

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 that are essential in most branches of engineering.

CO3 :: identify the fallouts of Rolle's theorem, significance of the Mean Value and other applications where calculus is useful.

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

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

CO6 :: understand the elementary notions of Fourier series for harmonic analysis.

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

Differential 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, Parseval'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

