Introduction to Linear Algebra

http://www.math.lamar.edu/faculty/maesumi/list.html

Coordinates: MATH 2318.02, TR 12:30-1:45, L117, Jan 10 - May 11, 2011.

Disclaimer: Dates, number of tests, and other information are subject to change. Attend all classes, check your emails, and course web site, to get the latest information.

Instructor: Dr. Maesumi, Ph.D., Lucas 206, main contact form: maesumi@gmail.com, (phone 8766 is for last minute check, follow up with an email. Phone and other email addresses are not monitored regularly).


Office Hours: MWF 11:10-12:00 TR 1:50-2:30. I am usually on campus 8:30-3:00. Feel free to drop in. If door is closed knock and wait 30 seconds. If you are coming to office it may be better if you bring exams, notebooks and other supporting material. If you are sending e-mail include your full name and use a heading that makes your e-mail stand out, e.g. LAMAR MATH 2318 Linear Algebra. Keep a copy and e-mail it again if you do not get a reply within one business day. The preferred contact form is through email given above, however if you want to leave a message on phone make it brief, speak clearly, and resend same information by email.

Class Format: We can have one of three formats:

Type A: Lectures will be delivered on-line, as hand-written in digital ink with narration. Class time will be used for problem presentations by students. Faculty is a moderator and mirrors and corrects the students’ presentations. This approach requires solid study habits and has been shown to substantially increase student grades when they actually do the requirements. Students will be asked to show their lecture notes taken from video lectures. Students are allowed to bring one binder containing handwritten lecture and homework to tests to compensate them for their extra effort.

Type B: Lectures are delivered online. Class time is used for presentation of homework problems by the instructor. Students are allowed to bring a half page one side formula sheet to tests.

Type C: Lectures are given in class. Some homework problems are done in remaining time. No formula sheet is allowed on tests.

We will decide as to which format will be used after a vote. My favorite approach is Type A, but that requires substantial participation. In case of lackluster participation we may switch to plan B or C. The main advantage of using a Type A course format is in maximizing the interaction between faculty and student. In addition:

You can replay the video to understand the lecture better.
You can review the video with a classmate or instructor.
You can pause the video, work a problem yourself, and compare with the presented solution.
You can view the video at your own place, time, and speed.
You get access to animation, graphing and useful links.
You get the most complete lecture notes. Now you cannot be absent.
Most importantly, by putting the lectures on-line, instructor’s time in class will be freed for interaction with students. Errors can be corrected in real time, insights can be recognized, and hands-on instruction can become a reality. Class becomes a public tutoring place. If you have the stamina for it, that is the best approach. The instructor is not there to judge you at the board but he is there to push you to do your best. More like a coach than an examiner.
Tests and Grading: Test dates (subject to change) are on Tuesday Feb 15 (30%),
Tuesday March 29 (30%), and final (40%) Tuesday May 10, 11-1:30 in class. Handwriting,
presentation, speed, and accuracy are important parts of each test. Tests are sectional
and focus mostly on the recent items. Certain topics (such as Guassian elimination, linear
combination, independence, etc) will be present throughout the semester. Tests should be
returned to me after you view it. Resolve grading issues within one week of tests. Tests will
cover class material, all assigned homework, problems done in class or videos, examples
in text, definitions, and occasionally other problems similar to the ones in the text. Final
grades are given according to $A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F$ or better.

Curving the Grades: You decide how much of a curve you want! It is up to you! When
students participate in the hybrid format then the exam will be “open notebook”. So the
more home work you do and the more orderly your notes are the higher your curve will
be, because you have access to more solid information on tests. You will be allowed to
bring one binder notebook containing lectures and homework problems etc to tests. No
loose papers or copied papers will be allowed. For this to be helpful you need to attend
all classes, keep a neat detailed journal, do the homework, and design a well organized
table of content and index. The indices are to be updated for each test. Pages need to
be numbered and you need to understand the content of your notebook. Participating
students get extra curve at the discretion of instructor. Typically a strong B can become
an A and a strong C can become a B. This extra grade depends on how well the student
solve or explain a problem or show insight about the material at the board.

Extra points: Up to 10 points for class participation (pro-rated), 5 points for lecture
note book, 5 points for quizzes (To be announced in a prior class and conducted at the
beginning of a class, there will be no make up quiz for any reason, the lowest will be
dropped). If I we use the traditional lecture format the exam will be closed notebook.

Course Evaluation/Extra Point: Students who complete the course evaluation and
return the completion form by the assigned deadline will get 5 point added to their lowest
test grade. When you finish evaluating a course a page comes up saying so. Print just
that page and give it to me (not your private answers!).

Tutoring: Free tutoring is available in L209.

Absence, Grade Appeals: If you are absent from an exam let me know as soon as
possible and be prepared to show proof of emergency. If you have an issue with your grade
let me know as soon as possible. At the end of semester you have two weeks to request an
appeal of your grade.

Calculator Policy: Only basic scientific calculators (typically costing less than $20) are
allowed on exams. Advanced graphic calculators (e.g. high-end TI), wireless devices, and
computers are not allowed on tests. You need to purchase and learn your calculator early
on.

Students Learning Outcomes and Objectives:
Students will learn to:
1. Work with matrices including basic arithmetic, inverses, determinants, LU decompo-
sition and solve systems of equations.
2. Identify vector spaces and subspaces and find the basis of a vector space, the column,
row and null space of a matrix.
3. Understand linear transformation and find the matrix associated with a linear trans-
formation.
4. Use Least Squares to find the closest solution to an inconsistent system.
5. Use the Gram-Schmidt process to find an orthonormal basis for a vector space
6. Find the eigenvalues and eigenvectors of a matrix and use them to diagonalize a matrix.
Co-requisites and Audience: MATH 2413 (3316 for education majors). It is recommended that you take this course after Calculus II MATH 2414. This course is intended for majors in math, engineering, computer science, and math-education. However students in other disciplines (e.g. hard sciences, physics, chemistry, econometrics, and computer aided graphics) may also benefit. This course partially prepares for Math 3321, 4315, and 4330.

Suggested/Optional Extra Activity: Learn to use Matlab to perform tasks we learn in this class. For those of you thinking of a design-engineering job or graduate school this is a must. A similar software, called Scilab, is available for free from http://www.scilab.org. Both are available in L209 and Gray Library Media Room on 7th floor.

Additional resources:
A very highly regarded and a complete high level course is available at (search for 18.06) http://ocw.mit.edu/OcwWeb/Mathematics/18-06Spring-2005/CourseHome/index.htm
http://web.mit.edu/18.06/www

No: Noise, food, chips, ice, drink, gum, coffee, chewables, ipod, texting, surfing, or other edrugs, etc.