

OBJECTIVE:

The objective of the course Mathematics-I is to familiarize the prospective engineers with techniques in calculus, Gamma & Beta function, differential equation of first and second order, series solution of differential equations, Laplace transform. It aims to equip the students with standard concepts and tools at an intermediate to advanced level that will serve them well towards tackling more advanced level of mathematics and applications that they would find useful in their disciplines.

Module-1 (8 hrs.)

Asymptote, Curvature (Cartesian and polar), Gamma & Beta function, Partial differentiation, Maxima and Minima for function of two variables.

Module-2 (8 hrs.)

Differential Equation: First order differential equations, Separable Equation, Exact differential equation, Linear differential equation, Bernoulli's equation application to Electrical circuits.

Module-3 (9hrs.)

Linear differential equation of second, Homogeneous equation with constant co-efficient, Euler-Cauchy equations, Solution by undetermined co-efficient, Solutions by variation of parameters, Modelling of electric circuits

Module-4 (10 hrs.)

Series solution of differential equations, Power series method, Legendreequation and Legendre polynomial. Bessels function and its properties.

Module – 5 (10 hrs.)

Laplace transformation and its use in getting solution to differential equations, Convolution, Integral Equations.

OUTCOMES

On completion of this course, student are able to:

- Apply the knowledge of calculus, Gamma & Beta functions for analyzing engineering problems.
- Solve first order differential equation analytically using standard method.
- Demonstrate various physical models through higher order differential equation and solve such linear ordinary differential equation.
- Obtain series solution of differential equation and explain application of Bessel's function.
- Apply Laplace problem to determine complete solution to ordinary differential equation.

Text Books:

1. Differential Calculus by Santi Narayan and Mittal,
2. Advanced Engineering Mathematics by E. Kreyszig, Tenth Edition , Willey
3. Higher Engineering Mathematics by B.V. Raman, , Mc-Graw Hills Education
4. Engineering Mathematics by Srimanta Pal and S.C. Bhunia, Oxford Publication

References:

1. Ordinary and Partial Differential equations by J. Sihna Ray and S Padhy, Kalyani Publishers
2. Advance Engineering Mathematics by P.V.O'NEIL, CENGAGE
3. Ordinary Differential Equation by P C Biswal , PHI second edition.
4. Engineering Mathematics by P. S. Das & C. Vijayakumari, Pearson.

N.B:Thecourseisof3creditwith4contacthours.