

JIS College of Engineering

(NAAC 'A' Accredited Autonomous Institution)

**Syllabus for B. Tech (BIO-MEDICAL ENGINEERING)
2ND YEAR 3RD SEM**

Paper Name: Mathematics-III (BIOMATHEMATICS & BIOSTATISTICS)

Paper Code: M (BME) 301

Contact: 3L+1T

Credits: 4

Course contents:

Module-I

Calculus of Complex Variable: Functions, Limit and Continuity, Analytic functions, Cauchy-Riemann equations, Complex integration and Cauchy's theorem, Cauchy's integral formula, Taylor's and Laurent series, Zeros of an analytic function, Poles, Essential singularities, Residue theorem. 10L

Module-II

Probability: Axiomatic definition of probability, Conditional probability, Baye's theorem (Statement only) & its application. Random variable, Discrete and Continuous distributions, Expectation, Binomial, Poisson, Uniform, Exponential and Normal distribution, Problems on Binomial, Poisson and Normal distribution. 10L

Module-III

Statistics: Sampling theory, Mean, Median, Mode, Variance and Standard Deviation, Correlation and Regression analysis, Testing of Hypothesis, ANOVA.

Numerical Integration: Trapezoidal rule, Simpson's 1/3rd rule. 10L

Module-IV

Partial Differential Equations: Solution of one dimensional wave equation, One dimensional heat-conduction equation, Laplace equation in two dimension by the methods of 1: Separation of variables 2: Integral Transforms (Laplace and Fourier Transforms). 5L

Series Solution of Ordinary Differential Equation: Introduction, validity of series solution of an ordinary differential equation, general method to solve equation of the type: $P_0(x)y'' + P_1(x)y' + P_2(x)y = 0$, Bessel's equation, properties of Bessel's function, Recurrence formula for Bessel's function of first kind, Legendre's equation, Legendre function; Recurrence formula for Legendre function ($P_n(x)$); Orthogonality relation. 5L

Suggested Text / Reference Books:

1. Lipschutz & Lipson, Schaum's Outline in Probability (2ndEd).
2. Colburn, Fundamentals of Probability and Statistics.
3. Advanced Ordinary & Partial Diff. Equation by M D Raisinghania.
4. Complex Variables and Applications (Brown and Churchill).
5. Probability and Statistics by N.G. Das.