Lamar University
Department of Mathematics

Syllabus, MATH 2318-04, Linear Algebra
Fall 2019, August 26 – December 02, Exams Dec 3-10, Grades Dec 12
MWF 11:30-12:25, Galloway Business GB113, 3 credits

Instructor: Dr. Mohsen Maesumi, Lucas Engineering L206, maesumi@gmail.com, 409-880-8766

Office Hours: Online + Before/After each class + Walk-in + By Appointment
M-R 2-3, knock on door

Recommended Text: Linear Algebra, A Modern Introduction, David Poole, 4th edition, ebook is part of WebAssign access code

Prerequisites: Grade of C or better in Calculus I Math 2413 or its equivalent.

Required Access Code: WebAssign homework access code is required, for Fall 2019
Register with class key

Website: http://www.math.lamar.edu/faculty/maesumi/syllabi.html

Short To-Do List of Required Steps:
*Respond to University-wide attendance roll call on BlackBoard, for EACH course.
*Be prepared for strict time management, substantial homework, reading the text
*Sign on WebAssign, turn on ALL notifications. Update browser, Adobe/Flash.
*Read, and as proof of agreement, upload the Class Regulations Sheet to WebAssign
*Upload a one-page resume, relevant to this class, with photo ID, in PDF, to WebAssign
*Students with disability need to contact me at start of semester + 3 days before each DRC-based test
*Correct “Preferred Banner email address issue” if so instructed; and notify me
*Prepare a binder + 200 pages + a basic scientific calculator (about $15 if new) + color tags/pens
*Submit class evaluation at the end of semester (your bonus point depends on this)

Notable Differences:
How does this class differ from comparable classes?
1- You have access to your lecture/homework notebook on exams.
2- Your homework counts as 50% of your grade.
3- The above policies are equivalent to at least a 25-point curve on your grade.
4- If you apply yourself from the beginning you can end up with a high grade.
5- Additional bonus points may be given for a well-written notebook, attendance and participation.

Why are we in a computer lab?
1- We will use many apps and online graphic software to visualize mathematics/applications.
2- We may use WebAssign in class. Some exam questions will be in a PDF file.
3- But, PLEASE, No Text/YouTube/Tweeter/Email/chat. No food or drinks! Or other distractions!
WARNINGS

Red Flags:
You are working so many hours to pay for a class you cannot attend.
You do not know why you are taking this course.
You do not have access to an online computer.
You do not have financial preparation to get the required items for the course.
You took prerequisite courses so long ago you have forgotten much of what you learned.

Class Regulations and Penalty Schedule:
(Read and upload this document as your first assignment on WebAssign)
During the last few years my courses have been redesigned to have an “open access” policy. For example, you have access to your notebook on tests. Also app-based instruction is used extensively to help students excel in their courses. As a result the grades have gone up from their historical average of 55 to well over 75. However a small group of students have taken unfair advantage of the course openness and engaged in various violations of academic honesty standards. For the grading system to be fair to all students it is essential that certain minimal and common-sense standards to be observed by all. To enforce these standards I will employ a “penalty schedule” for various infractions. Students are to read the class information here and online, and then sign a statement, at the latest by the census day, stating that they have read, understood, and agreed with class rules and the penalty schedule. As these will be strictly enforced you should take this seriously and if there are issues send an email and come to see me. Please note that the first rule states: “Saying ‘I did not know’ will double the penalty.”

