

MIDDLESEX COUNTY COLLEGE
EDISON, NEW JERSEY
MATHEMATICS DEPARTMENT

Date: July 15, 2009

Course Title: Linear Algebra

Course No. MAT 210

Class Hours: 4

Laboratory Hours: 0

Credit Hours: 4

Department Head Approval: _____
Maria DeLucia, Ph.D.

Dean Approval: _____
Reginald Luke, Ph.D.

Prerequisite: MAT 131, Analytic Geometry & Calculus I, and MAT 132, Analytic Geometry & Calculus II

Textbook of Course:

Author: Larson and Falvo

Title: Elementary Linear Algebra, 6th Edition

Publisher: Houghton Mifflin

Catalog Course Description:

A general course covering geometric vectors, vector spaces, systems of linear equations, determinants, linear transformations, matrix algebra, and the application of matrices to the engineering, social, and management sciences. Advanced topics include linear product spaces, eigenvalues and eigenvectors, canonical forms, and computations via the computer. Topics include linear differential equations, linear programming, and stochastic processes. The course provides an overall view of the application of linear algebra in a variety of areas.

General Objectives of Course:

The student will demonstrate through quizzes, examinations, homework and projects the ability to:

1. perform and understand computations involving vectors, matrices, systems of equations, and mathematical models.
2. communicate an understanding of when and how to apply the tools of linear algebra in a variety of areas, some of which include engineering science, the humanities, and the social sciences and computer science.

REMARKS AND SUGGESTIONS

Linear Algebra is a one semester introductory course intended to expose the fundamental ideas to students usually interested in engineering, computer science, and science related careers, although the course may also accommodate students interested in the social sciences, psychology, economics, etc. As the language of modern mathematics, linear algebra can be taught at many different levels of sophistication. We have found, however, that more learning takes place if the instructor steers a middle road between non-rigor and rigor. Consequently, the instructor is encouraged not only to develop the computational skills of the student, but also to develop an appreciation of the structure and concepts of a "proof" and the beauty and elegance of the topic as a whole.

Course Outline

<u>Day</u>	<u>Topic</u>	<u>Day</u>	<u>Topic</u>
1	Chapter 1.1, 1.2 Systems of Equations Gaussian Elimination	15	Catch up and review
2	Chapter 1.2, 1.3 Gauss-Jordan Elimination Applications	16	Test #2
3	Chapter 2.1, 2.2 Matrix Operations	17	Chapter 5.1, 5.2 Inner Product Spaces
4	Chapter 2.3, 2.4 Inverses Elementary Matrices	18	Chapter 5.2, 5.3 Gram Schmidt Process
5	Chapter 2.4, 2.5 Applications	19	Chapter 5.5 Applications
6	Catch up and review	20	Chapter 6.1, 6.2 Linear Transformations Kernel and Range
7	Test #1	21	Chapters 6.3, 6.4 Matrices and Transformations
8	Chapter 3.1, 3.2 Determinants	22	Chapter 6.5 Applications
9	Chapter 3.3 Properties of Determinants	23	Catch up and review
10	Chapter 3.4, 3.5 Eigenvalues and Eigenvectors Applications	24	Test #3
11	Chapter 4.1, 4.2 R^n Vector Spaces	25	Chapter 7.1, 7.2 Eigenvalues and Eigenvectors Diagonalization
12	Chapter 4.3, 4.4 Subspaces Spanning Sets and Independence	26	Chapter 7.3, 7.4 Symmetric Matrices and p^{-1} AP Applications
13	Chapter 4.5, 4.6 Basis Dimension and Rank	27	The Proof
14	4.7, 4.8 Change of Basis Applications	28	Catch up and Review
FINAL EXAM			