

# MATH 221: Introduction to Linear Algebra

*This detailed course description provides information about course topics & content. It is not a course syllabus. Summer 2013 course syllabi are updated in the spring, and may not be available until summer classes begin.*

## Instructor Information

Instructor	Email	Course Format	Number of Credits
Kalman Nanes	knanes@umbc.edu	Lecture	3

## General Information

### Delivery Format

In-Person

### Prerequisite /Co-requisite:

MATH 141 or MATH 151 or MATH 380 (C or better for any of the above)

## Course Materials

### Currently Used Materials

- Linear Algebra and its Applications, David Lay, 4th Edition

## Course Objectives/Learning Outcomes:

Solve and interpret solutions of systems of equations by row-reducing matrices.

Make basic arguments using matrix algebra.

Calculate the inverse of a matrix, and make conclusions about the nature of a matrix that are equivalent to its invertibility.

Use the concepts of bases and dimension to describe and work with common vector spaces and subspaces.

Calculate and interpret the determinant of a matrix.

Find and interpret eigenvalues, eigenvectors, and diagonalizations of a matrix.

Identify and manipulate properties of vectors, such as lengths, angles, and orthogonality. Make use of orthogonal projections.

Begin to learn to use theory - definitions, properties, theorems, and so on - to craft rigorous mathematical arguments.

Develop analytic and problem-solving skills, including the ability to break a complicated task into reasonable steps.

Begin to develop the framework of structured, logical thinking, upon which rests the study of advanced mathematics.

Improve mathematical maturity and mathematical self-confidence.

## Potential Topics Covered:

Systems of linear equations, row-reduction of matrices (Gauss-Jordan elimination), linear transformations, matrix algebra, vector spaces, properties of common subspaces, eigenvalues and eigenvectors, diagonalization of matrices, physical properties of vectors, dot products, orthogonal projections