

LESSON PLAN

CLASS- B.Sc./BA 1st sem. | *B.Sc Single MAJOR*

SEMESTER- 1st

Name of Extension lecturer

Subject/Paper - Function and Algebra

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	<i>AUGUST - 2026</i>	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	<i>SEPTEMBER 2026</i>	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	<i>october - 2026</i>	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	<i>November - 2026</i>	Diagonalization of matrix) 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

Suzade
Signature

AB
HOD

LESSON PLAN

CLASS- M.Sc. 1st

SEMESTER- 1st

Name of Extension lecturer

Surender Kumar

Subject/Paper - Mathematical Analysis

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	29 August - 2026 21 Sep - 2026	Riemann-Stieltjes integral, Existence and properties, Integration and differentiation, The fundamental theorem of calculus, Integration of vector-valued functions, Rectifiable curves.
Unit-2	21 - September 21 October - 2026	Sequence and series of functions, Point wise and uniform convergence, Cauchy criterion for uniform convergence, Weierstrass Mtest, Abel and Dirichlet tests for uniform convergence, Uniform convergence and continuity, Uniform convergence and differentiation, Weierstrass approximation theorem.
Unit-3	21 - October 20 November - 2026	Power series, uniform convergence and uniqueness theorem, Abel theorem, Tauber theorem. Functions of several variables, Linear Transformations, Euclidean space R^n , Derivatives in an open subset of R^n , Chain Rule, Partial derivatives, Continuously Differentiable Mapping, Young and Schwarz theorems.
Unit-4	20 - November - 2026 Dec - 2026	Taylor theorem, Higher order differentials, Explicit and implicit functions, Implicit function theorem, Inverse function theorem, Change of variables, Extreme values of explicit functions, Stationary values of implicit functions, Lagrange multipliers method, Jacobian and its properties.


Signature


HOD

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	29 August - 2026 21 September - 2026	Section-I Function of a complex variable, Continuity, Differentiability, Analytic functions and their properties, Cauchy Riemann 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 $\arg z$, $\log z$ and z^a .
Unit-2	21 September - 2026 21 October - 2026	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	21 - October 20 November - 2026	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, Rouché theorem, Fundamental theorem of algebra, Inverse function theorem.
Unit-4	20 - November Dec - 2026	Section-IV Calculus of residues, Cauchy residue theorem, Evaluation of integrals of the types $\int_0^{2\pi} f(\cos \theta, \sin \theta) d\theta$, $\int_0^{2\pi} f(\theta) e^{i\theta} d\theta$, $\int_0^{2\pi} f(\theta) \sin \theta d\theta$ and $\int_0^{2\pi} f(\theta) \cos \theta d\theta$, Conformal mappings. Space of analytic functions and their completeness, Hurwitz theorem, Montel theorem, Riemann mapping theorem


Signature


HOD

LESSON PLAN

CLASS- BCA

SEMESTER- 1st

Name of Extension lecturer

Surender Kumar

Subject/Paper - Mathematics Foundation to Computer Science - I

Sr. No.	Duration	Subject Matter/ Syllabus
Unit-1	August 2026	Set, Set Operations, Properties of Set operations, Subset, Venn Diagrams, Cartesian Products. Relations on a Set, Properties of Relations, Representing Relations using matrices and digraphs, Types of Relations, Equivalence Relation, Equivalence relation and partition on set, Closures of Relations, Warshall's algorithm. Functions, properties of functions (domain, range), composition of functions, surjective (onto), injective (one-to-one) and bijective functions, inverse of functions. Some useful functions for Computer Science: Exponential and Logarithmic functions, Polynomial functions, Ceiling and Floor functions.
Unit-2	Sep-2026	Basics of counting, Pigeonhole principle, permutation, combination, Binomial coefficients, Binomial theorem. Recurrence relations, modelling recurrence relations with examples, like Fibonacci numbers, the tower of Hanoi problem. Solving linear recurrence relation with constant coefficients using characteristic equation roots method.
Unit-3	October 2026	Basic terminologies of graphs, connected and disconnected graphs, subgraph, paths and cycles, complete graphs, digraphs, weighted graphs, Euler and Hamiltonian graphs. Trees, properties of trees, concept of spanning tree. Planar graphs. Definitions and basic results on the topics mentioned.

Unit-4	November 2026	Types of matrices, algebra of matrices–addition, subtraction, and multiplication of matrices, determinant of a matrix, symmetric and skew-symmetric matrices, orthogonal matrix, rank of a matrix, inverse of a matrix, applications of matrices to solve system of linear equations, Eigen values and Eigen vectors, Caley-Hamilton theorem.
--------	------------------	---

Signature
Signature

HOD