BS-301: Engineering Mathematics –III

Credit	L	T	P
3	2	1	-

UNIT I

Review of Gradient, Curl, Divergence, vector identities and directional derivatives: Line, Surface and volume integrals, Green's theorem in xy- plane, Gauss divergence theorem and Stoke's curl theorem (without proof), and related problems.

Extremals of functions (by mean of Euler- Poisson equation), Isoperimetric problems, Beta and Gamma functions, Dirichlet&Liouville's multiple integrals of first, second and third kinds Representation of a definite integrals in Legendre & Jacobi forms of Elliptic Integrals of first, second and third kinds.

UNIT II

Review of Theorem on Probability, conditional probability; Law of total probability, Baye's Theorem and related problems; Random variable and Probability distribution, mean & variance of Binomial & Poisson distributions, Normal, Gamma and ,Beta distribution and related problems, Moments generating function, measures of Skewness& Kurtosis, Correlation and Regression Analysis.

UNIT III

Fourier's series (full range and half range) for arbitrary period, Representation of a function in terms of Fourier integral, Fourier Sine integral and Fourier Cosine integral, Infinite complex Fourier transform, Finite & infinite Fourier sine & cosine transforms and their inverse transforms, Properties of different transforms and associated theorems, application in integral equations and boundary value problems.

UNIT-IV

Generating functions, Recurrence relations and orthogonal properties for Bessel's functions $J_n(x)$ and Legendre's polynomials $P_n(x)$, Jacobi series, Fourier-Bessel series and Fourier-Legendre series, Differential equations reducible to Bessel form, Rodrigue formula for $P_n(x)$ and related problems

UNIT-V

Test for convergence and divergence of infinite series using comparison test, D'Alembart's ratio test, Logarithmic test, Raabe's test, Cauchy n^{th} root test, Leibnitz test for convergence of alternating series, Absolute & conditional convergence and uniform convergence.

TEXT/REFERENCE BOOKS.

1. A.B. Mathur& V.P. Jaggi: "Advanced Engineering Mathematics"
2. B.S. Grewal: "Higher Engineering Mathematics".
3. R.K. Jain and S.R.K. Iyengar : "Advanced Engineering Mathematics"
4. H.C. Taneja :"Engineering Mathematics Volume I, II".
5. Erwin Kreyszig : "Advanced Engineering Mathematics"