

Course Description**MAT1033 | Intermediate Algebra | 3.00 credits**

The student will learn the concepts of linear equations, quadratic equations, rational equations, radical equations, rational expressions and equations, complex numbers, graphing linear equations and inequalities in one and two variables, and related applications. Prerequisites: MAT0022C, or MAT0028, or MAT0057 or by placement score, or eligible exemption.

Course Competencies:

Competency 1: The student will demonstrate knowledge of the slope of a line by:

1. Determining a line's slope and intercept(s) given its equation
2. Determining the slope of a line from its graph
3. Determining the slope of a line given two points from the line
4. Computing the slope of a primary line parallel to a given secondary line
5. Computing the slope of a primary line perpendicular to a given secondary line

Competency 2: The student will demonstrate knowledge of linear equations and inequalities in two variables by:

1. Finding the equation of a line given a point and slope from its graph
2. Finding the equations of a line given two points from its graph
3. Expressing the equations of a line in standard form
4. Expressing the equations of a line in slope-intercept form
5. Solving real world applications involving linear equations
6. Graphing linear equations in two variables using the slope and y-intercept
7. Graphing the solution of linear inequalities in two variables
8. Solving real world applications involving linear equations and linear inequalities

Competency 3: The student will demonstrate knowledge of systems of equations and inequalities in two variables by:

1. Solving systems of equations in two variables using the Addition Method (also known as the Elimination Method)
2. Solving systems of equations in two variables using the Substitution Method
3. Solving systems of equations and inequalities in two variables by graphing
4. Solving applications involving systems of linear equations in two variables

Competency 4: The student will demonstrate knowledge of rational expressions and equations by:

1. Simplifying rational expressions by factoring
2. Performing operations on rational expressions (addition, subtraction, multiplication and division)
3. Dividing polynomials using long and synthetic division
4. Solving equations involving rational expressions
5. Simplifying complex fractions
6. Solving literal equations
7. Solving equations involving proportions
8. Solving direct variation problems
9. Solving indirect (inverse) variation problems
10. Solving real-world applications involving variation equations

Competency 5: The student will demonstrate knowledge of radical expressions and rational exponents by:

1. Evaluating radical expressions with numerical and variable radicands
2. Simplifying expressions containing rational exponents
3. Performing operations on radical expressions
4. Rationalizing numerators and denominators
5. Solving radical equations
6. Solving real-world applications involving radical expressions

Competency 6: The student will demonstrate knowledge of complex numbers by:

1. Simplifying radicals with negative radicands by using the definition of i
2. Simplifying powers of i

Competency 7: The student will demonstrate knowledge of quadratic equations by:

1. Solving quadratic equations using the Square Root Method
2. Solving quadratic equations by Factoring
3. Solving quadratic equations by Completing the Square
4. Solving quadratic equations using the Quadratic Formula

Competency 8: 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 binomials that include difference of squares, sum of cubes, and difference of cubes

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
- Create strategies that can be used to fulfill personal, civic, and social responsibilities