WOLMER'S BOYS' SCHOOL
Department of Mathematics
Fourth Form
Subject: Additional Mathematics
Course Outline

RATIONALE:

The Caribbean society is an integral part of an ever-changing world. The impact of globalization on most societies encourages this diverse Caribbean region to revisit the education and career opportunities of our current and future citizens. A common denominator of the Caribbean societies is to create among its citizens a plethora of quality leadership with the acumen required to make meaningful projections and innovations for further development. Further, learning appropriate problem-solving techniques, inherent to the study of mathematics, is vital for such leaders. Mathematics promotes intellectual development, is utilitarian and applicable to all disciplines. Additionally, its aesthetics and epistemological approaches provide solutions fit for any purpose. Therefore, Mathematics is the essential tool to empower people with the knowledge, competencies and attitudes which are precursors for this dynamic world.

This Additional Mathematics course provides a variety of topics with related attributes which will enable Caribbean students to reason logically using the prior knowledge of Mathematics. **Candidates are expected to enter this course of study with a solid foundation of algebraic knowledge and mathematical reasoning**.

GOALS:

The syllabus aims to:
1. build upon those foundational concepts, techniques and skills acquired and
form linkages to areas of study at the Advanced Proficiency Level;
2. enhance ways of learning Mathematics;
3. stimulate further curiosity and analytical thinking in deriving solutions to problems which
may not necessarily be solved by a single/unique approach;
4. develop abilities to reason logically;
5. *develop skills such as, critical and creative thinking, problem solving, logical reasoning,*
modelling, collaboration, decision making, research, and information communication and
technological skills which are integral to everyday life and for life-long learning;
6. develop positive intrinsic mathematical values, such as, accuracy and rigour;
7. connect Mathematics with other disciplines such as Science, Business and the Arts; and,
8. *integrate Information and Communications Technology (ICT) tools and skills in the teaching*
and learning processes

CHRISTMAS TERM:

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
1 Sept 5-9	**Algebra**	a. Addition, subtraction, multiplication and division of algebraic expression including fractional expressions. b. Factorization of algebraic expression.	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate operations on algebraic expression, factorization and division of polynomials. Reinforcement of Content: https://www.youtube.com/watch?v=ZvL9aDGNHqA	Worksheet

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
				Online multiple-choice quiz that will be administered via Test Portal.	
2 Sept 12-16	**Algebra**	a. Division of a polynomial of degree less than or equal to 4 by a linear or quadratics polynomials. b. Solving Quadratic equations using Formula and Factorisation.	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate division of polynomials. Reinforcement of Content: https://www.youtube.com/watch?v=RPXMBIFG_W4 Google Classroom Quiz	Test Worksheet
3 Sept 19-23	**Quadratics**	a. The Remainder Theorem b. Factor Theorem	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate the Remainder and Factor Theorem. Google Classroom Quiz https://www.youtube.com/watch?v=zAGP46nR6-0	Defining Terms Test Standardized Test**1** Sep 14-16, 2022
4 Sept 26-30	**Quadratics**	a. Completing the Square b. The Maximum or Minimum values of quadratic functions	Guided Discovery Observation Exposition	GEOGEBRA to demonstrate Completing the Square. Reinforcement of Content: https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadrat	Defining Terms Worksheet

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
		c. The range quadratic functions.	Demonstration	ic-functions-equations/x2f8bb11595 b61c86:completing-square-quadratic s/v/solving-quadratic-equations-by-c ompleting-the-square	
5 & 6 Oct 03-07 & 10-12 Mid Term Oct 13-17	**Quadratics**	a. Sketching the graph of quadratic functions, including maximum or minimum points and intercepts on the axes. b. Evaluate unknown coefficients by equating coefficients	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate graph sketching. Reinforcement of Content: https://courses.lumenlearning.com/b oundless-algebra/chapter/graphs-of- quadratic-functions/ https://www.youtube.com/watch?v= -mGW2HM5Xoc Google Classroom Quiz	Defining Terms Worksheet Standardize d Test**2** Oct 03-07, 2022
7 & 8 Oct 18-21 & 24-28	**Quadratics**	a. The relationship between the sums and products of the roots and the coefficients of $ax^2 + bx + c = 0$.	Guided Discovery Observation Exposition Demonstration	Reinforcement of Content: https://www.youtube.com/watch?v= _rCwpk7m6Iw Google Classroom Quiz	Defining Terms Worksheet Standardize d Test**3** Oct 24-28, 2022

