

# GUJARAT TECHNOLOGICAL UNIVERSITY

## ELECTRICAL ENGINEERING (07)

LINEAR ALGEBRA

SUBJECT CODE: 2710710

SEMESTER: I

**Type of course: Post Graduate**

**Prerequisite:**

**Rationale:**

**Teaching and Examination Scheme:**

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	PA (V)		PA (I)			
					ESE	OEP	PA	RP		
3	2	0	4	70	30	30	0	10	10	150

**Content:**

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Finite dimensional vector space, subspaces, linear independence, bases and dimension	9	20
2	Algebra of transformations, range and null space of a linear transformation, matrix algebra, simultaneous equations	9	20
3	Sum and intersection of subspaces, direct sum of invariant subspaces, eigen values, characteristic vectors, Cayley-Hamilton theorem, minimal polynomial, Sylvester's interpolation method, various canonical form. Algebra of polynomial matrices, invariant	9	30
4	Polynomial matrices, invariant polynomials, elementary divisors, Smith canonical form. Innerproduct spaces, Gram Schmidt orthogonalization, linear transformation and their adjoint, self adjoint, unitary and normal transformations, polar decomposition	9	20
5	Some computational methods of linear algebra.	6	10

**Reference Books:**

1. Finkbeiner D.T. Introduction to Matrices and linear Transformation, D.B. Taraorewala's. 1968
2. Hoffman, K and Kunze, R. linear Algebra, Prentice Hall of India. 1972.
3. Gantmocher F.R. The Theory of Matrices, Chaisea. 1960
4. Goult, R.J., Hoskin, R.P., Milner, J.A and Pratt, M.J.- Computational methods in Linear Algebra, Stanley Thomas Pub. Ltd. 1974

**Course Outcome:**

After learning the course the students should be able to

- Understand the vector spaces, transformation
- Solve the engineering problems using linear algebra
- Use the theorms and canonical forms

- Use the computational methods for linear algebra

**Major Equipments: N.A**

**List of Open Source Software/learning website:**