

## Syllabus for First year Intermediate from Academic Year 2025-26

### Mathematics (1<sup>st</sup> Year)

#### **1. Sets**

- 1.1 Introduction
- 1.2 Sets and their Representations
- 1.3 The Empty Set
- 1.4 Finite and Infinite Sets
- 1.5 Equal Sets
- 1.6 Subsets
- 1.7 Universal Set
- 1.8 Venn Diagrams
- 1.9 Operations on Sets
- 1.10 Complement of a Set

#### **2. Relations and functions**

- 2.1 Introduction
- 2.2 Cartesian Product of Sets
- 2.3 Relations
- 2.4 Functions

#### **3. Trigonometric functions**

- 3.1 Introduction
- 3.2 Angles
- 3.3 Trigonometric Functions
- 3.4 Trigonometric Functions of Sum and Difference of Two Angles

#### **4. Complex number and quadratic equations**

- 4.1 Introduction
- 4.2 Complex Numbers
- 4.3 Algebra of Complex Numbers
- 4.4 The Modulus and the Conjugate of a Complex Number
- 4.5 Argand Plane and Polar Representation

#### **5. Linear inequalities**

- 5.1 Introduction
- 5.2 Inequalities
- 5.3 Algebraic Solutions of Linear Inequalities in One Variable and their Graphical Representation

#### **6. Permutations and combinations**

- 6.1 Introduction
- 6.2 Fundamental Principle of Counting
- 6.3 Permutations
- 6.4 Combinations

#### **7. Binomial theorem**

- 7.1 Introduction
- 7.2 Binomial Theorem for Positive Integral Indices

## **8. Sequences and series**

- 8.1 Introduction
- 8.2 Sequences
- 8.3 Series
- 8.4 Geometric Progression (GP.)
- 8.5 Relationship Between A.M. and G. M

## **9. Straight lines**

- 9.1 Introduction
- 9.2 Slope of a Line
- 9.3 Various Forms of the Equation of a Line
- 9.4 Distance of a Point from a Line

## **10. Conic sections**

- 10.1 Introduction
- 10.2 Sections of a Cone
- 10.3 Circle
- 10.4 Parabola
- 10.5 Ellipse
- 10.6 Hyperbola

## **11. Introduction to three dimensional geometry**

- 11.1 Introduction
- 11.2 Coordinate Axes and Coordinate Planes in Three Dimensional Space
- 11.3 Coordinates of a Point in Space
- 11.4 Distance between Two Points

## **12. Limits and derivatives**

- 12.1 Introduction
- 12.2 Intuitive Idea of Derivatives
- 12.3 Limits
- 12.4 Limits of Trigonometric Functions
- 12.5 Derivatives

## **13. Statistics**

- 13.1 Introduction
- 13.2 Measures of Dispersion
- 13.3 Range
- 13.4 Mean Deviation
- 13.5 Variance and Standard Deviation

## **14. Probability**

- 14.1 Event
- 14.2 Axiomatic Approach to Probability

**Syllabus for Second Year Intermediate from Academic Year 2026-27**  
**Mathematics (2<sup>nd</sup> Year)**

**1. Relations and Functions**

- 1.1 Introduction
- 1.2 Types of Relations
- 1.3 Types of Functions
- 1.4 Composition of Functions and Invertible Function

**2. Inverse Trigonometric Functions**

- 2.1 Introduction
- 2.2 Basic Concepts
- 2.3 Properties of Inverse Trigonometric Functions

**3. Matrices**

- 3.1 Introduction
- 3.2 Matrix
- 3.3 Types of Matrices
- 3.4 Operations on Matrices
- 3.5 Transpose of a Matrix
- 3.6 Symmetric and Skew Symmetric Matrices
- 3.7 Invertible Matrices

**4. Determinants**

- 4.1 Introduction
- 4.2 Determinant
- 4.3 Area of a Triangle
- 4.4 Minors and Cofactors
- 4.5 Adjoint and Inverse of a Matrix
- 4.6 Applications of Determinants and Matrices

**5. Continuity and Differentiability**

- 5.1 Introduction
- 5.2 Continuity
- 5.3 Differentiability
- 5.4 Exponential and Logarithmic Functions
- 5.5 Logarithmic Differentiation
- 5.6 Derivatives of Functions in Parametric Forms
- 5.7 Second Order Derivative

**6. Application of Derivatives**

- 6.1 Introduction
- 6.2 Rate of Change of Quantities
- 6.3 Increasing and Decreasing Functions
- 6.4 Maxima and Minima

**7. Integrals**

- 7.1 Introduction
- 7.2 Integration as an Inverse Process of Differentiation
- 7.3 Methods of Integration
- 7.4 Integrals of Some Particular Functions

- 7.5 Integration by Partial Fractions
- 7.6 Integration by Parts
- 7.7 Definite Integral
- 7.8 Fundamental Theorem of Calculus
- 7.9 Evaluation of Definite Integrals by Substitution
- 7.10 Some Properties of Definite Integrals

## **8. Application of Integrals**

- 8.1 Introduction
- 8.2 Area under Simple Curves

## **9. Differential Equations**

- 9.1 Introduction
- 9.2 Basic Concepts
- 9.3 General and Particular Solutions of a Differential Equation
- 9.4 Methods of Solving First Order, First Degree Differential Equations

## **10. Vector Algebra**

- 10.1 Introduction
- 10.2 Some Basic Concepts
- 10.3 Types of Vectors
- 10.4 Addition of Vectors
- 10.5 Multiplication of a Vector by a Scalar
- 10.6 Product of Two Vectors

## **11. Three Dimensional Geometry**

- 11.1 Introduction
- 11.2 Direction Cosines and Direction Ratios of a Line
- 11.3 Equation of a Line in Space
- 11.4 Angle between Two Lines
- 11.5 Shortest Distance between Two Lines

## **12. Linear Programming**

- 12.1 Introduction
- 12.2 Linear Programming Problem and its Mathematical Formulation

## **13. Probability**

- 13.1 Introduction
- 13.2 Conditional Probability
- 13.3 Multiplication Theorem on Probability
- 13.4 Independent Events
- 13.5 Bayes' Theorem