



# **ILLINOIS VALLEY COMMUNITY COLLEGE**

## **COURSE OUTLINE**

**DIVISION: Natural Sciences & Business**

**COURSE: MTH 0908 Basic Geometry**

Date: Spring 2020

Credit Hours: 3

Prerequisite(s): MTH 0910 or adequate placement test score

Delivery Method:

<input checked="" type="checkbox"/> Lecture	<b>3 Contact Hours (1 contact = 1 credit hour)</b>
<input type="checkbox"/> Seminar	<b>0 Contact Hours (1 contact = 1 credit hour)</b>
<input type="checkbox"/> Lab	<b>0 Contact Hours (2-3 contact = 1 credit hour)</b>
<input type="checkbox"/> Clinical	<b>0 Contact Hours (3 contact = 1 credit hour)</b>
<input type="checkbox"/> Online	
<input type="checkbox"/> Blended	

Offered:  Fall     Spring     Summer

IAI Equivalent – **Only for Transfer Courses**–go to <http://www.itransfer.org>:

### **CATALOG DESCRIPTION:**

This is a beginning course in geometry. Topics of student include: angles, triangles, quadrilaterals, circles, congruence, similarity, area and perimeter of plane figures, and surface areas and volumes of selected solids. Emphasis is on applying knowledge of geometry relations to solve problems rather than on rigorous developments of geometric relations. An individualized approach is used. Completion of this course satisfies the geometry prerequisite for any other course.

## GENERAL EDUCATION GOALS ADDRESSED

*[See last page for Course Competency/Assessment Methods Matrix.]*

### Upon completion of the course, the student will be able:

*[Choose up to three goals that will be formally assessed in this course.]*

- To apply analytical and problem solving skills to personal, social, and professional issues and situations.
- To communicate successfully, both orally and in writing, to a variety of audiences.
- To construct a critical awareness of and appreciate diversity.
- To understand and use technology effectively and to understand its impact on the individual and society.
- To develop interpersonal capacity.
- To recognize what it means to act ethically and responsibly as an individual and as a member of society.
- To recognize what it means to develop and maintain a healthy lifestyle in terms of mind, body, and spirit.
- To connect learning to life.

### EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

*[Outcomes related to course specific goals. See last page for more information.]*

#### Upon completion of the course, the student will be able to:

1. Demonstrate a working knowledge of angles, lines, and points.
  - 1.1. Define basic geometric terms pertaining to angles, lines, and points.
  - 1.2. Use theorems pertaining to angles, lines, and points.
  - 1.3. Distinguish between inductive and deductive reasoning.
  - 1.4. Differentiate between axioms or postulates and theorems.
2. Demonstrate a working knowledge of parallel lines.
  - 2.1. Define basic geometric terms relating to parallel lines.
  - 2.2. Use the theorems of parallel lines to determine angle measure.
3. Demonstrate a working knowledge of triangles.
  - 3.1. Define basic geometric terms pertaining to triangles.
  - 3.2. Classify types of triangles.
  - 3.3. Use theorems pertaining to triangles.
4. Demonstrate a working knowledge of quadrilaterals.
  - 4.1. Define basic geometric terms relating to quadrilaterals.
  - 4.2. Differentiate between the various types of quadrilaterals.
  - 4.3. Apply the various theorems of quadrilaterals to find angle measure and the lengths of sides.
5. Demonstrate the ability to find the area and perimeter of geometric figures.
  - 5.1. Find the area and perimeter of triangles, rectangles, squares, parallelograms, trapezoids, and circles.
  - 5.2. Evaluate area formulas.
  - 5.3. Apply the various area formulas in problem situations.
6. Demonstrate a working knowledge of circles and sectors.
  - 6.1. Define basic terms related to circles and sectors.
  - 6.2. Find the measure of a central angle, an inscribed angle, and the length of an arc.