Fair Use Policy (or how to avoid plagiarism charge on homework/project/take-home exams):
Students are encouraged to try do the homework problems/projects/papers without seeking help. But it is OK to consult the instructor, or other students and resources. If you want to seek help on a problem the acceptable and fair process is the following:
   (a) Throw away whatever you have written on that problem so far
   (b) Get input from and consult with as many sources as you wish
   (c) Write the project or solution of the problem all by yourself without using any other source
   (d) If you get stuck again go back to Step (a)
At the end you should be able to reproduce and justify the steps of the solution you submit. For example, by coming to the board and explaining it from scratch and without reading from your notes. Term papers are not to be outsourced or copied from the Internet. Come to office regularly to show your progress and the revisions of the drafts of your paper. (See Penalty Schedule)

Test Code:
During tests do not look sideways, you are to look at your own papers and protect them from others.
Your face should be visible to the instructor.
No obstruction of face by sunglasses, hair, hand, caps, etc.
No obstruction of ears by headsets or articles of clothing.
Bring Lamar ID or DL to all tests.
No printed sheets, cell phones, advanced calculators, shared calculators, loose papers.
Use of unauthorized websites and communication with others may result in a grade of F for the course.
Do not give your WebAssign passwords to any other person for any reason.
Unauthorized logins to your WebAssign account may result in a grade of F for the course.
Visits to WebAssign homework pages during tests may result in a grade of F for the course.
(See Penalty Schedule) for the cost of infractions. University academic integrity rules apply.
**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. 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 to find a change of basis matrix from one basis to another;
11. Use the least squares 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.

**Topics to be Covered:**

1. Geometry and algebra of vectors 1.1
2. Length and angle, dot product 1.2
3. Lines and planes 1.3
4. Applications, force vectors 1.4
5. Triviality 2.0
6. Introduction to linear systems 2.1
7. Direct methods for solving systems 2.2
8. Spanning sets and linear independence 2.3
9. Applications 2.4
   9.1 Allocation of resources
   9.2 Balancing chemical equations
   9.3 Network analysis
   9.4 Electrical networks
10. Matrices in action 3.0
11. Matrix operations 3.1
12. Matrix algebra 3.2
13. The inverse of a matrix 3.3
14. The LU factorization 3.4
15. Subspaces, basis, dimension, rank 3.5
16. Introduction to eigenvalues and vectors 4.1
17. Determinants 4.2
18. Eigenanalysis for n*n matrices 4.3
19. Similarity and diagonalization 4.4
20. Systems of differential equations 4.6
21. Gram Schmidt process 5.3
Lectures/Discussions: We will have traditional lectures augmented by online resources as found in Course website where links to video lectures of prior years for this course and prerequisite courses may be available. The course topics, sections, and homework list will be posted on WebAssign. Additional homework problems or projects may be posted on course website. Some lectures will be delivered online.

Reading is required! Students should expect that they will be required to read the text. We won’t have the necessary time to explain every fact, step, prerequisite, etc.

Grading Plan: 50% homework, and 50% tests.

Homework: This is listed on WebAssign and counts for 50% of your grade.
*Students are to show complete statement of each problem and its solution in their binder notebook and then enter final answer on WebAssign software. Student have access to their notebook on exams and the completeness of your notebook influences your bonus points.
*WebAssign has various helpful features, e.g. “show me an example” etc. If you have a question about a homework problem you may use “ask your instructor” button. Short questions can be answered online, however, if it is lengthy I will ask you to come and see me in office or bring it up during class.
*Students should consider a homework target deadline for themselves that is 24 hours earlier than the software deadline. Time extension will not be given for Internet/electrical/personal problems. There is a substantial penalty for late submission. There is an automatic extension button if you are not too late. Homework from beginning of semester will lose most of its point value by the end of semester. No extension past final. If you download the key to homework you cannot get an extension.

