With effect from: 2023-24 (R-23)

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with A++ Grade

9-5-81, Ibrahimbagh, Hyderbad-500031, Telangana State

DEPARTMENT OF MATHEMATICS

LINEAR ALGEBRA

(OPEN ELECTIVE-I for Civil,EEE,ECE,Mech of 2/4 B.E III-Sem)

L:T:P (Hrs./week):2:0:0	SEE Marks :60	Course Code: **U220E310MA**
Credits : 2	CIE Marks: 40	Duration of SEE: 3 Hrs

COURSE OBJECTIVES	**COURSE OUTCOMES**
The course will enable the students to:	***At the end of the course students will be able to:***
1. **Study** the concept of Vector Spaces and understand the meaning of Basis and Dimension of a vector Space and Co-ordinates.	*1.* **Solve** the problems on Vector Spaces and determine the Basis and Dimension of a Vector Space and find the Co-ordinates.
2. **Understand** the meaning of Linear transformation, properties.	*2.* **Determine** the Linear Transformation, Range and Kernel and Matrix of Linear Transformation.
3. **Understand** the Range and Kernel, Rank-Nullity and Matrix of Linear Transformation.	*3.* **Determine** the Range and Kernel, Rank-Nullity and Matrix of Linear Transformation.
4. **Understand** theInner Product Spaces, Orthonormal sets, Gram-Schmidt's Orthogonalization process.	*4.* **Determine the** distance, orthogonal, orthonormal sets and construct orthonormal basis based on Gram-Schmidt's Orthogonalization process.

UNIT – I (8 classes)
Vector Spaces-Definition of a Vector Space, Subspaces, Basis and Dimension, Coordinates and Change of Basis.

UNIT – II (6 classes)
Linear Transformation -I
Definition of Linear Transformation- Properties of Linear Transformations – Product of Linear Transformations – Algebra of Linear Operators- Linear sum- Scalar multiple- Composition of maps.

UNIT – III (6 classes)
Linear Transformation -II
Range and kernel of a linear map – Dimension of Range and Kernel - Rank and nullity – Inverse of linear transformation - Rank nullity theorem (without Proof)- Matrix of Linear Transformation.

UNIT – IV (8 classes)
Inner Product Spaces-The Dot Product on R and Inner Product Spaces, Orthonormal Bases, Orthogonal Complements- Gram-Schmidt's Orthonormolization process.

Learning Resources:

1. Introduction to Linear Algebra with Application, Author : Jim Defranza, Daniel Gagliardi, Publisher : Tata McGraw-Hill

2. An Introduction to Linear Algebra, V.Krishna Murthy, V.P Mainra, J.L Arora, Affiliated to East-West Press Pvt Ltd

Reference Books:

1 Elementary Linear Algebra, Author: Anton and Rorres, Publisher: Wiley India Edition.
2 Advanced Engineering Mathematics, Author : Erwin Kreysig, Publisher : Wiley Publication
3 Elementary Linear Algebra, Author : Ron Larson, Publisher : Cengage Learning

Online Resources :

1 **http://mathworld.wolfram.com/topics**
2 **http://www.nptel.ac.in/course.php**

The break-up of CIE: Internal Tests + Assignments + Quizzes

1	No. of Internal Tests	:	2	Max. Marks for each Internal Tests	:	30
2	No. of Assignments	:	2	Max. Marks for each Assignment	:	5
3	No. of Quizzes	:	2	Max. Marks for each Quiz Test	:	5
Duration of Internal Tests		:	90	Minutes		

24.06.23

Prof.N.Kishan
(OU Nominee)

Prof.M.A.Srinivas
(Subject Expert-JNTU-H)

Dr.T.Sudhakar Rao
Chairman, BOS)