MATHEMATICS

+2 (2024-2025)

The syllabus in the subject of Mathematics has undergone changes from time to time in accordance with growth of the subject and emerging needs of society. Senior secondary stage is a launching stage from where the students go either for higher academic education in Mathematics or for professional courses like engineering, physical and Bioscience, commerce or computer applications. The present revised syllabus has been designed in accordance with National curriculum Frame Work 2005 and as per guidelines given in Focus Group on teaching of Mathematics 2005 and which is to meet the emerging needs of all categories of students. Motivating the topics from real life situations and other subject areas, greater emphasis has been laid on application of various concepts.

OBJECTIVES

The board objectives of teaching Mathematics at senior school stage intend to help the pupil:

- To acquire knowledge and critical understanding particularly by way of motivation of visualization of basic facts, concepts, terms, principles and symbols and mastery of underlying processes and skills.
- To feel the flow of reasons while proving a result or solving a problem.
- To apply the knowledge and skills acquired to solve problems and wherever possible, by more than one method.
- To develop positive attitude to think, analyze and articulate logically.
- To develop interest in the subject by participating in related competitions.
- To acquaint students with different aspects of mathematics used in daily life.
- To develop an interest in students to study mathematics as a discipline.
- To develop awareness of the need for national integration, protection of environment observance of small family norms, removal of social barriers, elimination of sex biases.
- To develop reverence and respect towards great Mathematicians for their contribution to the field of Mathematics.

COURSE STRUCTURE

1. Relations and Functions
2. Inverse Trigonometric
3. Matrices
4. Determinants
5. Continuity and Differentiability
6. Application of Derivatives
7. Integrals
8. Application of Integrals
9. Differential Equations
10. Vector Algebra
11. Three Dimensional Geometry
12. Linear Programming
13. Probability

Units

I.	RELATIONS AND FUNCTIONS
II.	ALGEBRA
III.	CALCULUS
IV.	VECTORS AND THREE-DIMENSION GEOMETRY
V.	LINEAR PROGRAMMING
VI.	PROBABILITY

UNIT I. RELATIONS AND FUNCTIONS

1. Relations and Functions:

Introduction, Types of relations: reflexive, symmetric and transitive, equivalence relations, Types of Functions One to one and onto functions.

2. Inverse Trigonometric Functions:

Basic concept of Trigonometric Function, range, domain, principal value branches, Graphs of inverse trigonometric functions.

UNIT II. ALGEBRA

1. Matrices:

Concept, notation, order, equality, types of matrices, zero matrix, transpose of a matrix, symmetric and skew symmetric matrices, Algebra of Matrices and properties.

2. Determinants:

Introduction and definition of Determinant, area of triangle, minors and cofactors, Adjoint and inverse of a matrices. Application of Determinant and matrices, solving of system of linear equations using inverse of a matrix.

UNIT III. CALCULUS

1. Continuity and Differentiability:

Continuity and differentiability, derivative of composite functions, chain rule, Algebra of continues function, derivative of implicit function, Derivative of inverse trigonometric function. Exponential and logarithmic functions. Logarithmic differentiation. Second order derivatives.

2. Applications of derivatives:

Rate of change of Quantities, increasing/decreasing functions and related theorem, maxima and minima , Second Derivatives test, Maximum and minimum values of function in a closed interval.

3. Integrals:

Introduction of Integrals, Integration as an inverse process of differentiation. Method of Integration, Integration by substitution, by partial fractions and by parts , integrals of some particular function and of more types. Fundamental Theorem of Calculus, Evaluation of Definite integrals by substitution, properties of definite integrals and evaluation of Definite integrals.

4. Applications of the Integrals:

Introduction, area under simple curves.

5. Differential Equation:

Basic concepts of Differential Equation, order and degree of Differential Equations, general and particular solutions of differential equation, Methods of solving first order, first degree differential equation, separation of variables, general solution of differential equations, homogenous differential equation, linear differential equation.

UNIT IV. VECTORS AND THREE-DIMENSIONAL GEOMETRY

1. Vectors:

Basic concepts of Vector Algebra, direction ratios, Direction cosines, types of vector, addition, subtraction, multiplication of Vectors, Vector joining two point, section formula, product of two vectors (scalars (dot) or corss).

2. Three – Dimensional geometry:

Direction cosines and Direction ratios of a line, relation between direction cosines of a line, equation of lines in space. Angle between two lines, shortest distance between two lines, distance between two skew and parallel lines.

UNIT V. LINEAR PROGRAMMING

1. Linear Programming:

Introduction, definition of related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems. Feasible and infeasible reason. Graphical method to solve the LPP.

UNIT VI. PROBABILITY

1. Probability:

Multiplication theorem on probability, Conditional probability, independent events, total probability. Baye's theorem, Partition of a sample space.

PRESCRIBED BOOKS:

1. Mathematics Part-I published by H.P. Board of school Education Dharamshala.

2. Mathematics Part-II published by H.P. Board of school Education Dharamshala.