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
9 Oct 31-Nov 4	**Quadratics**	a. Solution of equations (one linear and one non-linear inclusive of quadratic and circle equations).	Guided Discovery Observation Exposition Demonstration	Reinforcement of Content: https://www.khanacademy.org/math/algebra-home/alg-quadratics/alg-systems-of-quadratic-equations/v/non-linear-systems-of-equations-1	Defining Terms Test
10 Nov 07-11	**Inequalities**	a. Quadratic inequalities in one unknown. b. Set builder notation to represent the solution set.	Guided Discovery Observation Exposition Demonstration	Reinforcement of Content: https://www.khanacademy.org/math/algebra2/x2ec2f6f830c9fb89:eq/x2ec2f6f830c9fb89:quad-sys/v/non-linear-systems-of-equations-3 https://www.youtube.com/watch?v=xnfUZ-NTsCE Google Classroom Quiz	Defining Terms Worksheet
11 Nov 14-18	**Inequalities**	a. The solution sets of inequalities of the form $\dfrac{ax + b}{cx + d} > 0; \geq 0; < 0; \leq 0$ using algebraic or graphical methods.	Guided Discovery Observation Exposition Demonstration	Reinforcement of Content: https://www.khanacademy.org/math/algebra-home/alg-rational-expr-eq-func/alg-rational-inequalities/v/rational-inequalities	Worksheet

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT	Student Assessment
12 Nov 21-25	**Discriminant**	The nature of the roots of a quadratic.			**End of term Exam Nov 28 – Dec 09, 2022.**

EASTER TERM:

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT
16 Jan 09-13	**Surds, Indices and Logarithms**	a. Addition, subtraction, multiplication and rationalization and denominators of surds.	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate operations perform on surds. Reinforcement of Content: https://www.youtube.com/watch?v=oNA0kOdpb3M https://www.youtube.com/watch?v=0mAQjd2eUrE https://www.youtube.com/watch?v=zM3tCF3vqoI Google Classroom Quiz Online multiple-choice quiz that will be administered via Test P

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT
17 & 18 Jan 16-20 and 23-27	**Surds, Indices and Logarithms**	a. Equations reducible to quadratic form parts 1, 2 and 3. For example, part 3. $2^{2x+1} - 3(2^x) - 2 = 0$ b. The relationship between indices and logarithms.	Guided Discovery Observation Exposition Demonstration	Reinforcement of Content: https://www.youtube.com/watch?v=AAcknrC0QJA https://www.youtube.com/watch?v=gTmyRccwnGs Google Classroom Quiz **Standardized Test1** Jan 20-24, 2023
19 Jan 30-Feb 3	**Surds, Indices and Logarithms**	a. Laws of logarithms. Excluding the 'change of base' method.	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate the laws of logarithms. Reinforcement of Content: https://www.youtube.com/watch?v=ulAxVjqAhRs Online multiple-choice quiz that will be administered via Test P
20 Feb 6-10	**Surds, Indices and Logarithms**	a. Solving questions of this form: $\log_a (2x + 5) - \log_a (3x - 10) = \log_a (x - 14)$	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate logarithm equations. Reinforcement of Content: https://www.youtube.com/watch?v=fnhFneOz6n8 Google Classroom Quiz

