APPLIED MATHEMATICS – III VECTOR CALCULUS AND PDES (GS-301) Pre-requisite: None Credit Hours: 03 Contact Hours: 48

RECOMMENDED BOOK(S)

Advanced Engineering Mathematics, Erwin Kreyszig, 8th Edition

REFERENCE BOOK(S)

Calculus and Analytical Geometry By Thomas Finney John 11th Ed.

COURSE OBJECTIVES

The successful completion of this course would help students in achieving the following objectives: • Model the problems arising in different areas of science and engineering in the form of differential equations • Solve the linear 1st order differential equations that appear in circuit analysis, electronics, motion, electric machines etc. • Solve second order differential equations using different techniques • Apply 2nd order differential equations to the variety of theoretical problems • Understand the meaning, use and applications of the partial differential equations

S. No.	CLO/PLOS MAPPING	DOMAIN	PLO
1	Use the knowledge of calculus to solve the 1st order ordinary differential equations.	C3	02
2	Use various techniques to solve higher order ordinary differential.	C3	02
3	Apply the knowledge of differential equations to solve the problems arising in different areas of science and engineering.	C3	02

COURSE CONTENTS

Definition and properties of vectors in 1-D, 2-D and 3-D. Limits of vector valued functions. Differentiation of vector valued functions. Integration of vector valued functions. Gradient, Divergent and curl of vectors and vector fields Greens theorem. Line integral. Stokes Theorem Guass Divergent Theorem Laplician operation and 3D Geometry. Introduction and classification of DDE's Initial and Types of boundary condition Solution of single dimensional heat Equation by separation of variable method Solution of ID wave equation by separation of variable method Solution of 2D laplace Equation by separation of variable method