PEI5H001   NUMERICAL METHODS

MODULE–I
Approximation of numbers, Significant figures, Accuracy and precision, Error definition, Round off errors, Error propagation, Total numerical error Roots of equation: Bisection ethos, False-position method, Fixed point iteration, Newton Raphson method, Secant method, Convergence and error analysis, System of non-linear equations

MODULE–II
Linear algebraic equation: LU decomposition, The matrix inversion, Error analysis and system conditions, Gauss- Siedel method Interpolation: Newton's divided difference interpolating polynomial, Lagrange interpolating polynomial, Spline interpolation.

MODULE–III
Numerical integration: The Trapezoidal rule, Simpson's rule, Newton-Cotes algorithm for equations, Romberg integration, Gauss quadrature

MODULE–IV
Ordinary differential equation: Euler method, Improvement of Euler's method, Runge-Kutta methods, System of equations, Multi step methods, General methods for boundary value problems, Eigen value problems (Algorithm and error analysis of all methods are included)

Text Book:
 1. S.C. Chapra, R.P.Canale," Numerical methods for Engineers", Fifth edition, THM Publication.

 Reference Books
1. S. Kalavathy, " Numerica methods", Thomson/ Cengage India
 2. K.E. Atkinson," Numerical analysis," Second edition, John Wiley & Sons.