MTH165:MATHEMATICS FOR ENGINEERS

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

Course Outcomes: Through this course students should be able to

CO1 :: recall the concepts of matrices and its application to solve the system of linear equations.

CO2 :: review the basic concept of calculus of one variable.

CO3 :: apply the concept of calculus to evaluate extreme values of functions.

CO4 :: describe calculus of multivariate functions and their applications.

CO5 :: evaluate surface and volume integral using multiple integral.

CO6 :: describe the concept of Fourier series and its application.

Unit I

Linear Algebra : Review of matrices, Elementary operations of matrices, Rank of a matrix, Linear dependence and independence of vectors, Solution of Linear system of equations, Inverse of matrices, Eigen values and Eigen vectors, Properties of Eigen values, Cayley-Hamilton theorem

Unit II

Differentiatial and integral calculus : General rules of differentiation, Derivatives of standard functions, Derivatives of Parametric forms, Derivatives of implicit functions, Logarithmic differentiation,, properties of indefinite integral, Methods of integration-By Parts, Methods of integration-By Partial fractions, Properties of definite integral

Unit III

Application of derivatives : Rolle’s theorem, Mean value theorems, Taylor’s theorems with remainders, Maclaurin theorems with remainders, indeterminate forms, L' Hospital's rule, maxima and minima.

Unit IV

Multivariate functions : Functions of two variables, Limits and Continuity, Partial derivatives, Total derivative and differentiability, Chain rule, Euler's theorem for Homogeneous functions, Maxima and Minima, Lagrange method of multiplier

Unit V

Multiple Integrals : Double integrals, change of order of integration, Triple integrals, change of variables, Application of double integrals to calculate area and volume, Application of triple integrals to calculate volume.

Unit VI

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, Perseval's Formula, Complex form of Fourier Series

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

2. MATHEMATICS TEXT BOOK FOR CLASS XII PART I by -, NCERT

3. MATHEMATICS TEXT BOOK FOR CLASS XII PART II by -, NCERT