CONTENT DISTRIBUTION
SUBJECT: MATHEMATICS
Class: Senior 4

Number of periods per week: 7periods

Note: Given that this subject has 7 periods per week, adjust this content distribution according to the number of weeks for the school year's calendar.

Term 1

UNIT 1: FUNDAMENTALS OF TRIGONOMETRY (21 periods instead of 26)		
Key unit Competence: Use trigonometric circle and identities to determine trigonometric ratios and apply them to solve related problems		
Week	**Content**	**Number of Periods**
1	Angle and its measurements	2
	Unit circle and identification of Trigonometric ratios of acute angles	1
	Trigonometric ratios of special angles $(0^o, 30^o, 45^o, 60^o, 90^o)$	2
	Introduction to trigonometric identities	2
2	Reduction to functions of Positive acute angles – Equivalent angles – Negative/Opposite angles – Complementary angles – Supplementary angles	 1 1 2 1
	Solving a triangle by cosine law Solving a triangle by Sine law	1 1
3	Application of trigonometry in bearing and air navigation	3
	Application of trigonometry: Angle of elevation, Angle of depression, Inclined plane	3
	End unit assessment	1
UNIT 2: PROPOSITIONAL AND PREDICATE LOGIC (14 periods)		
Key unit Competence: Use mathematical logic to organize scientific knowledge and as a tool of reasoning and argumentation in daily life		
Week	**Content**	**Number of Periods**
4	Generalities on propositions	2
	Propositional logic - Truth tables - Logical connectives - Tautologies and contradictions	 1 2 1
5	Predicate Logic: Propositional functions, Quantifiers	4
	Applications of logics to set theory and Electric circuits	2
	End unit assessment	1

UNIT 3: BINARY OPERATIONS (14 periods)		
Key Unit Competence: Use mathematical logic to understand and perform operations using the properties of algebraic structures.		
Week	**Content**	**Number of Periods**
6	Definition and properties - Binary operation, Closure and commutative properties - Identity and inverse properties	 1 1
	Definition and properties: - Associativity and distributive properties	 1
	Cayley table of binary operation	1
	Algebraic structure of a Group	2
7	Algebraic structure of Ring	3
	Algebraic structure of a Field	4
	End unit assessment	1
UNIT 4: SET OF REAL NUMBERS (21 periods instead of 24)		
Key Unit Competence: Think critically using mathematical logic to understand and perform operations on the set of real numbers and its subsets using the properties of algebraic structures.		
Week	**Content**	**Number of Periods**
8	Absolute value and its properties	2
	Powers and radicals	3
	Operation on radicals	2
9	Rationalization	2
	Decimal logarithms	2
	Properties of decimal logarithms	3
10	Model simple problems about growth, decay, compound interest and magnitude of an earthquake	6
	End unit assessment	1
11	Exams	

TERM 2:

UNIT 5: LINEAR EQUATIONS AND INEQUALITIES (7 periods instead of 12)		
Key unit Competence: Model and solve algebraically or graphically daily life problems using linear equations or inequalities		
Week	**Content**	**Number of Periods**
1	Linear equations in one unknown: Simple equations, equations involving products and quotients, equations involving absolute value	1
	Simultaneous equations in two unknowns	1
	Linear inequality in one unknown: Simple inequalities, Inequalities involving products or quotients , Inequalities involving absolute values	2
	Parametric equations in one unknown	1
	Parametric inequalities in one unknown	1
	Solving problems from real life situations involving equations and inequalities	
	End unit assessment	1
UNIT 6: QUADRATIC EQUATIONS AND INEQUALITIES (14 periods instead of 18)		
Key Unit Competence: Model and solve algebraically or graphically daily life problems using quadratic equations or inequalities.		
Week	**Content**	**Number of Periods**
2	Solving quadratic equations by factorizing or completing the square	1
	Solving quadratic equations by discriminant formula	
	Solving equations reducible to quadratic form: bi-quadratic equations, Nested equations, Irrational equations, Reciprocal equations	3
	Quadratic inequalities	2
	Parametric equations in one unknown	1
3	Parametric inequalities in one unknown	2
	Simultaneous quadratic equations in two unknowns	2
	Solving problems from real life situations involving equations and inequalities	2
	End unit assessment	1
UNIT 7: POLYNOMIAL, RATIONAL AND IRRATIONAL FUNCTIONS (14 periods)		
Key Unit Competence: Use concepts and definitions of functions to determine the domain of rational functions and represent them graphically in simple cases and solve related problems…		
Week	**Content**	**Number of Periods**
4-5	Factorization of polynomials	3
	Definition, domain and range of a function	2
	Determination of domain of definition	3
	Operations of functions	1
	Parity of a function	2
	Application of rational and irrational functions	2
	Assessment	1

