

**J. Sargeant Reynolds Community College
Course Content Summary**

Course Prefix and Number: MDE 61 **Credits:** 3

Course Title: Learning Supports for Pre-Calculus

Course Description:

Provides support to ensure success for students co-enrolled in Pre-Calculus (MTH 161). Course will review foundational topics through direct instruction, guided practice, and individualized support. Co-requisite: MTH 161 – Precalculus I. Lecture 3 hours.

General Course Purpose:

This course provides support to ensure student success with the MTH 161 objectives.

Course Prerequisites and Co-requisites:

Co-requisite: MTH 161 – Precalculus I

Student Learning Outcomes:

Upon completing the course, the student will be able to

This course provides support to ensure student success with the MTH 161 objectives, which are:

Relations and Functions

- Distinguish between relations and functions.
- Evaluate functions both numerically and algebraically.
- Determine the domain and range of functions in -general, including root and rational functions.
- Perform arithmetic operations on functions, including the composition of functions and the difference quotient.
- Identify and graph linear, absolute value, quadratic, cubic, and square root functions and their transformations.
- Determine and verify inverses of one-to-one functions.

Polynomial and Rational Functions

- Determine the general and standard forms of quadratic functions.

- Decompose partial fractions of the form $P(x)/Q(x)$ where $Q(x)$ is a product of linear factors.

Exponential and Logarithmic Functions

- Identify and graph exponential and logarithmic functions and their transformations.
- Use properties of logarithms to simplify and expand logarithmic expressions.
- Convert between exponential and logarithmic forms and demonstrate an understanding of the relationship between the two forms.
- Solve exponential and logarithmic equations using one-to-one and inverse properties.
- Solve application problems involving exponential and logarithmic functions.

Systems of Equations

- Solve three variable linear systems of equations using the Gaussian elimination method.

Note: Students who pass MTH 161 will also receive a passing grade (S) in MDE 61.

Major Topics to Be Included:

Topics focus on student needs and may include:

- a. Factoring
- b. Simplifying algebraic expressions
- c. Solving higher order equations with real and complex roots
- d. Graphing
- e. Asymptotic behavior
- f. Power, polynomial, rational, exponential, and logarithmic functions
- g. Systems of equations and inequalities
- h. Inverse functions