agree and there is no conflict with other classes, then tests will start about 10 minutes earlier and end about 10 minutes later than the official class time.
Bonus points may be allocated for the following: attendance, participation, and completing the course evaluation. Grading scale: A>90>B>80>C>70>D>60>F.
In case you want your exam to be reviewed and re-graded you need to notify me within one week from the day grades are announced. Two weeks after the final your course grade data will be discarded, unless you make a written request in person.

Mathematical writing rules: Handwriting, presentation, and precise mathematical exposition are expected on exams. Some of the basic points of writing mathematics are posted on a separate sheet. Students who ignore these rules may lose substantial points.

Test Code: During tests you are to look at your own paper and protect your papers from others. No more than two students per table. Your face should be visible to the instructor. No obstruction by sunglasses, hair, hand, caps, etc. Academic integrity rules apply (see below).

Calculator: You are allowed to have a basic scientific calculator on tests. These cost about $15 and do not have the following capabilities: graphing, matrix, computer algebra, wireless, or text storage. If you do not have a proper calculator you will take your test without one. Advanced calculators (e.g. TI80), cell phone calculators or sharing is not allowed. Students who ignore these rules will lose extra points.

Curving the Grades: Students usually want to know how to improve their grades, here are the typical questions and answers, as well as related policies:
Q. How does doing homework improve my grade?
A. Tests are open notebook. You are allowed to have one binder of handwritten notes (lecture and homework) on the tests. (Loose papers or printed papers are not allowed.)
For your notebook to be effective it needs to be searchable with page numbers, index, complete statement of problems and solutions, definitions, methods, and summaries. (Without having done the homework the notebook will not be of much help. So, please do not abuse this privilege!)
Q. How does attendance improve my grade?
A. Exam questions are very similar to problems done in class, and you are expected to solve them in the style done in class, so attendance becomes very important. Especially do not miss classes before tests (because we are reviewing) or after tests (because we are starting a new topic). Absence will lower your extra points.
Q. How do I improve my exam scores?
A. On exams you have ample time to double check your solutions. You will be required to check every step where a check is available. Your partial credit will depend on it. You are advised to solve each problem twice to check your answers.

Contact Info: Students are expected to have an active email registered with University. The email list will be made by the 12th class day from university database and you need to make sure your entry is correct by that date. No changes will be made to that list after the 12th day. Your email to me must be signed by putting your full name (as on the class roll) and the course name. You may be contacted with some last minute course information by email. My preferred contact is through my email: maesumi@gmail.com. If you leave a phone message for me (8766) please duplicate it by email.

Absence: Class roll will be taken. Do not sign for others. If you are absent on any day you have to drop me a note explaining why. Unexcused absence may reduce your bonus grade. Make up for tests requires notification on the same day and submission of written proof of emergency within one day.

No: Food, drinks, gum, ice, noise, tardiness, e-activity in class. Please turn off and put your phones and Ipods away.

Class break: We will have a 5 minute break in the middle of each class period.

Corrections: While I have made a sincere effort to ensure that this syllabus is correct, changes may be required. I will announce any substantive changes during a regularly scheduled class or by email.

Important University-Wide Information for Students

Drop Policy: Please make note of the three dates indicated in this drop policy. A student-initiated drop must be completed by going to the registrar office and signing the required forms.
February 4, 2015: (12th class day, 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 4:00 PM.
***February 26, 2015*:** (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.
***April 2, 2015*:** (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 Handbook's definition of cheating includes "purchasing or otherwise acquiring and submitting as one's 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 another's work or ideas into one's 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. See http://dept.lamar.edu/studentaffairs/handbook.htm

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.

Civility Policy: Lamar University expressly prohibits intimidation and harassment of students, faculty, staff, or applicants. See http://dept.lamar.edu/studentaffairs/handbook.htm for more details.

Academic Calendar: Important deadlines is listed at: http://www.lamar.edu/_files/documents/current-students/course-schedules/Academic%20Calendar%20Spring%202015.pdf

Campus Closure: 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 website's homepage (www.lamar.edu) for instructions about continuing courses remotely.

Accommodations: 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 collaborates 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.

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:

- 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.