

CB121**LINEAR ALGEBRA**

L	T	P	C	Int	Ext
2	1	-	3.0	30	70

Semester II [First Year]**COURSE OBJECTIVES:**

The objective of this course is to familiarize the Prospective engineers with techniques in Linear Algebra. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more a level of mathematics and applications that they would find useful in their discipline.

COURSE OUTCOMES:**After successful completion of the course student shall be able to:**

1. Solve System of Equations
2. Solve decomposition of matrices and Vector Space problems.
3. Find Eigen values and Eigen Vectors.
4. Orthogonalize given set of Vectors.

UNIT I**[CO:1] (12)**

Introduction to Matrices and Determinants; Solution of Linear Equations; Cramer's rule; Inverse of a Matrix Vectors and linear combinations; Rank of a matrix; Gaussian elimination.; Solving Systems of Linear Equations using the tools of Matrices.

UNIT II**[CO:2] (12)**

LU Decomposition; QR Decomposition. Vector space; Linear independent and dependent Vectors ;Basis; Dimension of a Vector Space.

UNIT III**[CO:3] (12)**

Linear transformations (maps); range and kernel of a linear map: rank and nullity.

Rank nullity theorem; Matrix associated with a linear map; Eigen values and Eigen vectors; Orthogonal matrices.

UNIT IV**[CO:4] (12)**

Diagonalization; Inner product spaces, Orthogonality; Projections; Gram-Schmidt orthogonalization Process.

LEARNING RESOURCES:**TEXT BOOK:**

1. Higher Engineering Mathematics, B. S. Grewal, Khanna Publishers.

REFERENCE BOOK(s):

1. Advanced Engineering Mathematics, (Seventh Edition), Peter V. O'Neil, Cengage Learning.
2. Advanced Engineering Mathematics, (Second Edition), Michael. D. Greenberg, Pearson.
3. Introduction to linear algebra, (Fifth Edition), Gilbert Strang, Wellesley-Cambridge Press.
4. Applied Mathematics (Vol. I & II), P. N. Wartikar & J. N. Wartikar, Pune Vidyarthi Griha Prakashan.
5. Digital Image Processing, R C Gonzalez and R E Woods, Pearson.