ESPALIER HERITAGE SCHOOL

SESSION – 2025 - 26

ANNUAL PEDAGOGICAL PLAN

CLASS - X

SUBJECT: MATHEMATICS			**BOOKS: 1. MATHEMATICS FOR CLASS X, NCERT** **2. MATHEMATICS FOR CLASS X EXEMPLER.** **3. MATHEMATICS CLASS X, R S AGARWAL.** **4. LABORATORY MANUAL – MATHEMATICS CLASS X**		
MONTH	**CHAPTER**	**No. of Periods**	**TOPICS**	**LEARNING OBJECTIVES**	**LEARNING OUTCOMES**
APRIL	**CH – 8 Introduction to Trigonometry**	25 Periods	**Revision:** • **Real Numbers** • **Polynomials** • **Basic Geometrical terms and definitions.** **CH- 8: Introduction to Trigonometry:** • Trigonometry ratios of an acute angle of a right-angled triangle. • Proof of their existence. • The ratios whichever are defined at $0^\circ \leq \theta \leq 90^\circ$. And values of the trigonometric ratios of 30°, $45^\circ$and 60°. • Relationships between the ratios. • Trigonometric Identities. • Summary (Concept Map). **Skills:** • Quality Education. • Develop critical thinking/ problem solving skills by analysing and applying	**Revision: To help the learners** • Reinforce learning. • Improve retention and reduce anxiety. • Assess and gauge knowledge and practice and apply knowledge. **CH – 8 Introduction to Trigonometry** **To help the learners** • Describe trigonometry and study the relationship between side and angle of a triangle. • Define and distinguish various trigonometric ratios and describe and verify sine, cosine, tangent, cosecant, secant, cotangent of the angle. • Use given trigonometric ratios and find and verify other trigonometric ratios/angles of the triangle. • Compute the T- Ratios of specific angles and use these for different angles. • Compute and apply trigonometric identities and simplify and solve mathematical identities.	**Learners will be able to:** • Remember important concepts, figures, formulas and methodologies that studied in the previous classes. **CH- 8: Introduction to Trigonometry:** **Learners will be able to** • Determines all trigonometric ratios with respect to a given acute angle (of a right triangle) in order to use them in solving problems based on T-Ratios and Identities.
			CH – 1 Real Numbers:	. **CH – 1 Real Numbers.**	

May	**CH – 1 Real Numbers**	14 Periods	Introduction • The Fundamental Theorem of Arithmetic, • Revisiting Irrational numbers. • Revisiting Rational Numbers and Their decimal Expansions. • Summary (Concept Map). **Skills:** • Quality Education. • Develop critical thinking/ problem solving skills by analysing and applying various mathematical concepts.	**To help the learners** • Use the Fundamental theorem of Arithmetic and calculate HCF and LCM of the given numbers in the context of the given problem. • Recall the properties of irrational number and prove that whether the sum / difference /product/quotient of two numbers is irrational or not. • Apply theorems of irrational number and prove whether a given number is irrational or not.	**CH – 1 Real Numbers.** **Learners will be able to** • Generalise properties of numbers and relations among them studied earlier, to evolve results, such as fundamental theorem of arithmetic in order to apply them to solve problems related to real life context.

JUNE	**CH – 2 Polynomials** CH – 4 **Quadratic Equations**	16 periods	**CH – 2 Polynomials** • Zeros of a polynomial. • Relationship between zeros and coefficients of quadratic polynomials. • Summary (Concept Map). **ACTIVITY- 1** **Experiential Learning** **Lab Activity 1:** To draw and analyse the graph of a quadratic polynomial. CH – 4 **Quadratic Equations** • Standard form of a quadratic equation. • Solutions of a quadratic equations by factorization, and by using quadratic formula. • Relationship between discriminant and nature of roots. • Situational problems based on quadratic equations related to day to day activities. • Summary (Concept Map). **Skills:** • Quality Education. • Develop critical thinking/ problem solving skills by analysing and applying various mathematical concepts.	**CH – 2 Polynomials** **To help the learners** • Recall degree of Polynomials and find the number of zeroes of polynomial. • Analyse the graph of the polynomials and find the number of zeroes of polynomial. • Compute zeroes of the polynomials and verify the relationship between zeroes and the coefficients. • Compute the sum and product of zeroes of the polynomial and find the quadratic polynomial. CH – 4 **Quadratic Equations** **To help the learners** • In the form of Quadratic Equation represent the given situation algebraically. • Rewrite the given equations in the standard form and check whether they are quadratic or not. • Solve quadratic equations through factorisation and middle term splitting and find its roots. • Use the quadratic formula and find the roots of quadratic equation and find out the nature of its roots.	**CH – 2 Polynomials** **Learners will be able to** • Use algebraic and graphical method of finding zeroes of a polynomial in order to establish a relationship between them. CH – 4 **Quadratic Equations** **Learners will be able to** • Demonstrates knowledge of application of various strategies in order to find roots and determine the nature of roots of a given

