UNIT I  INTRODUCTION TO SYSTEM MODELING  
.Modeling and General Systems Theory-Concepts of Simulation-Types of Simulation-
Experimental Design Consideration- Comparison and Selection of Simulation
Languages-Development of Simulation Models Using any one of the Languages for
Some Problems -Stochastic Simulation - Randomness and Random Numbers -
Random Number Generators - Software for Generating Random Numbers.

UNIT II  APPROXIMATIONS IN SCIENTIFIC COMPUTING  
General Strategy - Approximations in Scientific Computation - Mathematical Software -
Mathematical Software Libraries - Scientific Computing Environments - Extended
Arithmetic Packages

UNIT III  OPTIMIZATION  
Optimization Problems - Existence and Uniqueness - Convexity - Optimization in One
Dimension- Multidimensional Unconstrained Optimization - Constrained Optimization -
Linear Programming

UNIT IV  ROOTS OF EQUATION ,LINEAR ALGEBRAIC EQUATION AND
INTERPOLATION  
Graphical Method – Iterative Methods- Newton-Raphson Method- Break-Even Analysis-
Gauss Elimination-Solution Of Linear Systems By Gaussian, Gauss-Jordan, Jacobi And
Gauss Seidel Methods-Matrix Inversion-Gauss-Jordan Method. Least-Square
Regression -Newton’s Divided-Difference Interpolating Polynomials-Lagrange’s
polynomials-Newton’s Forward and Backward Difference Formula- Stirling’s and
Bessel’s Central Difference Formula.

UNIT V  NUMERICAL ORDINARY AND PARTIAL DIFFERENTIATION AND
INTEGRATION  
Numerical Differentiation: Runge-Kutta Methods, Boundary-Value and Eigen value
Integration: Trapezoidal and Simpson’s Rules – Two and Three Point Gaussian
Quadrature Formula – Double Integral Using Trapezoidal and Simpson’s Rule.

TOTAL: 45 PERIODS

TEXT BOOKS:
REFERENCES: