



BAPATLA ENGINEERING COLLEGE::BAPATLA
(Autonomous)

ABSTRACT LINEAR ALGEBRA															
IV B.Tech.VII Semester/OMAI															
Lectures	:	3 Hours/Week	Tutorial	:	0	Practical	:	0							
CIE Marks	:	30	SEE Marks	:	70	Credits	:	3							
Pre-Requisite: None															
Course Objectives: Students will learn how to															
➤	Verify a vector Space, check for basis and find the rank.														
➤	To le Findthe eigen values and eigen vectors, diagonalization of a square matrix and finding higher power of a given square matrix.														
➤	Define an inner product inner product, orthogonal projections, Gram-Schmidt orthogonalization process, least square solution of a system.														
➤	To learn diagonalization of symmetric matrices and singular value decomposition of a matrix.														
Course Outcomes: After studying this course, the students will be able to															
CO-1	Appy the definition for verification of a vector space, Change of basis and finding dimension of a vector space														
CO-2	Find matrix representation of a transformation, eigen values, eigen vectors and diagonalization of a matrix and its power matrix														
CO-3	Use the knowledge for orthonormal basis. Method of least square to fit a polynomial for the given data														
CO-4	To diagonalize a symmetric matrix and singular value decomposition of a matrix.														
Mapping of Course Learning Outcomes with Program Outcomes & Program Specific Outcomes															
		PO's											PSO's		
CO	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO-1	3	3	2									2	-	-	-
CO-2	3	2	2									3	-	-	-
CO-3	3	3	2									2	-	-	-
CO-4	2	2	2									3	-	-	-
UNIT-1												(12 Hours)			
Vector Spaces:															
Vector Space and Subspaces, Null Spaces, Column Spaces and Linear Transformations, Linear Independent Sets, Bases, The dimension of a vector space, Rank. [Sections 4.1, 4.2, 4.3 4.5, and 4.6]															
UNIT-2												(12 Hours)			
Eigen Values and Eigen Vectors:															
Eigen Vectors and Eigen values, The Characteristic Equation, Diagonalization, Eigen Vectors and Linear Transformations. [Sections 5.1, 5.2, 5.3, and 5.4]															



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UNIT-3		(12 Hours)
Orthogonality and Least Squares: Inner Product, Length, and Orthogonality, Orthogonal Sets, Orthogonal Projections, The Gram–Schmidt Process, Least-Squares Problems. [Sections 6.1, 6.2, 6.3, 6.4 and 6.5]		
UNIT-4		(12 Hours)
Symmetric Matrices and Quadratic Forms: Diagonalization of Symmetric Matrices, Quadratic Forms, Constrained Optimization, The Singular Value Decomposition. [Sections 7.1, 7.2, 7.3 and 7.4]		
Text Books :	Linear Algebra And Its Applications by David C. Lay, Steven R. Lay and Judi J. McDonald 5 th edition, Pearson, 2016	
References :	“Linear Algebra And Its Application” by Gilbert Strang, 4 th edition, Cengage India Limited,2014	