MATH C106: GEOMETRY FOR ELEMENTARY TEACHERS

Item	Value
Top Code	170100 - Mathematics, General
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)
Local General Education (GE)	• Area 2 Mathematical Concepts and Quantitative Reasoning (CA3)
California State University General Education Breadth (CSU GE-Breadth)	• CSU B4 Math/Quant.Reasoning (B4)

Course Description

This course will build fluency and understanding of basic mathematical concepts and develop reasoning, problem solving, and communicating skills. The course involves using technology, participating in group work and projects, and observing and/or teaching in local elementary schools. Topics covered include data analysis, probability, geometry, measurement, algebra, and coordinate geometry. PREREQUISITE: A course taught at the level of intermediate algebra or appropriate math placement. Transfer Credit: CSU; UC: Credit Limitation: MATH C104 and MATH C106 combined: maximum credit, 1 course.

Course Level Student Learning Outcome(s)

1. Apply Euclidean geometry and graph and network theory at a collegiate level and explain the learning process used by elementary school students to master these topics.

Course Objectives

- 1. Correctly select an appropriate sampling method to collect sample data when given a specific survey topic.
- 2. Interpret the solution of a problem as an algebraic equation; define and graph a function.
- 3. Graphically represent data; determine mean, median, mode, and standard deviation; study a sample and make inferences; decide if assertions are accurate or reliable; understand and apply theoretical and empirical probability.
- 4. Analyze, classify and represent shapes in the Euclidean plane using rays, lines, points, angles and polygons; graph and network theory; measurement including area, perimeter, surface area, volume and the Pythagorean Theorem; transformations, symmetries and tilings; and similarity, congruence and constructions.
- 5. Demonstrate effective teaching techniques to become a competent teacher of mathematics.
- 6. Use appropriate technology such as calculators or computer software to enhance mathematical thinking, visualization, and understanding, to solve mathematical problems, and judge the reasonableness of the results.
- 7. Demonstrate quantitative reasoning skills by developing convincing arguments and by communicating mathematically both verbally and in writing.

Lecture Content

Algebraic Reasoning and Representation Algebraic Expressions and Equations. Functions. Graphing Functions in the Cartesian Plane. Statistics: The Interpretation of Data The Graphical Representation of Data. Measures of Central Tendency and Variability. Statistical Inference. Probability Empirical Probability. Principles of Counting. Theoretical Probability. Geometric Figures Figures in the Plane. Curves and Polygons in the Plane. Figures in Space. Networks. Measurement The Measurement Process. Area and Perimeter. The Pythagorean Theorem. Surface Area and Volume. Transformations, Symmetries, and Tilings Rigid Motions and Similarity Transformations. Patterns and Symmetries. Tilings and Escher-like Design. Congruence, Constructions, and Similarities Congruent Triangles. Constructing Geometric Figures. Similar Triangles. Observation of Elementary School Classroom Deliver Instructional Unit to Elementary School Classroom Class Project and Presentation (Optional)

Method(s) of Instruction

- Lecture (02)
- DE Online Lecture (02X)

Reading Assignments

- Reading texbook - Exploriing word problems - Doing exercises

Writing Assignments

Observe real-world problems and translate into mathematical language.

Out-of-class Assignments

- Homework - Written assignments - Projects

Demonstration of Critical Thinking

Written Assignments include a variety of problems to reinforce the understanding and achievement of all SLOs. Quizzes will be multiple-choice or free-response; content will be from a recent lecture, reading assignment, or homework assignment. Midterm Examination will be free-response, open-ended, show your work for partial credit; content will be the first half of the course. Objective Examination may be separate assessment or part of an exam, could cover any of the SLOS. Written or oral report presented to class or instructor based on material in the course (optional). Individual or group projects based on material in the course presented written or verbally to instructor or the rest of the class (optional). Mathematical and Problem-Solving Exercises included as homework assignments, part of classroom lectures and discussions, part of quizzes, Midterm Examination, Final Examination, and Projects (optional).

Required Writing, Problem Solving, Skills Demonstration

Students will be able to explain solutions and justify reasoning verbally or in writing and may be included in classroom discussions, quizzes, Midterm Examination, Final Examination, and Projects (optional). Final examination will be free-response, open-ended, show your work for partial

credit; content will be the entire course. Instructor may include points for attendance, class participation, journals, etc.

Eligible Disciplines

Mathematics: Master's degree in mathematics or applied mathematics OR bachelor's degree in either of the above AND master's degree in statistics, physics, or mathematics education OR the equivalent. Master's degree required.

Textbooks Resources

1. Required Calvin, Long T.; DeTemple, Duane. Mathematical Reasoning for Elementary Teacher, 7th ed. Pearson, 2014 Rationale: - Legacy Textbook Transfer Data: Legacy text

Other Resources

1. Coastline Library