



**El Camino College**  
**COURSE OUTLINE OF RECORD – Approved**

**I. GENERAL COURSE INFORMATION**

**Subject and Number:** Mathematics 60  
**Descriptive Title:** Elementary Geometry  
**Course Disciplines:** Mathematics  
**Division:** Mathematical Sciences

**Catalog Description:**

This is an introductory course in geometry. Topics include: properties of geometric figures including circles, triangles and other polygons, congruence and similarity, and elementary logical reasoning. Formal proof is introduced and used throughout the course.

Note: This course is equivalent to one year of high school geometry.

**Conditions of Enrollment:**

**Prerequisite:** Mathematics 40 with a minimum grade of C or credit in Mathematics 37 or qualification by appropriate assessment

<b>Course Length:</b>	<b>X Full Term</b>	<b>Other (Specify number of weeks):</b>
<b>Hours Lecture:</b>	<b>4.00 hours per week</b>	<b>TBA</b>
<b>Hours Laboratory:</b>	<b>0 hours per week</b>	<b>TBA</b>
<b>Course Units:</b>	<b>4.00</b>	

**Grading Method:** Letter  
**Credit Status:** Associate Degree Credit

**Transfer CSU:** No  
**Transfer UC:** No

**General Education:**  
**El Camino College:**

**CSU GE:**

**IGETC:**

## II. OUTCOMES AND OBJECTIVES

**A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)**

1. Students will be able to define geometric terms, polygons, and shapes and apply characteristics of the shapes to solve geometric problems.  
Sample: Sketch, label and mark the following figure: Trapezoid PQRS with PQ perpendicular to QR, PQ parallel to RS and acute angle S.
2. Students will be able to calculate perimeter, area, surface area and volume for various 2D and 3D geometric shapes.  
Sample: If the diameter of the moon is 3475 km and an orbiting lunar station is circling 21 km above the lunar surface, find the distance traveled by the lunar station in one orbit. Give your answer to the nearest kilometer.
3. Students will be able to construct geometric shapes using the compass and straightedge.  
Sample: Given an obtuse triangle, construct all three altitudes for that triangle.
4. Students will be able to prove geometric conjectures and theorems using deductive logic.  
Sample: Prove that one diagonal of a rectangle divides the rectangle into two congruent triangles.

**B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)**

1. Identify properties of basic geometric figures and use these properties to solve problems.  
Objective Exams
2. Perform constructions using a compass and straightedge.  
Objective Exams
3. Formulate and prove conjectures using deductive reasoning.  
Objective Exams
4. Use both deductive and inductive arguments to explain conclusions.  
Objective Exams
5. Use the properties of right triangles to solve problems.  
Objective Exams
6. Determine the perimeter and area of common two-dimensional figures, including circles, triangles, squares and polygons, as well as the surface area and volume of common three-dimensional figures.  
Objective Exams
7. Use proportional reasoning, as well as congruence and similarity, in problem solving.  
Objective Exams
8. Solve problems involving triangles and other polygons inscribed within or circumscribed about circles.  
Objective Exams

**III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)**

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	10	I	Fundamental concepts A. Undefined terms and basic definitions B. Angles, supplementary, complementary and vertical angles C. Lines, parallel & perpendicular D. Inductive and deductive reasoning E. Geometric constructions F. Introduction to direct proof
Lecture	13	II	Triangle concepts A. Congruent triangles B. Isosceles triangle properties C. Special right triangles D. Pythagorean Theorem E. Triangle Inequality Theorem F. Proving triangles are congruent and corresponding parts of congruent triangles are congruent G. Sum of angles in a triangle H. Perimeter and area of triangles
Lecture	10	III	Quadrilateral concepts A. Characteristics of parallelograms, trapezoids, rectangles, rhombi, kites & squares B. Sum of the angles in a quadrilateral C. Perimeter and area of quadrilaterals D. Proving characteristics of quadrilaterals
Lecture	8	IV	Polygon concepts A. Vocabulary associated with polygons B. Sum of the angles in a polygon C. Perimeter and area of regular polygons D. Properties of polygons inscribed within and circumscribed about circles
Lecture	9	V	Three-Dimensional shapes A. Vocabulary associated with 3-D shapes B. Surface area C. Volume
Lecture	8	VI	Similarity A. Ratio and proportion B. Similar figures with emphasis on similar triangles C. Basic trigonometric ratios D. Relationship of area and volume in similar figures
Lecture	6	VII	Circles A. Vocabulary associated with circles B. Circumference and area of circles

