



BAPATLA ENGINEERING COLLEGE::BAPATLA (Autonomous)

ABSTRACT LINEAR ALGEBRA (OMA2)												
Common to all Branches												
IV B. Tech. – VII Semester												
Lectures	3	Tutorial	0	Practical	0	Credits	3					
Continuous Internal Evaluation			30	Semester End Examination			70					
Pre-Requisite: None.												
Course Objectives:												
➤ Verify a vector Space, check for basis and find the rank. ➤ Find the eigen values and eigven 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: At the end of this course, Students will be able to												
CO1	Apply the definition for verification of a vector space, Change of basis and finding dimension of a vector space											
CO2	Find matrix representation of a transformation, eigven values, eigen vectors and diagonalization of a matrix and its power matrix											
CO3	Use the knowledge for orthonormal basis. Method of least square to fit a polynomial for the given data											
CO4	To diagonalize a symmetric matrix and singular value decomposition of a matrix.											
Mapping of Course Outcomes with Program Outcomes & Program Specific Outcomes												
		POs										
	CO	1	2	3	4	5	6	7	8	9	10	11
	CO1	3	3	2	-	-	-	-	-	-	-	2
	CO2	3	2	2	-	-	-	-	-	-	-	3
	CO3	3	3	2	-	-	-	-	-	-	-	2
	CO4	2	2	2	-	-	-	-	-	-	-	3
UNIT-I												
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-II												
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-III	
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-IV	
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.