I	Course Code	**MA 192002**
II	Course Title	**Mathematics IV: Introduction to Numerical Methods**
III	Credit Structure	L T P C 3 1 0 4
IV	Prerequisite (If any)	NIL
V	Course Content	Interpolation by polynomials, divided differences, error of the interpolating polynomial, piecewise linear and cubic spine interpolation, Numerical differentiation, Numerical integration, composite rules, error formulae, Solution of a system of linear equations, Gauss elimination, Gauss Seidel methods, partial pivoting, row-echelon form, LU factorization, Cholesky's method, matrix norms, Solution of non-linear equations, Bisection and Secant methods, Picard iteration, Newton's method, Numerical solution of ordinary differential equations, Euler and Runge-kutta methods, multi- step, predictor-corrector methods, Difference equations, Stability, Finite difference methods, Eigen value problem, Gershgorin's theorem, Power and inverse power methods, QR method, Explore to software packages like R, MATLAB.
VI	Text/References	1. S. D. Conte and Carl de Boor, *Elementary Numerical Analysis- An algorithmic Approach*, McGraw Hill, 1980. 2. C. E. Froberg, *Introduction to Numerical Analysis*, Addison-Wesley, 1981. 3. E. Kreyszig, *Advanced Engineering Mathematics,* Wiley India. 4. K. Atkinson and W. Han, *Elementary Numerical Analysis*, Wiley India, 2004. 5. Ward Cheney & David Kincaid, *Numerical Mathematics and Computing*, Cengage Learning, India Private Limited. 6. Steven C. Chapra & Raymond P. Canale. *Numerical Methods for Engineers*, McGraw Hill, 2012.