MEDFORD HIGH SCHOOL
COURSE SYLLABUS

Department:	Mathematics
Course Title:	Precalculus
Level and/or Grade:	Standard; Grades 11-12
Prerequisite:	C+ or better in Algebra 2 or a passing Honors Algebra 2

Course Description:

Through problem solving, reasoning, communication, representation, and connections, this course reviews linear, quadratic, exponential, polynomial, and logarithmic functions with a thorough treatment of trigonometric functions. Additional topics include complex numbers, mathematical induction, sequences and series, data distributions, and probability topics. The concepts of vectors and conic sections will be introduced.

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

Number Sense and Operations*:*
- Represent and plot complex numbers using rectangular and polar coordinate systems.

Patterns, Relations and Algebra*:*
- Identify and use the properties of arithmetic and geometric sequences and finite arithmetic and geometric series to solve problems.
- Use mathematical inductions to prove theorems and verify summation formulas.
- Demonstrate an understanding of the trigonometric identities and functions.
- Solve problems involving exponential, logarithmic, and trigonometric functions.
- Solve a variety of equations and inequalities using algebraic, graphical and numeric methods.
- Explore the concept and discuss features of conic sections.

Geometry*:*
- Use vectors to solve problems; describe addition of vectors, multiplication of vectors by a scalar, and the dot product of two vectors, both symbolically and geometrically.
- Apply sine, cosine, and tangent functions to solve triangle problems.

Measurement*:*
- Describe the relationship between degree and radian measures; use radian measures in the solution of problems.

Data Analysis, Statistics, and Probability*:*
- Collect, interpret, and organize data in tables, matrices, and graphs; design surveys and apply ransom sampling techniques.
- Apply regression results and curve fitting to make predictions from data.
- Apply uniform, normal, and binomial distributions to the solutions of 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.