# Geometry – Credit Recovery

**COURSE DESCRIPTION:** This is a comprehensive course featuring geometric terms and processes, logic, and problem solving. Topics include parallel line and planes, congruent triangles, inequalities and quadrilaterals. Various forms of proof are studied. Emphasis is placed upon reasoning and problem solving skills gained through study of similarity, areas, volumes, circles, and coordinate geometry.

Students will learn about quadrilaterals and polygons, including their properties. Students will learn how to show two figures are similar and learn about the properties and theorems associated with similar figures. Students will continue their exploration of Geometry by discussing circles, their properties, their angles, and how to find circumference and area. Students will learn how to find area and perimeter of polygons and surface area and volume of three dimensional shapes. Students will end the course by discussing transformations.

**COURSE OBJECTIVES:**

- Providing students with the basics of reasoning and inquiry skills.
- Exposure to the real nature of geometry is the backbone of this course.
- Enhancing skills needed for critical thinking and decision making processes.
- Deep engagement in the content of this course will lead students to streamlines tactics and strategies needed in dealing with sophisticated problems.
- Improve level of mathematical retention and analytical competency.
- Apply the theorems associated with quadrilaterals.
- Identify the properties of squares.
- Identify the properties of rectangles.
- Identify the properties of parallelograms.
- Identify quadrilaterals as parallelograms.
- Identify the properties of rhombi.
- Identify the properties of trapezoids.
- Identify the properties of polygons
- Calculate the angle measures of polygons.
- Form ratios in simplest form.
- Apply proportions to solve problems.
- Identify similar figures.
- Apply the Similarity Postulates to show two triangles are similar.
- Identify similar quadrilaterals.
- Identify similar polygons.
- Identify parts of a circle.
- Apply the theorems related to arcs, chords, diameters, and tangents.
- Identify and apply the properties of central angles.
- Identify and apply the properties of inscribed angles.
- Identify and apply the properties of tangent-chord angles.
- Write equations of circles with center at the origin and a radius r.
- Write equations of circles with a center at (a, b) and a radius r.
- Calculate sine, cosine, tangent, and cotagent ratios.
- Identify and apply trigonometric ratios.
- Find the angles and sides of right triangles.
- Apply the Law of Sines.
- Apply the Law of Cosines.
- Calculate the area of a triangle.
- Calculate the perimeter of a triangle.
- Calculate the area of a polygon.

- Calculate the perimeter of a polygon.
- Calculate the area and perimeter of a square.
- Calculate the area and perimeter of a rectangle.
- Calculate the area and perimeter of a parallelogram.
- Calculate the area and perimeter of a rhombus.
- Calculate the area and perimeter of a trapezoid.
- Calculate the circumference of a circle.
- Calculate the area of a circle.
- Calculate the surface area of a prism.
- Calculate the surface area of a cylinder.
- Calculate the surface area of a pyramid.
- Calculate the surface area of a cone.
- Calculate the surface area of a sphere.
- Calculate the volume of a prism.
- Calculate the volume of a cylinder.
- Calculate the volume of a pyramid.
- Calculate the volume of a cone.
- Calculate the volume of a sphere
- Apply translations.
- Apply reflections.
- Apply rotations.

**PREREQUISITES:** Successful completion of Algebra I

**COURSE LENGTH:** Two Semesters

**REQUIRED TEXT:** No required textbook for this course.

**MATERIALS LIST:** No required materials for this course.

**COURSE OUTLINE:**

**Semester 1**

**Unit 1. Connections From Algebra**

- Basic Elements of Geometry
- Measuring Segments
- Rays and Angles
- Classifying Angles
- Pairs of Angles
- Right Angles and Perpendicular Lines

**Unit 2: Reasoning and Introduction to Proof**

- Inductive Reasoning
- If-Then, Converses, and Postulates

- Deductive Reasoning
- Properties from Algebra and Proof
- Two-Column Proof with Segments and Angles

## Unit 3. Parallel Lines and Coordinate Plane

- Lines and Points in a Plane
- Lines and Points in Coordinate Plane
- Equations of Lines in Coordinate Plane

## Unit 4. Triangles: Basic Closed Figures in Geometry

- Basic Closed Figures in Geometry
- Congruent Triangles and Congruence Tests
- Special Segments in Triangles

## Unit 5. Special Triangles and Special Relationships in Triangles

- Isosceles Triangles
- Equilateral Triangles
- Right Triangles and Pythagorean Theorem

## Semester 2

## VI. Quadrilaterals and Polynomials

- Squares and Rectangles
- Parallelograms
- The Rhombus and Trapezoids
- Polygons

## VII. Similarity

- Ratios and Proportions
- Similar Figures
- Similar Quadrilaterals and Polygons

## VIII. Circles

- Arcs and Special Segments
- Special Angles in Circles
- Equations of Circles

## IX. Right Triangles and Trigonometry

- Special Ratios in Right Triangles
- Law of Sines and Cosines

### X. Perimeter and Area

- Perimeter and Area of Triangles and Polygons
- Perimeter and Area of Quadrilaterals
- Circumference and Area of a Circle
- Surface Area
- Volume
- Transformations