

MATH 565 -- LINEAR ALGEBRA

FALL 2012

INSTRUCTOR: DAVID LEEP

MWF 3:00 - 3:50 PM      CB 347

OFFICE:    721 POT

OFFICE PHONE: 257-3470

E-Mail:    leep@email.uky.edu

OFFICE HOURS: By appointment

This is a graduate level course in linear algebra. Students enrolling in this course should have taken an undergraduate linear algebra course. Here is an outline of what I hope to include this semester.

- (1). VECTOR SPACES: A thorough presentation of the basic facts about vector spaces. (Linear independence, bases, dimension etc.)
- (2). LINEAR TRANSFORMATIONS: Image, kernel, basic isomorphism theorems, dimension formulas etc.
- (3). MATRICES: Correspondence between linear transformations and matrices, change of basis matrices, elementary matrices.
- (4). DUAL SPACES
- (5). INNER PRODUCT SPACES: Symmetric and hermitian bilinear forms, normal transformations.
- (6). DETERMINANTS
- (7). CANONICAL FORMS: Cayley-Hamilton Theorem, Jordan Canonical Form, Rational Canonical Form

GRADES: The final grade will be computed as follows.

Homework 20%

Exam 1 20%

Exam 2 20%

Exam 3 20%

Final Exam 20%

EXAMS: The dates of the first three exams will be announced later.

The final exam is Friday, December 14, 1:00 pm - 3:00 pm.

**HOMEWORK:** I hope to assign homework regularly throughout the semester.

I strongly encourage students to discuss material together and to study together, but I would like the homework assignments that are turned in to be individual efforts. Discussing problems with other students is useful, but it is in your best interest to not copy other students' answers. You must develop your own ability to solve problems and to write them up clearly and correctly.

**TEXT:** There is no official text for this course. I have a set of class notes that will cover most of the material in the course. You can find the notes at [www.ms.uky.edu/~leep/Teaching.html](http://www.ms.uky.edu/~leep/Teaching.html)

During the semester I will make a few improvements and additions, but there will be no major changes.

I expect you to read the notes carefully and thoroughly.

**REFERENCES:** I suggest that you learn to use the Mathematics section of the Science Library by consulting other books on Linear Algebra. There are many choices. If you find a particularly good reference, tell others in the class about it. I can also suggest some references.