Teaching Scheme	Examination Scheme
Lectures : 2 hrs / week	Internal Test 1: 20 marks
Tutorial: 1 hr / week	Internal Test 2: 20 marks
	End Sem. Exam: 60 marks

Objectives : Basic necessity for the foundation of Engineering and Technology being mathematics, the main aim is, to teach mathematical methodologies and models, develop mathematical skills and enhance thinking power of students.

Unit I : Matrices and linear equations: basic properties of matrices, row operations and Gauss elimination, Determinants and their basic properties. Basic concepts in linear algebra: vector spaces, subspaces, linear independence and dependence of vectors, bases, dimensions. Row and Column spaces, rank. Applications to systems of linear equations.   **[10 Hrs]**

Unit II : Linear mappings, representation by matrices, rank-nullity theorem, Eigen values, Eigen vectors and their basic properties. **[08 Hrs]**

Unit III : Inner product spaces, orthogonality, Gram-Schmidt process, Diagonalization of special matrices, Jordan Canonical form, Geometric applications of Linear transformation, quadratic forms: positive definiteness. **[08 Hrs]**

.**Text Book :**

- Introduction to Linear Algebra (2nd edition) by Serge Lang, Springer.

Reference Books :

- Linear Algebra and its Applications (4th edition) by Gilbert Strang, Cengage Learning (2006) .
  - Linear Algebra (3rd edition) by Serge Lang, Springer.
  - Elementary Linear Algebra (10th edition) by Howard Anton and Chris Rorres, John Wiley and sons.
  - Schaum's outlines of Linear Algebra (5th edition) by Seymour Lipschutz, Marc Lipson, McGraw-Hill Education (India) Private Limited, New Delhi.
  - Linear Algebra by Hoffman and Kunze, (2nd edition) Prentice Hall Publication, New Delhi.
  - Advanced Engineering Mathematics (10th edition) by Erwin Kreyszig, Wiley eastern Ltd.

Outcomes : Students will be able to

- know and recall core knowledge of the syllabus. (To measure this outcome, questions may be of the type- define, identify, state, match, list, name etc.)
- understand basic concepts. (To measure this outcome, questions may be of the type- explain, describe, illustrate, evaluate, give examples, compute etc.)
- analyze the problem and apply the appropriate concept. (To measure this outcome, questions will be based on applications of core concepts)
- give reasoning. (To measure this outcome, questions may be of the type- true/false with justification, theoretical fill in the blanks, theoretical problems, prove implications or corollaries of theorems, etc.)

- apply core concepts to new situations. (To measure this outcome, some questions will be based on self-study topics and also comprehension of unseen passages.)

Note:

Some topics from the syllabus will be taught from the notes prepared by Prof. K.D. Joshi (Emeritus Professor, COEP).

All the Course outcomes 1 to 3 will be judged by 75% of the questions and outcomes 4 and 5

 will be judged by 25 % of questions.