Course: Math 129A Linear Algebra, Sec. 2 (Code 25195): MWF 12:30-1:20, in MacQuarrie Hall 320

Instructor: Jane M. Day  Office: MacQuarrie Hall 317  Phone: 408-924-5119  Web: http://www.math.sjsu.edu/~day/

Office Hours (tentative): MWF 10:30 - noon and MW 1:30-2:00. Also by appointment.

Email: Use subject line like “Pat Smith 129A question” and both email addresses: day@math.sjsu.edu, janemday@earthlink.net

Required text: Elementary Linear Algebra, Spence, Insel and Friedberg, 2nd ed., Prentice Hall, 2008. We’ll cover most of Chapters 1-4, Sec. 5.1-5.3 and Sec. 6.1-6.4.

Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>Grade Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 tests</td>
<td>45%</td>
<td>A = 90-100</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20%</td>
<td>B = 80-90</td>
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<tr>
<td>(except in test weeks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tests</td>
<td>25%</td>
<td>C = 70-79</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
<td>D = 60-69</td>
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<tr>
<td>Final exam</td>
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Extra Credit problems may be offered occasionally, and these can improve your homework grade.

No cell phones, PDA’s or calculators during quizzes.

No cell phones or PDA’s during tests. Calculators ok for tests.

About the subject:

Linear Algebra is very useful in statistics, business, social science, economics, psychology, engineering, physics, chemistry, meteorology, geology, as well as many areas of math. To me it a lovely subject, and I hope you will see some beauty too! However, this subject is much different from Calculus. Most of your time in Calculus was spent doing algebra and calculating, but Linear Algebra is more like a literature course – you must read the book! It is not very hard if you keep up and study it properly.

You will do a lot of computation here, and it can help a lot to interpret concepts geometrically, but there are many abstract ideas and new language which you have to master.

Here’s how to study:

- Read the book very carefully, working out details of proofs and examples as you go. Then work on exercises.
- Memorize definitions and theorems. Write examples of these for yourself.
Practice writing each new definition correctly, and using it correctly when you talk about it.

**Learning Objectives for Math 129A. You should learn to:**

- Implement the Gaussian Elimination algorithm by hand for small matrices.
- Understand what rref(A) reveals about rank, equations and subspaces related to A
- Read, write, and speak correctly the language of linear algebra.
- Use concepts and basic facts of linear algebra to solve simple application problems.
- Learn to use MATLAB to find solutions of linear systems, eigenvalues, least squares solutions, etc.
- Justify basic facts about matrices, vector spaces, linear transformations, eigenvalues and orthogonality

**Computer Projects** will be assigned from time to time. When a project is assigned, print it from my website. You will need to use MATLAB for some of the computer projects. See “Software Needed” below.

**Homework:**

Do all the exercises assigned for yourself. Ask questions in class and office about any you don’t understand.

I will only collect a few problems. As we cover the material, I will tell you exactly what is due and when. However, I suggest you keep all your homework in a binder and bring this whenever you have questions.

Assignments for the first few sections:

<table>
<thead>
<tr>
<th>Section</th>
<th>Text Exercises</th>
<th>Other assignments related to the section</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>1-31 (odd); 36-56 (all); 67-81 (all); 82</td>
<td>Handout “Sketching in R^2 and R^3”</td>
</tr>
<tr>
<td>1.2</td>
<td>1-19 (odd); 29-60 (all); 69-77 (odd)</td>
<td>C.P. “Getting Started With Matlab”</td>
</tr>
<tr>
<td>3.3</td>
<td>1-7 (odd), 11-22 (all), 23-37 (odd), 39-45 (all), 55, 57-76 (all)</td>
<td>C.P. “Mixing Seeds”</td>
</tr>
<tr>
<td>1.4</td>
<td>1-7 (all); 9-13 (odd), 17-20 (all), 27, 35, 37, 53-59 (all), 62-69 (all), 72-75 (all), 81, 82, 88, 93</td>
<td></td>
</tr>
<tr>
<td>6.6</td>
<td>1-11 (odd), 21-35 (odd), 40-42 (all), 45-67 (all)</td>
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<tr>
<td>6.8</td>
<td>1-19 (odd), 23-27 (odd), 31, 32, 37, 38, 51, 53, 63, 68-72 (all), 78, 80-85 (all); Handout on linear independence</td>
<td></td>
</tr>
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2.1

<table>
<thead>
<tr>
<th>Text Exercises</th>
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<tbody>
<tr>
<td>C.P. “Traffic Flow”</td>
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<tr>
<td>C.P. “SIF Elem. Analysis of Spotted Owls”</td>
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**POLICIES**

**Late work:** No late homework and no makeup tests except: If you know ahead of time that you must be absent, tell me ahead and take the test or turn HW in early. If you miss a test or HW deadline for an unexpected, serious reason, tell me and I’ll make allowances.
Policy on Incompletes: Almost never given. If you realize at some point that you don’t think you can complete the course successfully, talk with me. The best plan is usually to take it again using Academic Renewal.

