

B S 301 M T

as per AICTE model

University College of Engineering(A)

With effect from the academic year 2019 – 2020

**MATHEMATICS-III**  
( PDE AND PROBABILITY )

(Civil Engineering)

Instruction :	3 Periods per week (2 Theory + 1 Tutorial)
Duration of SEE :	3 Hours
SEE :	70 Marks
CIE :	30 Marks
Credits :	2

Course Objectives:

- To introduce the solution methodologies for first and second order Partial Differential Equations with applications in engineering
- To provide an overview of probability and statistics to engineers

Course Outcomes:

Upon completion of this course, students will be able to

- Solve field problems in engineering involving PDEs.
- They can also formulate and solve problems involving random variables and apply statistical methods for analysing experimental data.

**Unit-I:** Definition of Partial Differential Equations, First order partial differential equations, Solutions of first order linear PDEs , Solution to homogenous and non-homogenous linear partial differential equations of second order by complimentary function and particular integral method.

**Unit-II:** Second-order linear equations and their classification, Initial and boundary conditions, Heat diffusion and vibration problems, Separation of variables method to Solve simple problems in Cartesian coordinates.

**Unit-III :** Discrete random variables, expectation of discrete random variables, moments, variance of a sum, continuous random variables & their properties.

**Unit-IV:** Probability distributions: Binomial, Poisson and Normal, evaluation of statistical parameters for these three distributions,

**Unit-V:** Curve fitting by the method of least squares: fitting of straight lines, second degree parabolas and more general curves, Correlation, regression and rank correlation.

**Textbooks/References:**

1. R.K.Jain & S.R.K Iyengar, Advanced Engineering Mathematics, Narosa Publications, 4<sup>th</sup> Edition 2014.
2. B.S.Grewal, *Higher Engineering Mathematics*, Khanna Publications, 43<sup>rd</sup> Edition.
3. Erwin Kreyszig, Advanced Engineering Mathematics, 9<sup>th</sup> Edition, John Wiley & Sons.2006.
4. S. Ross, “A First Course in Probability”, Pearson Education India, 2002.
5. S.C Gupta & Kapoor: Fundamentals of Mathematical statistics, Sultan chand & sons, New Delhi.