CORE PAPER – VII - LINEAR ALGEBRA

Semester	Subject Code	Category	Lecture		Theory		Practical	Credit
V		Core paper – VII	Hrs/week	Hrs/Sem	Hrs/week	Hrs/Sem	0	4
			6	90	6	90		

COURSE OBJECTIVES:

The students will be able to

- Demonstrate competence with the basic ideas of linear algebra including concepts of linear systems, independence, theory of matrices, trace and transpose.
- Study the Algebraic structures of Vector Spaces and Linear Transformation

COURSE OUTCOMES:

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	Understand the concepts of Vector space	K2
CO2	Compute inner products and determine orthogonality on Vector spaces	K2
CO3	Prove theorems on linear transformations and find the characteristic root	K3
CO4	Understand Triangular form and solve related problems	K3
CO5	Apply the trace and transpose on linear systems	K3

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze

MAPPING WITH PROGRAMME OUTCOMES:

Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	M	M	S	S	S	M
CO2	M	S	M	M	S	S
CO3	S	M	S	M	S	M
CO4	S	M	S	M	M	S
CO5	S	S	S	S	M	S

S- Strong: M- Medium: L- Low

UNIT – I: VECTOR SPACES   **18 Hours**
Definition and examples – Linear dependent and independence. Related Theorems – Simple Problems.
(Chapter – 4: Sections 4.1, 4.2)

UNIT – II: VECTOR SPACES (CONTD.)   **18 Hours**
Dual space – Inner Product spaces – Definitions – Examples - Theorems – Simple Problems.
(Chapter – 4: Sections 4.3, 4.4)

UNIT – III: LINEAR TRANSFORMATION   **18 Hours**
Algebra of linear transformations – Characteristic roots - Definitions – Examples-Related Theorems – Simple Problems.
(Chapter – 6: Sections 6.1, 6.2)

UNIT – IV: LINEAR TRANSFORMATION (CONTD.)   **18 Hours**
Matrices, Canonical forms: Triangular forms - Definitions – Examples - Theorems – Simple Problems.

(Chapter – 6: Sections 6.3, 6.4)

UNIT – V: LINEAR TRANSFORMATION (CONTD.)   **18 Hours**
Trace and Transpose, Determinants - Theorems – Simple Problems.

(Chapter – 6: Sections 6.8, 6.9)

DISTRIBUTION OF MARKS: THEORY 80% AND PROBLEMS 20%

TEXT BOOK

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	I.N.Herstein.	Topics in Algebra	Wiley Eastern Ltd. New Delhi	1989

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Surjeet Singh and Qazi Zameeruddin	Modern algebra	Vikas Publishing House Pvt. Ltd. New Delhi	1982

2	J.B.Fraleigh	A First Course in Algebra (3rd Edition)	Addison Wesley, Mass. (Indian Print)	1987
3	M.L. Santiago	Modern Algebra	Tata McGraw Hill, New Delhi	2002
4	S. Arumugam	Modern Algebra	Scitech Publications, Chennai.	2004
5	S. Lipschutz	Beginning Linear Algebra	Tata McGraw Hill Edition, New Delhi.	2005

WEB RESOURCES

1. https://marinazahara22.files.wordpress.com/2013/10/i-n-herstein-topics-in-algebra-2nd- edition-1975-wiley-international-editions-john-wiley-and-sons-wie-1975.pdf

2. https://www.khanacademy.org/math/linear-algebra

TEACHING METHODOLOGY

1. Class room Teaching

2. Assignments

3. Seminars

4. Discussions

5. PPT Presentations