

Course Code	Course Name	Load Distribution (L T P C)			
TMA – 201	ENGINEERING MATHEMATICS – II	3	1	0	4

Pre-requisite: Basic Knowledge of Mathematics

1. Evaluate exact, linear, Bernoulli and Euler's equations and calculate the equations not of first degree. Express second order linear differential equations with constant coefficients and justify Cauchy-Euler equation and variation of parameters and its applications.
2. Evaluate Laplace and inverse Laplace Transform of functions and apply it in linear and simultaneous differential equations for solution.
3. Apply Fourier series for signal analysis in various engineering discipline.
4. Solve partial differential equations and apply in string waves and one dimensional heat flow equation.
5. Find the series solution of differential equations and comprehend the Legendre's polynomials, Bessel's functions and its related properties.

UNIT- I Differential Equations 09

Ordinary differential equations of first order (Exact and reducible differential equations). Linear differential equations of nth order with constant coefficients, Complementary functions and particular integrals, Euler Homogeneous differential equation. Method of variation of parameters and its applications.

UNIT-II Laplace Transform 09

Introduction to Laplace transform, It's Existence theorem and its properties, Laplace transform of derivatives and integrals, Inverse Laplace transform, Laplace transform of periodic function, Unit step function and Dirac delta function, Convolution theorem, Applications to solve simple linear and simultaneous linear differential equations.

UNIT- III Fourier series 09

Periodic functions, Fourier series of periodic function of period 2π , Euler's formula, Fourier series having arbitrary period, Change of intervals, Even and odd functions, Half range sine and cosine series.

UNIT- IV Partial Differential Equations 09

Introduction to partial differential equations, Solution of Linear partial differential equations with constant coefficients of second order and Partial differential equations. Method of separation of variables for solving partial differential equations. One dimensional wave and heat conduction equations. Laplace equation in two dimensions.

UNIT-V Special Function 09

Series solution of differential equations, Legendre's differential equations and Polynomials, Bessel's differential equations and Bessel's Functions Recurrence relations. Generating Functions, Rodrigues's formula.

References:

- C.B. Gupta, S.R. Singh and Mukesh Kumar, 'Engineering Mathematics for Semesters I and II' Mc Graw Hill Education, First edition 2015.
- E. Kreyszig: Advance Mathematics, Wiley Eastern India, 2006.
- B. S. Grewal: Higher Engineering Mathematics, Khanna Publications. 2009
- C. Prasad, Advanced Mathematics for Engineers, Prasad Mudralaya. 1996.
- R. K. Jain & R. K. Iyengar, Advanced Engineering Mathematics. Narosa Publications, 2004