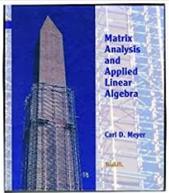


A COURSE

Course: 12452 – MATH – 4318 – 01 (Applied Linear Algebra with Matrix Theory)
Classroom: Lucas Engineering 118
Time: **5:30PM – 6:50PM MW**
Associated Term: Fall 2017

B SUGGESTED TEXTBOOKS

B.1 Course Textbook



Matrix Analysis and Applied Linear Algebra, by Carl D. Meyer

B.2 Other Suggested Textbooks

1. **Linear Algebra**, by Jim Hefferon.
<https://aimath.org/textbooks/approved-textbooks/hefferon/>
2. **Linear Algebra Done Wrong**, by Sergei Treil
<https://aimath.org/textbooks/approved-textbooks/treil/>
3. **Applied Linear Algebra**, by Peter Olver & Chehrzad Shakiban
4. **Matrix Computations**, by G. Golub and C.F. Van Loan

C PREREQUISITE

Undergraduate level MATH 3328 Minimum Grade of C and Undergraduate level MATH 3301 Minimum Grade of C.

D INSTRUCTOR

Name: Jose M. Vega Guzman
Office Hours: MWF 11:30AM – 12:30PM & TR 12:30PM – 1:30PM, or by appointment.
Office: MAES 09
Office Telephone #: (409) 880-8540
E-mail: jose.vegaguzman@lamar.edu
Course URL: <https://sites.google.com/site/profjmvvg/AppliedLinearAlgebra>

E COURSE DESCRIPTION

This course was created mainly to help students to succeed in their lifetime. This course was created so that the students develop basic techniques from contemporary theory of linear algebra that sustain the analysis and simulation of a large and diverse collection of applications in the natural sciences and engineering. Moreover, it has been designed so that the students appreciate the utility and beauty of the subject matter. The general topics to be covered are: Matrix factorization, canonical forms, orthogonality, matrix norms, projectors, least squares, generalized inverses, and singular values.

F EXPECTED COURSE OUTCOMES

Upon the successful completion of the course, the student should be able to:

1. apply the theory of linear transformations, eigenvalues and eigenvectors, characteristic polynomials;
 2. calculate using inner-product spaces, norms, orthonormal bases, operators on inner-product spaces;
 3. use spectral theory and singular value decomposition on various applications of linear algebra;
 4. utilize MatLab to solve other problems appropriate for a course in applied linear algebra.
- **Use of electronic devices during class:** I do understand that we are living in a very well connected society. However, in order to reach the above expected course outcomes, and for demonstrate respect to everybody in the classroom, everyone (including the instructor)¹ will be required to either turn off any electronic device(except calculators, or any other course electronic resources) or put them in silence mode away from the seats and tables during class time. Only very special cases(e.g DRC accommodations) will be exempted from this requirement.

G SUGGESTED COURSE TOPICS

Weeks	Topics
1–3	Rectangular Systems and Echelon Forms. Gauss-Jordan Method.
4–6	Matrix Algebra and Determinants. Exam-1 on Week-6.
7–10	Vector Spaces. Norms, Inner Products and Orthogonality
11–13	Eigenvalues and Eigenvectors. Exam-2 on Week-11.
12–15	Special topics(if time allow). Final Projects.

H COURSE EVALUATION

The students will have the 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.

I GRADING POLICIES

I.1 Final Grade

The instructor will post the grade of each evaluation in Blackboard. Your Final Grade will be determined by:

¹The instructor may use a cellphone to daily program an alarm to alert about the end time of the class.

- About 12 Homeworks (15 points each) ≤ 150 points = 25% of the final grade. Each assignment will have a specific due date. Each will include analytical and numerical(Matlab) exercises. No late homework will be graded.
- About 12 Quizzes (15 points each) ≤ 150 points = 25% of the final grade. The date of the quizzes will be provided in advance.
- Two Exams (100 points each) ≤ 200 points = 33.33% of the final grade. The corresponding dates(see also section G above) will be announced in class and in the course website at least one week in advance.
- Final Project ≤ 100 points = 16.67% of the final grade. The project will be chosen with the help of the instructor, and will be due in or before December-12/2017.

Each evaluation will be shorter and less intense than the corresponding for MATH 5328.

I.2 Grading System

A \rightarrow [90, 100] **B** \rightarrow [80, 89] **C** \rightarrow [70, 79] **D** \rightarrow [60, 69] **F** \rightarrow [0, 59]

The grade of "I" may be provided **only in very seldom and extreme extenuating circumstances**, and when requirements of the course including the final examination, is not completed. Follow LU Academic Policies and Procedures for "Q" grades.

I.3 Makeup Exams

The instructor of this course do not give makeup exams. The instructor however, understand that emergencies arise. Should you find yourself in a situation where you will miss an exam you must inform me as soon as you know you will be missing the exam or as soon as possible after you missed the exam and the reason for missing the exam. If you so inform me and you are granted an excused absence then I will replace ONE missed exam with your final exam percent. You may only replace a missed exam with the final if you have talked to me and gotten an excused absence for the missed exam! The only exception to my makeup policy is for those students who are required to be absent on exam day for a school sponsored event (sports teams, student conventions, etc.). If you are required to miss the exam you must provide me with a letter from the department sponsoring the event in advance of the day of the exam. Only then will I arrange a makeup exam.

J DROP POLICY

Please make note of the three dates indicated in this drop policy. Any drop will be the student's responsibility; The instructor will not drop a student from the course.

September 5,-15 2017: Late registration for Fall 2017 (No late fee applied for Fall 2017 due to Harvey, advisor & instructor permission required, not chair, dean, or Senior Assoc. Provost)

September 12, 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.

October 6, 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 10, 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.

K ACADEMIC INTEGRITY

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

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.

L ACCOMMODATIONS THROUGH THE DISABILITY RESOURCE CENTER

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](tel: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.

More information can be found at: <http://www.lamar.edu/disability-resource-center/>

M ATTENDANCE

All students are expected to attend classes regularly and promptly. It is especially important to attend the FIRST meeting of each class. It is there that you will receive much of the information critical to your success in the class – syllabi, handouts, names of textbooks, instructor contact information, class format, etc. **If you are absent from classes, you are still responsible for the work missed.** Attendance will be taken **daily**. A student is allowed up to three absences. After the third absence the student’s overall grade will be reduced by five points for each subsequent absence. The student must inform the Instructor about possible absence(s) on Religious Holy Days.

N CAMPUSE 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 for instructions about continuing courses remotely. <http://lamar.edu>

O EMERGENCY PROCEDURE

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:

1. 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.

2. 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.

P OTHERS

LU Academic Calendar <http://events.lamar.edu/academic-calendar-listing.html>

LU Mathematics Department <http://artssciences.lamar.edu/mathematics/>

LU Academic Policies and Procedures <https://catalog.lamar.edu/general-academic-policies/index.html>

LU News and Events <http://www.lamar.edu/news-and-events/index.html>

Students Life at Lamar University <http://www.lamar.edu/student-life/index.html>

Campus Carry <http://facultystaff.lamar.edu/policy/campus-carry/index.html>