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# ILLINOIS VALLEY COMMUNITY COLLEGE

# **COURSE OUTLINE**

**DIVISION: Natural Sciences & Business** 

**COURSE: MTH 0908 Basic Geometry** 

Date:	Spring 2	2020	
Credit Hou	urs:	3	
Prerequisi	ite(s):	MTH 0910 or a	dequate placement test score
Delivery N	lethod:	<ul><li>☐ Lab</li><li>☐ Clinical</li><li>☐ Online</li></ul>	<ul> <li>3 Contact Hours (1 contact = 1 credit hour)</li> <li>0 Contact Hours (1 contact = 1 credit hour)</li> <li>0 Contact Hours (2-3 contact = 1 credit hour)</li> <li>0 Contact Hours (3 contact = 1 credit hour)</li> </ul>
Offered:	⊠ Fall	<ul><li>∐ Blended</li><li>⊠ Spring</li></ul>	⊠ Summer

### **CATALOG DESCRIPTION:**

This is a beginning course in geometry. Topics of student include: angels, 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.

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

### **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.]

oxtimes 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
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 I 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.]

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

# **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.

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

Course Competency/Assessment Methods Matrix

(Dept/# Course Name)		, <del>.</del>		<u> </u>	<del> </del>	111	<u> </u>	,,				Ass	ses	sm	ent	Or	otio	ns														
For each competency/outcome place an "X" below the method of assessment to be used.	Assessment of Student Learning	Article Review	Case Studies	Group Projects	Lab Work	Oral Presentations	Pre-Post Tests	Quizzes	Written Exams	Artifact Self Reflection of Growth	Capstone Projects	Comprehensive Written Exit Exam	Course Embedded Questions	Multi-Media Projects	Observation	Writing Samples	Portfolio Evaluation	Real World Projects	Reflective Journals	Applied Application (skills) Test	Oral Exit Interviews	Accreditation Reviews/Reports	Advisory Council Feedback	Employer Surveys	Graduate Surveys	Internship/Practicum /Site Supervisor Evaluation	Licensing Exam	In Class Feedback	Simulation	Interview	Written Report	Assignment
Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.	Direct/ Indirect	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D		_	_	_	D	D						D
1.1 Define basic geometric terms pertaining to angles, lines, and points.								Х	X				х																			Х
1.2 Use theorems pertaining to angles, lines, and points.								Χ	X				Х																			Х
1.3 Distinguish between inductive and deductive reasoning.								Χ	X				Х																			Х
1.4 Differentiate between axioms or postulates and theorems.								Χ	X				Х																			Χ
2.1 Define basic geometric terms relating to parallel lines.								Χ	Χ				Х																			Χ
2.2 Use the theorems of parallel lines to determine angle measure.								Χ	Х				X																			X
3.1 Define basic geometric terms pertaining to triangles.								Χ	Χ				Х																			Χ
3.2 Classify types of triangles.								Χ	Χ				Х																			Χ

3.3 Use theorems pertaining to triangles.	X		Х		Χ									Х
4.1 Define basic geometric		Τ,	V		V									_
terms relating to quadrilaterals.	X		X		Χ									Х
4.2 Differentiate between the	Х	,	Х		Х									Χ
various types of quadrilaterals.	_ ^		^		^									^
4.3 Apply the various theorems														
of quadrilaterals to find angle	l x	١,	x		Х									Х
measure and the lengths of	^	1	^		^									^
sides.														
5.1 Find the area and														
perimeter of triangles,														
rectangles, squares,	X	.   2	X		Χ									Х
parallelograms, trapezoids,														
and circles.														
5.2 Evaluate area formulas.	X		X		Χ									Χ
5.3 Apply the various area	X	,	Х		Х									Х
formulas in problem situations.	^		^		^									
6.1 Define basic terms related	X	,	Х		Х									Х
to circles and sectors.	^		^		^									
6.2 Find the measure of a														
central angle, an inscribed	X		X		Χ									Х
angle, and the length of an arc.														
6.3 Apply the theorems														
pertaining to circles to find the					.,									
measure of various arcs and	X		X		X									X
angles and the lengths of line														
segments.						-				-				
7.1 Define basic geometric		١,												
terms relating to congruence	X	. 4	X		X									X
and similarity.														_
7.2 Use congruence properties	l x		Χ		Χ									Χ
in problem situations.														_
7.3 Use similarity properties in	X		Χ		Χ									Χ
problem situations.						<del></del>					1			
8.1 State the Pythagorean	X		Χ		Χ									Χ
Theorem and its converse.						<del></del>					1			
8.2 Apply the Pythagorean Theorem to find the sides of a		,	$\sqrt{}$		~									$\sqrt{}$
	X	4	Х		Χ									X
right triangle.														

8.3 Apply the Pythagorean Theorem to determine if a triangle is a right triangle.	Х	X		X	
8.4 Use the theorems related to 30-60-90 and 45-45-90 triangles.	х	х		X	x
9.1 Define basic geometric terms relating to planes, volumes, and surface areas.	Х	Х		X	x
9.2 Compute the volume of rectangular solid, pyramid, cylinder, cone, and sphere.	Х	Х		X	x
9.3 Evaluate volume formulas.	Х	Χ		X	X
9.4 Compute the surface area of the same solids listed above.	Х	Х		X	X
9.5 Evaluate surface area formulas.	Х	Х		X	X