BSc IT

DSC-6: Matrix Algebra (LTP::4:0:2) 6 Credits

Unit-1

Matrices and Gaussian Elimination: Introduction, Geometry of Linear Equations, Example of Gaussian Elimination, Matrix notation and Matrix Multiplication, Triangular Factors and Row Exchanges, Inverses and Transposes, Special matrices and applications.

Unit-2

Vector Spaces: Vector spaces and Subspaces, Solving problems, linear independence, basis and dimension, the four fundamental subspaces, Graphs and Networks, Linear Transformations.

Unit 3

Orthogonality: Orthogonal Vectors and Subspaces, Cosines and Projections onto Lines, projections and least squares, orthogonal bases and Gram-Schmidt, The Fast Fourier Transform.

Unit-4

Determinants: Introduction, Properties of the determinant, formulas for the determinant and applications.

Eigenvalues and Eigenvectors: Introduction, Diagonalization of a matrix, difference equations and powers, Differential equations, complex matrices, similarity transformations.

Books Recommended

1. Linear algebra and its applications, fourth edition, Gilbert Strang.

2. Linear algebra and its applications, Third edition, David C. Lay.