Do study with other students. Discuss the ideas of this course and methods for homework. It’s amazing how much you can learn from trying to say things so other people can understand them.

University Policies: It is your responsibility to read about the University’s policies regarding academic integrity, disabilities, attendance, add/drop, academic renewal, withdrawal, plagiarism, etc. (see www.math.sjsu.edu/Quick Links/Greensheet, http://sa.sjsu.edu/judicial_affairs/index.jsp and http://www.sjsu.edu/senate/S07-2.htm).

If you need special accommodations, let's discuss that early. For test taking, I can make arrangements with DRC, but it seems to work better to find a time and quiet place near my office, so I can explain if anything is not clear.

SJSU takes academic integrity very seriously. In particular, your work on tests must be entirely your own. The penalty for cheating will be at least an F on that test, possibly an F in the course, and I will submit a Violation of Academic Integrity report to the Judicial Affairs Officer and put a copy of this report in your department file. Repeated offenses lead to dismissal from the University.

Last date to drop a class by Touchtone: Monday Feb. 4: PLEASE LET ME KNOW if you drop the class this way.

After Feb. 4, it gets increasingly hard to drop a course, and you will get a W on your transcript. To apply, get a form from the Student Affairs Office or online. This form requires signatures from the Math Dept. Chairman and me. Your application will not be approved unless you have a serious and compelling reason beyond your control -- such as a family emergency, change in job hours, etc.

Last Date to add a class by Touchtone: Monday, Feb. 11

Waiting List:

(a) Turn in an Information slip on which you say you would like to register for the class.

(b) Attend all lectures and do well on all quizzes and homework.

(c) Bring me a copy of your transcript (unofficial is ok), or a copy of your Graduation Checklist (sent to you by Admissions and Records if you have applied to graduate). I will use this information to prioritize those who wish to add the course. Graduating seniors who are required to take this course get first priority.

I will give add codes to qualified students as space is available. Even if no space opens for you before Feb. 11, if you have done very good work up until then, I will email an add code to you on that day.

SOFTWARE NEEDED FOR COMPUTER ASSIGNMENTS

You will need to use MATLAB in this course. This is a professional software package for matrix calculations. It is very user friendly and widely used by engineers and other scientists. It will enhance your resume to say you have experience with it.

The easiest way to get access to MATLAB is to get a Math Dept. computer account and use
computers in the Math Department Computer Lab, MH 221. The special functions and data for my projects are already installed on the computers there.

Note: To print a file in this lab, you need money on your SJSU ID card.

An account on the CS Dept. system will not help – the CS Dept. does not supply MATLAB.

WAYS TO GET A MATH DEPARTMENT COMPUTER ACCOUNT

1. If you can add one unit without paying extra tuition, go to MH 221 after it opens, and ask to enroll in Math 110L. For most students this is the preferred way. Math 110L is a one unit, CR/NC lab course that never meets as a class.

2. Or, if you would have to pay extra tuition for Math 110L, go to MH 221 after it opens, and pay $25 for a Math Dept. computer account.

ALTERNATE WAYS TO GET ACCESS TO MATLAB***

1. Buy Student MATLAB, which comes on a CD with a good Manual, and install it on your computer. You may be able to find a used copy. Version 4 or higher will work fine for my projects in Math 129A.

2. Use MATLAB in an Engineering or Physics lab. Ask the lab director there if they have MATLAB and if it's ok for you to do math homework there. This may only work if you're taking a course in one of those departments.

3. Find a partner in our class who has access to MATLAB, and do your projects as a team.

*** Important Note: If you use MATLAB anywhere other than MH 221, you must go to the Math Dept. Office MH 208 and borrow a Math129A CD or diskette. Also ask for instructions for installing the files on your computer. These files contain the data for my projects.

You must leave a $5 deposit, which will be returned when you bring the CD or diskette back.

CALCULATORS ARE GOOD TOO

It can be helpful to also have a calculator which can calculate RREF and eigenvalues of a matrix.