Las Positas College
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Course Outline for MATH 58

GEOMETRY

Effective: Fall 2020

I. CATALOG DESCRIPTION:
MATH 58 — GEOMETRY — 3.00 units

Topics in plane geometry include: congruence, similarity, parallel lines, and properties of polygons and circles.

3.00 Units Lecture

Prerequisite
MATH 110 - Elementary Algebra
with a minimum grade of C
or

NMAT 210 - Elementary Algebra
with a minimum grade of C

Grading Methods:
Letter or P/NP

Discipline:
- Mathematics

	MIN
Lecture Hours:	54.00
Total Hours:	54.00

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 1

III. PREREQUISITE AND/OR ADVISORY SKILLS:

Before entering the course a student should be able to:

A. MATH110
1. Perform arithmetic operations on real numbers and polynomial expressions;
2. Simplify and evaluate algebraic expressions;
3. Translate a verbal statement into an algebraic expression;
4. Solve linear equations in one variable;
5. Solve a formula for a specified variable;
6. Find the equation of a line;
7. Develop and graph linear equations in two variables using various methods;
8. Apply the rules for integer exponents;
9. Factor polynomials completely;
10. Solve polynomial and quadratic equations;
11. Solve, justify, and interpret the solution in the context of a modeling problem.

B. NMAT210
1. Perform arithmetic operations on real numbers and polynomial expressions;
2. Simplify and evaluate algebraic expressions;
3. Translate a verbal statement into an algebraic expression;
4. Solve linear equations in one variable;
5. Solve a formula for a specified variable;
6. Find the equation of a line;
7. Develop and graph linear equations in two variables using various methods;
8. Apply the rules for integer exponents;
9. Factor polynomials completely;
10. Solve polynomial and quadratic equations;
11. Solve, justify, and interpret the solution in the context of a modeling problem.

IV. MEASURABLE OBJECTIVES:

Upon completion of this course, the student should be able to:

A. Identify the four parts of an axiomatic system.
B. Identify the hypothesis and conclusion in a conditional statement.
C. Identify the converse and contrapositive of a conditional statement.
D. Construct direct proofs using the Reflexive, Symmetric, and Transitive properties.

E. Construct an indirect proof.
F. Use a compass and a straightedge for geometric constructions.
G. Classify angles as acute, obtuse, straight, or right angles.
H. Identify and name specific polygons
I. Apply the Protractor, Angle, Segment, and Arc-Addition Postulates.
J. Identify alternate interior angles and alternate exterior angles.
K. Prove two lines are parallel.
L. Prove two triangles are congruent .
M. Use the Pythagorean Theorem.
N. Identify and use the Triangle Inequality.
O. Use proportions to solve word problems.
P. Use line, segment, and angle relationships in a circle.
Q. Evaluate areas using formulas.

V. CONTENT:
A. Statements and reasoning
1. Identify the hypothesis and conclusion of a conditional statement
2. Finding the converse and contrapositive of a conditional statement
3. Identifying the four parts of an axiomatic system
B. Measurement
1. Use of a ruler and protractor
C. Angles and their relationships
D. Introduction to proofs (direct and indirect)
E. Perpendicular lines
F. The parallel postulate and special angles
G. Proving lines parallel
H. The angles of a triangle
I. Convex polygons
J. Congruent triangles
K. Corresponding parts of congruent triangles
L. Isosceles triangles
M. Basic constructions
N. Identifying quadrilaterals
O. Properties of quadrilaterals
P. Similar triangles and polygons
Q. The Pythagorean Theorem
R. Special right triangles
S. Circles and related segments and angles
T. Angle measures in the circle
U. Line and segment relationships in the circle
V. Areas of polygons and circles

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. **Classroom Activity** - Any of the following: individual problem solving, group work, presentations
C. Collaborative learning where applicable
D. **Lab** - Assignments
E. **Discussion** -

VII. TYPICAL ASSIGNMENTS:
A. Homework
1. Requiring homework from the textbook is a typical assignment for this course. The amount of problems assigned from each section is dependent on the types of exercises sampled. For example, the section on proportions contains many problems involving short computations in addition to word problems. It would be reasonable to assign at least fifteen computational exercises with a minimum of five word problems. Since proofs require more thought than using a formula, the instructor could assign as many as six proofs per section.
B. In-class Assignment
1. Handouts and collaborative exercises involving geometric constructions are also typical. For example, the instructor could have their students use time in the classroom to construct an isosceles triangle with base of length c and altitude of length a using a compass and straightedge
C. Lab
1. Lab assignments can be used to reinforce fundamental concepts and skills or to explore certain concepts in more depth than is possible in-class. They may be designated for individual or group work.

VIII. EVALUATION:
Methods/Frequency

A. Exams/Tests
Recommended minimum of 3 midterms and a final exam
B. Quizzes
Optional, either announced or unannounced
C. Projects
Optional
D. Class Work
Optional
E. Home Work
Recommend problems assigned from each section covered in the course
F. Lab Activities
Optional

IX. TYPICAL TEXTS:
1. Alexander, Daniel. *Elementary Geometry for College Students.* 7th ed., Cengage, 2019.
2. Kay *College Geometry A Discovery Approach.* 2nd ed., Addison Wesley, 2001.
3. Camp *Plane Geometry.* 2nd ed., Kendall/Hunt Publishing Company, 1997.
4. Martin-Gay, Elayn. *Geometry.* 1st ed., Pearson, 2016.
5. Lial, Margaret. *Essentials of Geometry for College Students.* 2nd ed., Pearson, 2004.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. A calculator, compass, straightedge, and protractor may be required.