# Sardar Vallabhbhai Patel Institute of Technology, Vasad

## B. E. Semester IV (Computer and IT)

## Numerical and Statistical Methods for Computer Engineering

## (NSM) (2140706)

## Syllabus for Mid Semester Exam-2018

**Root of Equation**
Roots of equation using Bisection method, Newton's Raphson method, Secant Method, false position method and Successive approximation.

Budan's Theorem and Barristow's Methods and Case studies

**Solution of a System of Linear Equations**
Gauss elimination, Gauss Jordan, Gauss-Jacobi method and Gauss-Seidel method

**Interpolation**
Finite Differences, Forward, Backward and Central operators, Interpolation by polynomials: Newton's forward, backward interpolation formulae, Newton's divided difference formulae and Lagrange's interpolation formulae for unequal intervals

**Numerical Integration**
Newton-Cotes formula, Trapezoidal and Simpson's formulae, error formulae, Gaussian quadrature formulae

**Numerical solution of Ordinary Differential Equations:**
Solution of first order ODE using Euler's and Modified Euler's Methods, R-k Method, Taylor series Methods and Predictor Corrector Methods, General Methods for Boundary value problems

**Approximation and Errors:**
Significant figures, accuracy and precision, Errors, round off and truncation errors, error propagation.

**Curve Fitting:**
Least square for linear and polynomial regression, Non-linear regression.