**NEW**
**RARITAN VALLEY COMMUNITY COLLEGE**
**ACADEMIC COURSE OUTLINE**

**MATH 101 Number Systems**

## I. Basic Course Information

A. Course Number and Title: MATH 101 Number Systems

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall Year: 2023

D. Effective Term Fall 2024

E. Sponsoring Department: Mathematics

F. Semester Credit Hours: 3

G. Weekly Contact Hours: 3 Lecture: 3
Laboratory: 0
Out of class student work per week: 6

H. ☐ Prerequisite (s):
☐ Corequisite (s):
☒ Prerequisite (s) and Corequisite (s): MATH 020 Elementary Algebra or MATH 020W Elementary Algebra with workshop or corequisite of MATH 070 Number Systems Workshop or satisfactory score on a placement test.

I. Additional Fees**:** None

J. Name and E-Mail Address of Department Chair and Divisional Dean at time of approval**:**
Lori Austin: Lori.Austin@raritanval.edu (Department Chair);
Sarah Imbriglio: Sarah.Imbriglio@raritanval.edu (Division Dean).

## II. Catalog Description

**Prerequisites and corequisites: MATH 020 Elementary Algebra or MATH 020W Elementary Algebra with workshop or corequisite of MATH 070 Number Systems Workshop or satisfactory score on a placement test.** A survey course designed to serve the needs of liberal arts majors. Topics include systems of numeration, sets and set operations, logic, problem solving strategies, modular arithmetic, Euclidean geometry, and number theory. MATH 101 will **not** satisfy mathematics requirements for students in science, mathematics, and Business Administration AS programs.

## III. Statement of Course Need:

**A.** This is a survey course designed to serve the needs of non math-intensive majors.
**B**. There is no lab component to this course.
**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.
B. The course serves as a General Education course in Mathematics.
C. The course meets a program requirement for various AAS degree programs.
D. This course is a program option for various AAS and AA degree programs and various certificates
E. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; for all other colleges and universities, go to the individual websites.

## V. Outline of Course Content:

A. Reasoning
   1. Inductive Reasoning & Deductive Reasoning
   2. Problem Solving

B. Sets
   1. Concepts
   2. Operations
   3. Representation
   4. Applications

C. Logic
   1. Logical operators
   2. Truth tables
   3. Symbolic and syllogistic arguments

D. Real Number System and Systems of Numeration
   1. Historic Numeration Systems
   2. Non-decimal number bases and computation
   3. Modular arithmetic
   4. Rational numbers
   5. Percent

E. Geometry
   1. Points, lines, planes, angles, polygons
   2. Volume and Surface Area of solids
   3. Transformation and Tessellations

## VI. A. Course Learning Outcomes:

**At the completion of the course, students will be able to:**

1. Use fundamental set concepts to make valid conclusions. (GE-2)
2. Analyze the validity of mathematical and non-mathematical arguments. (GE-2)
3. Solve problems using deductive and inductive reasoning (GE-2)
4. Solve applications involving the geometry of angles, polygons, circles and three dimensional objects. (GE-2).
5. Convert among various numeration systems including mathematical bases. (GE-2)

### B. Assessment Instruments

A. midterm and final examination
B. homework
C. quizzes / projects / discussions

## VII. Grade Determinants

The following grade determinants will be required for the course:

A. midterm and final examination
B. homework
C. quizzes / projects / discussions

The methods for teaching and learning that may be used in the course:

A. lecture/discussion
B. small-group work
C. student collaboration

## VIII. Texts and Materials

A. Suggested textbook**:** *A Survey of Mathematics with Applications,* current edition, by Angel, Abbott, and Runde, Pearson Publishing
B. scientific calculator

(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

No other resources will be needed.

## X. Check One: ☐Honors Course ☐Honors Options ☒ N/A

Definition: According to the Honors Council, an Honors course is one that enriches and challenges students beyond a course's regular scope and curriculum. An Honors course will offer a sophisticated use of research, introduce intellectually stimulating readings and critical perspectives, promote a higher level of critical discussion and written work, and encourage independent study projects, at the option of the instructor.

State how the Honors or Honors Option of this course conforms to this definition. For example: the difference may include additional content, text, materials, assessment instruments, and grade determinants: