

**MEDFORD HIGH SCHOOL  
COURSE SYLLABUS**

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

***Course Description:***

Through problem solving, reasoning, communication, representation, and connections, this course presents a comprehensive study of elementary functions with a thorough treatment of trigonometric, logarithmic, and exponential functions. There will be additional study around complex numbers and conic sections with introductions to vectors, sequences and series, polar coordinates, data distributions and probability topics.

***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.
- Introduce mathematical induction proofs.
- 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.
- Identify and discuss features of conic sections.

***Geometry:***

- Explore the concept of vectors and problems involving vectors.
- 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.
- Discuss 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.