SEMESTER-V

1.5 Linear Algebra

(w.e.f. academic year 2021-22)

DSC-E

BS:501

Theory: 5 credits and Tutorials: 0 credits Theory: 5 hours /week and Tutorials: 1 hours /week

Objective: The students are exposed to various concepts like vector spaces , bases , dimension, Eigen values etc.

Outcome: After completion this course students appreciate its interdisciplinary nature.

Unit- I

Vector Spaces: Vector Spaces and Subspaces -Null Spaces, Column Spaces, and Linear Transformations -Linearly Independent Sets; Bases -Coordinate Systems -The Dimension of a Vector Space

Unit- II

Rank-Change of Basis - Eigenvalues and Eigenvectors - The Characteristic Equation

Unit- III

Diagonalization - Eigenvectors and Linear Transformations - Complex Eigenvalues - Applications to Differential Equations.

Unit- IV

Orthogonality and Least Squares : Inner Product, Length, and Orthogonality -Orthogonal Sets -Orthogonal Projections - The Gram-Schmidt Process.

Text:

• David C Lay, Linear Algebra and its Applications 4e

References:

- S Lang, Introduction to Linear Algebra
- · Gilbert Strang, Linear Algebra and its Applications
- Stephen H. Friedberg, Arnold J. Insel, Lawrence E. Spence; Linear Algebra
- Kuldeep Singh; Linear Algebra
- · Sheldon Axler; Linear Algebra Done Right