



# ILLINOIS VALLEY COMMUNITY COLLEGE

## COURSE OUTLINE

**DIVISION: Natural Sciences & Business**

**COURSE: MTH 0908 Basic Geometry**

Date: Spring 2022

Credit Hours: 3

*Complete all that apply or mark "None" where appropriate:*

Prerequisite(s): MTH 0910

Enrollment by assessment or other measure?  Yes  No

If yes, please describe: By appropriate assessment

Corequisite(s): None

Pre- or Corequisite(s): None

Consent of Instructor:  Yes  No

Delivery Method:

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

Offered:  Fall  Spring  Summer

### **CATALOG DESCRIPTION and IAI NUMBER (if applicable):**

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. Completion of this course satisfies the geometry prerequisite for any other course.

## **ACCREDITATION STATEMENTS AND COURSE NOTES:**

Successful completion requires a final grade of C or better.

### **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:**

- Chapter Readings
- Instructional videos

### **EVALUATION OF STUDENT ACHIEVEMENT:**

- Hand-in assignments
- Instructional videos

### **INSTRUCTIONAL MATERIALS:**

#### **Textbooks**

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

#### **Resources**

- Scientific calculator
- Links to content specific videos

### **LEARNING OUTCOMES AND GOALS:**

#### **Institutional Learning Outcomes**

- 1) Communication – to communicate effectively;
- 2) Inquiry – to apply critical, logical, creative, aesthetic, or quantitative analytical reasoning to formulate a judgement or conclusion;
- 3) Social Consciousness – to understand what it means to be a socially conscious person, locally and globally;
- 4) Responsibility – to recognize how personal choices affect self and society.

#### **Course Outcomes and Competencies**

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.