ST. CHARLES NORTH HIGH SCHOOL
COURSE SYLLABUS

COURSE: **Geometry/Geometry Extended**

COURSE CURRICULUM

COURSE DESCRIPTION:

Geometry is designed to develop the concepts of Euclidean Geometry through the development of reasoning skills. Students learn and use the language of geometry to describe the world around them and solve geometric problems using logic and algebraic problem-solving skills.

UNITS OF STUDY:

- **Unit 1: Shapes and Transformations**

Students will become familiar with basic geometric shapes, learn how to describe each one using its attributes, and investigate three basic rigid transformations: reflection, rotation, and translation.

- **Unit 2: Angles and Measurements**

  Students will deepen their understanding of the relationships between pairs of angles formed by transversals and the angles in a triangle, how to find the area and perimeter of triangles, parallelograms, and trapezoids, the relationship among the three side lengths of a right triangle, and how to determine when the lengths of three segments can and cannot form a triangle.

- **Unit 3: Justification and Similarity**

Students will learn how to support a mathematical statement using flowcharts and conditional statements, about the special relationships between shapes that are similar or congruent, and how to determine if triangles are similar or congruent.

- **Unit 4: Trigonometry and Probability**

In the trigonometry section of this unit, students will learn the trigonometric ratio of tangent, how the tangent ratio is connected to the slope of a line, how to apply trigonometric ratios to find missing measurements in right triangles, and how to model real world situations with right triangles and use trigonometric ratios to solve problems.

In the probability section of this unit, students will explore several ways to model probability situations, such as tree diagrams and area models, formalize methods for computing probabilities of unions, intersections, and complements of events, and learn how to find expected value in games of chance.

- **Unit 5: Completing the Triangle Toolkit**

Students will learn how to recognize and use special right triangles, the trigonometric ratios of sine and cosine as well as the inverses of these functions, how to apply trigonometric ratios to find missing measurements in right triangles, new triangle tools called the Law of Sines and the Law of Cosines, hand how to recognize when the information provided is not enough to determine a unique triangle.

- **Unit 6: Congruent Triangles**

Students will learn about the information that is needed in order to conclude that two triangles are congruent, the converse of a conditional statement and how to recognize whether or not the converse is true, and how to organize a flowchart that concludes two triangles are congruent.

- **Unit 7: Proof and Quadrilaterals**

Students will examine the relationships of the sides, angles, and diagonals of special quadrilaterals, such as parallelograms, rectangles, kites, and rhombi, learn how to write a convincing proof in a variety of formats, such as a flowchart or two-column proof, review how to find the midpoint of a line segment, and learn how to use algebraic tools to explore quadrilaterals on coordinate axes.

- **Unit 8: Polygons and Circles**

Students will learn about special types of polygons, such as regular and non-convex polygons, how the measures of the interior and exterior angles of a regular polygon are related to the number of sides of the polygon, and how the areas of similar figures are related. Students will also be introduced to how to find the area and circumference of a circle and parts of circles and use this ability to solve problems in various contexts.

- **Unit 9: Solids and Constructions**

Students will learn how to find the surface area and volume of three-dimensional solids, such as prisms and cylinders, represent a three-dimensional solid with a mat plan, a net, and side and top views, determine the changes to volume when a three-dimensional solid is enlarged proportionally, and construct familiar geometric shapes using construction tools.

- **Unit 10: Circles and Conditional Probability**

Students will explore the relationships between angles, arcs, and chords in a circle. Students will also develop an understanding of conditional probability and more formal mathematical definitions of independence, determine if two categorical variables are associated with each other, and add the additional tool of two-way tables to their existing tools of area models and tree diagrams.

- **Unit 11: Solids and Circles**

Students will discover how to find the volume and surface area of a pyramid, a cone, and a sphere. Students will learn about the properties of Platonic Solids, how to find the cross-section of a solid, how to find the measures of angles and arcs that are formed by tangents and secants, and about the relationships between the lengths of segments created when tangents or secants intersect outside a circle.

- **Unit 12: Conics and Closure**

Students will extend their geometric understanding of circles to write algebraic equations for circles, explore conic sections and learn about the geometric properties of parabolas. The final section offers a chance for students to apply their geometric tools in new ways, find new connections between familiar geometric ideas, and learn more special properties of familiar shapes.

TEXT: Core Connections Geometry (Second Edition, Version 5.0)

GRADING SCALE:

90% – 100%	A
80% - 89%	B
70% - 79%	C
60% - 69%	D
59% or below	F

GRADING RULES:

40%	Individual Tests
20%	Quizzes
10%	Team Challenges
5%	Homework
5%	Learning Target Checks
20%	Semester Exam