JULY	**CH – 3 Pair of Linear Equations in two Variables.** **CH- 6 Triangles**	14 +12 =26 Periods	**CH – 3 Pair of Linear Equations in two Variables.** • Pair of linear equations in two variables and graphical method of their solution. • Conditions of consistency/ inconsistency. • Algebraic conditions for number of solutions. • Solution of a linear equations in two variables algebraically by substitution and by elimination. • Simple situational problems. • Summary (Concept Map). **Subject Enrichment** **Lab Activity 2 :** To obtain the conditions for consistency of a pair of linear equations in two variables. **CH- 6 Triangles** • Introduction, Similarity of Triangles, Basic Proportionality Theorem, Converse of basic proportionality theorem, Criteria for Similarity of Triangles, AAA, SAS and ASA Similarity criteria. • Summary (Concept Map). **Lab Activity 3** To verify the basic proportionality theorem using activity method. ACTIVITY - 3 **Art Integrated:** Modal of Similar triangles using card board. **Skills:** Creative Thinking	**CH – 3 Pair of Linear Equations in two Variables.** **To help the learners** • State the properties of linear equation and classify the given equations as linear or non-linear. • Interpret the concepts of linear equations and represent any given situation algebraically and graphically. • Plot the lines corresponding to the given two linear equations and comment on the nature/behaviour of the lines representing the linear equations. • Use different algebraic methods and solve a pair of linear equations. • Use the most appropriate algebraic method and solve the given pair of linear equations. • Rewrite the given equations which are reducible to a pair of linear equations and find the solutions and find the solution of those equations. **CH – 6 Triangles** **To help the learners** • Distinguish between congruency and similarity and understand the concept of similar figures. • Compute the angles and ratio of sides of polygons and determine their similarity. • Compute the angles and ratio of sides of triangles in order to determine their similarity.	**CH – 3 Pair of Linear Equations in two Variables.** **Learners will be able to** • Use graphical and algebraic methods in order to find solutions of pairs of linear equations in two variables. **CH- 6 Triangles** **Learners will be able to** • Use reasoning in order to differentiate between congruent and similar figures. • Use different geometric criteria established such as basic proportionality theorem etc. In order to establish properties for similarity of two triangles.

AUGUST	**CH – 7 Coordinate Geometry.** **CH – 14 Statistics** **CH – 15 Probability**	10 +12 + 6 = 28 periods	**CH – 7 Coordinate Geometry.** • Concepts of coordinate geometry. • Graphs of linear equations. • Distance formula and Section formula. • Summary (Concept Map). **Experiential Learning** **Lab Activity 4 :** To derive the Distance formula using graph paper **CH – 14 Statistics** • Mean, median and mode of grouped data. • Summary (Concept Map). **CH – 15 Probability** • Classical definition of probability, problems on finding the probability of an event. • Summary (Concept Map). **Lab Activity 5 :** To determine experimental probability of 1, 2, 3, 4, 5 or 6 by throwing a die and compare them with their theoretical probability. **Skills:** • Quality Education. • Develop critical thinking/ problem solving skills by analysing and applying various mathematical concepts.	**CH – 7 Coordinate Geometry.** **To help the learners** • Apply and derive distance formula and determine the distance between two coordinates on the graph. • Apply distance formula and solve various mathematical and real-life problems graphically. • Apply and derive section formula and divide the line segment in a given ratio. • Apply distance and section formula and determine the vertices /diagonal/mid-points of given geometrical shapes. **CH – 14 Statistics** **To help the learners** • Apply direct and assumed mean method to calculate the mean of grouped data. • Compute the mode of the given data. • Apply formula for the median of a given grouped data and calculate missing values of frequency. • Differentiate between mean, median and mode with examples and use most effective measure of central tendency in various cases **CH – 15 Probability** **To help the learners** • Find the classical definition of probability. • Simple problems on finding the probability of an event.	**CH – 7 Coordinate Geometry.** **Learners will be able to** • Derive formulae to establish relations for geometrical shapes in the context of a coordinate plane, such as finding the distance between two given points, in order to determine coordinates of a point between any two given points and section formula and its uses in solving various problems. **CH – 14 Statistics** **Learners will be able to** • Calculate mean, median and mode in order to apply them to real life contexts. **CH – 15 Probability** **Learners will be able to** • Calculates in order to determine the probability of a given event**.**

SEPTEMBER	**CH – 9 Some Applications of Trigonometry**	10 Periods	Revision of CH – 1, CH -2, CH – 3, CH – 4, CH – 6 CH - 7 CH – 8 CH - 14 and CH - 15 **CH – 9 Some Applications of Trigonometry** • Angle of elevation, Angle of Depression, problems on heights and distances. • Summary (Concept Map). **Activity 2** **Experiential Learning :** Construct a Clinometre and measure the height of your school building. **Skills:** • Quality Education. • Develop critical thinking/ problem solving skills by analysing and applying various mathematical concepts.	**CH – 9 Some Applications of Trigonometry** **To help the learners** • Identify line of sight and determine angle of elevation and angle of depression. • Apply trigonometric ratios and determine heights and distances of the objects in the real-life context. • Apply trigonometric ratios and determine heights and distances of the objects / structures in the real-life context.	**CH – 9 Some Applications of Trigonometry** **Learners will be able to** • Determine all trigonometric ratios with respect to a given acute angle in order to use them in solving problems in daily life contexts like finding heights of different objects.