Exam Policies:
*There will be four sectional tests each counting as 10% of the total grade,
*There is a cumulative final counting as 10% of the total grade for the course.
*The tests and final, together, account for 50% of the final grade and homework is 50%.
*Approximate exams dates: Fridays, Sept 13, Oct 4, Oct 25, Nov 15, Final TBA.
*Grading scale: A>90>B>80>C>70>D>60>F.
*Exams are open notebook. You are allowed to have a handwritten lecture notebook including the solution of all homework problems. You are advised to have applicable tables of formulas, index, and page numbers.
*You are to have a picture ID placed on table during tests.
*You are to have a basic scientific calculator on tests, (these typically cost less than $15).
*You are to print your name on the exam attendance sheet, on the seat map.
*If you leave early you are to time-stamp the attendance sheet under you name.
*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 given. Two weeks after the final exam your course grade data will be discarded, unless you make a written request, in person, during the semester.
*All issues that may influence your grade should be documented in an email from you to me and acknowledged in an email from me to you. At the time of the final test, and before final grades are given, send a summary email.
*If an emergency prevents holding the final exam for the whole class, a substitute grade will be made from existing grades at the instructor’s discretion.
*There are strict regulations regarding what is not permitted during tests. Read the section below and (See Penalty Schedule)
**Items Not Allowed on Tests:**

**Items Allowed in Your Binder:**
You may have a single binder of entirely hand-written class notes. You may have hand-written solutions for homework, provided that the entire problem is recorded. You may have a table of content in your binder, with page numbers, and an index of key phrases. You may have hand-written formula sheets in your binder (for algebra/trig/integral/derivative). For including anything else on your notebook ask me before assuming. See penalty schedule for the cost of infractions.

**Disability Services Policy:**
To help students with disabilities achieve their potential I will use the following policies. This will allow me to prepare for special arrangements, make sure various software are available to students, and respond to student inquiries during tests
1- Students who are in the process of applying to DRC are encouraged to come for an office visit and introduction as early as possible.
2- A student who is registered with DRC should present his/her approved request for a special test to me at least one week before the test. If the student misses that deadline then he/she will take the regular test.
3- The location of test will be decided by me. This could be the regular class, an otherwise empty classroom, instructor's office, or at DRC.
4- If the test is to be held at DRC, the instructor, or his representative, will be in the cubicle in DRC where the test is administered.

**Software Used in Assignments:** We may use several software. These include MatLab, Desmos, DField, and others. DField need to be installed on your desktop. You need to practice each as they may be used on exams. Students are responsible to make sure the required software is available to them before tests. Before opening any software on an exam, you should check to see if its use is authorized for that exam.

**Privacy Issues:**
Your binders, papers, calculators, phones, and any item visible during test, may be withheld and inspected by the instructor. You are advised to put all personal items in your backpack and keep it closed. If you must reach inside your backpack raise your hand to get permission first. There may be a seating assignment. You may be asked to change your seat during a test. Your activity on computer will be monitored and recorded. If many seats are available then every-other seating, starting from front row, should be used. If you violate the Test Code or class decorum rules you may get a public reminder in class.

**Calculator:** You can have a basic scientific calculator on tests. These cost about $15-30 new and do not have the following capabilities: graphing, computer algebra, matrix, wireless, or text storage. If you do not have a proper calculator you will take your test without one. Advanced calculators (e.g. TI80 etc.), cell phone calculators or sharing is not allowed. (See Penalty Schedule) for cost of infractions.
**Late Registration:** Not allowed. If you bypass this rule and register late in my classes or start attending late or sporadically you are not going to ask me to rewind the course for you. Any missed homework or exam will have a grade of zero.

**Curving the Grades and the Borderline Cases:**
Or, when does 89.99 become an A?
Note that there is never a good answer to this issue. Because no matter where a line is drawn, the person behind the line would want to cross it. This issue comes up whenever numerical grades are converted to letter grades.
However, at the discretion of instructor, the following policy may be used:
I will calculate a MAX grade based on completing all homework, all other bonus points, and matching the highest grade obtained on each test. Then, at my discretion, I may add up to (100-MAX)/2, or a certain number of points to be declared at the end of the semester, to the individual grades based on the following factors:
- Attendance and participation in classes as indicated by quizzes and coming to the board.
- Having a neat and complete binder for all homework (come to office at least twice to show).
- Registering on WebAssign on the first day.
- Sending your resume, in required format, within the first two week.
- Observing ALL class regulations.
- Doing the course evaluation (upload the acknowledgement page as proof).
- To get any bonus point the evaluation need to be done!

