MATHEMATICS – II (NACP)

Paper Code	**AS-405**
Course Credits	**4**
Lectures / week	**3**
Tutorial / week	**1**
Course Description	**UNIT – I**

INTERPOLATION WITH EQUAL & UNEQUAL INTERVALS OF THE ARGUMENT

Newton-Gregory, gauss, Sterling's and Bessel's formula, Aitkin's and cubic spline interpolation methods for equal intervals, Newton's divided difference and Lagrange formula for unequal intervals; inverse interpolation using Lagrange formula and the method of successive approximation, double interpolation.

UNIT- II

NUMERICAL DIFFERNTIATION AND NUMERICAL INTEGRATION

Numerical successive differentiation using forward, backward and central differences interpolation formula, and Newton's divided difference formula. Review of trapezoidal, Simpson's 1/3 and 3/8 rules, numerical integration using Boole's rule, waddle's rule, Gaussain legendre and lobatto rules, error in quadrature formula, romberg integration, and numerical double integration.

UNIT- III

NUMERIC SOLUTIONS OF ALGEBRAIC & TRANSCENDENTAL EQUATIONS

Bisection, Regula false position, Newton Raphson , Graeffe's Root squaring and iteration methods for the solution of non-linear algebraic and transcendental equations involving one variable, rate of convergence and error analysis of the methods, and Newton Raphson

Paper Code	method for the solution of a system of non linear equations.
Course Credits	
Lectures / week	
Tutorial / week	**UNIT- IV**
Course Description	**SOLUTION OF A SYSTEM OF SIMULTANEOUS LINEAR EQUATIONS AND CURVEFITTING** Gauss elimination methods and gauss Jordan methods, III conditioned linear system, gauss seidal and Crout's methods for the solution of a system of linear equations in four unknown; general curve (linear, quadratic, exponential and other non linear functions) fitting using methods of least squares. **UNIT – V** **NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS AND BOUNDED VALUE PROBLEMS** Numeric approximation solutions of a system of simultaneous and higher order differential equations using Taylor's series method, Picard's method and Ranga – kutta fourth order method; Ranga – kutta fehlberg method, modified euler's and milne's method; solutions of boundary value problems using finite differences method and cubic Spline method. **IMPORTANT NOTE:** In a total of five questions to be set in the final examination, 50% questions woulsd be on numerical methods and remaining 50% would be on computer applications of numeric methods suing C/C++ language.
References / Text Books:	• M.K.Jain , SRK lyengar and R.K.jain "Numerical Methods for scientific and engineering computation", 4th edition , New age international publication • S.S. Sastri "Introductory methods of numerical analysis" 3rd edition prentice hall of India publication • Steven C chapra and Raymond P. Canale "Numerical methods for

engineers", 2nd edition TMH publication

- B.S. Grewal "Numerical Methods in Engineering and Science " 3rd edition, prentice hall of India publication

Computer Usage / Software Requires: