Advanced Engineering Mathematics

CO1 Recall and construct the difference table and finite differences with evaluations of Interpolation formulas.
CO2 Apply the concept of Lagrange's theorem for finding the unknown functions for equal as well as unequal Interpolation and Stirling and Newton's divided difference formulae.
CO3 Solve complex problems using Fourier series, partial differential equations, and boundary value problems.
CO4 Analyze numerical methods for solving algebraic, differential, and integral equations using computational techniques.
CO5 Develop the concept of finding Integration by Inverse Laplace transform and approach for finding Z- Transform and its application in solving difference equations.
CO6 Apply differential equations and Laplace transforms to model and solve engineering problems and engage in lifelong learning.

Course Plan (CO-wise)

Week	Topics	CO	Teaching Method	Assessment
1	Introduction, Errors, Difference Operators	CO1	Lecture	Quiz
2	Difference Tables, Finite Differences	CO1	Lecture/Tutorial	Assignment 1
3	Newton Forward & Backward Interpolation	CO1	Practice	Class Test
4	Lagrange & Newton Divided Difference	CO2	Lecture	Assignment 2
5	Stirling & Bessel Formula	CO2	Tutorial	Quiz
6	Fourier Series	CO3	Lecture	Assignment 3
7	Half-range Series	CO3	Practice	Mid-Sem
8	PDE Introduction	CO3	Lecture	Tutorial
9	Boundary Value Problems	CO3	Practice	Assignment 4
10	Bisection & Newton-Raphson	CO4	Lecture	Quiz

11	Euler & Runge-Kutta	CO4	Tutorial	Assignment 5
12	Numerical Integration	CO4	Practice	Class Test
13	Inverse Laplace	CO5	Lecture	Assignment 6
14	Z-Transform	CO5	Practice	Quiz
15	Inverse Z-Transform	CO5	Tutorial	Assignment 7
16	Engineering Applications & Revision	CO6	Discussion	Revision Test

CO-wise Mapping

CO	Topics	Weeks
CO1	Difference tables & Newton interpolation	1-3
CO2	Lagrange, Divided Difference, Stirling	4-5
CO3	Fourier Series, PDE	6-9
CO4	Numerical Methods	10-12
CO5	Inverse Laplace, Z-Transform	13-15
CO6	Engineering Applications	16