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT
21 Feb 13-17	**Surds, Indices and Logarithms**	a. Using logarithms to solve equations of the form $a^x = b$. b. Linear reduction	Guided Discovery Observation Exposition Demonstration	Reinforcement of Content: Online multiple-choice quiz that will be administered via Test P Google Classroom Quiz **Standardized Test2** Feb 06-09, 2023
22 Feb 27-Mar 3	**Sequences and Series**	a. Defining a sequence of terms $\{a_n\}$ where n is a positive integer. b. Writing a specific term from the formula for the nth term of a sequence.	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate defining a series. Reinforcement of Content: https://www.youtube.com/watch?v=3_MhGoYKgng https://www.youtube.com/watch?v=VgBSzYBMbh4 Online multiple-choice quiz that will be administered via Test P
23 Mar 6-10	**Sequences and Series**	a. Identifying Arithmetic Series and deriving expressions for the nth term and sum of first n terms. b. Finding and using the nth term and the sum of the first n terms arithmetic series.	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate arithmetic and geometric series. Reinforcement of Content: https://www.youtube.com/watch?v=MSAWzIlPlkg Online multiple-choice quiz that will be administered via Test P

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT
		c. Nth term = sum of n terms – sum of first n-1 terms, for **any** series.		Standardized Test**3** Mar 06 - 09, 2023

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT
24 Mar 13-17	**Sequences and Series**	a. Identifying geometric series and derive expressions for the nth term and sum of first n terms. b. Finding and using nth term and the sums of finite and infinite geometric series.	Guided Discovery Observation Exposition Demonstration	Reinforcement of Content: https://www.youtube.com/watch?v=jxRqRLMliPc Google Classroom Quiz
25 Mar 20-24	**Sequences and Series**	a. Application of the concepts of the arithmetic and geometric series to solve real-world problems such as investments.	Guided Discovery Observation	Google Classroom Quiz

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT
March 20 - 24 **SUMMER TERM**		b. Find the sum of a Convergent and Divergent series. **March 20-24, 2023** **In-class Progress Test**	Exposition Demonstration	
28 & 29 April 17-21 & Apr 24-28	**Coordinate Geometry**	a. The equation of a straight line can be written in any form. For example: $y = mx + c$ $ax + by + c = 0$ b. Relationships between the gradients of parallel and mutually perpendicular lines.	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate topics. Reinforcement of Content: https://www.youtube.com/watch?v=uOboYVGdwVg https://www.youtube.com/watch?v=BPgM3q6e-bk Google Classroom Quiz Standardized Test**1** April 17 - 20, 2023
30 & 31	**Coordinate Geometry**	a. Point of intersection of two straight lines.	Guided Discovery Observation	GEOGEBRA to demonstrate topics.

Week	NSC Unit	Topics	Lesson/Method of Delivery	Use of ICT
May 1-5 And May 8-12		b. The equation of the circle in the forms: $(x + f)^2 + (y + g)^2 = r^2$ $x^2 + y^2 + 2fx + 2gy + c = 0$	Exposition Demonstration	Reinforcement of Content: https://www.youtube.com/watch?v=zkNBSyHh7vw https://www.youtube.com/watch?v=5dtdupxyQK0 Google Classroom Quiz **Standardized Test2** May 09 - 12, 2023
32 May 15-18	**Coordinate Geometry**	a. The center and radius. b. Tangents and normal to the circle	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate topics. Reinforcement of Content: https://www.youtube.com/watch?v=JbEfcJyOd2Y https://www.youtube.com/watch?v=m5Gc2yCgqQ4 Google Classroom Quiz
33 May 24-26	**Coordinate Geometry**	a. Point(s) of intersection of a circle with a straight line. **Revision May 29 to June 02** **June 5 – 30, 2023** **End of term exam**	Guided Discovery Observation Exposition Demonstration	GEOGEBRA to demonstrate topics. Reinforcement of Content: https://www.youtube.com/watch?v=c8nBAY9iMKI Google Classroom Quiz **Standardized Test3** May 24 - 26, 2023