PARKLAND COLLEGE

Course Information Form (CIF)

Course Code: MAT 220 (IAI MTH 911)

Course Title: Linear Algebra

Department: Mathematics
PCS Code: 1.1 - Baccalaureate/Transfer
CIP Code: 27.0101
Repeatability: 0

Effective Date: Summer 2026

Credit Hours

Catalog Notation: 3-0-3
Credit Hour Distribution:

Lecture: 3	Lab: 0	Clinical: 0	**Total: 3**

General Course Information

Catalog Description

Vector spaces, subspaces, linear independence, basis, dimension, linear transformations, eigenvalues, eigenvectors, matrices, and determinants.

General Course Objectives

Students will understand the theory and applications of vector spaces; linear transformations; matrices; and determinants.

Minimum Placement Levels

English	Reading	Math
None	None	None

Prerequisites

Credit in MAT 129 with a grade of C or higher

Methods of Evaluation

3 exams, 4-8 quizzes, homework, and a final exam.

Instructional Materials and Additional Supplies

Elementary Linear Algebra, 8th Edition, by Larson, Brooks/Cole Cengage. ISBN 1-305-65800-4
Required: TI-83 Plus or TI-84 Plus or TI-89 graphing calculator; $85-$120/$160.

Course Content

General Learning Outcomes (GLOs)

- Reasoning and Inquiry: Students will demonstrate the ability to solve problems using deductive reasoning and logic, quantitative reasoning, or the scientific method.

Course Segments and Student Learning Outcomes

Course Segment	Learning Outcomes	Lecture Hours	Lab Hours	Clinical Hours
Linear Equations, Matrices, and Applications	1. Perform matrix operations. Solve systems of equations by using the Gauss-Jordan elimination method. 2. Find the inverse of a matrix using elementary row operations. 3. Apply matrices to polynomial curve fitting.	7	0	0
Determinants and their Applications	1. Apply determinants to homogeneous systems and invertibility. 2. Use Cramer's Rule and other applications of the determinant. 3. Perform student-written proofs.	3	0	0
Vectors and Vector Spaces	1. Apply the concepts of a vector space and subspace. 2. Use the concepts of linear independence, null space, span, basis, and dimension. 3. Determine the rank of a matrix. 4. Determine the structure of solutions to linear systems of equations. 5. Connect the concept of orthogonality, its relationship to linear independence, and the Gram-Schmidt process. 6. Apply the concepts of an inner product space. 7. Perform student-written proofs.	13	0	0
Linear Transformations and Matrices	1. Determine the matrix representation of a linear transformation. 2. Determine the range and kernel of a linear transformation. 3. Perform transformation of coordinate vectors under a change of basis. 4. Find sums, composites, and inverses of linear transformations.	5	0	0
Applications of Linear Transformations	1. Apply linear transformations to rotation of axes and to computer graphics.	2	0	0
Eigenvalues and Eigenvectors	1. Determine and interpret eigenvalues, eigenvectors, and eigenspaces. 2. Apply the concept of diagonalizability. 3. Perform student-written proofs.	4	0	0
Additional Applications	1. Apply matrices to least squares regression and Markov chains. 2. Apply vector spaces to linear differential equations. 3. Apply inner product spaces to Fourier coefficients.	4	0	0
Review and Tests	1. Earn at least a 70 percent on each of three hour exams and the final exam.	7	0	0
Graphing Calculator Usage	1. Graphing calculator usage is integrated throughout the course.	0	0	0

Total Contact Hours

Lecture Hours	Lab Hours	Clinical Hours
45	0	0