MTH174:ENGINEERING MATHEMATICS

L:3 T:1 P:0 Credits:4

Course Outcomes: Through this course students should be able to

CO1 :: recall the concept of matrices and their applications to solve the system of linear equations.

CO2 :: understand the use of different methods for the solution of linear differential equations.

CO3 :: understand the elementary notions of Fourier series for harmonic analysis.

CO4 :: apply the concept of multi-variable differential calculus for solving problems in the field of sciences and engineering.

CO5 :: analyze the surface and volume integrals using various concepts of multi-variable integral calculus.

Unit I

Matrix Algebra : elementary operations and their use in getting the rank, inverse of a matrix and solution of linear simultaneous equations, eigen-values and eigenvectors of a matrix, Cayley-Hamilton theorem

Unit II

Linear differential equation-I : introduction to linear differential equation, solution of linear differential equation, linear dependence and linear independence of solution, method of solution of linear differential equation- differential operator, solution of second order homogeneous linear differential equation with constant coefficient, solution of higher order homogeneous linear differential equations with constant coefficient

Unit III

Linear differential equation-II : solution of non-homogeneous linear differential equations with constant coefficients using operator method, method of variation of parameters, method of undetermined coefficient, solution of Euler-Cauchy equation

Unit IV

Fourier Series : introduction and Euler's formulae, conditions for a Fourier expansion and functions having points of discontinuity, change of interval, even and odd functions, half range series

Unit V

Multivariate Calculus : limit, continuity and differentiability of functions of two variables, chain rule, change of variables, Euler’s theorem for homogeneous equations, Jacobians, extrema of functions of two variables, Lagrange’s method of undetermined multipliers

Unit VI

Integral Calculus : double integrals, change of order of integration, change of variables, application of double integrals to calculate area and volume, triple integrals, application of triple integrals to calculate volume

Text Books:

1. ADVANCED ENGINEERING MATHEMATICS by R.K.JAIN, S.R.K. IYENGER, NAROSA PUBLISHING HOUSE

References:

1. HIGHER ENGINEERING MATHEMATICS by B.S. GREWAL, KHANNA PUBLISHERS