**Course Title:** Geometry B

**Course #:** 1421-1422

**Course Description:** This slower paced course fulfills the graduation requirement for geometry, but due to the basic emphasis on proofs, will not prepare students for entry into most higher-level mathematics courses in high school or college.

**UC/CSU Approval:** “c” approved

**Grade Level:** 9-12

**Estimated Homework Per Week:** 1.5 - 3 hours per week. Approximately 10-20 problems per assignment

**Prerequisite:** Completion of Algebra 1A with a “C” or higher second semester

**Recommended Prerequisite Skills:**

- Solve simple multi-step equations
- Understanding radicals and integer exponents
- Graph Coordinate Pairs
- Find the square of a number
- Find the square root of a number
- Understand the connection between proportional relationships, lines, and linear equations.
- Solving linear equations as well as apply graphical and algebraic methods to analyze and solve systems of linear equations in two variables.
- Defining, evaluating, and comparing functions, and use them to model relationships among quantities.
- Solving real-world and mathematical problems using linear mathematical models.

**Course Grade Scale:**

- Tests: 40%
- Quizzes: 15%
- Homework: 20%
- Participation: 10%
- Final Exam: 15%

**Major Assessments/Units/Topics:**
Students are assessed with a Quiz and Test each Chapter. Assessments include application of geometric properties with figures and Algebra to solve problems.

Units/Topics:

I. **Foundations of Geometry (omit section 7)**
   Students will identify and name points, lines, rays, segments, and angles, draw and interpret geometric figures. In addition, students will construct & measure segments and their midpoints as well as angles and their bisectors. Students will classify angles and identify angle pairs. Students will use geometry formulas to find lengths and areas and determine distances and find midpoint coordinates. *(1 quiz and 1 test)*

II. **Geometric Reasoning (sections 5 and 6)**
   Students will use the properties of equality and congruence and definitions and theorems to write algebraic and geometric two-column proofs. *(1 quiz)*

III. **Parallel and Perpendicular Lines (all sections)**
   Students will identify Parallel, Perpendicular, and Skew Lines. In addition, students will identify the angle pairs formed by two lines and a transversal and find the measures of those angles. Students will use the converse theorems to prove that lines are parallel. Students will use slopes to determine when lines are parallel or perpendicular and write the equations of perpendicular and parallel lines. *(1 quiz and 1 test)*

IV. **Triangle Congruence (sections 1 - 4)**
   Students will draw and identify transformations in the coordinate plane and determine whether transformations produce congruent figures. Students will also classify triangles by the measures of their angles and the lengths of their sides and find the measures of angles in isosceles and equilateral triangles. Students will use the triangle sum theorem and exterior angle theorem to determine the measures of angles of a triangle. *(1 quiz and 1 test)*

V. **Properties and Attributes of Triangles (sections 1, 7, 8)**
   Students will apply the perpendicular and angle bisector theorems to find distances. In addition, they will prove and use the pythagorean theorem to determine the side lengths of a triangle and classify triangles. Finally, they will use the 45-45-90 Triangle Theorem and the 30-60-90 Triangle Theorem to Find the Sides of a Triangle *(1 quiz and 1 test)*

VI. **Polygons and Quadrilaterals (all sections)**
   Identify types of polygons and construct various regular polygons. Find the interior and exterior Angle measures of regular and nonregular polygons. In addition, they will also use the properties of parallelograms and special parallelograms to find measures and complete proofs. Students will also use the condition for parallelogram theorems to verify that a figure is a parallelogram. Students will identify special parallelograms use the conditions theorems to prove that a given quadrilateral is a rectangle, rhombus, or square and use the properties of
kites and trapezoids to find the measures of their sides and angles. Finally, they will use the trapezoid midsegment theorem to find lengths. (1 quiz and 1 test)

VII. Similarity (omit sections 2 and 6)
Identify and determine the corresponding sides and angles of similar polygons and if they are similar. They will prove similarity within triangles and find segment lengths using the triangle proportionality theorem, the two-transversal proportionality theorem, and the triangle angle bisector theorem. Finally, they will use Ratios to Find Lengths, Perimeters, and Areas in order to draw similar polygons and make scale drawings. (1 quiz/project and 1 test)

VIII. Right Triangles and Trigonometry (omit section 5 and 6)
Students will find the geometric mean between two numbers and use the corollaries to find the lengths of altitudes and legs. Also they will find and use trigonometric ratios by hand and by calculator to find lengths and angles, solve right triangles and real-world problems. Then students will find distances using angles of elevation and depression. students will write radicals in simplified form. (1 quiz and 1 test)

IX. Extending Transformational Geometry (Chapter 9 omitted)

X. Perimeter, Circumference, and Area (omit section 4)
Students will develop area formulas for triangles, quadrilaterals, and composite figures and calculate areas, given appropriate Measurements. In addition, they will calculate the circumference and area of a circle and the area of a regular polygon estimate the area of an irregularly shaped figure. In addition, describe the effect on area caused by a proportional change in dimension and the effect on dimension caused by a change in area. (1 quiz and 1 test)

XI. Spatial Reasoning (all sections)
Students will classify three-dimensional geometric figures and describe nets and cross sections of three-dimensional geometric figures. In addition, they will calculate volumes and surface areas of the geometric solids and describe the effects on volume and surface area caused by changes in dimension. (1 quiz and 1 test)

XII. Circles (all sections)
Students will Identify, construct, measure and find lengths of chords, arcs, secants, and tangents of a circle. Students will also use the tangency theorems to find lengths. They will find the measures of arcs and chords and calculate arc lengths sector and segment Areas. In addition they will find the measures of arcs, inscribed angles and angles formed by secants and tangents and chords to a circle and inscribed quadrilaterals as well as finding arc measures. Students will write the equation of a circle in the coordinate plane by finding the center and radius of a circle and graph the circle. (1 quiz and 1 test)