

MIDDLESEX COUNTY COLLEGE
EDISON, NEW JERSEY
MASTER SYLLABUS

Course Title: Linear Algebra

Course No. MAT 210

Class Hours: 4

Laboratory Hours: 0

Credit Hours: 4

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

E-book of Course:

Author: Larson
Title: Elementary Linear Algebra, 8th Edition
Publisher: Cengage

Online Software: WebAssign

Learning Objectives:

The student will demonstrate the ability to:

1. Understand the basic concepts and perform computations involving vectors and linear maps, matrices, bases and dimension, eigenvalues and eigenvectors.
2. Communicate and understand when and how to apply the tools of linear algebra in a variety of areas, such as other branches of sciences, engineering, and economics.

Student Learning Outcomes (SLO):

Upon successful completion of this course, students will be able to:

1. Solve systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion.
2. Perform matrix operations, including inverses, determinants and applications.
3. Demonstrate understanding of the concepts of vector space, subspace, and rank.
4. Demonstrate understanding of linear independence, span, basis, and dimension.
5. Demonstrate understanding of symmetric matrices and orthogonal diagonalization
6. Determine eigenvalues, eigenvectors of matrices and apply eigenvalue problems.
7. Apply principles of matrix algebra to linear transformations and similarities.
8. Demonstrate understanding of inner product space and apply for mathematical modeling.
9. Use appropriate computational technology to solve relevant real-life problems.
10. Perform operations of complex matrices and their applications.
11. Demonstrate understanding of techniques and methods to solve basic linear programming problems.

Course Content Strand	
#1	Geometric Vectors and Vector Spaces
#2	Systems of Linear Equations
#3	Determinants and Linear Transformations
#4	Matrix Algebra and Applications
#5	Linear Product Spaces
#6	Eigenvalues and Eigenvectors
#7	Canonical Forms
#8	Linear Differential Equations
#9	Linear Programming and Stochastic Processes

Policies:

Disability Support

Students with disabilities, whether physical, learning or psychological, who believe that they may need accommodations in this class, are encouraged to contact Disability Services as soon as possible to ensure that the accommodations are implemented. Please meet with the Disability Services staff in Edison Hall, Room 100, (732) 906-2546.

Code of Student Conduct

To foster a productive learning environment, the College requires that all students adhere to the Code of Student Conduct which is published in the college catalog and website.

Course Outline

Day	Topic	Day	Topic
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 Stochastic Matrices and Applications	24	Test #3
11	Chapter 4.1, 4.2 \mathbb{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	Chapter 8.3, 8.4 Complex Vector Spaces and Matrices
14	4.7, 4.8 Change of Basis Applications	28	Chapter 9.1, 9.2 Linear Programming involving Two Variables
FINAL EXAM			