NIRMA UNIVERSITY
Integrated B. Tech. (CSE)-MBA programme
Term - I

L	T	P	C
3	1	0	4

Course Code	CSI0101
Course Title	Linear Algebra

Course Outcomes:

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:

Teaching hours: 30

Unit I **14**

Matrix Theory: 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, eigen values and eigen vectors, Cayley-Hamilton Theorem (without proof), 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.

Unit II **16**

Vector Space and Linear Transformation: Vector space, subspaces, linear combination, Wronskian, Basis of a 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 a basis.

Tutorials:

This shall consist 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

^this is not an exhaustive list