UNIT 8: Limits of Polynomial, Rational and Irrational Functions (14 periods)		
Key Unit Competence: Evaluate correctly limits of functions and apply them to solve related problems		
Week	**Content**	**Number of Periods**
6	Neighborhood of a real number and limit of a variable	1
	Definition and graphical interpretation of limit of a function	1
	One-sided limits	2
	Infinite limits	1
	Limits at infinity	1
	The Squeeze theorem and Operations on limits	1
7	Indeterminate cases	2
	Applications of limits on: Continuity of a function, Asymptotes	4
	End unit Assessment	1
UNIT 9: Differentiation of Polynomials, Rational and Irrational Functions and their Applications (21 Periods)		
Key Unit Competence: Use the gradient of a straight line as a measure of rate of change and apply this to line tangent and normal to curves in various contexts and use the concepts of differentiation to solve and interpret related rates and optimization problems in various context		
Week	**Content**	**Number of Periods**
8	Concepts of derivative of a function: Definition and Differentiation from first principle	1
	Rules of differentiation	4
	Rules of differentiation	1
	High order derivatives	1
9	Applications of differentiation - Geometric interpretation of derivatives: Equation of the tangent to a curve, Equation of normal to a curve. - Mean value theorem for derivatives: Lagrange's theorem - Rolle's theorem - Hospital's theorem	4
	- Applications of differentiation: Variations of a function (Maximum and minimum values, critical points, inflexion points, concavity, stationary points,…, Increasing and decreasing function)	3
10	- Applications of differentiation: Gradient as a measure of rate of change	2
	- Applications of differentiation: Kinematic meaning of derivatives	2
	- Applications of differentiation: Optimization problems	2
	End unit Assessment	1
UNIT 10: VECTORS SPACE OF REAL NUMBERS (14 Periods instead of 16)		
Key Unit Competence: Determine the magnitude and angle between two vectors and to be able to plot these vectors and Point out dot product of two vectors		

Week	Content	Number of Periods
11	Definitions and operations on vectors in the Vector spaces ^{2}	1
	Properties of operations on vectors in the Vector spaces ^{2}	2
	Sub-vector spaces of the Vector spaces ^{2}	1
	Linear combination of vectors the Vector spaces ^{2}	1
	Basis and Dimension	2
12	Introduction to Euclidian Vector space ^{2}	1
	Dot product and properties	2
	Modulus or Magnitude of Vectors	1
	Angle between two vectors	2
	End unit Assessment	1
13	Exams	7

TERM 3

UNIT 11: Concepts and Operations on linear transformations in 2D (14 Periods)		
Key Unit Competence: Determine whether a transformation of ^{2} is linear or not ,and Perform operations on linear transformations		
Week	**Content**	**Number of Periods**
1	Linear transformation in 2 dimensions	3
	Geometric transformation in 2 dimensions	4
2	Kernel and Range	4
	Operations on transformations	2
	End unit Assessment	1
UNIT 12: Matrices and Determinants of Order 2 (14 Periods instead of 12)		
Key Unit Competence: Use matrices and determinants of order 2 to solve systems of linear equations and to define transformations of 2D		
Week	**Content**	**Number of Periods**
3-4	Matrix of a linear transformation: definition and operations	2
	Matrix of a geometric transformation	2
	Operations on matrices and their properties: Equality of matrices, Addition of matrices, Multiplication by a scalar, Multiplication of matrices, transpose of a matrix, Inverse of a square matrix.	6
	Determinant of a matrix of order 2: Definition and properties	2
	Applications of determinants	1
	End unit Assessment	1

UNIT 13: Points, Straight Lines and Circles in 2D (21 Periods)		
Key Unit Competence: Determine algebraic representations of lines, straight lines and circles in the 2D		
Week	**Content**	**Number of Periods**
5	Points in 2D:Cartesian coordinates of a point, Distance between two points, Mid-points of a line segment	4
	Lines in 2D: Vector equation of a line, Parametric equations of a line, Cartesian equation of a line	3
6	Problems on points and straight lines in 2D: Positions, Angles, Distance	7
7	Definition of a circle	1
	Cartesian equation of a circle	2
	Problems involving position of a circle and a point or position of circle and lines in 2D	3
	End unit assessment	1

UNIT 14: Measures of Dispersion (7 Periods)		
Key Unit Competence: Extend understanding, analysis and interpretation of data arising from problems and questions in daily life to include the standard deviation.		
Week	**Content**	**Number of Periods**
8	- Recall on bivariate data and examples - Variance - Standard deviation (including combined set of data) - Coefficient of variation - Application of Measures of Dispersion in data interpretation	6
	End unit assessment	1

UNIT 15: COMBINATORICS (21 periods instead of 18 Periods)		
Key Unit Competence: Use combinations and permutations to determine the number of ways a random experiment occurs		
Week	**Content**	**Number of Periods**
9	Counting techniques: - Venn diagram - Tree diagrams - Contingency table - Multiplication principles	7
10	Arrangement and Permutations: • Arrangements with or without repetition • Permutations with or without repetition	5
	Combinations: Definitions and properties	2
11	Pascal's triangles and Binomial expansion	6
	End unit assessment	1

UNIT 16: ELEMENTARY PROBABILITY (7 Periods)		
Key Unit Competence: Use counting techniques and concepts of probability to determine the probability of possible outcomes of events occurring under equally likely assumptions.		
Week	**Content**	**Number of Periods**
12	Concepts of probability: Event, Random experiment, Sample space	1
	Probability of an event A under equally likely assumptions: Definition and formula	2
	Rules or properties of probability	1
	Determination of probability for different events occurring under equally likely assumptions	2
	End unit assessment and Remediation	1
13	**Exams**	