

Sankalchand Patel University

Faculty of Engineering and Technology Second Year Bachelor of Technology (Electrical Engineering / Electronics & Communication Engineering)

In Effect from Academic Year 2017-18

Subject Code:1ET1000402	Subject Title: Numerical and Statistical Methods
Pre-requisite Subject	Calculus, Differential equations and Linear algebra, Probability &
	Statistics

Course Objective: To understand the applications of complex numbers and complex variable functions. To understand the applications of numerical methods. To solve equations numerically, to evaluate integrals numerically, to solve ordinary differential equations numerically. To apply mathematical concepts in various subjects of relevant branch.

Teaching Scheme (Hours per week)			Evaluation Scheme (Marks)					
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
								(T+P)
				University	Continuous	University	Continuous	
				Assessment	Assessment	Assessment	Assessment	
2	0	-	2	35	15			50

Subject Contents				
Sr. No	Торіс		Weight (%)	
1.	Roots of Algebraic and Transcendental Equations: Bisection, false position, secant and Newton-Raphson method,		14	
2.	Solution of a System of Linear Equations: Gauss elimination, partial pivoting, Gauss-Jacobi and Gauss-Seidel methods	3	11	
3.	Finite Differences and Interpolation: Finite Differences, Forward, Backward and Central operators, Interpolation by Newton's forward and Backward formulae, Stirling's central difference formulae, Newton's divided and Lagrange's interpolation formulae for unequal intervals.	6	21	
4.	Numerical Integration: Newton-Cotes formulae, Trapezoidal and Simpson's formulae, Gaussian Quadrature formulae of one, two and three points.	4	15	
5.	Numerical solution of Ordinary Differential Equations: Taylor's series method, Euler's method, Runge-Kutta method of fourth order, Milne's predictor-corrector method.	4	14	

6.	Probability:		
	Revision, Random variable, Mathematical Expectation, Standard Deviation,	7	25
	Binomial, Poisson and Normal distributions, Mean, Median, Mode		

Course Outcome: Students will be able to apply mathematical concepts to engineering problems of their relevant branches after studying this course.

List of Reference Books:

- 1. A. Papoulis and S. Unnikrishna Pillai, Probability, Random variables and Random Processes, Tata McGraw Hill.
- 2. S.S. Gupta, Fundamentals of Statistics, Himalaya Publications House.
- 3. S. D. Conte and Carl de Boor, Elementary Numerical Analysis-An Algorithmic Approach (3rd Edition), McGraw-Hill, 1980.
- 4. Chapra S.C, Canale, R P, Numerical Methods for Engineers, Tata McGraw Hill, 2003
- 5. S.C. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics (11th Edition), Sultan Chand & Sons.