AMAE-07 STATISTICS AND NUMERICAL METHODS

UNIT-1 TESTING OF HYPOTHESIS

1.1 Large sample test based on Normal distribution for single mean and difference of means
1.2 Tests based on t, 2 and F distributions for testing means and variances
1.3 Contingency table (Test for Independency)
1.4 Goodness of fit.

UNIT-2 DESIGN OF EXPERIMENTS

2.1 One way and two way classifications
2.2 Completely randomized design
2.3 Randomized block design
2.4 Latin square design- 22 factorial design.

UNIT-3 SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS

3.1 Newton Raphson method
3.2 Gauss elimination method- pivoting
3.3 Gauss Jordan methods
3.4 Iterative methods of Gauss Jacobi and Gauss Seidel
3.5 Matrix inversion by Gauss Jordan method
3.6 Eigen values of a matrix by power method.

UNIT-4 INTERPOLATION, NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION

4.1 Lagrange's and Newton's divided difference interpolations
4.2 Newton's forward and backward difference interpolation
4.3 Approximation of derivates using interpolation polynomials
4.4 Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules.

UNIT-5 NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS

5.1 Taylor's series method
5.2 Euler's method- Modified Euler's method
5.3 Fourth order Runge- Kutta method for solving first order equations
5.4 Milne's predictor corrector methods for solving first order equations
5.5 Finite difference methods for solving second order equations.

References Books:

1. Walole. R.E., Myers. R.H., Myers. S.L., and Ye. K., "Probability and Statistics for Engineers and Scientists", 8th Edition, Pearson Education, Asia, 2007.
2. Spiegel. M.R., Schiller. J., and Srinivasan. R.A., "Schaum's Outlines on Probability and Statistics", Tata McGraw Hill Edition, 2004.
3. Chapra. S.C., and Canale. R.P, "Numerical Methods for Engineers", 5th Edition, Tata McGraw Hill, New Delhi, 2007.