SALEM - IMMANUEL LUTHERAN COLLEGE
S. 6 Pure Mathematics Teaching Schedule (2009-2010)

Cycle	Topic	Objectives	Contents	Period	Remarks
1 ⌒ 2/9 | 9/9 ⌣	Unit A1 The Language of Mathematics	1. To understand the first notion of set language. 2. To understand the first notion of logic.	A1.1 Set language A1.2 Simple logic	4 5	Past Paper Review
2 ⌒ 10/9 | 17/9 ⌣	Unit A3 Mathematical Induction	1. To understand the Principle of Mathematical Induction. 2. To apply the Principle of Mathematical Induction to prove propositions involving integers. 3. To be able to modify the Principle of Mathematical Induction to suit different purposes.	A3.1 The Principle of Mathematical Induction and its applications A3.2 Other common variations of the Principle of Mathematical Induction and their applications	4 5	Past Paper Review Test 1
3 ⌒ 18/9 | 25/9 ⌣	Unit A5 The Binomial Theorem for Positive Integral Indices	1. To learn and apply the binomial theorem for positive integral indices. 2. To study the simple properties of the binomial coefficients.	A5.1 The binomial theorem for positive integral indices A5.2 Application of the binomial theorem for positive integral indices A5.3 Simple properties of the binomial coefficients	2 2 5	Past Paper Review Test 2
4 – 5 ⌒ 28/9 | 15/10 ⌣	Unit A6 Polynomials and Equations	1. To learn the properties of polynomials with real coefficients in one variable. 2. To learn division algorithm, remainder theorem and Euclidean algorithm and their applications. 3. To resolve rational functions into partial fractions. 4. To learn the properties of roots of polynomial equations with real coefficients in one variable.	A6.1 Polynomials with real coefficients in one variable A6.2 Rational functions A6.3 Polynomial equations with real coefficients in one variable	6 6 6	Past Paper Review Test 3
6 – 7 ⌒ 16/10 | 9/11 ⌣	Unit A4 Inequalities	1. To learn the elementary properties of inequalities. 2. To prove simple absolute inequalities. 3. To solve simple conditional inequalities.	A4.1 Absolute inequalities A4.2 A.M. $\geq$ G.M. A4.3 Cauchy-Schwarz's inequality A4.4 Conditional inequalities	5 4 4 5	Past Paper Review Test 4

Cycle	Topic	Objectives	Contents	Period	Remarks
8 – 10 ⌒ 10/11 | 4/12 ⌣	Unit A8 Matrices	1. To learn the concept and operations of matrices. 2. To learn the properties and operations of square matrices of order 2 and 3 and their determinants. 3. To apply matrices to two dimensional geometry.	A8.1 Matrices and their operations A8.2 Square matrices of order 2 and 3 A8.3 Applications to two dimensional geometry	6 14 7	Past Paper Review Test 5
11 ⌒ 7/12 | 14/12 ⌣	Unit A9 System of Linear Equations in 2 or 3 Unknowns	1. To solve a system of linear equations using Gaussian elimination. 2. To recognize the existence and uniqueness of solution.	A9.1 Gaussian elimination and Echelon form A9.2 Existence and uniqueness of solution	4 5	Past Paper Review Test 6
12	Revision				
First Term Examination					
13 – 14 ⌒ 21/1 | 5/2 ⌣	Unit B1 Sequence, Series and their Limits	1. To learn the concept of sequence and series. 2. To understand the intuitive concept of the limit of sequence and series. 3. To understand the behaviour of infinite sequence and series.	B1.1 Sequence and series B1.2 Limit of a sequence and series B1.3 Convergence of a sequence and series	6 7 5	Past Paper Review Test 7
15 – 16 ⌒ 8/2 | 5/3 ⌣	Unit B2 Limit, Continuity and Differentiability	1. To understand the intuitive concept of the limit of a function. 2. To understand the intuitive concept of continuity and differentiability of a function. 3. To recognize limit as a fundamental concept in calculus.	B2.1 Limit of a function B2.2 Continuity of a function B2.3 Differentiability of a function	10 4 4	Past Paper Review Test 8
17 – 18 ⌒ 8/3 | 26/3 ⌣	Unit A2 Functions	1. To recognize function as a fundamental tool in other branches of mathematics. 2. To sketch and to describe the shapes of different functions.	A2.1 Functions and their graphs A2.2 Properties and operations of functions A2.3 Algebraic functions A2.4 Trigonometric functions and their formulae A2.5 Exponential and logarithmic functions	2 4 2 2 8	Past Paper Review Test 9

Cycle	Topic	Objectives	Contents	Period	Remarks
19 – 21 ⌒ 12/4 | 12/5 ⌣	Unit B3 Differentiation	1. To acquire different techniques of differentiation. 2. To learn and acquire techniques to find higher order derivative. 3. To understand the intuitive concept of Rolle's Theorem and Mean Value Theorem.	B3.1 Fundamental rules for differentiation	3	
			B3.2 Differentiation of trigonometric functions	2	
			B3.3 Differentiation of composite functions and inverse functions	4	
			B3.4 Differentiation of implicit functions	2	
			B3.5 Differentiation of parametric equations	2	
			B3.6 Differentiation of logarithmic and exponential functions	4	
			B3.7 Higher order derivatives and Leibniz's Theorem	5	
			B3.8 The Rolle's Theorem and Mean Value Theorem	5	Past Paper Review Test 10
22 – 23 ⌒ 13/5 | 31/5 ⌣	Unit B4 Application of Differentiation	1. To learn and to use the L' Hospital's Rule. 2. To learn the applications of differentiation.	B4.1 The L' Hospital's Rule	4	
			B4.2 Rate of change	2	
			B4.3 Monotonic functions	2	
			B4.4 Maxima and minima	4	Past Paper Review Test 11
			B4.5 Curve Sketching	6	
24	Revision				
		Second Term Examination			