



Department of Mathematics

MATHEMATICS –IV (MT251)

Unit	Details
I	. Functions of Complex variables: Limits and continuity of function- Analytic function- Cauchy Riemann equation- Harmonic functions- Complex integration- Cauchy's theorem- derivative of analytic functions- Cauchy's integral formula and its applications.
II	Taylor's and Laurent's Expansions –Zeroes and singularities –Residues – Residues theorem- evaluation of real integrals using Residue theorem- Conformal Mapping-Bilinear transformation
III	Z-Transforms: Introduction, Basic theory of Z-Transforms, Z-Transforms of some standard sequences, Existence of Z-Transform, Linearity property, Translation theorem, Scaling Property, Initial and Final value Theorems, Differentiation of Z-Transform, Convolution Theorem, Solution of Differential equations using Z Transforms
IV	Fourier Transforms: Introduction, Fourier Integrals, Fourier Sine and Cosine Integrals, Complex Form of Fourier Integrals, Fourier Transforms, Fourier Sine and Cosine Transforms, Finite Fourier Sine and Cosine Transforms, Properties of Fourier Transforms, Convolution Theorem for Fourier Transforms.
V	Numerical Methods : Solutions of Algebraic and Transcendental equations- Bisection method, Regula falsi method and Newton-Raphson's method- solution of linear system of equations, Gauss elimination method, Gauss Seidel iterative method, ill conditioned equations and refinement of solutions, Interpolation, Newton's divided difference interpolation- Numerical differentiation, Solution of differential equations by Euler's

	methos, modified Euler's method and Runge-Kutta method 4 th order.
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Book Title/Authors/Publication
R.K.Jain and S.R.K.Iyengar , "Advanced Engineering Mathematics", Narosa Publications
B.S,Grewal "Higher Engineering Mathematics", Khanna Publications
Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley-India.

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