**Ephrata High School**
**Course Syllabus**
**Geometry**
**3030, 3031**

## I. Course Description

Any student who has a "C" or better in Algebra 1 or who has a recommendation from his/her Algebra 1 teacher, may elect this course. It includes Euclidean geometry and plane coordinate geometry. This course develops the student's inductive and deductive reasoning and helps him/her communicate this reasoning. A scientific calculator is required.

## II. Materials & Equipment

Geometry - McDougal, Littell & Co. – 2001 ed.
Scientific or graphing calculator

## III. Course Goals & Objectives

Enduring Understanding – Students will understand (that)

- How to apply Inductive and deductive reasoning.
- Geometry is a language with an essential vocabulary.
- Angle relationships are necessary to understand properties of perpendicular and parallel lines.
- How to recognize, analyze, and write conditional and biconditional statements.
- Properties of algebra and geometry are used to measure and justify segment and angle relationships as well as congruency.
- Writing a proof requires understanding of definitions, properties, postulates, and theorems.
- How to apply the distance formula, midpoint formula, and slope relationships in triangles and quadrilaterals of a coordinate plane.
- Congruent figures and corresponding parts of triangles are significant in planning and writing a proof.
- The difference between properties of quadrilaterals by comparing their sides, angles, and diagonals.
- Connections between similar figures and its importance to algebraic concepts.
- How the Pythagorean theorem and trigonometric concepts pertains to real life applications.
- The connections between interior and exterior angles of a polygon.
- How to use properties of tangents, arcs, and chords to identify segments and lines related to circles.
- How to find area and perimeter of polygons, circles, and irregular figures.
- How to find surface area and volume of polyhedra.

## IV. Course Topics (Summary Outline)

I. Basics of Geometry
- Finding and describing patterns
- Using inductive reasoning for real life conjectures
- Understanding and using the basic terms
- Using segment postulates
- Using distance formula
- Using angle postulates
- Classifying angles
- Bisect segments and angles
- Understanding Vertical angles and linear pairs
- Understanding Complementary and Supplementary angles
- Problem Solving using Perimeter and area
- Problem solving

II. Reasoning and Proof
- Using Conditional statements
- Using Points, lines, and planes
- Using definitions and biconditional statements
- Understanding Properties from algebra
- Justifying segment and angles relationships

- Using and understanding Congruent statements
- Introduction to proof
- Using the Angle congruence properties

III. Perpendicular and Parallel Lines
- Identifying relationships between lines
- Using Angles formed by transversals
- Using flow, paragraph and two-column proofs
- Using Proofs of parallel lines
- Using Proofs of perpendicular lines
- Finding slopes of lines
- Using slopes of lines for coordinate proofs

IV. Congruent Triangles
- Classifying triangles
- Using Angle measures in triangles
- Solving and understanding C=congruent figures and corresponding parts
- Proving triangles are congruent
- Using these theorems and postulates (SSS, SAS, ASA, AAS)
- Understanding proofs using congruent triangles
- Using properties of isosceles, equiliateral, and right triangles

V. Properties of Triangles
- Using properties of perpendicular bisectors
- Using angle bisectors to identify equal distances
- Using properties of medians and altitudes
- Using midsegments of a triangle
- Solving the Triangle inequality theorem

VI. Quadrilaterals
- Identifying and describing polygons
- Understanding the sum of the measures of interior angles
- Using properties of parallelograms
- Proofing quadrilaterals are parallelograms
- Using coordinate geometry in parallelograms
- Using properties of sides and angles of rhombuses, rectangles, and squares
- Using properties of diagonals of rhombuses, rectangles, and squares
- Using properties of trapezoids and kites
- Solving areas of quadrilaterals and triangles

VIII. Similarity
- Finding and simplying ratio of two numbers
- Using properties of proportions
- Identifying and using similar polygons
- Identifying and using similar triangles

IX. Right Triangle Trigonometry
- Solving problems involving similar right triangles
- Using geometric mean
- Proofing and using the Pythagorean theorem
- Using side lengths to classify triangles
- Finding side lengths of special triangles
- Problem solving using special right triangles
- Finding sine, cosine, and tangent
- Problem solving using trigonometric ratios
- Solving a right triangle

X. Circles
- Problem solving using segments and lines related to circles
- Using properties of tangents, arcs, and cords
- Using inscribed angles
- Using properties of inscribed polygons

XI. Area of Polygons and circles

- Finding measures of interior and exterior polygons
- Problem solving using measures of angles of polygons
- Finding area of equilateral triangles
- Finding area of regular polygons
- Comparing perimeter and area of similar figures
- Problem solving using perimeters and areas of similar figures
- Finding circumference of a circle
- Finding length of a circular arc
- Problem solving using circumference and arc length
- Finding area of a circle and a sector of a circle
- Problem solving using areas of circles and sectors
- Finding a geometric probability
- Problem solving using geometric probability

XII. Surface Area and Volume

- Using Properties of Polyhedra
- Understanding and using Euler's Theorem
- Finding the surface area of a prisms, cylinders, pyramids, cones, spheres
- Finding the volume of a prisms, cylinders, pyramids, cones, spheres.
- Problem solving using surface area and volume
- Finding and using scale factors of similar solids
- Problem solving using similar solids

## *V. Assignments & Grading*

Assignment sheets will be distributed periodically throughout the year. Homework will be assigned on a daily basis. Grades will be based on quizzes and tests. Additionally, teachers may use homework, group work and activities, and projects for grading. All students will take mid year and final exams. Ephrata Senior High School's grading system and scale will be used in determining letter grades.