

Mathematics – III			
Hours/Week L-T-P :	3-0-0	Credits:	3
Course Type :	Mandatory/ Common Course	Course Code:	BH2459

Course Outcome :

At the end of the course the student will be able to:

- CO 1** Demonstrate the use of common numerical methods such as numerical solutions of equations, interpolation, differentiation and integration etc.
- CO 2** Recognize mathematical model of heat equations, wave equations and their solution by appropriate method.
- CO 3** Understand the different terminology in probability and have clear concept on probability distribution functions both in continuous and discrete case.
- CO 4** Select appropriate statistical tools to investigate a research hypothesis, perform data analysis by applying relevant methodology and interpret result in a variety of settings.

UNIT-I: Elementary Numerical Methods

(7 Hours)

Solution of algebraic and transcendental equations by Newton-Raphson and secant method.

Interpolation: Lagrange's method, divided difference method, Newton's forward and backward method.

Numerical Integration: Trapezoidal and Simpson's Rule.

UNIT- 2: Applied PDE's

(7 Hours)

Elementary PDE's: separation of variables method to simple problems. One dimensional wave equation: solution by separation of variables and use of Fourier series, D' Alembert's solution of wave equation.

Normal forms of PDE's. One dimensional heat equation: solution by Fourier series.

UNIT-3: Basic Probability and Probability Distributions

(7 Hours)

Probability spaces, conditional probability, independence, Random variables (discrete and continuous), probability mass and density functions, cumulative distribution functions, moments of random variables, mean and variance.

Discrete Probability distributions: Binomial, Poisson and hyper-geometric distributions. Continuous Probability distributions: exponential, uniform and normal distributions.

UNIT-4: Applied Statistics

(7 Hours)

Random sampling, estimation of parameters, maximum likelihood estimation, confidence intervals, testing of hypotheses for mean and variance.

Regression and correlation analysis: fitting of straight lines (method of least squares), correlation coefficient with basic properties.

Text Books:

1. Advanced Engineering Mathematics by E. Kreyszig, John Wiley & Sons Inc. 10th Edition.
2. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers & Keying Ye, "Probability & Statistics for Engineers & Scientists", Eighth Edition, 2007, Pearson Education Inc., New Delhi.

Reference Books:

1. Ordinary and Partial Differential equations by J. Sinha Roy and S. Padhy, Kalyani Publishers.
2. Higher Engineering Mathematics by B. V. Ramana, McGraw Hill Education.
3. Engineering Mathematics by Pal and S. Bhunia, Oxford Publication.
4. Stochastic Processes, 2nd Edition by Roy D. Yates, Rutgers and David J. Goodman, John Wiley and Sons, INC.

COs and POs Mapping

Course Outcome	Expected Mapping with Programme Outcomes (1- Weak Correlation; 2- Medium correlation; 3- Strong Correlation)											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
CO-1	3	3	3	3	3	3	2	-	2	-	2	3
CO-2	3	3	3	3	3	2	2	-	-	-	2	2
CO-3	3	3	3	3	3	2	3	-	2	-	-	3
CO-4	3	3	3	3	3	2	2	-	2	-	2	3