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.