

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.	August 25	Test in 1 st week of September
	Discussion of doubts of the test		
	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	Sept 25 to 1 st week of October	Assignment in 2 nd week of October
	Assignment of unit 1 and unit 3 during mid -sem break		
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.	October 25	Test of Vector Spaces in 2 nd week of November 25
	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.	2 nd week of November till 3 rd week of November 25	Assignment
Revision of whole syllabus			

References:

1. Kreyszig Erwin, “Advanced Engineering Mathematics”, 10th Edition, Wiley, 2015.
2. David C. Lay, Steven R. Lay and Judi J. McDonald, “Linear Algebra and its applications”, 5th edition, Pearson.

Additional References:

1. Strang Gilbert, “Introduction to Linear Algebra”, 5th Edition, Wellesley-Cambridge Press, 2021.
 2. Stephen Andrilli and David Hecker, “Elementary Linear Algebra”, Fourth Edition, Academic Press, 2010, ISBN: 978-0-12-374751-8
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