In certain semesters as many as 25% of students got a bump in their grade due to this policy because their grades were at the border. So, make sure you do all optional items to collect as much point as you can.
Also note that you have access to your notebook on your tests, and most of the questions are just as done in class or homework. This policy is equivalent to at least a 25-point curve.

**Student Contact Info:** Students are required to have an active email registered with University which shows up on the “class email list”. A trial email will be sent and announced in class. If you do not receive it, it is your responsibility to correct the issue.
A small percentage of students do have problems with their emails. It is typically due to not selecting a “preferred email” during registration. Other issues are forgetting the email you used during the first registration, misspelling your email, putting parent email, or using email from a cancelled service. If you ignore this issue, there will be no compensating recourse later.
Please do not change your name or email address mid semester. Write your name as in the transcript.

**Instructor Contact Info:** Your emails to me must be signed by putting your full name (as on the class roll) and it should include the course name/section. My only contact is through the following address: maesumi@gmail.com. If you leave a phone message for me (8766) please keep it brief and duplicate it by an email. Please do not use other email addresses, links or clickable address to reach me. Do not use reply button if your email is on a new topic. Do not use my Lamar email address.

**Course Evaluations:** This is the final homework, and an important and required component for the course. You will receive an email reminder through your LU account. Evaluation window is open only for a few days and closes before finals start. Once you get the reminder go to your “MyLamar/Course Evals” link to complete. To prove that you have done the evaluations and get the bonus points you need to upload and/or print the “Acknowledgement Page” that comes up once you are done with evaluations. This page should list ALL courses you are registered. Write your name on the printed copy and give it to me during final. Problems: Assessment Office 880-1843.
WebAssign Syntax, Mathematical Writing Rules:
Students are to familiarize themselves with type-setting formulas on WebAssign. See this. Also pay attention to these basic points of hand-writing mathematics.

Absence: There is no make-up or extension for in-class activities or quizzes etc. WebAssign quizzes may be used to take attendance. Unexcused absence beyond 2 classes per month may reduce your final grade by 1 point per missed class. Make up for tests requires notification on the same day and submission of a verifiable written proof of emergency within one day. An individual decision will be made in each case. The final exam cannot be postponed. (See Penalty Schedule) for the results of fake emergency excuse. At instructors discretion the grade for an excused missed test may be constructed through adjusted average of other tests or by using the final exam score.

Buddy System: Students are to form groups for helping each other in case of absence (for example giving each other copies of notes) or for group study.

No: Tardiness, food of any type, drinks, gum, ice, chips, crackers, candy, noise, music, headsets, e-activity as in surfing, scrolling, texting, etc. in class. Please turn off and put your phones and music devices away. Same rules apply when you come for office visits. (See Penalty Schedule) for the cost of infractions.

Half-time Breaks: Class time will be split to 25-minute windows and a 5-minute break will be given. This is a good time for asking questions or just walking around.

WebAssign Errors: These do occur but are very rare. Typically the student has made a typo and thinks it is an error in WebAssign. Please read the syntax hints sheet that is posted online. Usually it is the issue of lower case f vs upper case F, Greek (α) vs English (a), 1 (one) vs l (ell), 0 (zero) vs o (oh), bold font F vs ordinary font F, [ ] vs ( ), \sqrt{2} t vs \sqrt{2}t, \sqrt{2} vs 1.141 etc. Keep a record of your typical errors to remind yourself. If you think WebAssign is making a mistake let me know and I will contact the company.

WebAssign Compatibility: Check your PC for compatibility with WebAssign. You may have to update your browser or Flash or other components. Check that graphs and formulas show properly. This must be done well in advance of any critical deadline for any assignment. Tablets or phones might not be compatible with WebAssign and they may not work as expected.

