Geometry

5 credits - Level I
Grades: 9-10
Prerequisite: Minimum grade of B in 8th grade Algebra I, a minimum grade of 70 in Algebra I Level I (or a minimum grade of 90 in Algebra I, Topics Level II).

Geometry which is extended to include solid or spatial geometry, builds logical and critical thinking skills. Units of study include deductive and inductive reasoning, parallel lines and planes, polygons, circles, measurements of angles and arcs, area and volume, proportions, congruency, similarity, spatial relations, and coordinate geometry.

PROFICIENCIES

LANGUAGE OF GEOMETRY
-Identify and graph ordered pairs
-Identify and draw models of points, lines, planes, co-linear and coplanar points, intersecting lines and planes
-Find the distance and midpoint between two points
-Identify and use congruent segments
-Use terminology to solve problems involving angles and angle pairs

REASONING AND INTRO TO PROOF
-Identify the hypothesis, conclusion and converse of an "if-then" statement
-Use properties of equality in algebraic and geometric proofs

PARALLEL
-Identify the relationships between pairs of angles formed by two lines and a transversal
-Use the properties of parallel lines to determine angle measures
-Identify angle conditions that produce parallel lines
-Prove two lines parallel based on given angle relationships
-Calculate the slope of a line and identify parallel and perpendicular lines

CONGRUENT TRIANGLES
-Classify triangles and identify parts of triangles
-Apply angle sum and exterior angle theorems
-Identify congruent triangles
-Use SAS, SSS, ASA, AAS and HL to test for triangle congruence
-Use properties of isosceles and equilateral triangles

APPLYING CONGRUENT TRIANGLES
-Use medians, altitudes, angle bisectors and perpendicular bisectors in a triangle
-Use tests for congruence of right triangles
-Apply properties of inequalities to the measure of segments and angles
-Identify and use relationships between sides and angles of a triangle
-Apply triangle inequality theorem
-Use SSS and SAS inequality theorems to solve problems

QUADRILATERALS
-Apply the conditions that ensure that a quadrilateral is a parallelogram
-Recognize the properties of a rectangle, rhombus, square and trapezoid
-Use distance formula and slope to classify specific quadrilaterals

SIMILARITY
-Apply and use the properties of proportions to solve problems involving similar figures
-Use proportional relationships of corresponding perimeters, altitudes, angle bisectors and medians of similar triangles

RIGHT TRIANGLE AND TRIGONOMETRY

-Find geometric mean
-Solve problems using relationships between parts of a right triangle and the altitude to the hypotenuse
-Use the pythagorean theorem and its converse
-Use properties of a 45-45-90 and 30-60-90 triangles
-Identify trigonometric relationships from right triangles
-Find values of trigonometric ratios or measures of angles
-Use trigonometry to solve problems
-Solve triangles using the law of sines and law of cosines

CIRCLE
-Write the equation of a circle
-Identify arcs, central and inscribed angles, chords and tangents

POLYGONS AND AREA
-Calculate perimeter and areas of plane figures

SURFACE AREA AND VOLUME
-Calculate the lateral area and surface area of 3-dimensional figures
-Calculate the volume of 3-dimensional figures

GRAPHING LINEAR EQUATIONS
-Relate a linear equation to the graph of a line
-Write an equation of a line given information about its graph

TRANSFORMATIONS
-Determine, describe and draw reflection images, translation images, rotation images and dilation images