

**Miami Dade Community College**  
**MAT 0020**  
**College Preparatory Mathematics**

**COURSE COMPETENCIES**

**Course Description:** This course introduces students to the basic topics of arithmetic, measurement of geometric figures, and algebra. Students will add, subtract, multiply, and divide whole numbers, fractions and decimals. They will solve problems involving proportions and percents. Students will simplify or perform operations on signed numbers, radicals, polynomials, and expressions containing exponents; factor polynomials; solve and graph linear equations and inequalities in one variable; solve related applications.

**Prerequisites:** Placement test scores or referral determine admission.

**Credits:** 4 (6 contact hours lecture/lab)

**COURSE COMPETENCIES:**

**Competency 1: The Student will demonstrate knowledge of place value (base 10) by:**

- a. Identifying place value
- b. Writing numbers using word notation, standard notation, and expanded notation.
- c. Rounding whole numbers

**Competency 2 : The Student will demonstrate knowledge of whole numbers by:**

- a. Performing operations of addition, subtraction, multiplication, and division on whole numbers.
- b. Applying the order of operations agreement on whole numbers
- c. Listing all factors of a given whole number
- d. Writing the prime factorization of a given whole number

**Competency 3: The Student will demonstrate knowledge of fractions by:**

- a. Changing improper fractions to mixed numerals and mixed numerals to improper fractions.
- b. Performing operations of addition, subtraction, multiplication, and division on fractions or mixed numerals.
- c. Applying the order of operations agreement on fractions.

- Competency 4: The student will demonstrate knowledge of decimals by:**
- a. Changing decimals to fractions
  - b. Rounding off a given decimal.
  - c. Performing operations of addition, subtraction, multiplication, and division on decimals.
  - d. Applying the order of operations agreement on decimals.

- Competency 5: The student will demonstrate knowledge of proportion by**
- a. Setting up and solving problems with proportions

- Competency 6 : The Student will demonstrate knowledge of percent by:**
- a. Converting any number from one form (fraction, decimal, percent) to another
  - b. Solving problems written in the form “A is R% of B”
  - c. Solving applications involving percent.

- Competency 7: The Student will demonstrate knowledge of basic measurements of geometric figures by:**

- a. Finding the perimeter of polygons and the circumference of circles
- b. Finding the area of polygonal regions and circular regions
- c. Finding the volume of a rectangular solid

- Competency 8: The Student will demonstrate knowledge of real numbers by:**
- a. Performing operations of addition, subtraction, multiplication, and division on real numbers.
  - b. Applying the order of operations agreement on real numbers.
  - c. Recognizing and applying the commutative, associative, identity, inverse, and distributive properties of real numbers.
  - d. Evaluating and interpreting absolute value

- Competency 9: The Student will demonstrate knowledge of algebraic expressions by:**

- a. Evaluating algebraic expressions.
- b. Simplifying expressions.

- Competency 10: The Student will demonstrate knowledge of polynomial by:**

- a. Using properties of exponents to simplify exponential expressions.
- b. Performing the operations of addition, subtraction, multiplication on polynomials.
- c. Dividing a polynomial by a monomial.

- Competency 11: The Student will demonstrate knowledge of scientific notation by:**

- a. Converting decimal notation to scientific notation and scientific notation to decimal notation.
- b. Multiplying and dividing numbers that are in scientific notation.

- Competency 12: The Student will demonstrate knowledge of linear equations by:**
- Solving linear equations in one variable.
  - Solving linear equations with one variable that have no solution.
  - Solving linear equations with one variable that have an infinite number of solutions.
  - Solving applications involving linear equations including proportions.
  - Solving literal equations.
- Competency 13: The Student will demonstrate knowledge of linear inequalities by:**
- Solving linear inequalities in one variable and graphing the solution set.
  - Using interval notation to express intervals of real numbers
- Competency 14: The student will demonstrate knowledge of graphing by:**
- Plotting ordered pairs in a Cartesian Coordinate plane.
  - Identifying points and naming the quadrant or axis on which they lie.
  - Graphing linear equations of two variables using table of values
  - Graphing linear equations of two variables using the x-intercept and y-intercept
  - Determining intercepts from the graph of a line
  - Graphing horizontal and vertical lines.
- Competency 15: The Student will demonstrate knowledge of factoring by:**
- Factoring out the greatest common factor.
  - Factoring by grouping.
  - Factoring quadratic trinomials including perfect square trinomials
  - Factoring special products.
- Competency 16: The Student will demonstrate knowledge of rational expressions by:**
- Simplifying rational expressions.
- Competency 17: The Student will demonstrate knowledge of radical expressions by:**
- Simplifying square roots of monomials.
  - Adding, subtracting, and multiplying square roots of monomials
- Competency 18: The student will demonstrate knowledge of quadratic equations by:**
- Solving quadratic equations by factoring