DSC 03: Mathematics for computing

Syllabus with Planner

Unit	Topic	Month wise schedule to be followed	Test/ Assignment/ Revision
1	Introduction to Matrix Algebra: Echelon form of a Matrix, Rank of a Matrix, Determinant and Inverse of a matrix, Solution of System of Homogeneous & Non-Homogeneous Equations: Gauss elimination and Solution of System of Homogeneous Equations: Gauss Jordan Method.	**November 2022**	**Assignment in last week of November Test in 1st week of December**
	Revision and doubt session		
2	Vector Space and Linear Transformation: Vector Space, Sub-spaces, Linear Combinations, Linear Span, Convex Sets, Linear Independence/ Dependence, Basis & Dimension, Linear transformation on finite dimensional vector spaces, Inner Product Space, Schwarz Inequality, Orthonormal Basis, Gram-Schmidt Orthogonalization Process.	**December 2022**	**Assignment + test in 4th week**
	Revision and doubt session		
3	Eigenvalue and Eigenvector: Characteristic Polynomial, Cayley Hamilton Theorem, Eigen Value and Eigen Vector of a matrix, Eigenspaces, Diagonalization, Positive Definite Matrices, Applications to Markov Matrices	**1st 3 weeks of January**	**Assignment + test in 3rd week**
	Revision and doubt session		
4	Vector Calculus: Vector Algebra, Laws of Vector Algebra, Dot Product, Cross Product, Vector and Scalar Fields, Ordinary Derivative of Vectors, Space Curves, Partial Derivatives, Del Operator, Gradient of a Scalar Field, Directional Derivative, Gradient of Matrices, Divergence of a Vector Field, Laplacian Operator, Curl of a Vector Field.	**Last week of January till mid of February.**	**Assignment**
Revision of whole syllabus			

Reference

1. Strang Gilbert, “Introduction to Linear Algebra”, 5th Edition, Wellesley-Cambridge Press, 2021.

2. Kreyszig Erwin, “Advanced Engineering Mathematics”, 10th Edition, Wiley, 2015.

3. Stephen Andrilli and David Hecker, “Elementary Linear Algebra”, Fourth Edition, Academic Press, 2010, ISBN: 978-0-12-374751-8