

**RARITAN VALLEY COMMUNITY COLLEGE  
ACADEMIC COURSE OUTLINE**

**MATH 108 MATHEMATICAL REASONING FOR EDUCATORS: GEOMETRY AND  
STATISTICS**

**I. Basic Course Information**

A. Course Number and Title:	MATH 108 Mathematical Reasoning for Educators: Geometry and Statistics
B. New or Modified Course:	Modified
C. Date of Proposal:	Fall 2025
<b>D. Effective Term:</b>	<b>Fall 2026</b>
E. Sponsoring Department:	Mathematics
F. Semester Credit Hours:	3
G. Weekly Contact Hours: 4	Lecture: 3 Laboratory: 1 Out of class student work per week: 6.5
H. Prerequisite: MATH 030 Intermediate Algebra ( <i>or MATH 030R Intermediate Algebra</i> ).	
I. Additional Fees:	none

**II. Catalog Description**

Prerequisites: MATH 030 Intermediate Algebra or MATH 030R Intermediate Algebra with Review.

This course is designed as a transfer course for students seeking degrees in Elementary & Middle School Education and Early Childhood Education. Emphasis is placed on computational skills, problem solving and teaching via a hands-on approach. Topics include Probability, Statistics and Geometry.

### **III. Statement of Course Need**

#### **Background:**

- A. This course is part of a two-course sequence which serves students in the education program who will be transferring to a four-year college to complete a teaching certification program. This course is aligned with the topics on the PRAXIS Core and the Common Core State Standards for Mathematics (very similar to the NJ Student Learning Standards). This course prepares the students with the content they need for the classroom, the state exam, and the subsequent courses they will be taking at their transfer school.
- B. The one-hour lab component allows students to work collaboratively using manipulatives and technology to solve problems.
- C. This course generally transfers as a Mathematics general education course dependent on the transfer institution.

### **IV. Place of Course in College Curriculum**

- A. Free elective. (This applies automatically to all credit courses in the College.)
- B. The course serves as a General Education Elective in Mathematics for Education Majors.
- C. This course meets a mathematics requirement for the AA in Education P-12 for those students pursuing P-3, K-6, K-6 with 5-8 Endorsement and/or K-12 certification.
- D. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, [www.njtransfer.org](http://www.njtransfer.org); b) for all other colleges and universities, go to the individual websites.

### **V. Outline of Course Content**

Prospective teachers need a solid understanding of mathematics so that they can teach it as a coherent, reasoned activity and communicate its elegance and power.

In this course, students will work cooperatively and use physical materials to explore geometric concepts, spatial reasoning and measurement. They will become aware of the relationship of mathematics to other disciplines and its applications in society by solving problems involving data analysis, statistics and probability.

This course will address the fundamental principles that underlie elementary school mathematics from advanced viewpoint.

Topics addressed include:

- A. Probability
  - 1. Properties of probability
    - i. Measure of likelihood
    - ii. Randomness
    - iii. Mutual exclusivity
  - 2. Counting Principles
  - 3. Empirical and theoretical probability
  - 4. Simulations
  
- B. Data Analysis and Statistics
  - 1. Random Sampling
  - 2. Data Organization, Representation and Interpretation
  - 3. Measures of Central Tendency and Dispersion
  - 4. Statistical Inference
  
- C. Geometry Basics
  - 1. Two and Three-dimensional Geometry
  - 2. Graphing points, lines & functions on the coordinate plane
  - 3. Connections between Algebra and Geometry
  - 4. Measurement
    - i. Units of measure
    - ii. Comparison and conversion from one unit to another
    - iii. Derive and use formulas for Perimeter/Area/Volume/Surface Area for basic shapes
  - 5. Lines and Angles
  - 6. Congruence and Similarity
  - 7. Symmetry
  - 8. Tessellations and Transformations

## VI. Course Learning Outcomes

### A. At the completion of the course, students will be able to:

1. Gather information, use a variety of data representation techniques and analyze data using measures of central tendency and dispersion. (GE - 2)
2. Apply principles of probability to determine likelihood of outcomes. (GE - 2)
3. Solve mathematical application problems utilizing the Euclidean geometry of points, lines, planes, and angles. (GE - 2)
4. Construct various types of patterns using tessellations, transformations, rotations and reflections. (GE - 2)
5. Find measures such as areas, perimeters, surface areas, volumes, and angle measures. (GE - 2)

### B. Assessment Instruments

The following assessment methods may be used:

- A. laboratory reports
- B. research papers
- C. presentations
- D. math games
- E. quizzes, tests, cumulative exams

## VII. Grade Determinants

- A. lab reports resulting from work with manipulatives and problem solving activities
- B. oral presentations
- C. creative math games
- D. tests or midterm
- E. cumulative final exam

Given the goals and outcomes described above, LIST the primary formats, modes, and methods for teaching and learning that may be used in the course:

- A. lecture/discussion
- B. small-group work
- C. computer-assisted instruction
- D. guest speakers
- E. laboratory
- F. student oral presentations
- G. student collaboration
- H. paper or computer homework
- I. independent study

## **VIII. Texts and Materials**

- A. suggested textbook
- B. paper and/or online homework assignments to accompany textbook
- C. film and video
- D. web sources
- E. other computer-based sources
- F. manipulatives

(Please Note: The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.)

## **IX. Resources**

- A. student computer labs
- B. cards & dice
- C. compass & protractor
- D. Unifix cubes
- E. tangrams/polydrons/geometric shapes
- F. geoboards