LESSON PLAN

CLASS- M.sc

SEMESTER- 1st

Name of Extension lecturer Surender Kumar

Subject/Paper - Complex Analysis

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	Aug. 2025	Section-I Function of a complex variable, Continuity, Differentiability, Analytic functions and their properties, CauchyRiemann equations in cartesian and polar coordinates, Power series, Radius of convergence, Differentiability of sum function of a power series, Branches of many valued functions with special reference to argz, logz and za.
Unit-2	Sept. 2025	Section-II Path in a region, Contour, Complex integration, Cauchy theorem, Cauchy integral formula, Extension of Cauchy integral formula for multiple connected domain, Poisson integral formula, Higher order derivatives, Complex integral as a function of its upper limit, Morera theorem, Cauchy inequality, Liouville theorem, Taylor theorem
Unit-3	Oct. 2025	**Zeros of an analytic function, Laurent series, Isolated singularities, Cassorati-Weierstrass theorem, Limit point of zeros and poles. Maximum modulus principle, Schwarz lemma, Meromorphic functions, Argument principle, Rouche theorem, Fundamental theorem of algebra, Inverse function theorem.**
Unit-4	Nov. 2025	Section-IV Calculus of residues, Cauchy residue theorem, Evaluation of integrals of the types $\int f(\cos\theta, \sin\theta)d\theta$, $\int_{-\infty}^{\infty} f(x)dx$, $\int f(x)\sin mx\,dx$ and $\int f(x)\cos mx\,dx$, Conformal mappings. Space of analytic functions and their completeness, Hurwitz theorem, Montel theorem, Riemann mapping theorem

Signature

HOD

LESSON PLAN

CLASS- B.Sc. 3rd Year

SEMESTER- 5th

Name of Extension lecturer Surender Kumar

Subject/Paper - Real Analysis

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	Aug. 2025	Riemann integral, Integrabililty of continuous and monotonic functions, The Fundamentaltheorem of integral calculus. Mean value theorems of integral calculus.
Unit-2	Sept 2025	Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests,Frullani's integral, Integral as a function of a parameter. Continuity, Differentiability andintegrability of an integral of a function of a parameter.
Unit-3	Oct. 2025	**Definition and examples of metric spaces, neighborhoods, limit points, interior points, open and closed sets, closure and interior, boundary points, subspace of a metric space, equivalentmetrics, Cauchy sequences, completeness, Cantor's intersection theorem, Baire's categorytheorem, contraction Principle**
Unit-4	Nov. 2025	Continuous functions, uniform continuity, compactness for metric spaces, sequentialcompactness, Bolzano-Weierstrass property, total boundedness, finite intersectionproperty, continuity in relation with compactness, connectedness , components,continuity in relation with connectedness.

Signature

HOD

LESSON PLAN

CLASS- B.Sc. 1st sem.Single Major

SEMESTER- 1st

Name of Extension lecturer Surender Kumar

Subject/Paper - Function and Algebra

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	Aug. 2025	Relations, Functions along with domain and range, Composition of functions, Invertibility and inverse of functions, One-to-one correspondence and the cardinality of a set.
Unit-2	Sept. 2025	Section-II (Theory of Equations) Relations between the roots and coefficients of general polynomial equation in one variable. Solutions of polynomial equations having conditions on roots. Common roots and multiple roots. Transformation of equations. Nature of the roots of an equation Descarte's rule of signs. Solutions of cubic equations (Cardon's method). Biquadratic equations and their solutions
Unit-3	Oct. 2025	**Matrix and its types. Symmetric, Skew-symmetric, Hermitian and Skew Hermitian matrices. Unitary and Orthogonal Matrices, Idempotent, Involuntary, Nilpotent Matrices.** **Rank of a Matrix & its applications. Rank of a matrices, Row rank and column rank of a matrix, Elementary Operations on matrices, Inverse of a matrix , Normal Form, PAQ Form, Linear dependence and independence of rows and columns of matrices , Applications of matrices to a system of linear (both homogeneous and non–homogeneous) equations, Theorems on consistency of a system of linear equations**
Unit-4	Nov. 2025	Cayley Hamilton theorem. Eigenvalues, eigenvectors and the characteristic equation of a matrix. Minimal polynomial of a matrix. Cayley Hamilton theorem and its use in finding the inverse of a matrix. Diagonalization of matrix

Signature

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