RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

MATH 112 PRECALCULUS I

I. Basic Course Information

A. Course Number and Title: MATH 112 Precalculus I

B. New or Modified Course: Modified Course

C. Date of Proposal: Semester: Fall Year: 2024

D. Effective Term: Fall 2025

E. Sponsoring Department: Mathematics and Computer Science

F. Semester Credit Hours: 3

G. Weekly Contact Hours: 4 Lecture: 3
In Class Practice/Exploratory session: 1
Out of class student work per week: 8

H. ☒ Prerequisite (s): MATH 030 Intermediate Algebra, or MATH 030R Intermediate Algebra with Review, or appropriate score on math placement test.
☐ Corequisite (s):

I. Laboratory Fees: No

II. Catalog Description

Prerequisite: MATH 030 Intermediate Algebra, or MATH 030R Intermediate Algebra with Review, or appropriate score on math placement test. This course is designed as the first semester of a two semester sequence for students preparing to study calculus. Topics include the study of polynomial, rational, logarithmic, and exponential functions and other topics from algebra.

III. Statement of Course Need

A. This course is the second in a two course sequence that prepares students for the study of Calculus.
B. This course has a lab component that allows for in class practice of the lecture material through paper lab assignments.
C. This course transfers as a mathematics course in most liberal arts programs.

IV. Place of Course in College Curriculum

A. This course is a free elective.
B. This course serves as a General Education course in Mathematics.
C. This course meets a program requirement for various A.S., A.A.S. and A.A. degrees.
D. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites. Note that Rutgers University will only accept this course to fulfill a Gen Ed. Mathematics requirement if the student has also completed MATH 113: Precalculus II. They will take Math 112 as elective credit.

V. Outline of Course Content

A. Functions and Their Graphs
   1. Function definition
   2. Graphs: shifts, translations, reflections, stretches
   3. Combinations of functions
   4. Inverse functions

B. Polynomial and Rational Functions
   1. Quadratic functions
   2. Higher degree polynomials
   3. Complex numbers
   4. Fundamental Theorem of Algebra
   5. Rational functions and asymptotes
   6. Graphs of rational functions

C. Exponential and Logarithmic Functions
   1. Exponential characteristics, properties, graphs
   2. Logarithmic characteristics, properties, graphs
   3. Solving equations involving exponents and logs
   4. Non-linear models

D. Systems of Equations and Inequalities
   1. Linear systems of two and three variables
   2. Systems of inequalities
   3. Partial Fractions (optional)

VI. A. Course Learning Outcomes

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

1. Apply mathematical arguments to problems. (GE-2)
2. Solve problems quantitatively and symbolically. (GE-2)
3. Identify functional relationships between two variables, both graphically and algebraically.
4. Specify the graphical and algebraic characteristics of polynomial, rational, radical, exponential, or logarithmic functions.
5. employ mathematical modeling techniques to solve problems using polynomial, rational, radical, exponential, or logarithmic functions.

B. Assessment Instruments

Student learning outcomes are assessed using a combination of the following:

A. tests
B. final examination
C. projects / practice/exploratory assignments

VII. Grade Determinants

Final grades are determined by a combination of the following:

A. cumulative final examination
B. tests
C. Exploratory/Practice assignments
D. projects
E. individual teacher determinants

Instructors can use a variety of modes of teaching including, but not limited to the following:

A. lecture/discussion
B. small-group work
C. computer-assisted instruction
D. Exploratory/Practice assignments
E. student oral presentations
F. student collaboration
G. independent study

VIII. Texts and Materials

The following text and materials are required for the course:

A. Suggested Textbook: *Precalculus* by Blitzer, published by Pearson Prentice Hall
B. Scientific calculator is required.

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 unusual resources are needed.

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

This course does not have an honors option because there is a dedicated course (Math 114H) for students wishing to take an honors level Precalculus course.