

**MEDFORD HIGH SCHOOL  
COURSE SYLLABUS**

<b>Department:</b>	Mathematics
<b>Course Title:</b>	Precalculus
<b>Level and/or Grade:</b>	Standard; Grades 11-12
<b>Prerequisite:</b>	B- or better in Standard Algebra 2 or C in Honors Algebra and 2 with teacher recommendations

***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 random 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.