NUMERICAL METHODS AND STATISTICS	L T P C
	3 1 0 3

AIM: Expose the students to understand the basic concepts of numerical methods for solving problems, mastering of methodological approaches of numerical calculation development.

OBJECTIVES:

With the present development of the computer technology, it is necessary to develop efficient algorithms for solving problems in science, engineering and technology. This course gives a complete procedure for solving different kinds of problems that occur in engineering numerically.

OUTCOMES:

On successful completion on this course the student will be able to

UNIT I: SOLUTION OF EQUATION AND EIGNVALUE PROBLEM Solution of linear system of equation – Bijection method – fixed point Iteration method – Newton Raphson Method – Ragula Falsi method – Decomposition Method – Gauss Elimination Method – Gauss Jordan Method – Gauss Jacobi Method –Finding largest eigen value- Inverse of matrix by Jordan Method.	**9**
UNIT II: INTERPOLATION AND APPROXIMATING POLYNOMIALS Lagrangian polynomials – Divided difference formulae for equal intervals and unequal intervals – Interpolating with a cubic spline – Newton's forward and backward difference formulas – Stirlings formula.	**9**
UNIT III: NUMERICAL DIFFERENTIATION AND INTEGRATION Differentiation using interpolation formulae – Numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rule – Romberg's Method – Double integrals using trapezoidal and Simpson's rules.	**9**

S.No.	COs	Blooms level

1	Find the values of the variables using iterative methods.	K2
2	Know the method of finding numerical solution for differential equation by initial value problems.	K1
3	Know the method of finding numerical solution for differential equation by final value problems.	K1
4	Solve the physical problems by small and large sampling theory.	K3
5	Understand the method of analysis of variance to solve real world problem	K2

UNIT IV: THEORY OF ESTIMATION Estimation: Point and Interval estimates for population parameters of large sample and small samples, determining the sample size.	**9**
UNIT V: TESTING OF HYPOTHESIS Sampling distributions – Testing of hypothesis for mean – variance –proportions and differences using Normal–'t'–Chi-square and F-distributions–Tests for independence of distributions of attributes and goodness of fit.	**9**
	Total: 45 Periods

TEXT BOOKS:

1. M.K. JAIN, S.R.K. IYENGAR and R.K. JAIN "Numerical methods: for scientific and engineering computation" 2013. 6th ed.,

2. DEVORE, J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning , New Delhi, 8th Edition, 2014.

3. S.C. GUPTA AND V.K. KAPOOR "*Fundamentals of mathematical statistics*" Elevanth thoroughly revised ed., Sultan Chand & Sons educational publishers, New Delhi (June 2003)

4. T. VEERARAJAN, "*Probability, Statistics and Random Processes"* Tata McGraw-Hill Publishing Company Limited, New Delhi(2006)

REFERENCES:

1. SANKARARAO.K " Numerical Methods for Scientists and Engineers" -3rd edition Printice Hall of India Private Ltd. New Delhi-(2007).

2. WALPOLE, R.E., MYERS, R.H., MYERS, S.L. and YE. K., "Probability and Statistics For Engineers and Scientists", 9th Edition, Pearson Education, Asia, 2010

3. Dr. Singaravelu, " Numerical Methods" 19th Edition, Meenakshi Agency, Chennai (Dec 2012)