

MT-273 DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA

Linear Algebra:

Linearity and Linear dependence of vectors, basis, dimension of a vector space, field matrix and types of matrices (singular, non-singular, symmetric, non-symmetric, upper, lower, diagonal tri-diagonal matrix), Rank of a matrix using row operations and special method, echelon and reduced echelon forms of a matrix, determination of consistency of a system of linear equation using rank, transitions matrix. Geometric representation of vector, norm of vector, Euclidean inner product, projections and orthogonal projections, Euclidean n spaces n properties Cauchy-Schwartz inequality, Euclidean transformations, apply geometric transformations to plane figure, composition of transformations. Eigen value and Eigen space.

Ordinary Differential Equations:

Definitions (differential equation, general solution, particular solution, initial condition, boundary condition, initial homogenous and non-homogenous linear differential equations with constant coefficients, solutions of Euler differential equation, computation of particular integral of non-homogenous differential equations with problems.

Partial Differential Equations:

Formation of partial differential equations, Solutions of first order linear and special types of second and higher order differential equation. Homogenous partial differential equations of order one. Lagrange multiplier.

Recommended Books:

1. “Elementary Linear Algebra: Application Version”, Howard Anton and Chris Rorres, John Wiley & Sons Wiley, 10th Edition, 2010.
2. “Differential Equations with Boundary Value Problems:”, Dennis G. Zill and Michael R. Cullen, Thomson Brooks/Cole Publishing, 7th Edition, 2009.
3. “Advanced Engineering Mathematics”, Erwin Kreyszig, John Wiley & Sons, 9th Edition, 2006.
4. “Differential Equations: A modelling Perspective”, Robert L. Borelli and Courtney S. Coleman, Wiley, 2nd Edition, 2004.