

Calculus

Derivatives for Graphing and Applications, Sketching and Tracing of Curves, Volume and Area of Surfaces, Vector Calculus and its Applications.

Algebra

Theory of Equations and Complex Numbers, Equivalence Relations and Functions, Basic Number Theory, Row Echelon Form of Matrices and Applications

Real Analysis

Real Number System R , Properties of R , Sequences in R , Infinite Series

Differential Equations

Differential Equations and Mathematical Modeling, Population Growth Models, Second and Higher Order Differential Equations, Analysis of Mathematical Models,

Theory of Real Functions

Limit of Functions, Continuous Functions and their Properties, Derivability and its Applications, Taylor's Theorem and its Applications

Multivariate Calculus

Calculus of Functions of Several Variables, Extrema of Functions of two variables and Properties of Vector Field, Double and Triple Integrals, Green's, Stokes and Gauss Divergence Theorem.

Partial Differential Equations

First order PDE and Method of Characteristics, Mathematical Models and Classification of 2nd Order Linear PDE, The Cauchy Problem and Wave Equations, Method of Separation of Variables

Riemann Integration and Series of Functions

Riemann Integration, Improper Integral, Sequence and Series of Functions, Power Series

Ring Theory and Linear Algebra-I

Introduction of Rings, Ring Homomorphisms, Introduction of Vector Spaces, Linear Transformations

Metric Spaces

Basic concepts of Metric Spaces, Topology of Metric Spaces, Continuity & Uniform Continuity in Metric Spaces, Connectedness and Compactness.

Group Theory-II

Automorphisms and Properties, External and Internal Direct Products of Groups, Group Action, Sylow Theorems and Applications

Complex Analysis

Analytic Functions and Cauchy-Riemann Equations, Elementary Functions and Integrals, Cauchy's Theorems and Fundamental Theorem of Algebra, Series and Residues

Ring Theory and Linear Algebra – II

Polynomial Rings and Unique Factorization Domain (UFD), Dual Spaces and Diagonalizable Operators, Inner Product Spaces, Adjoint Operators and Their Properties

Topics of syllabus- Teaching Education and Methodology:

1. Learning & Teaching
2. Language across the curriculum
3. Understanding discipline and subject
4. Gender school and Society
5. Pedagogy of a school subject
6. Knowledge and curriculum
7. Assessment for learning
8. Creating an inclusive school
9. Childhood and growing up
10. Drama and Art in Education