

Subject Code: 2SC1040402	Subject Title: Advanced Linear Algebra
---------------------------------	---

Course Objective:

This course is designed to enable students to acquire the understanding of advanced linear algebra.

Teaching scheme (hours) per week		credit		Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
3	--	3	--	70	30	--	--	100

Subject Contents				
Unit No.	Topic	Total Hours	Weight (%)	
1	Matrices of a Linear Transformation: Definition of a Matrix of a linear transformation, Linear Transformation associated with a matrix, the dimension of $L(U, V)$, and its determination, Rank and Nullity of a Matrix, invertibility of system of linear equations.	12	25	
2	Linear Functional And Duality: Definition of linear functional and its examples, Definition of Dual space and Dual basis and its examples, Adjoint of a linear operator, its properties and examples.	12	25	
3	Inner Product Space: Definition of inner product space, Norm, Orthogonality, Schwarz's & Triangular inequality, Parallelogram law, Orthonormal basis.	12	25	
4	Linear Operators on Inner Product Spaces: Inner Product Space Morphisms, Linear Functionals and Inner Product Spaces, Adjoint Operators, Spectral Theorem and Orthogonal Operators.	12	25	

Course Outcome:

After successfully completion of the course, the student will be able to ...

- Understand the concept of linear transformation applied to various problems.
- Understand the several forms of linear functional and duality.
- Know about inner product space.
- Understand the concept of Adjoint Operators.

List of References:

- 1) an Introduction to Linear Algebra' by V. Krishnamurthy, V P Mainra, J L Arora, Affiliated East-west Press Pvt Ltd., New Delhi
- 2) Linear Algebra , Ramchandra Rao, P. Bhimasankar, Tata MacGrawHill.
- 3) Topics in Algebra, I N Herstein, Wiley Eastern Ltd.
- 4) Linear Algebra, S K Berberion, Oxford University Press.
- 5) Linear Algebra Problem Book, P R Holmos, Cambridge University Press.
- 6) Linera Algebra, Sharma and Vashishtha, Krishna Prakashan, Meerut.

- 7) Linear Algebra, Gupta K P, Pragati Prakashan, Meerut.
- 8) Linear Algebra, G Paria, New Central book agency Ltd, Calcutta.
- 9) Surekh Bij Ganit, I H Sheth, University Granth Nirman Board (Gujarati).
- 10) Theory and Problems of Linear Algebra, Dr. R.D.Sharma, Dr. Ritu Jain, I.K.International Publication House Pvt. Ltd., New Delhi.