

(Proposed from A.Y 2018-2019)

NIRMA UNIVERSITY
Institute of Technology
(B. Tech. All Programmes)
(Semester II)

L	T	P	C
3	1	0	4

Course Code	MA202
Course Title	Linear Algebra

Course Learning Outcomes (CLO)

At the end of the course, students will able to-

1. acquire basic knowledge of matrix theory,
2. comprehend basic concept of vector space and linear transformation,
3. apply the knowledge of linear algebra in engineering problems.

Syllabus:

Unit 1 Matrix Theory

Teaching hours: 23

Review of algebra of matrices, Rank of matrix, Inverse of matrix by Gauss-Jordan method, Solution of system of algebraic simultaneous equations, Linearly dependent and Linearly independent functions, Caley-Hamilton Theorem (without proof), eigen values and eigen vectors, Eigen values and eigen vectors of orthogonal, symmetric, skew-symmetric matrices, Hermitian matrix, skew-Hermitian matrix, Unitary matrix, Normal matrix, Algebraic and geometric multiplicity, Diagonalization, Spectral theorem for Real symmetric matrices, Application of quadratic forms.

Unit 2 Vector Space and Linear Transformation

Teaching hours: 22

Definition of vector space, subspaces, linear combination, Linearly dependent and linearly independent vectors, Basis of vector space, Dimension, Rank-Nullity theorem (statement and verification by examples), Definition of linear transformation, types of linear transformations (Rotation, Reflection, Expansion, Contraction, Projection), Matrix of Linear transformations, Change of basis and similarity.

Tutorials:

This shall consists of at least 8 tutorials based on the syllabus.

Self-Study:

Self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from the self-study contents.

Suggested Readings:

1. D C Lay, Linear Algebra and its Application; Pearson Publication
2. E Kreyszig, Advanced Engineering Mathematics; John Wiley Publication

3. H Anton, Elementary linear algebra with applications; John Wiley Publication
4. K Hoffman and R Kunze, Linear Algebra; PHI Publication
5. S Kumaresan, Linear algebra - A Geometric approach; PHI Publication
6. J P Sharma and M Yeolekar, Engineering mathematics Vol-II; PHI Publication

L = Lecture, T = Tutorial, P = Practical, C = Credit