Student Resume: Students are required to make a resume for themselves applicable to this course. Items to include: an ID photo, name, major, minor, detail of math courses taken, math courses required for your major. Optional items: employment, long-term career plans, challenges and responsibilities, and any specific issues I need to know about. Upload it as a PDF file to WebAssign. If the grade for this course is especially important to you detail for me the steps you are taking from the beginning of the semester and number of hours of study you allocate to ensure your success.

Extension Time on Tests and Votes: Occasionally students ask for extension time on tests. During a test I may ask if you agree to extend the test by 0, 5, 10, or 15 minutes. We will go by what is feasible and approved by all in attendance. In case of an in-class vote, if you are not in class during the vote and do not contact me on the day of class vote then you accept the result of the vote cast by others.
**Audit Students:** These students should contact me before signing on WebAssign. Uninvited students, multiple registrations, and dropped students will be removed from the class list. In case of multiple registration you might lose points already earned.

**Letters of Recommendations:** Students who are applying to graduate schools or scholarships are encouraged to do a project in addition to course requirements in order to get a strong letter.

**How to Succeed and Improve Your Grades:** This class is designed to allow you to get a high passing grade if you consistently apply yourself from the beginning. The grading style already has a built-in curve by allocating a substantial percentage to homework and allowing students to use their notebooks.

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?
   I. It counts as a substantial part of course grade.
   II. Your homework notebook determines your bonus point.
   III. Tests are open notebook and mostly based on problems you have already done.

You are allowed to have one binder of entirely handwritten notes on the tests. Your notebook may contain
(a) Complete statement of problems and their solutions, from WebAssign or the text.
(b) Lecture notes.
(c) Handwritten formula tables from algebra/trig/calculus.
(d) Table of Content and an Index.
For your notebook to be effective it needs to be searchable (as in a well-designed website) with page numbers, index, complete statement of problems and solutions, definitions, methods, and summaries. Even though you enter the homework on WebAssign for a grade you should consider writing each problem in your notebook in its entirety so that you can look it up during tests. Redo each problem several times to build up speed. That is how to do well on tests.

Please use a binder as loose papers are not allowed. Having printed papers results in a penalty. This is a major privilege, not a right; so please do not abuse it as it may be revoked.

Q. How does attendance improve my test grade?
   I. Your homework is very similar to problems we will do in class.
   II. Exam questions are very similar to homework problems.
   III. Your attendance influences your bonus points.

Q. How do I improve my exam scores?
   Drive, time-management and pro-active mind-set are the main ingredients of success.
   Try timed-practice tests before exams. The more of these practice tests you do the higher your grade.

**Protecting Your Passwords:**
1- Use a password that is at least 20 characters or five words long.
2- Combine upper and lower-case letters, numbers and special characters.
3- Change it frequently.
**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. If you have suggestions or concerns, feel free to bring it to my attention.

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**Important University-Wide Information for Students**

Please double check ALL deadlines on the academic calendar.

Lamar University expressly prohibits intimidation and harassment of students, faculty, staff, or applicants. See [http://students.lamar.edu/academic-support/code-of-conduct.html](http://students.lamar.edu/academic-support/code-of-conduct.html)

**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. [http://students.lamar.edu/student-handbook.html](http://students.lamar.edu/student-handbook.html)

**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 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. [http://www.lamar.edu/disability-resource-center/](http://www.lamar.edu/disability-resource-center/)

**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 for instructions about continuing courses remotely. Check [http://lamar.edu](http://lamar.edu)
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 Procedure:
• 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 Procedure:
▪ CALL 8311 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.

Grade of Incomplete:
A grade of “Incomplete” may be recorded in the case of a medical emergency documented prior to the final exam and if the student is passing at the time. Such a request must be in writing and include a plan for completion of the course. No "Incomplete" will be authorized after the final exam.

From: https://catalog.lamar.edu/general-academic-policies/index.html
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.