

**MEDFORD HIGH SCHOOL  
COURSE SYLLABUS**

<b>Department:</b>	Mathematics
<b>Course Title:</b>	Algebra 1
<b>Level and/or Grade:</b>	Standard; Grades 9-10
<b>Prerequisite:</b>	A passing grade in grade 8 mathematics or grade 8 Algebra with teacher recommendation

***Course Description:***

This rigorous course in algebra, to be completed in one year, provides a strong algebraic foundation for all subsequent mathematics courses. Students will develop depth of understanding of algebraic concepts and procedures through communication, representation, reasoning, making connections, problem solving, and technology integration. Topics include the study of properties of operations on real numbers; linear and non-linear (e.g. quadratic, exponential) functions; systems of linear equations and inequalities; patterns; polynomials; data analysis and probability; coordinate geometry; and the geometry of right triangles.

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

***Number Sense and Operations:***

- Use the properties of operations on real numbers; identify and compute within the real number system and the subsets of real numbers.
- Use estimation to judge reasonableness of results of computations and of solutions to problems.
- Simplify expressions and solve problems involving absolute value, square and cube roots, and exponents.

***Patterns, Relations and Algebra:***

- Describe, analyze, generalize, and create a variety of numeric and geometric patterns.
- Simplify and evaluate expressions; solve linear equations and inequalities; find the linear equation describing a line from a graph or geometric description (e.g. point-slope, slope y-intercept, parallel, perpendicular).
- Recognize and describe functions translating among tables, graphs, rules, and words; use technology as appropriate.
- Model (with tiles and diagrams) and demonstrate facility in symbolic manipulation of polynomial and rational expressions to simplify expressions and solve equations.
- Add, subtract, and multiply polynomials; divide polynomials by monomials.
- Find solutions to quadratic equations with real roots by factoring.
- Solve everyday problems that can be modeled using linear and non-linear functions.
- Solve everyday problems that can be modeled using systems of equations and inequalities.

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

**Geometry:**

- Apply the Pythagorean Theorem to the solution of problems; find the distance between two points; apply the midpoint formula.

**Measurement:**

- Understand measurable attributes of objects and the units, systems, and processes of measurement.

**Data Analysis, Statistics, and Probability:**

- Select, create, and interpret an appropriate graphical representation for a set of data and use the appropriate statistics to communicate information, develop and evaluate inferences and make predictions that are based on data.
- Approximate the line of best fit; solve problems involving the line of best fit.
- Apply basic probability concepts.

**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.

