Math 306, Linear Algebra II, will cover Chapters 1 through 5, and part of Chapter 6, of the text. There will be some supplements to the text on Blackboard.

Linear algebra is one of the most important topics in mathematics. It is used extensively in both applied and theoretical mathematics. We will primarily be learning the definitions and theorems of linear algebra, but some applications will be included.

**GRADING POLICY**

- Quizzes and take-home quizzes: 10%
- Homework: 20%
- Each of two midterm exams: 20%
- Final: 30%

**EXAM SCHEDULE**

- Quizzes (5-10 minutes): Tuesday of second week, Fridays thereafter
- Midterm 1 (50 minutes): Friday, October 20
- Midterm 2 (50 minutes): Friday, November 17
- Final (2 hours and 50 minutes, comprehensive): Friday, December 15, 10:10 am - 1:00 pm

You may use cheap scientific calculators on quizzes and exams to help you add, but programmable calculators that do matrix computations or have memory are not permitted. Exams will be written so that calculators are not needed.

**QUIZZES**

Each Friday (except exam weeks) at the end of class (the last 10 minutes), I will give you one short proof as an in-class quiz. Along with each homework assignment, one problem will be designated a take-home quiz. You should spend as long as you need on the take-home quiz, but please do your own work. Turn in the take-home quiz and the in-class quiz together separate from your homework assignment. The first quizzes will be given and collected Tuesday of the second week.

Note: I will not officially consider it cheating if you work with someone else on the take-home quiz (because it would be impossible to enforce), but it will be a waste of your time and my time if I am giving you feedback on others’ work.

**HOMEWORK**

Homework will be collected most Fridays (but Tuesday of the second week). Most of the homework problems will be proofs, and many students find writing proofs very difficult. You should start the homework several days before it is due. Some of the problems may require thinking for a long time before you can write up a final solution. This is normal, and although it can be frustrating
when you are trying to complete an assignment in a fixed time period, I believe that this process of solving problems is the most useful part of a mathematics course.

Please come to office hours if you are have questions about the homework. I will discuss some of the problems in class, but there will not be enough class time to go over all of the homework problems.

**PREREQUISITES FOR MATH 306**

The prerequisites for Math 306 are Math 206 and Math 248. You should be able to: Use Gaussian elimination to solve systems of equations; compute inverses of matrices; compute determinants of matrices; compute eigenvalues and eigenvectors of matrices. In all of these cases, you should be able to do these computations for 2 by 2 or 3 by 3 matrices, and you should understand the process well enough that you could also do the computations for nicely contrived larger matrices.

We will probably be studying vector spaces, linear transformations on vector spaces, and eigenvalues and eigenvectors more rigorously than you did in Math 206, but I will not spend class time on how to do the computations. Feel free to ask me about them in office hours.

Math 248 was an introduction to proof techniques. As you learn the subject matter in this class, you will probably learn more about proofs as well.

**Math 306 Schedule for Weeks 1 and 2, Fall 2006**

HW 1: p 19 # 1-7, #9, plus the following extra problems.

EP # 1: Prove that the set $U$ of polynomials over $\mathbb{F}$ whose odd power coefficients are all zero is a subspace of $P(\mathbb{F})$. That is, show $U$ is a subspace where

$$U = \{a_0 + a_2 z^2 + a_4 z^4 + \ldots + a_{2n} z^{2n} \mid a_i \in \mathbb{F}, \text{n a non-negative integer}\}.$$  

EP # 2: Is the set of polynomials of even degree a subspace of $P(\mathbb{F})$? Prove or disprove.

EP # 3: Prove that the set of diagonal matrices in $\text{Mat}(n, n, \mathbb{F})$ is a subspace of $\text{Mat}(n, n, \mathbb{F})$.

Take Home Quiz #1 (THQ 1): p 19, #8.