GUJARAT TECHNOLOGICAL UNIVERSITY
M. E. Semester I
Civil Engineering (Structural Engineering)

Subject: - Numerical Methods (Major Elective I)

Sr, No.	Course Content
1	Error analysis, types of errors, accuracy & precision, stability in numerical analysis
2	Interpolation & extrapolation, general, interpolation formulae, numerical differentiation & integration.
3	Solution of non – linear algebraic equations, Newton – Raphson iterative method, numerical solutions of ordinary differential equations and partial differential equations using finite difference technique, its applications to structural engineering problems.
4	Solution of Eigen value problems, iterative methods & transformation methods. Applications to Structural Dynamic problems, stress problems, buckling of columns.
5	Laplace transform methods, Laplace equation - Properties of harmonic functions - Fourier transform methods for Laplace equation.
6	Euler's equation - Functional dependant on first and higher order derivatives

REFERENCE BOOKS:

1. Numerical methods in Engineering Salvadori & Baron
2. Numerical Methods in Finite Element Analysis Bathe & Wilson
3. Advanced Mathematics Kresysig
4. Numerical Analysis Scarborough