MEDFORD HIGH SCHOOL
COURSE SYLLABUS

Department:	Mathematics
Course Title:	Algebra 2
Level and/or Grade:	Honors; Grades 10-12
Prerequisite:	A- or better in Standard Geometry or B or better in Honors Geometry or teacher recommendation and department approval

Course Description:

This course provides rigorous preparation for Precalculus through the investigation of challenging problems and through discussions that develop understanding of algebraic concepts. Emphasis is placed on the study of functions, their properties, and graphs. Special attention is given to polynomial, exponential, rational, trigonometric, and logarithmic functions, and the integration of graphic technology (e.g. TI83+). Students will develop understanding of algebraic concepts and procedures through communication, representation, reasoning, making connections, problem solving, and technology representation. Other topics include the study of functions, complex numbers, matrices, sequences and series, statistics, and probability.

Learning Standards: *Through communication, representation, reasoning, making connections, and problem solving, students will be able to…*

Number Sense and Operations*:*

- Define, identify, and perform computations with complex numbers; relate the system of complex numbers to the systems of real and rational numbers.
- Simplify numerical and variable expressions with positive and negative powers, roots, absolute value, and rational numbers.

Patterns, Relations and Algebra*:*

- Identify and use the properties of arithmetic and geometric sequences and finite arithmetic and geometric series to solve problems.
- Identify and describe families of functions from their symbolic, tabular, verbal, and graphic representations.
- Write, graph, and solve problems involving linear, exponential, quadratic, rational, polynomial, logarithmic, and trigonometric functions, absolute values and square roots..
- Solve problems involving quadratic relations by factoring, finding square roots, completing the square, and using quadratics.
- Solve a variety of equations and inequalities using algebraic, graphical and numeric methods.
- Solve systems of equations and inequalities using a variety of methods (e.g. substitution, elimination, graphing, matrices).
- Identify maximum and minimum values of functions and apply to the solution of problems.
- Perform operations on functions.

Learning Standards (cont.): *Through communication, representation, reasoning, making connections, and problem solving, students will be able to…*

Geometry*:*
- Define sine, cosine, and tangent of an acute angle; apply basic trigonometric identities and laws of sines and cosines.

Measurement*:*
- Use radian measures in the solution of problems.

Data Analysis, Statistics, and Probability*:*
- Collect, interpret, and organize data in tables, matrices, and graphs; select appropriate models for a set of data and use appropriate statistics to analyze data.
- Use combinatorics to solve problems.

Course Alignment with High School Expectations for Student Learning:

Students will…

1. Analyze, interpret, evaluate and use logical reasoning to solve problems using a variety of resources and strategies.
    - Build new mathematical knowledge through problem solving.
    - Adapt and apply a variety of appropriate strategies to solve problems; reflect on the process of mathematical problem solving.
    - Monitor and reflect on the process of mathematical problems solving.
    - Recognize reasoning and proof as fundamental aspects of mathematics.
    - Make and investigate mathematical conjectures.
    - Solve problems that arise in mathematics and other contexts; use connections among mathematical ideas.
2. Communicate effectively to a variety of audiences.
    - Communicate mathematical thinking coherently and clearly to peers, teachers, and others - orally and through written work.
    - Use the language of mathematics to express ideas precisely.
3. Create works using a variety of communication forms.
    - Present arguments through writing; solve problems through projects, homework, tests, and quizzes; use technology; make oral presentations.
4. Develop skills and knowledge to reach personal and career goals.
- Develop ‘habits of mind’: work beyond center of competence; gain attitude of persistence; seek feedback; develop confidence.
5. Work cooperatively to achieve objectives.
    - Work in pairs, small groups, and part of the whole class to solve problems.
    - Analyze and evaluate the mathematical thinking and strategies of others.

Assessment:

- See attached grading policy.