VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS)

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

DEPARTMENT OF MATHEMATICS

Linear Algebra and its Applications
Open Elective – B.E. IV Semester – CBCS w.e.f: 2018-19

Name of the Faculty: Prof. P. Hemagiri Rao

Instruction:	3 hrs Per week	Semester End Exam Marks :	60	Subject Reference Code :	OE630MA
Credits:	3	Sessional Marks :	40	Duration of Semester End Exam :	3 hours

Course Outcomes:

At the end of the course the students will learn:

1. The concept of vector spaces and sub spaces. These concepts are useful to generate **Code Words** to improve the quality of transmissions.
2. The concept of bases and dimension and change of bases. These concepts are useful in ordinary differential equations.
3. The concept of linear transformations and isomorphism and these concepts are useful in **Computer Graphics**.
4. The concept of inner product spaces Orthonormal bases. These concepts are useful in **Least Square Approximations**, which is used in engineering applications and statistics.

Unit – I: 10 hrs
Vector Spaces: Definition of Vector Space, Subspaces Basis and Dimension, Coordinates and Change of Basis

Unit – II: 10 hrs
Linear Transformations: The Null Space and Range and Isomorphisms

Unit – III: 8 hrs
Matrix Representation of a Linear Transformation, Similarity, Application: Computer Graphics

Unit – IV: 6 hrs
Inner Product Spaces: the Dot Product on R^n, Inner Product Spaces,

Unit – V: 6 hrs
Orthonormal Bases, Orthogonal Complements, Application: Least Square Approximation

<u>**Text Books:**</u>
1. Introduction to linear algebra with applications, Jim DeFranza, Daniel Gagliardi, Tata McGraw-Hill
2. An introduction to Linear Algebra, V.P Mainra, J.L Arora, Affiliated to East-West Press Pvt Ltd

<u>**Reference Books:**</u>
1. Elementary Linear algebra, Anton and Rorres, Wiley India Edition
2. Advanced Engineering Mathematics, Erwin Kreysing, Wiley Publication
3. Elementary Linear algebra, ron Larson, Cengage Learning

<u>**Relevance of the Course:**</u>

I. The concept of vector spaces and sub spaces are useful to generate Code Words**,** which are useful to improve the quality of transmissions, which are relevant to **ECE** and **EEE** branches.

II. Linear Transformations, Null Space and Range, Isomorphisms and Matrix Representation of a Linear Transformation – These concepts are mainly useful in Computer Graphics, which are relevant to **CSE** and **IT** branches.

III. Dot Product on R^n and Inner Product Spaces, Orthonormal Bases – These concepts are useful in least square approximations. Least square approximations are useful in engineering applications and statistics, which are relevant to **Mechanical** and **Civil** branches.

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