

## **SYLLABUS**

### **MA 8452 - STATISTICS AND NUMERICAL METHODS**

#### **UNIT - I**

##### **TESTING OF HYPOTHESIS**

Sampling distributions - Estimation of parameters - Statistical hypothesis - Large sample tests based on Normal distribution for single mean and difference of means - Tests based on  $t$ , Chi-square and  $F$  distributions for mean, variance and proportion - Contingency table (test for independent) - Goodness of fit.

#### **UNIT - II**

##### **DESIGN OF EXPERIMENTS**

One way and two way classifications - Completely randomized design - Randomized block design - Latin square design -  $2^2$  factorial design.

#### **UNIT - III**

##### **SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS**

Solution of algebraic and transcendental equations - Fixed point iteration method - Newton Raphson method - Solution of linear system of equations - Gauss elimination method - Pivoting - Gauss Jordan method - Iterative methods of Gauss Jacobi and Gauss Seidel - Eigenvalues of a matrix by Power method and Jacobi's method for symmetric matrices.

#### **UNIT - IV**

##### **INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION**

Lagrange's and Newton's divided difference interpolations - Newton's forward and backward difference interpolation - Approximation of derivatives using interpolation polynomials - Numerical single and double integrations using Trapezoidal and Simpson's  $1/3$  rules.

#### **UNIT - V**

##### **NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS**

Single step methods : Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order equations - Multi step methods : Milne's and Adams - Bash forth predictor corrector methods for solving first order equations.