PETERS TOWNSHIP HIGH SCHOOL
COURSE SYLLABUS: ALGEBRA II ACADEMIC

Course Overview and Essential Skills

This course is a study of the language, concepts, and techniques of Algebra that will prepare students to approach and solve problems following a logical succession of steps. This course is the foundation for high school mathematics courses. Topics include the study of functions (linear, quadratic, polynomial, radical, rational, exponential and logarithmic), probability and statistics, and sequences and series. Real world applications are presented within the course content. For each unit, students may be required to analyze, recall, explain, interpret, apply, and/or evaluate the particular concepts taught. Concepts will be presented, applied, and assessed analytically, numerically, and graphically.

Course Textbook and Required Materials

- *Algebra 2*, Holt McDougal (2011)
  ISBN-13: 978-0030995767
  ISBN-10: 0030995760
- Online Book: http://my.hrw.com/
- Please bring the following supplies with you to class daily:

  o You must have **your own** graphing calculator. It is ESSENTIAL in order to participate in class.
  ** TI-84/TI-84 Plus Graphing Calculator**

Course Outline of Material Covered:

Unit or Topic	Concepts/Skills/Resources	Timeframe
Chapter 1 Foundations for Functions	• Differentiate between relations and functions • Identify domain and range • Understand and use function notation • Understand parent functions	~2 Weeks
Chapter 2 Linear Functions	• Solve linear equations and inequalities • Apply proportional reasoning • Graph linear functions • Write linear functions • Solve linear inequalities in two variables • Fit data with linear models • Solve absolute-value equations and inequalities	~4 Weeks
Chapter 3 Linear Systems	• Use graphs and tables to solve linear systems • Use algebraic methods to solve linear systems • Solve systems of linear inequalities • Apply linear programming	~2 Weeks
Chapter 5 Quadratic Functions	• Use methods of factoring to simplify expressions • Solve quadratic equations by factoring	~8 Weeks

	- Solve quadratic equations using the quadratic formula - Use transformations to graph quadratic functions - Apply and graph properties of quadratic functions in standard form - Solve quadratic inequalities - Fit data with quadratic models - Understand complex roots and numbers - Compute operations with complex numbers	
Chapter 6 Polynomial Functions	- Understand polynomials - Add and subtract polynomials - Multiply polynomials - Divide polynomials - Factor polynomials - Investigate graphs of polynomial equations	~3 Weeks
Chapter 7 Exponential and Logarithmic Functions	- Understand exponential functions and growth and decay - Graph exponential functions - Use the natural base - Evaluate and apply properties of logarithms - Solve exponential equations - Solve logarithmic equations	~5 Weeks
Chapter 8 Rational and Radical Functions	- Understand radical expressions and radical exponents - Create graphs of radical functions - Solve radical equations - Multiply and divide rational expressions - Add and subtract rational expressions - Solve rational equations and inequalities - Create graphs of rational functions	~6 Weeks
Chapter 9 Properties and Attributes of Functions	- Understand piecewise functions - Use operations with functions - Understand functions and their inverses	~2 Weeks
Chapter 11 Probability and Statistics	- Identify and apply the counting principal - Differentiate between permutations and combinations - Understand theoretical and experimental probability - Differentiate between independent and dependent events - Calculate compound events	~2 Weeks
Chapter 12 Sequences and Series	- Understand sequences - Understand series and use summation notation - Use arithmetic sequences and	~2 Weeks

	series	
	• Use geometric sequences and series	
	• Calculate infinite geometric series	

Depending on the needs of the class or changes in the school year, the course outline is subject to change.