CONTENT DISTRIBUTION

SUBJECT: SUBSIDIARY MATHEMATICS (PCB)

Class: Senior **5** **Number of periods per week:** 4 Periods

Term 1 48 Periods

UNIT 1: Trigonometric Formulae and Equations		**24 Periods**
Key unit Competence: Solve trigonometric equations and real-life problems involving trigonometric functions and equations		
Week	**Content**	**Number of Periods**
1	Introduction to trigonometric formulae	1
	Addition and subtraction formulae;	2
	Double angle formulae	1
2-3	Half-angle formulae	3
	Transformation of product in sum and difference	3
	Transformation of sum in product	2
4	Trigonometric equation reducible to the form $\sin(x+\alpha)=k, \cos(x+\alpha)=k$ and $\tan(x+\alpha)=b$ for $\lvert k\rvert \leq 1$ and $b \in IR$	3
	Trigonometric equation reducible to the form $\sin nx = k$	1
5-6	Trigonometric equation of the form $a\sin x + b\cos x = c$	3
	Applications of trigonometry: Simple harmonic motion in physics, Refraction of light, and waves.	3
	End unit assessment	2
UNIT 2: Sequences		**16 periods**
Key unit Competence: Understand, manipulate and use arithmetic, geometric and harmonic sequences, including convergence		
Week	**Content**	**Number of Periods**
7	Introduction and definition of sequences	2
	Convergent and divergent sequences	2
8	Arithmetic sequences: generalities	2
	Arithmetic sequences: terms and their sum	2
9	Geometric sequences: generalities	2
	Geometric sequences: terms and their sum	2
10	Application of sequences in solving real life problems: Problems involving population growth, Problems involving compound and simple interests, Half-life and Decay problems in Radioactivity, Bacteria growth problems in Biology, etc.	3
	End unit assessment	1
UNIT 3: Logarithmic and exponential equations (20 Periods)		**8/20 Periods**
Key Unit Competence: Solve equations involving logarithms or exponentials and		

apply them to model and solve related problems.		
Week	**Content**	**Number of Periods**
11-12	Introduction to Exponential and logarithmic functions	2
	Logarithmic equations including natural logarithms (ln)	6
13	**Exam**	

TERM 2: 48 Periods

UNIT 3: Logarithmic and exponential equations (20 Periods)		**12/20 Periods**
Key Unit Competence: Solve equations involving logarithms or exponentials and apply them to model and solve related problems.		
Week	**Content**	**Number of Periods**
1-2	Exponential equations	8
3	Applications of logarithmic and exponential equations in solving real life problems: Interest rates problems, Mortgage problems, Population growth problems, Radioactive decay problems, Earthquake problems, Carbon dating problems, Problems about alcohol and risk of car accident	3
	End Unit Assessment	1
UNIT 4: Trigonometric functions and their inverses		**20 periods**
Key unit Competence: Apply theorems of limits and formulas of derivatives to solve problems involving trigonometric functions.		
Week	**Content**	**Number of Periods**
4	Introduction on trigonometric functions and their inverses	1
	Domain of trigonometric functions and their inverses	2
	Range of trigonometric functions and their inverses	1
5-6	Parity and periodicity of trigonometric functions	2
	Limits of trigonometric functions and their inverses	3
	Differentiation of trigonometric functions	3
7-8	Successive derivatives	1
	Applications of trigonometric functions: refraction of light in a prism, simple harmonic motion problems, and optimization	2
	Revision for this unit	4
	End unit assessment	1
UNIT 5: Vector space of real numbers		**16 periods**
Key Unit Competence: Apply properties of vectors and their operations in $\mathbb{R}^3$ to solve problems related to angles between vectors.		
Week	**Content**	**Number of Periods**
9	Introduction on vectors of $\mathbb{R}^3$ and definitions.	1
	Operations of vectors in $\mathbb{R}^3$ and linear combination of vectors.	3
10-12	Introduction to Euclidian vector space $\mathbb{R}^3$	1

	Scalar or Dot product of two vectors and properties	2
	Magnitude (or norm or length) of a vector	1
	Angle between two vectors	
	Vector product, mixed product and their properties	2
	Applications of scalar and vector products: Work done by the force, area of a parallelogram	1
	Revision for this units	4
	End unit assessment	1
13	Exams	

TERM 3 48 Periods

UNIT 6: Matrices and determinants of order 3		**20 Periods**
Key Unit Competence: Apply matrix and determinant of order 3 to solve related problems		
Week	**Content**	**Number of Periods**
1	Introduction on square matrices of order 3	1
	Types of matrices and equality of matrices	3
2	Operations on matrices and properties	4
3	Transpose of matrix	2
	Multiplication of matrices	
	Determinants of order 3 and properties	2
4	Matrix inverse	4
5	Application of matrices in everyday life: Solving a system of 3 linear equations delivered from real life problems	3
	End unit assessment	1
UNIT 7: Bivariate statistics		**16 Periods**
Key Unit Competence: Extend understanding, analysis and interpretation of bivariate data to correlation coefficients and regression lines		
Week	**Content**	**Number of Periods**
6-7	Introduction to bivariate statistics	2
	Covariance	3
	Regression lines	3
8-9	Coefficient of correlation	4
	Applications: Data analysis, interpretation and prediction problems in various areas (biology, business, engineering, geography, demography)	3
	End unit assessment	1
UNIT 8: Conditional probability and Bayes theorem		**12 periods**
Key Unit Competence: Solve problems using Bayes theorem and use data to make decisions about likelihood and risk		
Week	**Content**	**Number of Periods**

10	Tree diagram and probability problems	2
	Independent event, dependent events and multiplication rule	3
11	Conditional probability: Probability of event B occurring when event A has already taken place	2
	Basic formulae and properties of conditional probability	2
12	Bayes theorem and its applications	2
	End unit assessment	1
13	Exams	