NUMERICAL METHODS
Code: M (CS) 401
Contacts: 2L+1T
Credits: 2

Approximation in numerical computation: Truncation and rounding errors, Fixed and floating-point arithmetic, Propagation of errors. **[4]**
Interpolation: Newton forward/backward interpolation, Lagrange's and Newton's divided difference Interpolation. **[5]**
Numerical integration: Trapezoidal rule, Simpson's 1/3 rule, Expression for corresponding error terms. **[3]**

Numerical solution of a system of linear equations:
Gauss elimination method, Matrix inversion, LU Factorization method, Gauss-Seidel iterative method. **[6]**

Numerical solution of Algebraic equation:
Bisection method, Regula-Falsi method, Newton-Raphson method. **[4]**
Numerical solution of ordinary differential equation: Euler's method, Runge-Kutta methods, Predictor-Corrector methods and Finite Difference method. **[6]**

Text Books:
1. C.Xavier: C Language and Numerical Methods.
2. Dutta & Jana: Introductory Numerical Analysis.
3. J.B.Scarborough: Numerical Mathematical Analysis.
4. Jain, Iyengar , & Jain: Numerical Methods (Problems and Solution).

References:
1. Balagurusamy: Numerical Methods, Scitech.
2. Baburam: Numerical Methods, Pearson Education
3. N. Dutta: Computer Programming & Numerical Analysis, Universities Press.
4. Soumen Guha & Rajesh Srivastava: Numerical Methods, OUP.
5. Srimanta Pal: Numerical Methods, OUP.