

Mathematical Portion

Unit -I

1. Algebraic Topology
 - The fundamental Group
 - Covering Spaces
 - Retractions and Deformation Retracts
 - Fundamental Theorem of Algebra
 - Fundamental groups of various figures like Circle, S_n , Torus
 - The Borsuk- Ulam Theorem ; The Jordan Separation Theorem
 - The Jordan Curve Theorem Topology

Unit -II

2. Stability Analysis
 - System of first order Question
 - Non-linear Equation ; Autonomous Systems
 - The Phase Plane and its phenomena
 - Types of critical points;-Stability & Critical Points for linear Systems
 - Stability by Liapunou's direct method; -critical points for non –liner System
 - Non-linear mechanics ; Conservation Systems

Unit -III

3. Laplace and Fourier series
 - Laplace Transforms ; App. of differential Equation
 - Deviation & Integration of Laplace Transforms
 - Trigonometric Polynomial ; flourier series & Transformation

Unit-IV

3. Application of Linear Algebra
 - Application of Matrix Theory
 - Application of Projection Theory and Orthogonal complements
 - Diagonalizable linear Operator , Eigen values, Eigen vectors, Spectrum and Eigen spaces of an Operator
 - Estimate of Eigen value and Application to finite Difference Equations.

List of Reference Books:

1. Linear Algebra with Application by J.T.Scheick, McGraw Hill, 1997
2. Linear Algebra By S.K. kumareyam
3. Abstract Algebra By I.N. Hertain
4. Topology – Second Edition, J.R.Munkres, Pearson Edu.2004
5. Differential Equation , Tata Mac Grow Hill, G.F. Simmons
6. Introduction to Real Variable Theory , By S.C.Saxena & S.M.Shah
7. Biometrics By Pundir ; Pragti Prakashan
8. Mathematical Analysis for Modeling, Judag R osenblatt & Bell CRC Press, DC-1999