MATH 5 Course Outline as of Fall 1999

CATALOG INFORMATION

Dept and Nbr: MATH 5 Title: LINEAR ALGEBRA

Full Title: Linear Algebra Last Reviewed: 2/8/2021

| Units | | Course Hours per Week | | Nbr of Weeks | Course Hours Total | |
|---------|------|-----------------------|------|--------------|---------------------------|-------|
| Maximum | 3.00 | Lecture Scheduled | 3.00 | 17.5 | Lecture Scheduled | 52.50 |
| Minimum | 3.00 | Lab Scheduled | 0 | 17.5 | Lab Scheduled | 0 |
| | | Contact DHR | 0 | | Contact DHR | 0 |
| | | Contact Total | 3.00 | | Contact Total | 52.50 |
| | | Non-contact DHR | 0 | | Non-contact DHR | 0 |

Total Out of Class Hours: 105.00 Total Student Learning Hours: 157.50

Title 5 Category: AA Degree Applicable

Grading: Grade Only

Repeatability: 00 - Two Repeats if Grade was D, F, NC, or NP

Also Listed As:

Formerly:

Catalog Description:

A complete lower division course in Linear Algebra including the theory of matrices, determinants, vector spaces, linear transformations, eigenvectors, eigenvalues and applications.

Prerequisites/Corequisites:

Math 1B.

Recommended Preparation:

Concurrent enrollment in Math 2A or 2B.

Limits on Enrollment:

Schedule of Classes Information:

Description: Matrices, determinants, vector spaces, linear transformations, eigenvectors &

eigenvalues, applications. (Grade Only) Prerequisites/Corequisites: Math 1B.

Recommended: Concurrent enrollment in Math 2A or 2B.

Limits on Enrollment:

Transfer Credit: CSU; UC. (CAN MATH26)

Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree: Area Effective: Inactive: CSU GE: Transfer Area Effective: Inactive:

IGETC: Transfer Area Effective: Inactive:

CSU Transfer: Transferable Effective: Spring 1989 Inactive:

UC Transfer: Transferable Effective: Spring 1989 Inactive:

CID:

CID Descriptor:MATH 250 Introduction to Linear Algebra

SRJC Equivalent Course(s): MATH5

Certificate/Major Applicable:

Not Certificate/Major Applicable

COURSE CONTENT

Outcomes and Objectives:

- 01 Solve systems of linear equations with Gauss-Jordan elimination.
- 2. Define operations on matrices, inveribility, elementary matrices, orthogonal matrices.
- 3. Apply properties of determinants, evaluation by row reduction.
- 4. Define cofactors and adjoint, formula for inverse of a matrix, Cramer's rule.
- 5. Define properties of vectors, subspace, span, linear independence, basis, dimension, rank, solution space of a system of linear equations, inner product spaces, orthonormal bases.
- 6. Define kernel, range, rank/nullity theorem, matrix representation of linear transformation, similarity, change of basis.

Topics and Scope:

- 1. Matrices.
 - Systems of linear equations, Guass-Jordan elimination, operations on matrices, invertibility, elementary matrices, orthogonal matrices.
- 2. Determinants.
 - Properties, evaluation by row reduction, cofactors and adjoint, formula for inverse of a matrix, Cramer's rule.
- 3. Vector Spaces.
 - Defining properties, subspace, span, linear independence, basis, dimension, rank, solution space of a system of linear equations, inner product spaces, orthonormal bases, Gram-Schmidt process.
- 4. Linear Transformations.
 - Kernel, range, rank/nullity theorem, matrix representation of linear transformation, similarity, change of basis.
- 5. Eigenvectors and Eigenvalues.

Characteristic equations, eigenspaces (diagonalization of matrices, orthogonal diagonalization of symmetric matrices).

6. Applications (time permitting).
Differential equations, Fourier series, quadratic forms,
Gauss-Seidel method, partial pivoting, eigenvalue approximation, others.

Assignment:

- 1. The student will have daily outside reading, problem set assignments from required text(s), or instructor chosen supplementary materials.
- 2. Instructional methodology may include, but not limited to: lecture, demonstrations, oral recitation, discussion, supervised practice, independent study, outside project or other assignments.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

None, This is a degree applicable course but assessment tools based on writing are not included because problem solving assessments and skill demonstrations are more appropriate for this course.

Writing 0 - 0%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

Homework problems, Exams

Problem solving 25 - 50%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Performance exams

Skill Demonstrations 30 - 70%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice

Exams 5 - 25%

Other: Includes any assessment tools that do not logically fit into the above categories.

None

Other Category 0 - 0%

Representative Textbooks and Materials:

Text(s) required of each student will be selected by the department, a committe of the department, or the responsible instructor from the

books currently available. Choices in the past have included: ELEMENTARY LINEAR ALGEBRA (7th) Howard Anton, Wiley, 1997. ELEMENTARY LINEAR ALGEBRA (3rd) Heath 1996.