Miami Dade College

Course Description

MAT0022 | Developmental Mathematics Combined | 5.00 credits

This course combines Developmental Mathematics I and II. The student will learn operations on signed numbers, solving linear equations and inequalities in one variable, operations on polynomials, factoring, integer exponents, radicals, graphing, and applications. This course does not satisfy the college level mathematics requirements. Prerequisite: Non-demonstration of readiness through placement testing or alternate methods or referral determine admission.

Course Competencies:

Competency 1: The student will demonstrate knowledge of place value by:

1. Identifying place value
2. Writing numbers using word, standard, and expanded notation
3. Rounding whole numbers

Competency 2: The student will demonstrate knowledge of whole numbers by:

1. Performing operations with addition, subtraction, multiplication, and division with whole numbers
2. Solving applications involving operations with whole numbers, including area and perimeter
3. Performing order of operations, including absolute value
4. Evaluating exponents with whole numbers
5. Classifying sets of numbers
6. Comparing the magnitude of real numbers
7. Identifying and applying the properties of real numbers

Competency 3: The student will demonstrate knowledge of integers by:

1. Performing operations with integers, including applications
2. Evaluating exponents with integers
3. Evaluating absolute value expressions

Competency 4: The student will demonstrate knowledge of fractions by:

1. Performing operations with addition, subtraction, multiplication, and division with fractions
2. Distinguishing between proper fractions, improper fractions, and mixed numerals
3. Performing operations with addition, subtraction, multiplication, and division with mixed numerals
4. Solving applications involving operations with fractions

Competency 5: The student will demonstrate e knowledge of decimals by:

1. Performing operations with addition, subtraction, multiplication, and division with decimals
2. Rounding decimals
3. Solving applications involving operations with decimals

Competency 6: The student will demonstrate knowledge of percent by:

1. Using percent notation, fractional notation, and decimal notation interchangeably
2. Solving applications involving percentages

Competency 7: The student will demonstrate knowledge of basic geometric figures by:

1. Solving application problems including finding the polygons' perimeter and the circles' circumference
2. Finding the area of a triangle, parallelogram, and circle
3. Converting units of measurement within the same measurement system

Competency 8: The student will demonstrate knowledge of Pre-Algebra by:

1. Setting up and solving ratios and proportions with simple algebraic expressions
2. Solving linear equations involving the addition and multiplication properties of equality
3. Defining variables and writing an expression to represent a quantity in a problem

4. Combining like terms in one variable (e.g., 2x + 5x)
5. Evaluating algebraic expressions (e.g., find the value of 3x when x =2)
6. Solving formulas with given values
7. Graphing an inequality on a number line

Competency 9: The student will demonstrate knowledge of signed numbers by:
1. Performing addition, subtraction, multiplication, and division operations with signed numbers
2. Applying the order of operations rule
3. Comparing signed numbers using <, >, ≥, ≤, ≠, or=
4. Determining the absolute values of signed numbers

Competency 10: The student will demonstrate knowledge of equations by:
1. Solving linear equations in one variable
2. Solving linear equations involving fractions and decimals
3. Solving literal equations for a given variable with applications
4. Solving applications involving linear equations in one variable (including number problems, geometry problems, and proportion problems)

Competency 11: The student will demonstrate knowledge of linear inequalities by:
1. Solving linear inequalities in one variable
2. Graphing solutions of linear inequalities on a number line

Competency 12: The student will demonstrate knowledge of algebraic expressions by:
1. Evaluating expressions, given specific values of the variable
2. Identifying and combining like terms
3. Simplifying expressions by applying the order of operations
4. Solve application problems involving geometry, including perimeter and area with algebraic expressions

Competency 13: The student will demonstrate knowledge of polynomials by:
1. Performing operations with addition, subtraction, multiplication, and division with polynomials
2. Applying the rules of exponents to perform operations with polynomials
3. Converting numbers to scientific notation and changing from scientific notation to decimal form

Competency 14: The student will demonstrate knowledge of factoring by:
1. Factoring out the most significant common factor
2. Factoring by grouping
3. Factoring trinomials
4. Factoring the difference between two squares
5. Solving quadratic equations in one variable by factoring

Competency 15: The student will demonstrate knowledge of linear equations in two variables by:
1. Graphing linear equations in two variables
2. Determining the slope of a line (from slope formula, graph, and equations)
3. Determining the x-and y-intercepts of a line given the graph of the line or its equation

Competency 16: The student will demonstrate knowledge of rational expressions by:
1. Simplifying a rational expression by factoring
2. Solving problems involving rates and ratios
3. Simplify, multiply, and divide rational expressions
4. Add and subtract rational expressions with monomial denominators
5. Converting units of measurement across measurement systems

Competency 17: The student will demonstrate knowledge of radical expressions by:
1. Simplifying radical expressions using the product rule
2. Adding, subtracting, and multiplying radicals

3. Rationalizing the denominator (monomials only)
4. Solving application problems involving geometry (Pythagorean Theorem)

Learning Outcomes:

- Communicate effectively using listening, speaking, reading, and writing skills
- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information
- Demonstrate knowledge of ethical thinking and its application to issues in society