- 6.3. Apply the theorems pertaining to circles to find the measure of various arcs and angles and the lengths of line segments.
- 7. Demonstrate a working knowledge of congruence and similarity.
  - 7.1. Define basic geometric terms relating to congruence and similarity.
  - 7.2. Use congruence properties in problem situations.
  - 7.3. Use similarity properties in problem situations.
- 8. Demonstrate a working knowledge of the Pythagorean Theorem.
  - 8.1. State the Pythagorean Theorem and its converse.
  - 8.2. Apply the Pythagorean Theorem to find the sides of a right triangle.
  - 8.3. Apply the Pythagorean Theorem to determine if a triangle is a right triangle.
  - 8.4. Use the theorems related to 30-60-90 and 45-45-90 triangles.
- 9. Demonstrate the ability to find volume and surface area of geometric solids.
  - 9.1. Define basic geometric terms relating to planes, volumes, and surface areas.
  - 9.2. Compute the volume of rectangular solid, pyramid, cylinder, cone, and sphere.
  - 9.3. Evaluate volume formulas.
  - 9.4. Compute the surface area of the same solids listed above.
  - 9.5. Evaluate surface area formulas.

### MAPPING LEARNING OUTCOMES TO GENERAL EDUCATION GOALS

*[For each of the goals selected above, indicate which outcomes align with the goal.]*

<b>Goals</b>	<b>Outcomes</b>
First Goal	
To apply analytical and problem solving skills to personal, social, and professional issues and situations.	1c. Distinguish between inductive and deductive reasoning. 5c. Apply the various area formulas in problem situations. 8c. Apply the Pythagorean Theorem to determine if a triangle is a right triangle.
Second Goal	
To connect learning to life.	5a. Find the area and perimeter of triangles, rectangles, squares, parallelograms, trapezoids, and circles. 5c. Apply the various area formulas in problem situations. 9b. Compute the volume of rectangular solid, pyramid, cylinder, cone, and sphere. 9d. Compute the surface area of solids.

## **COURSE TOPICS AND CONTENT REQUIREMENTS:**

- I. Angles, lines and points
  - a. Points, line segments and lines
  - b. Rays and angles
  - c. Vertical angles
  - d. Supplementary and complementary angles
- II. Reasoning
  - a. Inductive
  - b. Deductive
- III. Parallel lines
  - a. Terminology related to parallel lines
  - b. Properties of parallel lines
- IV. Triangles
  - a. Classifications of triangles
  - b. Angle measure
- V. Quadrilaterals and polygons
  - a. Shapes
  - b. Properties of parallelograms
  - c. Properties of rectangles
  - d. Properties of trapezoids
  - e. Other polygons
- VI. Area and perimeter
  - a. Parallelograms
  - b. Triangles
  - c. Trapezoids
  - d. Composite figures
- VII. Circles
  - a. Circumference
  - b. Area
  - c. Arc length
  - d. Sectors
  - e. Central and inscribed angles
  - f. Tangents and secants
- VIII. Triangles
  - a. Congruence
  - b. Similarity
  - c. Ratio and proportion
- IX. Pythagorean Theorem and special triangles
  - a. Pythagorean Theorem
  - b. Converse of the Pythagorean Theorem
  - c. 30-60-90 triangles
  - d. 45-45-90 triangles

- X. Volumes and surface areas
  - a. Prisms
  - b. Pyramids
  - c. Cylinders
  - d. Cones
  - e. Spheres

**INSTRUCTIONAL METHODS:**

- Individualized format in the Math Learning Center

**INSTRUCTIONAL MATERIALS:**

Text: Basic Geometry for College Students, by Allen S. Tussy & R. David Gustafson

**STUDENT REQUIREMENTS AND METHODS OF EVALUATION:**

1. Worksheets
2. Paper-pencil tests (minimum grade of 75% is required on each test.)

A = 91 – 100

B = 82 – 90

C = 74.5 – 81

D = 64.5 – 74.4

F = 0 – 64.4

**OTHER REFERENCES**

Essential Geometry for College Students, Lial, Brown, Steffensen & Johnson, 2<sup>nd</sup> edition, Pearson/Addison-Wesley, 2004.

Cord Geometry, Mathematics in Context, Center for Occupational Research and Development, Waco, Texas, Globe-Fearon, 1999.





