

**PALOMAR COLLEGE**  
**COURSE OUTLINE OF RECORD FOR**  
**DEGREE CREDIT COURSE**

X Transfer Course    X A.A. Degree applicable course  
(check all that apply)

**COURSE NUMBER AND TITLE:** Math 106 – Concepts of Elementary Math II

**UNIT VALUE:** 3

**MINIMUM NUMBER OF SEMESTER HOURS:** 48

**BASIC SKILLS REQUIREMENTS:** Appropriate language and computational skills.

**ENTRANCE REQUIREMENTS**

**PREREQUISITE:** A minimum grade of ‘C’ in Math 105.

**COREQUISITE:** None

**RECOMMENDED PREPARATION:** None

**SCOPE OF COURSE:**

An extension of Mathematics 105, including selected topics from two- and three-dimensional geometry, motion geometry, and measurement. Recommended for prospective elementary and junior high school teachers, parents, and liberal arts students.

**SPECIFIC COURSE OBJECTIVES:**

Successful students will be able to do the following:

1. Use inductive reasoning to formulate mathematical conjectures;
2. Use critical thinking and problems solving skills to solve mathematical problems involving geometry;
3. Evaluate, compare, and contrast mathematical and logical techniques and concepts,
4. Use appropriate technology to research and explore mathematical topics and to solve problems;
5. Use concrete examples to understand mathematical concepts that involve geometry;
6. Relate current academic standards for mathematical education to mathematical topics that involve geometry.

## **CONTENT IN TERMS OF SPECIFIC BODY OF KNOWLEDGE:**

At least the following topics will be covered:

### **I. Inductive Reasoning:**

- A. Definitions of inductive and deductive reasoning; comparisons of inductive and deductive reasoning.
- B. Number patterns.
- C. Picture patterns.

### **II. Introduction to Geometry:**

- A. Definitions and undefined terms.
- B. Defining line and angle relationships.
- C. Defining polygons, triangles, and special quadrilaterals.

### **III. Using the Tools of Geometry:**

- A. Duplicating angles and segments.
- B. Constructing perpendicular bisectors, perpendiculars, angle bisectors, parallel lines, and points of concurrency.

### **IV. Line and Angle Properties:**

- A. Using line and angle properties to discover angle relationships.
- B. Parallel lines; perpendicular lines.
- C. Conjectures with midpoint and slope.
- D. Equations of lines; intersections of lines.

### **V. Triangle Properties:**

- A. Triangle Sum Conjecture.
- B. Discovering properties of Isosceles triangles.
- C. SSS, SAS, SAA, ASA congruence.
- D. AAA similarity.

### **VI. Polygon Properties:**

- A. Polygon Sum Conjecture.
- B. Exterior angles.
- C. Discovering properties of kites and trapezoids.
- D. Discovering properties of midsegments.
- E. Discovering properties of parallelograms.

### **VII. Circles:**

- A. Defining circles.
- B. Discovering chord and tangent properties.
- C. Arcs and angles.
- D.  $\frac{C}{D}$  ratio.

### **VIII. Transformations and Tessellations:**

- A. Transformations.
- B. Isometries.
- C. Symmetry.
- D. Tessellations; tessellations using translations, rotations, and glide reflections.

IX. Area:

- A. Areas of parallelograms, triangles, trapezoids, kites, and regular polygons.
- B. Areas of circles.
- C. Surface area.

X. Pythagorean Theorem

- A. Theorem of Pythagoras and applications.
- B. Special Right triangles.
- C. Distance in coordinate geometry.

XI. Volume:

- A. Polyhedrons, prisms, and pyramids.
- B. Curved surfaces.
- C. Cylinders and cones.
- D. Volume and surface area of a sphere.

XII. Similarity:

- A. Ratio and proportion.
- B. Similarity.
- C. Similar triangles; corresponding parts of similar triangles.
- D. Proportions with area and volume.

- Additional topics may be included at the instructor's discretion.

**REQUIRED READING:**

Serra, Michael. Discovering Geometry: An Investigative Approach. 3<sup>rd</sup> edition. New York: Key Curriculum Press, 2003.

**SUGGESTED READING:**

Mathematics Content Standards for California Schools, K – 12.

NCTM. Curriculum and Evaluation Standards for School Mathematics.

**REQUIRED WRITING:**

Students will write solutions/explanations to homework problems using correct mathematical notation, logic, and complete sentences as required. (Examinations will require the same.)

At the instructor's discretion, students will write on mathematical topics such as teaching methodologies, curriculum and evaluation issues, etc.

**OUTSIDE ASSIGNMENTS:**

**Students are expected to spend a minimum of three hours per unit per week in class and on outside assignments, prorated for short-term classes.**

Outside assignments will include (but not be limited to) problem sets, written assignments, review of lecture materials, and reading the text.

**INSTRUCTIONAL METHODOLOGY:**

**Check all that apply:**

- lecture
- laboratory
- lecture-laboratory combination
- directed study

**DISTANCE LEARNING:**

**This course may be offered as a distance learning course and meets Title 5 regulations 55370, 55372, 55374, 55376, 55378, and 55380.**

Yes  No

**If yes, check all that apply:**

- Television Course (Video one-way, e.g. ITV, video cassette, etc.)
- Online Course (Text one-way, e.g. newspaper, correspondence, electronic file, etc.)
- Two-Way Video Conferencing (Two-way interactive video and audio)
- One-Way Video Conferencing (One-way interactive video and two-way interactive audio)
- Computer Assisted Instruction (A specialized form of mediated instruction relying primarily on student access to information and prepared lessons or teaching materials through a computer terminal, but not under immediate supervision of a qualified instructor.)

**GRADING POLICY AND STANDARDS** (include methods of determining whether the stated objectives have been met by students):

- Written exams: 60 – 80% of grade.
- Final exam: 20 – 40% of grade
- Homework: 0 – 20% of grade
- Writing assignments: 0 – 10% of grade

**IS COURSE REPEATABLE FOR REASON(S) OTHER THAN DEFICIENT GRADE?**

Yes  No  Number of times course may be taken for credit: \_\_\_\_\_

If yes, identify specific provision of Title 5 Division 2 section(s), 55761-55763 and 58161 which qualifies course as repeatable:

**CONTACT PERSON:** Robert Jones, ext. 2547

**SIGNATURES ON FILE:**