Tohoku International School

Secondary School Course Syllabus

Course Title: Algebra Essentials	**Teacher**: Mr. Zane Clifford **Email:** zclifford@tisweb.net
Grade Level(s): Grade 9 - 10	**Time Frame**: 37 weeks

Course Description:

The key concepts in Algebra Essentials are equations, graphs, functions, and real-life applications. This course explores in greater depth many of the concepts already encountered in Grade 8 Math. Students who complete this course successfully should be ready to take Geometry and/or Mathematics: Applications and Interpretation.

This course will prepare students for success in college, and in their careers and daily lives in the 21st century. Students will develop their abilities to understand and solve mathematical problems, think critically, and communicate ideas clearly. As students explore the material presented in this course, they should begin to see the connections and applications between mathematics and the world around them.

Course Philosophy:

What is mathematics?

> Buying groceries on your way home. Enjoying fireworks on a hot summer night. Traveling by car to go camping in the mountains. Machines manufacturing chocolate cookies with cream filling. Deciding which iPhone plan is better for you. Is this math? Of course! Math surrounds us every day, helping us make a multitude of important decisions in our life. It can provide structure and order in an otherwise chaotic universe. This is why we study it.

What is Algebra?

> How fast can high-speed trains travel? How can you predict membership enrollments for an organization? How can you combine swimming and inline skating to burn 300 Calories? What is the best way to organize data about music sales? Is there a way to model the height of lava from an erupting volcano? Learning how to analyze, describe, and model concepts like these – with both equations and graphs – is at the heart of Algebra.

Units of Study:

- Equations and Inequalities
- Linear Functions
- Quadratic Functions
- Quadratic Equations and Complex Numbers
- Mathematical Literature Project ("The Feeling of Power," by Isaac Asimov)
- Polynomial Functions
- Rational Exponents and Radical Functions
- Exponential and Logarithmic Functions
- Rational Functions

Algebra Essentials

Assessments

Projects – 15%

Each student will be expected to complete several projects throughout the school year. There are various types of formats for these projects: research papers, posters, video projects, in-class presentations, math skits, etc. Some projects will be done individually; others will be in pairs or small groups. Detailed information will be provided at the time the project is assigned.

Quizzes – 20%

Students should expect one or two quizzes per week. They will always be announced in advance. Students may use their graphing calculator and math notebook on most quizzes. When a quiz is returned to a student, s/he has the option of revising any mistakes on that quiz, re-submitting it, and receiving up to half the points missed.

Tests – 40%

At the end of each chapter or unit of study, there will be a test to assess each student's understanding. They will always be announced in advance. Students may use their graphing calculator and math notebook on most tests. When a test is returned to a student, s/he has the option of revising any mistakes on that test, re-submitting it, and receiving up to half the points missed.

Final Exam – 15%

At the end of each semester, there will be a 90-minute exam on all of the major topics covered during that term. Students may use their graphing calculator and one page (A4 size) of handwritten notes, front and back. Their page of notes will be turned in along with their exam.

Learning Skills – 10%

Attendance, organization, homework completion and the ability to take initiative and work independently and in groups all play a role in student success and are important for achieving the course expectations.

Course Specific Materials Required

- Graphing calculator (TI-84 Plus or equivalent)
- Pencils, erasers, etc.
- Graph paper notebook
- Homework/handout folder
- Ruler/straightedge
- Textbooks:
    - Big Ideas Math: Algebra 2, by Larson and Boswell
    - Algebra 2, by McDougal and Littel