

CODE : CE 111

ENGINEERING MATHEMATICS – I

Lectures : 4 periods / week
Tutorials : 1 period / week
Semester End Exam : 3 hrs

Sessional Marks : 40
Semester End Exam Marks : 60
Credits : 4

Course Objectives:

- To provide knowledge on solving ordinary differential equations and applications of first order ordinary differential equations.
- To give basic knowledge on evaluation of double, triple integrals, area and volume.
- To provide knowledge and skills in writing a periodic function in its Fourier series form and on their applications.
- To develop skills for applying them in future on various engineering applications

Course Outcomes:

- Understand methods of solving First order and Higher order ordinary differential equations along with some physical applications.
- Understand the relation between two variables by Curve fitting.
- Able to evaluate double, triple integrals and the area, volume by double & triple integrals respectively.
- Understand the concept of Fourier-series representation of periodic functions and their applications.

UNIT – I

Ordinary Differential Equations:

Introduction, Linear equation, Bernoulli's equation, Exact differential equations, Equations reducible to exact equations, Orthogonal trajectories, Newton's law of cooling. Linear differential equations with constant coefficients: Definition, Theorem, Operator D, Rules for finding the complementary function, Inverse operator, Rules for finding the particular integral, working procedure to solve the equation.

UNIT – II

Method of variation of parameters:

Equations reducible to linear equations with constant coefficients: Cauchy's homogeneous linear equation, Legendre's linear equation, Simultaneous linear equations with constant coefficients.

Statistics: Method of least squares, Correlation, Co-efficient of correlation (direct method), Lines of regression.

UNIT - III

Fourier series:

Introduction, Euler's formulae, Conditions for a Fourier expansion, Functions having points of discontinuity, Change of interval, Even and Odd functions, half range series. Parseval's formula, Practical harmonic analysis.

UNIT – IV

Multiple Integrals: Double integrals, Change of order of integration, Double integrals in polar coordinates, Area enclosed by plane curves, Triple integrals, Volume by triple integral, Change of variables in a double integral.

Beta, Gamma functions, Error function.

TEXT BOOK:

Higher Engineering Mathematics by Dr.B.S.Grewal, Khanna Publishers, 40th Edition, 2007.

REFERENCE BOOK:

Advanced Engineering Mathematics by Erwin Kreyszig, 8th edition, 2007.