

**NEW RIVER COMMUNITY COLLEGE
DUBLIN, VIRGINIA**

COURSE PLAN

Course Number and Title: MTH 161 Precalculus I

Prepared by: Math Department Fall 2022
(Date)

Approved by: *S. Tolbert-Hungz* Fall 2022
(Dean) (Date)

I. Course Description

Presents topics in power, polynomial, rational, exponential, and logarithmic functions, and systems of equations and inequalities. This is a Passport and UCGS transfer course.

Prerequisites: Competency in Math Essentials MTE 1-9 as demonstrated through the placement and diagnostic tests, or by satisfactorily completing the required MTE units or equivalent. (Credit will not be awarded for both MTH 161 and MTH 167.)

II. Introduction

The course satisfies a mathematics requirement for many degree programs. It does not count toward a degree in engineering. The course is designed to develop the skills and concepts which are needed for calculus and other advanced mathematics courses.

III. Student Learning Outcomes

Upon successful completion of this course, the student will be able to:

- A. Relations and Functions
 - a. Distinguish between relations and functions.
 - b. Evaluate functions both numerically and algebraically.
 - c. Determine the domain and range of functions in general, including root and rational functions.
 - d. Perform arithmetic operations on functions, including the composition of functions and the difference quotient.
 - e. Identify and graph linear, absolute value, quadratic, cubic, and square root functions and their transformations.
 - f. Determine and verify inverses of one-to-one functions.
- B. Polynomial and Rational Functions
 - a. Determine the general and standard forms of quadratic functions.
 - b. Use formula and completing the square methods to determine the standard form of a quadratic function.
 - c. Identify intercepts, vertex, and orientation of the parabola and use these to graph quadratic functions.
 - d. Identify zeros (real-valued roots) and complex roots, and determine end behavior of higher order polynomials and graph the polynomial, and graph.

- e. Determine if a function demonstrates even or odd symmetry.
 - f. Use the Fundamental Theorem of Algebra, Rational Root test, and Linear Factorization Theorem to factor polynomials and determine the zeros over the complex numbers.
 - g. Identify intercepts, end behavior, and asymptotes of rational functions, and graph.
 - h. Solve polynomial and rational inequalities.
 - i. Interpret the algebraic and graphical meaning of equality of functions ($f(x) = g(x)$) and inequality of functions ($f(x) > g(x)$)
- C. Exponential and Logarithmic Functions
- a. Identify and graph exponential and logarithmic functions and their transformations.
 - b. Use properties of logarithms to simplify and expand logarithmic expressions.
 - c. Convert between exponential and logarithmic forms and demonstrate an understanding of the relationship between the two forms.
 - d. Solve exponential and logarithmic equations using one-to-one and inverse properties.
 - e. Solve application problems involving exponential and logarithmic functions.
- D. Systems of Equations
- a. Solve three variable linear systems of equations using the Gaussian elimination method.

IV. **General Education Student Learning**

General education at NRCC provides the educational foundation necessary to promote intellectual and personal development. Upon completing the associate degree, graduates will demonstrate competency in student learning outcomes in 1) civic engagement, 2) critical thinking, 3) professional readiness, 4) quantitative literacy, 5) scientific literacy, and 6) written communication.

This course includes the following general education student learning outcomes:

- Explain numerical information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words)
- Convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words)
- Accurately solve mathematical problems

V. **Instructional Methods**

The instructional procedures may include lectures, discussions, in class work, homework, reviews and tests.

VI. **Instructional Materials**

Textbook: **College Algebra, 3rd Corrected Edition free eBook** by Stitz & Zeager

Software: MyOpenMath <https://www.myopenmath.com/>

Calculator: Students are allowed to use a TI 30XIIS or equivalent.

Other: Pencils and paper. Ink is not to be used for any graded work

VII. Course Content

- Functions and their graphs
- Polynomial and rational functions
- Exponential functions
- Logarithmic functions
- Systems of equations

VIII. Evaluation

The grade for the course will be calculated from Tests, online homework, a final exam and other work as deemed appropriate by the instructor. See individual syllabus for details on percentages/points.

