

Module 2: Linear Algebra

- 1 What is a Matrix ?
- 2 Row and Column Interpretation of a Matrix.
- 3 Rectangular and Square Matrices.
- 4 Singular Matrices.
- 5 Matrix as set of vectors.
- 6 Transpose and Inverse of a matrix.
- 7 Conditions on Invertibility of a matrix.
- 8 Gauss Jordan Elimination Method for solving system of Linear Equations in Matrix form.
- 9 Rank of a Matrix.
- 10 Full Rank Matrices.
- 11 Vector Spaces and Subspaces.
- 12 Null Space, Left Null Space ,Column Space and Row Space of a Matrix.
- 13 **Sample Python code demonstration along with detailed explanation for Coding Assignment.**
- 14 **Coding Assignment 7.**
- 15 Linearly Dependent and Independent Vectors.
- 16 Row or Column Space spanned by Basis Vectors.
- 17 Orthogonal Vectors.
- 18 Orthogonal Matrices.
- 19 Orthonormal Matrices.
- 20 Approximate nearest solution to the system of Linear Equations when there is no solution.
- 21 Projection of a vector onto another vector.
- 22 Projection Matrices.
- 23 Gram Schmidt Orthogonalization for getting Orthonormal Basis Matrices.
- 24 **Sample Python code demonstration along with detailed explanation for Coding Assignment.**
- 25 **Coding Assignment 8.**
- 26 Determinant and Trace of a Matrix.
- 27 Eigen Vectors and Eigen Values.
- 28 Symmetric Matrices.
- 29 Singular Value Decomposition of Matrices.
- 30 Positive Semidefinite and Definite Matrices.
- 31 **Sample Python code demonstration along with detailed explanation for Coding Assignment.**
- 32 **Coding Assignment 9.**
- 33 **Portfolio Project 2 on Linear Algebra.**