GEOMETRY
1 Unit

I.   SPECIFIC COURSE OBJECTIVES

   A.   At the completion of this course, the student will:
         1. be able to think inductively and deductively
         2. have the knowledge of theory and application involved in geometry

II.   SPECIFIC OUTLINE OF COURSE CONTENT

   A. Points and lines   standards(9.G.2.2)
         1. Dots as points
         2. Locations as points
         3. Ordered pairs as points
         4. Points in networks
         5. Drawing in perspective
         6. The need for undefined terms
         7. Postulates
         8. One-dimensional figures
         9. The triangle inequality

   B. Definitions and if-then statements   standards(9.S.6.1)
         1. The need for definitions
         2. "If-then" statements
         3. Converses
         4. Good definitions
         5. Unions and intersections of figures
         6. Terms associated with polygons

   C. Angles and Lines   standards(9.S.6.1)
         1. Angles and their measures
         2. Types of angles
         3. Justifying conclusions
         4. Parallel lines
         5. Perpendicular lines
         6. Constructing perpendiculars.

   D. Reflections   standards(9.N.4.4)
         1. Reflecting points
         2. Reflecting figures
         3. The first theorem in Euclid's *Elements*
         4. The perpendicular bisector theorem

5. Reflecting polygons

6. Reflection-symmetric figures

E. Polygons   standards(9.G.2.2)
1. Isosceles triangles
2. Types of quadrilaterals
3. Conjectures
4. Properties of kites
5. Properties of trapezoids
6. Alternate interior angles
7. Sums of angle measures in polygons

F. Transformations and congruence   standards(9.N4.4)
1. Transformations
2. Translations
3. Rotations
4. Miniature golf and billiards
5. Congruent figures
6. Isometries
7. Corresponding parts in congruent figures

G. Triangle congruence   standards(9.A.1.1, 9.A.1.3)
1. Drawing triangles
2. Triangle congruence theorems
3. Triangle congruence proofs
4. Overlapping triangles
5. The SSA condition and HL congruence
6. Properties of special figures
7. Sufficient conditions for parallelograms
8. The SAS inequality

H. Measurement formulas   standards(9.M.3.1)
1. Perimeter formulas
2. Tiling the plane
3. Fundamental properties of area
4. Areas of irregular regions
5. Areas of triangles
6. Areas of trapezoids
7. The Pythagorean Theorem
8. Arc measure and arc length
9. The area of a circle

I. Three dimensional figures   standards(9.P.5.2)
1. Point, lines, and planes in space
2. Prisms and cylinders
3. Pyramids and cones

4. Plane sections
5. Reflections in space
6. Views of solids and surfaces
7. Making surfaces
8. The four-color problem

J. Surface areas and volumes   standards(9.M.3.2)
   1. Surface areas of prisms and cylinders
   2. Surface areas of pyramids and cones
   3. Fundamental properties of volume
   4. Multiplication, area, and volume
   5. Volumes of prisms and cylinders
   6. Remembering formulas
   7. Volumes of pyramids and cones
   8. The volume of a sphere
   9. The surface area of a sphere

K. Coordinate geometry   standards(9.N.4.2)
   1. Proofs with coordinates
   2. The distance formula
   3. Equations for circles
   4. The midpoint formula
   5. The midpoint connector theorem
   6. Three-dimensional coordinates

L. Similarity   standards(9.N.4.1)
   1. Size changes on a coordinate plane
   2. Size changes without coordinates
   3. Properties of size changes
   4. Proportions
   5. Similar figures
   6. The fundamental theorem of similarity
   7. Can there be Giants?
   8. The SSS similarity theorem
   9. The AA and SAS similarity theorem
   10. The side-splitting theorem

M. Logic and indirect reasoning   standards(9.G.2.1)
   1 . The logic of making conclusions
   2. Negations
   3. Ruling out possibilities
   4. Indirect proof
   5. Tangent to circles and spheres
   6. Uniqueness
   7. Exterior angles
   8. Exterior angles of polygons

N. Trigonometry and vectors   standards(9.P.5.1)
1. Special right triangles
2. Lengths in right triangles
3. The tangent ratio
4. The sine and cosine ratios
5. Vectors
6. Properties of vectors
7. Adding vectors using Trigonometry

O. Further work with circles   standards(9.A.1.2)
1. Chord length and arc measure
2. Regular polygons and schedules
3. The inscribed angle theorem
4. Locating the center of a circle
5. Angles formed by chords or secants
6. Angles formed by tangents
7. Lengths of chords, secants, and tangents
8. The isoperimetric inequality
9. The isoperimetric theorems in space

III. PLAN FOR STUDENT EVALUATION

A. Daily assignments will be graded
B. Quizzes will be given at the rate of one to two per chapter
C. Tests will be given at the end of each chapter over material covered in the chapter

IV. SPECIFIC STANDARDS FOR PASSING

A. The student will accomplish passing work (60% accuracy) in the following areas:

1. Applying distance to real situations
2. Writing and interpreting statements in "if-then" form
3. Drawing hierarchies of triangles and   polygons
4. Determiming measure of angles formed by parallel lines and transversals
5. Using algebra to represent and find measures of angles
6. Writing proofs using theorems, postulates, or definitions that are studied
7. Making drawings and constructions applying the definition of reflection image
8. Applying the Trapezoid Angle Theorem and the theorems about alternate interior angles

9. Applying the triangle congruence and CPCF theorems to prove that segments or angles are congruent

10. Calculating areas and perimeters of various polygons

11. Identifying parts of common 3-dimensional figures

12. Determining and drawing symmetry planes in 3-dimensional figures

13. Calculating surface areas and volumes of cylinders, prisms, cones, pyramids, and spheres

14. Writing an equation for a circle

15. Find the point of intersection of two lines in the plane

16. Writing indirect proofs

17. Calculating sines, cosines, and tangents of angles in right triangles

18. Using vectors for force to determine combinations of forces

19. Calculating measures of angles between chords, secants, or tangents

20. Making a schedule for a round robin tournament