92.523   Linear Algebra   Dr. Charles Byrne
Course Overview

<u>Instructor:</u> Charles Byrne

<u>Overview:</u>
Viewed somewhat abstractly, linear algebra is the study of algebraic objects, called vectors, that satisfy certain nice properties involving superposition and a matrix is a two-dimensional rectangular configuration (or array) of numbers that can be used to represent linear transformations on vectors. In recent years linear algebra has become an important part of undergraduate mathematical training in a variety of disciplines primarily because of the growing use of matrices in applications. The numbers in the matrix (called *its entries*) can represent the gray levels of a picture, the coefficients in a system of linear equations, the various second partial derivatives of a function of several variables, the cross-correlations between components of a random vector, the probabilities of x-ray attenuation in tomography, and many more things as well.

In this course we begin with the geometry of (finite dimensional) vector spaces and systems of linear equations. We then move to computational issues that arise in the solving of such systems and, finally, to applications.

<u>Intended audience:</u>
The course is designed for current and prospective secondary level mathematics teachers. It is assumed that the student has had a three semester calculus course.

<u>Texts and readings:</u>
The required text is:
Lipschutz *Beginning Linear Algebra* Schaum's Outlines, 1997.

<u>Format:</u>
There will be one three-hour lecture per week. Assigned problems from the text will be collected and graded every two weeks. See the pdf file "Homework Assignments for 92.523" on the web site. Course grades will be based on homework and class participation.