OCTOBER	**CH – 5 Arithmetic Progressions** **CH – 10 Circles**	10 + 10 = 20 Periods	**CH – 5 Arithmetic Progressions** • Introduction of Arithmetic Progression. • Derivation of nth term and sum of the first n terms of A.P. • Application of A.P and their application in solving daily life problem. • Summary (Concept Map). **CH – 10 Circles** • Tangent to a circle at a point of contact, Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact, Prove that the length of tangents drawn from an external point to a circle are equal. • Summary (Concept Map). **Experiential Learning:** **Lab Activity 6 –** Identify arithmetic progression in some given list of series. **Lab Activity 7 –** To find the sum of the first n natural numbers. **Lab Activity 8 –** To verify the length of tangents from an external points are equal in length. **Skills:** Curiosity, Critical Thinking.	**CH – 5 Arithmetic Progressions** **To help the learners** • Produce patterns and observe that succeeding terms are obtained by adding a fixed number to the preceding terms. • Distinguish between finite and infinite A.P and determine the nature and write the last term of the given A.P • Calculate the nth term of a given A.P and find its terms and their nature and solve real-life word problems. • Calculate the sum of a given A.P and get the solution of real-life word problems and solve contextual problems. • Calculate the last term of the given A.P and find solution of real-life word problems. **CH – 10 Circles** **To help the learners** • Draw, Identify and differentiate between secant and tangent of a circle and prove and apply various theorems related to circles. • Prove and apply theorems related to tangent of a circle and determine number of tangents from the given points and determine length of the tangents.	**CH – 5 Arithmetic Progressions** **Learners will be able to** • Develop strategies in order to apply the concept of AP to daily life situations. **CH – 10 Circles** **Learners will be able to** • Apply theorems related to tangent of a circle in order to determine number of tangents from the given point and determine the length of the tangent.

NOVEMBER	**CH – 12 Areas Related to Circles** **CH – 13 Surface Areas and Volumes**	12 + 14 = 26 Periods	**CH – 12 Areas Related to Circles** • Introduction, Perimeter and Area of a Circle, Circumference of a Circle. • Areas of a Sector and Segment of a Circle, Areas of Combinations of Plane Figures. • Summary (Concept Map). **Experiential Learning** ACTIVITY - 3 Construct circular disc / Combination of figures using cardboard and find the area. **CH – 13 Surface Areas and Volumes.** • Surface areas of combinations of cubes, cuboids, spheres, hemispheres and right circular cylinders and cones. • Volumes of combinations of cubes, cuboids, spheres, hemispheres and right circular cylinders and cones. • Summary (Concept Map) **SDG 4** - Quality Education with case study based questions so that the students see the usefulness of Maths while instilling values and attitude towards it.	**CH – 12 Areas Related to Circles** **To help the learners** • Describe the relationship between circumference and diameter of a circle and define □. • Apply the concepts of circumference and area of circles and solve in for various circular objects in real life. • Describe sector and segment of a circle and differentiate between the two. • Describe minor and major sector and minor and major segment of a circle and differentiate between two. • Calculate the length of an arc of a circle and comment whether it is the major or minor arc. • Calculate the area of various combinations of plane figures and apply the concepts of circles. **CH – 13 Surface Areas and Volumes** **To help the learners** • Apply formulae of surface area and volume of 3D solids and derive the surface area of combination of solid shapes. • Combine different solid shapes to create a new solid form and apply the formula to find the surface area and volume. • Use concepts of surface areas and volumes for variety of 3-D objects and apply them into real life situations.	**CH – 12 Areas Related to Circles** **Learners will be able to** • Apply the concepts of Theorems in order to solve questions based on circumference and area of circles, sector and segment of a circle and differentiate between the two and solve in for various circular objects in real life. **CH – 13 Surface Areas and Volumes.** **Learners will be able to** • Visualize objects in surrounding as a combination of different solids like cylinder and a cone, cylinder and a hemisphere, combination of different cubes etc. In order to find their surface areas and volumes.

DECEMBER			Revision + 2nd terminal examination		
JANUARY			SQP + Previous years board Question paper + pre-Board examination		
FEBRUARY			Remedial classes		