

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

Performance exams	Skill Demonstrations 30 - 70%
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Exams: All forms of formal testing, other than skill performance exams.

Multiple choice	Exams 5 - 25%
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Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%
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Representative Textbooks and Materials:

Text(s) required of each student will be selected by the department, a committee 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.