COURSE TITLE: Honors Algebra II/Trigonometry

GRADE LEVEL: 10-12

LENGTH OF COURSE: 1 year

INSTRUCTOR: Mr. Joseph

PURPOSE:
This course includes a brief review of Algebra I and continues with deeper insight into the concepts of arithmetic and geometric sequences, exponentiation, imaginary numbers, arithmetic and logarithmic functions, trigonometry, and matrices. This is an honors course that will cover the entire course of Algebra II and the entire course of Trigonometry combined into one school year.

GOALS:
1. To continue to reinforce basic algebra and geometric skills.
2. To further develop the logical thought processes needed to complete mathematical functions in everyday life.
3. To develop extensively the students' ability to think in an abstract manner.
4. To further develop the students' ability in logic and mathematical problem solving.
5. To broaden and sophisticate the students' algebraic knowledge.
6. To introduce and develop a students' understanding of finite mathematics.
7. To further investigate and develop the complexities of trigonometry.
8. To adequately prepare the student for an introductory course in calculus.

The students will be able to:

1. Simplify algebraic equations.
2. Solve algebraic equations; solve and graph inequalities.
3. Solve systems of equations and inequalities with absolute value.
4. Recognize and use function notation and its mathematical vocabulary.
5. Mathematically manipulate polynomial expressions.
6. Factor and solve polynomial equations.
7. Mathematically manipulate rational expressions and solve rational equations.
8. Simplify radical expressions with root indices of two or greater and solve radical equations.
9. Simplify complex expressions and solve polynomial equations over the set of complex numbers.
10. Solve quadratic equations by factoring, completing the square, and the quadratic formula.
11. Understand the inter-relationship between exponentials, radicals, and logarithm notation.
12. Simplify and evaluate logarithmic expressions and solve logarithmic equations.
13. Use trigonometry definitions in solving triangular measures of angles and lengths.
14. Graph trigonometric functions.
15. Manipulate trigonometric functions algebraically and solve trigonometric functions.
16. Translate Cartesian/polar coordinates and equations.
17. Use trigonometric applications with complex numbers and equations.

MATERIALS REQUIRED:

1. Textbook
2. Paper, pencil, three-ring binder
3. Graphic calculators – A TI-84 Plus calculator is recommended but not required

CLASSROOM POLICIES:

1. Come into the classroom orderly and quietly.
2. No food or drink in class (exception: water).
3. Bring your book, notebook, and pencils everyday.
4. No cell phones visible.
5. Do not line up at the door at the end of class.
6. No passes will be issued unless it is an emergency.
7. No student will interfere with the teaching or learning of any other student.

ASSIGNMENTS:

Assignments will be given daily. Most class periods will allow study time to begin assignments. It is expected that each student will work on their assignment during this time.

HOMEWORK EXPECTATIONS:

1. Homework will contain a name, date, hour, and assignment label as discussed in class.

2. It will be completed in a logical and orderly presentation and it must be readable (please cut fringes if paper is torn from a spiral notebook).

IF THE STUDENT IS ABSENT:

1. The student is responsible for checking my website to get the lessons that they missed. My website address is: mjoseph.weebly.com Any study sheets will be on the table in the front of the classroom.

2. The student is responsible for checking and correcting the assignment using the "Answer Keys".

GRADES:

1. Quizzes and homework will count as 25% of your grade.
2. There will be retakes on all quizzes (re-quiz requirements are on the next page)
3. Chapter tests count as 75% of your grade. There will be no retakes on chapter tests
4. A chapter test will be given at the end of each chapter.
5. Tests and quizzes will be announced several days before the test. If you have received prior notice of a test, you must take the test on the day announced if you are present that day.
6. When a student is absent, the length of time allowed to do the make-up work will correspond to the number of days absent.

GRADING:

100 - 93	A	79 - 77	C+
92 - 90	A-	76 - 73	C
89 - 87	B+	72 - 70	C-
86 - 83	B	69 - 67	D+
82 - 80	B-	66 - 63	D
		62 - 60	D -
		Below 60	E

Re-quiz Requirements

In order to take a re-quiz, the following rules are required:

1. All quiz corrections completed on a separate sheet of paper
2. Bring your copy of the original quiz and your work
3. You will only be required to re-do similar problems that were wrong on the original quiz
4. A deadline will be given for all re-quizzes and they MUST be completed before the Chapter Test is given to the class
5. All *COMPLETED* homework assignments that were assigned for those sections on the quiz must be brought with you as a "ticket" to get in to take your re-quiz
6. Re-quizzes will be given before or after school
7. Full credit will be given for correct answers on the re-quiz
8. If there are incorrect answers given on the re-quiz, you will have an opportunity to re-do those incorrect problems again for full credit
9. If you have an 80% or higher on your original quiz, you are NOT required to bring in your homework as a "ticket" to take the re-quiz

UNITS OF STUDY

1st Semester:

I) Data to Equations
- 1) Using technology in algebra
- 2) Linear equations
  - a) Tables
  - b) Graphs
  - c) Slopes
  - d) Intercepts
  - e) Scatter plots and correlation
- 3) Direct Variation and Proportions
- 4) Solving Equations
- 5) Solving Inequalities

II) Operations with Real Numbers & Functions
- 1) Exploring Numbers and Functions
  - a) Properties of exponents
  - b) Definition of function
  - c) Function notation
- 2) Linear Functions
- 3) Operations with functions

III) Equations and Functions
- 1) Symmetry
- 2) Inverse functions
- 3) Composition of functions
- 4) Absolute value functions
- 5) Step functions
- 6) Parametric equations

IV) Matrices and Systems of Equations
- 1) Representing data through matrices
- 2) Operations with matrices
- 3) Solving systems with matrices
- 4) Using matrix algebra
- 5) Transformations with matrices
- 6) Systems of linear inequalities
- 7) Linear programming

V) Quadratic Functions
- 1) Solving quadratic equations
- 2) Graphs of quadratic functions
- 3) Completing square and quadratic formulas

4) Complex numbers
5) Curve fitting using quadratics
6) Quadratic inequalities

VI) Polynomial Functions
1) Factoring polynomials
2) Dividing polynomial
3) Applications of polynomial functions

Second Semester:

VII) Exponential and Logarithmic Functions
1) Properties of exponential functions
2) Properties of logarithmic functions
3) Common logarithms
4) Natural logarithms
5) Solving exponential and logarithmic equations

VIII) Rational Functions
1) Inverse variation
2) Reciprocal functions
3) Quotients of polynomial functions
4) Solving rational equations

XIII) Trigonometric Functions
1) Right-Triangle Trigonometry
2) Angles of Rotation
3) Trigonometric Functions of Any Angle
4) Radian Measure and Arc Length
5) Inverses of Trigonometric Functions

XIV) Further Topics in Trigonometry
1) The Law of Sines
2) The Law of Cosines
3) Fundamental Trigonometric Identities
4) Sum and Difference Identities
5) Double-Angle and Half-Angle Identities
6) Solving Trigonometric Equations

X) Counting Principles and Probability
1) Probability
2) Permutations
3) Combinations
4) Independent and dependent events
5) Conditional probability
6) Permutations

7) Simulation methods

XI) Series and Patterns
1) Sequences
2) Series
a) Arithmetic
b) Geometric
3) Pascal's triangle
4) Binomial theorem

XII) Statistics and Probability
1) Frequency charts
2) Histograms
3) Stem and leaf plots
4) Box and whisker plots
5) Measures of dispersion
6) Binomial distribution
7) Normal distribution