			C. Proving basic concepts of circle theorems (involving chords, tangents & secants)
Lecture	8	VIII	Analytic geometry A. Cartesian coordinate system B. Midpoint and distance formula C. Basic Coordinate proofs
<b>Total Lecture Hours</b>	72		
<b>Total Laboratory Hours</b>	0		
<b>Total Hours</b>	72		

#### IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

##### A. PRIMARY METHOD OF EVALUATION:

Problem solving demonstrations (computational or non-computational)

##### B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

Draw three angles of different measures on a piece of paper using a straightedge. At least one of the angles should be obtuse. Use a compass and straightedge to construct a congruent angle for each of the angles you drew.

##### C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Explain why a triangle cannot have more than one right angle. Use complete sentences.
2. Given a right triangle ABC with a right angle at C, AC = 7 inches and BC = 5 inches. The triangle PQR is also a right triangle with a right angle at R, PR = 7 inches and QR = 5 inches. Write a short paragraph explaining why triangle ABC is congruent to triangle PQR.

##### D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Other exams  
Quizzes  
Homework Problems

#### V. INSTRUCTIONAL METHODS

Lecture

**Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.**

#### VI. WORK OUTSIDE OF CLASS

Study  
Answer questions  
Skill practice  
Required reading  
Problem solving activities  
Other (specify)  
Geometrical constructions using only a straightedge and compass.

**Estimated Independent Study Hours per Week: 6**

**VII. TEXTS AND MATERIALS**

**A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS**

Daniel Alexander & GERALYN KOEBERLEIN, Elementary Geometry for College Students, 6<sup>th</sup> edition, Cengage, 2014

**B. ALTERNATIVE TEXTBOOKS**

**C. REQUIRED SUPPLEMENTARY READINGS**

**D. OTHER REQUIRED MATERIALS**

Scientific or graphing calculator, straightedge, compass and protractor

**VIII. CONDITIONS OF ENROLLMENT**

**A. Requisites (Course and Non-Course Prerequisites and Corequisites)**

<b>Requisites</b>	<b>Category and Justification</b>
Course Prerequisite Mathematics-40 or	Sequential
Course Prerequisite Mathematics-37 or	Sequential
Non-Course Prerequisite	Placement assessment is an officially recognized mechanism for controlling enrollment in developmental mathematics courses. Placement cut scores are periodically reviewed by faculty and adjusted to match success rates in the target courses. Students who do not meet the placement cut score for this class are statistically highly unlikely to succeed.

**B. Requisite Skills**

<b>Requisite Skills</b>
1. Manipulate algebraic expressions, including expressions with fractions and radicals  MATH 40 - Use the properties of the real numbers to evaluate, simplify, and factor algebraic expressions, including expressions with fractions and radicals.  MATH 37 - Use the properties of the real numbers to evaluate, simplify, and factor algebraic expressions, including expressions with fractions and radicals.
2. Solve systems of linear equations.

MATH 40 - Set up and solve application problems using linear equations and inequalities, systems of two linear equations with two variables, and quadratic equations.

MATH 37 - Set up, graph, and solve linear equations, systems of linear equations, and linear inequalities using a variety of techniques.

3. Solve application problems using linear equations.

MATH 40 - Set up and solve application problems using linear equations and inequalities, systems of two linear equations with two variables, and quadratic equations.

MATH 37 - Represent linear and quadratic models with tables, graphs and equations (coordinate graphing), and transform the model from one representation to another.

MATH 37 - Set up, graph, and solve linear equations, systems of linear equations, and linear inequalities using a variety of techniques.

**C. Recommended Preparations (Course and Non-Course)**

Recommended Preparation	Category and Justification
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**D. Recommended Skills**

Recommended Skills
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**E. Enrollment Limitations**

Enrollment Limitations and Category	Enrollment Limitations Impact
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Course created by L. Bodman on 05/01/1974.

BOARD APPROVAL DATE:

LAST BOARD APPROVAL DATE: 12/16/2019

Last Reviewed and/or Revised by: Susan Tummers Stocum

Date: 9/2/2019

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