NUMERICAL ANALYSIS AND STATISTICAL TECHNIQUES

	L	T/P	C
Paper Code: ETMA-203			
Paper: Numerical Analysis and Statistical Techniques	3	1	4

INSTRUCTIONS TO PAPER SETTERS: **Maximum Marks: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.
2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks.

Objective: To develop numerical ability and to impart knowledge in Statistical methods and Probability theory and their applications in Engineering to enable them to apply that for solving real world problems.

UNIT I
Probability Theory: conditional probability, Baye's theorem, Random variable: discrete probability distribution, continuous probability distribution, expectation, moments, moment generating function, skewness, kurtosis, binomial distribution, Poisson distribution, normal distribution, Curve Fitting: Principle of least square Method of least square and curve fitting for linear and parabolic curve .

[T1,T2][No. of Hrs. 11]

UNIT II
Correlation Coefficient, Rank correlation, line of regressions and properties of regression coefficients, ANOVA, Sampling distribution: Testing of hypothesis, level of significance, sampling distribution of mean and variance, Chi-square distribution, Student's T- distribution, F- distribution, Fisher's Z- distribution.

[T1,T2][No. of Hrs. 11]

UNIT III
Numerical Methods: Solution of algebraic and transcendental equations using bisection method, Regula-Falsi method and Newton – Raphson method. Solution of linear simultaneous equations using Gauss-Jacobi's iteration method and Gauss-Seidal's iteration methods. Finite differences: Forward differences, backward differences and Central differences. Interpolation: Newton's interpolation for equi-spaced values. Stirling's central difference interpolation formula, Divided differences and interpolation formula in terms of divided differences, Lagrange's interpolation formula for unequi-spaced values.

[T1,T2][No. of Hrs. 11]

UNIT IV:
Numerical Differentiation, maxima and minima of a tabulated function. Numerical Integration: Newton-Cote's quadrature formula, Trapezoidal rule, Simpson's one-third rule and Simpson's three-eighth rule .Numerical solution of ordinary differential equations: Picard's method, Taylor's method,Euler's method, modified Euler's method, Runge-Kutta method of fourth order.

[T1,T2][No. of Hrs. 11]

Text Books:
[T1]   R.K. Jain and S.R.K. Iyengar," Numerical methods for Scientific and Engineering Computation", New Age.
[T2]   N.M. Kapoor, "Fundamentals of Mathematical Statistics", Pitambar Publications

Reference Books:
[R1]   E. kresyzig," Advance Engineering Mathematics", Wiley publications
[R2]   P. B. Patil and U. P. Verma, " Numerical Computational Methods", Narosa
[R3]   Partial Differential Equations "Schaum's Outline Series", McGraw Hill.
[R4]   Michael Greenberg, "Advance Engineering mathematics", Pearson.
[R5]   Schaum's Outline on Fourier Analysis with Applications to Boundary Value Problem, TMH
[R6]   B.S. Grewal., "Numerical Methods in Engg. And Science", Khanna Publications.
[R7]   Miller and Freund, "Probability and statistics for Engineers", PHI
[R8]   Gupta and Kapoor, "Fundamentals of Mathematical Statistics" Sultan Chand and Sons.