LINEAR ALGEBRA

Course Code: **MM24404CR** Total Credits: **02**
Semester: **MA/M.Sc. 4th Semester** Total Marks: **50**
Continuous Assessment: **Marks 10,** Theory: **Marks 40** Time Duration: **1½ hrs**

Course objectives: To inculcate the students to study linear functions and their representations through matrices and vector spaces.

Course Outcomes: This course shall help the students in developing students' understanding of fundamental concepts in linear algebra and their ability to apply these concepts to various mathematical. In particular this will help in understanding bilinear and quadratic forms, including symmetric matrices, diagonalization of quadratic forms, and applications.

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UNIT -I

Linear transformation, algebra of linear transformations, linear operators, invertible linear transformations, matrix representation of a Linear transformation, linear functionals, dual spaces, dual basis, annihilators, eigenvalues and eigenvectors of linear transformation, diagonalization, similarity of linear transformation.

UNIT -II

Canonical forms: triangular form, invariance, invariant direct sum decomposition, primary decomposition, nilpotent operators, Jordon canonical form, cyclic subspaces, rational canonical form, quotient spaces, bilinear forms, alternating bilinear forms, symmetric bilinear forms, quadratic forms.

Books Recommended:

1. Robort A. Beezer, A first course in linear algebra, Organge Grove Books, 2009.
2. John B. Fraleigh and Raymond, Linear Algebra, Pearson Publishers, 3rd Edition, 1995.
3. A. K. Sharma, Linear Algebra, Discovery Edition, 1st Edition, 2016.
4. Vivek Sahai and Vikas Bist, Linear Algebra, Alpha Science International Ltd., 2001.