

# MATH 169: MATHEMATICS FOR ELEMENTARY TEACHERS LL

## Citrus College Course Outline of Record

Heading	Value
Effective Term:	Fall 2021
Credits:	5
Total Contact Hours:	90
Lecture Hours :	90
Lab Hours:	0
Hours Arranged:	0
Outside of Class Hours:	180
Prerequisite:	MATH 168.
Transferable to CSU:	Yes
Transferable to UC:	Yes - Approved
Grading Method:	Standard Letter

## Catalog Course Description

Second class for elementary school teachers. Course covers topics in measurement, geometry, probability and statistics. Techniques in the design of instruction delivery will be explored. 90 lecture hours.

## Course Objectives

- This course focuses on fundamental Mathematics (mostly computational, and some conceptual) for elementary education teachers to know in order to competently teach mathematics with conceptual understanding, stressing higher order critical thinking skills and problem solving techniques.
- The students will learn the basic concepts of probability, and the rules that are used to analyze the likelihood of events occurring, both theoretically and empirically (through simulations).
- The students will learn basic statistical methods employed to analyze data and visualize data, in tabular and graphical form. Inferential Statistics will be explored, which links statistics to probability.
- The students will learn the structure of the axiomatic system of Euclidean Geometry. Rules and formulas will be used to explain relationships, but geometric constructions will be used to understand the evolution of these concepts from their beginnings.
- The teaching of using various methods of assessment will be a focus, as the students will one day be teachers. The teachers will learn how to assess themselves (& their classmates), in order to understand the role of assessment with in Education. They will assess how they assess student work, which will one day become part of their daily jobs as an elementary education teacher.
  - Assessment Tools to be used are :
    - Formal Tests (through out the course)
    - In class & take home quizzes (through out the course)
    - Homework (On-line utility - MyMathLab.com)
    - Group Work (through out the course)
    - Simulations (Probability & Statistics)
    - Spreadsheet work in a computer lab (Using Microsoft Excel &/or Google Sheets)
    - Digital Constructions in a computer lab (Using Geometers' Sketchpad)
    - Work on the World Wide Web - Using apps like Desmos, Minitab, and WolframAlpha, and other web-based applets for better

understanding the Normal Distribution, as well as research for the project(s)

## Major Course Content

Instruction for Prospective Elementary Education (K-8) Teachers focusing mainly on Probability, Statistics, Geometry.

The main content areas are Probability, Statistics and Geometry, but review of Real (& Whole) Number numeracy (including place value understanding with decimals, and computational accuracy when operating with fractions), algebraic concepts, and basic problem solving techniques learned in the pre-requisite Math 168 course, will be revisited cyclically, especially with Probability & Statistics.

## Examples of Required Writing Assignments

Students will undergo two projects. Each project is unique, but both will require introductory and conclusive paragraphs. The first project will focus on the computing the measurements of central tendency and variation, from a substantial data set ( $n \geq 100$ ) collected using sound data collecting techniques. This will address a hypothesis that they will firstly make before doing the project concerning the variable that they are measuring through their collection of data. At this project's conclusion the students must assess the viability of their hypothesis though sound statistical analysis. The second project will be using either pencil and paper constructions (done by hand) or by digital means (Using Geometers Sketchpad), to construct a (regular, semi-regular, or irregular) tessellation (tiling of a 2 dimensional space). They will be essentially creating a piece of art (because the use of color will be highly encouraged) that uses Geometric properties of symmetry, and will stress concepts of translations and transformations. understanding of common properties of polygonal shapes is necessary to successfully complete this second project.

## Examples of Outside Assignments

Students are expected to regularly practice the concepts learned in class through twice weekly assigned on-line homework assignments (MyMathLab.com)

## Instruction Type(s)

Lecture, Online Education Lecture