IX. Attendance

Regular attendance at classes is required. When absence from a class becomes necessary, it is the responsibility of the student to inform the instructor prior to the absence whenever possible. The student is responsible for the subsequent completion of all study missed during an absence. Any instruction missed and not subsequently completed will necessarily affect the grade of the student regardless of the reason for the absence.

X. Cheating Policy

The giving or receiving of any help from another student or unauthorized individual on any graded portion of the course is considered cheating and will not be tolerated. The use of books, notes, electronic devices of any other unauthorized material during tests is considered cheating, and will not be tolerated. Any student found cheating will receive a grade of “0” on that assignment and may receive an “F” for the course. This “0” cannot be replaced by any other score. Mobile phones are not permitted to be used as calculators.

XI. Withdrawal Policy

Student Initiated Withdrawal Policy

A student may drop or withdraw from a class without academic penalty during the first 60 percent of a session. For purposes of enrollment reporting, the following procedures apply:

- a. If a student withdraws from a class prior to the termination of the add/drop period for the session, the student will be removed from the class roll and no grade will be awarded.
- b. After the add/drop period, but prior to completion of 60 percent of a session, a student who withdraws from a class will be assigned a grade of “W.” A grade of “W” implies that the student was making satisfactory progress in the class at the time of withdrawal, that the withdrawal was officially made before the deadline

published in the college calendar, or that the student was administratively transferred to a different program.

- c. After that time, if a student withdraws from a class, a grade of “F” or “U” will be assigned. Exceptions to this policy may be made under documented mitigating circumstances if the student was passing the course at the last date of attendance.

A retroactive grade of “W” may be awarded only if the student would have been eligible under the previously stated policy to receive a “W” on the last date of class attendance. The last date of attendance for a distance education course will be the last date that work was submitted.

Late withdrawal appeals will be reviewed and a decision made by the Coordinator of Admissions and Records.

No-Show Policy

A student must either attend face-to-face courses or demonstrate participation in online courses by the last date to drop for a refund. A student who does not meet this deadline will be reported to the Admissions and Records Office and will be withdrawn as a no-show student. No refund will be applicable, and the student will not be allowed to attend/participate in the class or submit assignments. Failure to attend or participate in a course will adversely impact a student’s financial aid award.

Instructor Initiated Withdrawal

A student who adds a class or registers after the first day of class is counted absent from all class meetings missed. Each instructor is responsible for keeping a record of student attendance (face-to-face classes) or performance/participation (online classes) in each class throughout the semester.

When a student’s absences equal twice the number of weekly meetings of a class (equivalent amount of time for summer session), the student may be dropped for unsatisfactory attendance in the class by the instructor.

Since attendance is not a valid measurement for online courses, a student may be withdrawn due to non-performance. A student should refer to his/her online course plan for the instructor’s policy.

When an instructor withdraws a student for unsatisfactory attendance (face-to-face class) or non-performance (online class), the last date of attendance/participation will be documented. Withdrawal must be completed within five days of a student’s meeting the withdrawal criteria. A grade of “W” will be recorded during the first sixty percent (60%) period of a course. A student withdrawn after the sixty percent (60%) period will receive a grade of “F” or “U” except under documented mitigating circumstances when a letter of appeal has been submitted by the student. A copy of this documentation must be placed in the student’s academic file.

The student will be notified of the withdrawal by the Admissions and Records Office. An appeal of reinstatement into the class may be approved only by the instructor.

XII. Disability and Non-Discrimination Statements

If you are a student with a documented disability who will require accommodation in this course, please register with the Disability Services Office located in the Advising Center for assistance in developing a plan to address your academic needs.

This College promotes and maintains educational opportunities without regard to race, color, national origin, religion, disability, sex, sexual orientation, gender identity, ethnicity, marital status, pregnancy, childbirth or related medical conditions including lactation, age (except when age is a bona fide occupational qualification), veteran status, or other non-merit factors.

XII. Evacuation Procedure

Evacuation Procedure: Please note the evacuation route posted at the classroom doorway. Two routes are marked in case one route might be blocked.