Course: Algebra II
Teacher: BTW Algebra II teachers
Year: IB MYP Years 4-5 (Grade 9-10)

Course Description:
This course focuses on:

- Expressions, Equations, and Inequalities
- Functions, Equations, and Graphs
- Linear Systems
- Quadratic Functions and Equations
- Polynomials and Polynomial Functions
- Radical Functions and Rational Exponents
- Exponential and Logarithmic Functions
- Rational Functions
- Sequences and Series
- Quadratic Relations and Conic Sections
- Probability and Statistics
- Matrices

Our aims are:
The aims of teaching and learning mathematics are to encourage and enable students to:
• recognize that mathematics permeates the world around us
• appreciate the usefulness, power and beauty of mathematics

• enjoy mathematics and develop patience and persistence when solving problems
• understand and be able to use the language, symbols and notation of mathematics
• develop mathematical curiosity and use inductive and deductive reasoning when solving problems
• become confident in using mathematics to analyse and solve problems both in school and in real-life situations
• develop the knowledge, skills and attitudes necessary to pursue further studies in mathematics
• develop abstract, logical and critical thinking and the ability to reflect critically upon their work and the work of others
• develop a critical appreciation of the use of information and communication technology in mathematics
• appreciate the international dimension of mathematics and its multicultural and historical perspectives

At the core of the MYP program is the unit/ guiding question and the areas of interaction (AOI's):

There are five AOI's: approaches to learning, community and service, health and social education, human ingenuity, and environments. For every unit, there will be a guiding/unit question and an area of interaction that will provide a framework and give our classroom a context. The areas of interaction are the fuel that fires our intellectual pursuit. The following are our units:

Title	AOI	Question	Topic	Assessment
Bite out of Parabola	**Human Ingenuity**	**How do we sketch a graph without plotting points?**	**Translations of graphs**	**Packet on Parabolas**
Financial Literacy	**ATL**	**Spending or Saving**	**Money Sense**	**Money Chart**

At the end of the year, the following IB MYP specific objectives will be covered:

A: Knowledge and understanding

Knowledge and understanding are fundamental to studying mathematics and form the base from which to explore concepts and develop problem-solving skills. Through knowledge and understanding students develop mathematical reasoning to make deductions and solve problems.

At the end of the course, students should be able to:
• know and demonstrate understanding of the concepts from the five branches of mathematics (number, algebra, geometry and trigonometry, statistics and probability, and discrete mathematics)
• use appropriate mathematical concepts and skills to solve problems in both familiar and unfamiliar situations including those in real-life contexts
• select and apply general rules correctly to solve problems including those in real-life contexts.

B: Investigating patterns

Investigating patterns allows students to experience the excitement and satisfaction of mathematical discovery. Mathematical inquiry encourages students to become risk-takers, inquirers and critical thinkers. The ability to inquire is invaluable in the MYP and contributes to lifelong learning. Through the use of mathematical investigations, students are given the opportunity to apply mathematical knowledge and problem-solving techniques to investigate a problem, generate and/or analyse information, find relationships and patterns, describe these mathematically as general rules, and justify or prove them.

At the end of the course, when investigating problems, in both theoretical and real-life contexts, student should be able to:

- select and apply appropriate inquiry and mathematical problem-solving techniques
- recognize patterns
- describe patterns as relationships or general rules
- draw conclusions consistent with findings
- justify or prove mathematical relationships and general rules.

C: Communication in mathematics

Mathematics provides a powerful and universal language. Students are expected to use mathematical language appropriately when communicating mathematical ideas, reasoning and findings—both orally and in writing.

At the end of the course, students should be able to communicate mathematical ideas, reasoning and findings by being able to:

- use appropriate mathematical language (notation, symbols, terminology) in both oral and written explanations
- use different forms of mathematical representation (formulae, diagrams, tables, charts, graphs and models)
- move between different forms of representation.

Students are encouraged to choose and use ICT tools as appropriate and, where available, to enhance communication of their mathematical ideas. ICT tools can include graphic display calculators, screenshots, graphing, spreadsheets, databases, and drawing and word-processing software.

D: Reflection in mathematics

MYP mathematics encourages students to reflect upon their findings and problem-solving processes.
Students are encouraged to share their thinking with teachers and peers and to examine different problem solving strategies. Critical reflection in mathematics helps students gain insight into their strengths and weaknesses as learners and to appreciate the value of errors as powerful motivators to enhance learning and understanding.

At the end of the course students should be able to:

- explain whether their results make sense in the context of the problem

• explain the importance of their findings
• justify the degree of accuracy of their results where appropriate
• suggest improvements to the method when necessary.

The methodology or the "how" we will learn:
• **knowledge-acquisition skills**—an understanding of mathematical concepts and ideas, as defined in the framework
• **problem-solving skills**—mathematical strategies to solve problems in familiar and unfamiliar situations, in both mathematical and real-life contexts
• **communication skills**—oral and written skills using mathematical language, symbols and notation, and a range of forms of representation (for example, drawings, diagrams, graphs, tables)
• **thinking skills**—coherent logical and abstract thinking, inductive and deductive reasoning, justification and proof, estimation and accuracy
• **information literacy skills**—the ability to use the library and other media to access information, selecting and judging information critically, knowing how to acknowledge references and how to avoid plagiarism
• **information and communication technology skills**—confident use of computer applications and calculators when analysing problems, expressing a clear line of mathematical reasoning by use of technology
• **collaborative skills**—the ability to work as a team member, listening and interacting with others, respecting and considering different points of view
• **reflection skills**—evaluation of one's own work and performance, identifying personal strengths and weaknesses to improve learning.

The province of Québec generally expects that students are able to do certain things. You should be able to:

- Organizational skills, study practices and attitudes towards work
- Collaborative skills
- Communication
- Information literacy
- Reflection
- Problem solving and thinking skills

Assessment is the term used to measure the students' demonstrations of learning:
There will be summative assessment projects and tests to show what they have learned. These will be assessed using the IB MYP criteria:

- Criterion A Knowledge and understanding Maximum 8
- Criterion B Investigating patterns Maximum 8
- Criterion C Communication in mathematics Maximum 6
- Criterion D Reflection in mathematics Maximum 6

During the year each of these criteria will be measured at least twice, not necessarily at the same time. Because this is criterion based assessment you are not measured against others – it is not normative. All work will be compiled in a **portfolio**.

- **Internal Grading Policy :** Assessments in first semester include a polygon investigation. Assessments in second semester include a Real World Problem dealing with slopes of handicapped ramps and questions on a test covering volume of solids.

Resources and materials:

- Textbooks
- Workbooks
- Internet worksheets
- Teacher made worksheets
- Teachers in the department