



Official Course Outline
MAT 1033C
Intermediate Algebra

General Course Information

Common Course Number: MAT1033C

Course Title: Intermediate Algebra

Contact Hour Breakdown: CR 3.0 CLASS LAB

Discipline: Mathematics

Catalog Description: Prerequisite: Minimum grade of C in MAT 0020C or MAT 0024C or appropriate score on an approved assessment. This course presents algebraic skills for MAC 1105. Topics include linear equations and inequalities in two variables and their graphs, systems of linear equations and inequalities, introductions to functions, factoring, algebraic functions, rational equations, radical and rational exponents, complex numbers, quadratic equations, scientific notation, applications of the above topics and the communication of mathematics.

Major Topics/ Concepts/ Skills/ Issues

- Factoring
- Algebraic Fractions
- Radicals and Rational Exponents
- Complex Numbers
- Quadratic Equations
- Rational Equations
- Linear Equations and Inequalities in Two Variables and Their Graphs
- Systems of Linear Equations and Inequalities
- Introduction to Functions
- Applications of the Above Topics

Major Learning Outcomes with Evidence, Core Competencies and Indicators

Learning Outcome 1:

The student will be able to understand the properties of exponents, and work with real life applications such as scientific notation, and formulas like compound interest.

Corresponding Evidence of Learning

- Apply rules of exponents to simplify an exponential expression.
- Apply exponents to real life situations, such as scientific notation and compound interest problems, and state the solutions in the context of the problem.

Core Competency: Act

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • implement effective problem-solving, decision-making, and goal-setting strategies 	<ul style="list-style-type: none"> • Practice 	

Core Competency: Think		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> analyze data, ideas, patterns, principles, perspectives 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
<ul style="list-style-type: none"> employ the facts, formulas, procedures of the discipline 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
Core Competency: Communicate		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> Instruct 	

Learning Outcome 2:

The student will recognize the mathematical function concept and describe relationships between variables in real world situations. The student will also be able to use functions expressed verbally, numerically, graphically, and symbolically.

Corresponding Evidence of Learning

- Determine if a relation is a function using different representations.
- Evaluate and solve a function expressed verbally, numerically, and graphically.
- Determine the domain and range of a given function including any restrictions.
- Recognize various families of functions including linear, quadratic, polynomial, rational, and radical.

Core Competency: Think

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> analyze data, ideas, patterns, principles, perspectives 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
<ul style="list-style-type: none"> employ the facts, formulas, procedures of the discipline 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
<ul style="list-style-type: none"> draw well-supported conclusions 	<ul style="list-style-type: none"> Practice 	

Core Competency: Communicate

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> Instruct 	

Core Competency: Act

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> apply disciplinary knowledge, skills, and values to educational and career goals 	<ul style="list-style-type: none"> Practice 	

Learning Outcome 3:

The student will be able to recognize, model, and analyze linear equations in the real world.

Corresponding Evidence of Learning

- Solve a linear equation symbolically, graphically, and numerically.
- Determine the slope of a line under various conditions and use slopes to determine relationships between pairs of lines i.e. parallel, perpendicular, or neither.
- Determine the slope intercept form of a linear equation given various data such as: slope and y-intercept, a coordinate and slope, 2 coordinates, a coordinate and another linear equation that is parallel or perpendicular to the desired linear equation, and a graph.
- Solve a formula for a specified variable.
- Construct and apply linear equations to real world situations, develop solutions to those situations, and interpret the solution in the context of the problem.

Core Competency: Act

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> implement effective problem-solving, decision-making, and goal-setting strategies 	<ul style="list-style-type: none"> Practice 	

Core Competency: Think

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> analyze data, ideas, patterns, principles, perspectives 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
<ul style="list-style-type: none"> draw well-supported conclusions 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz

Core Competency: Communicate

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> Instruct 	

Learning Outcome 4:

The student will be able to recognize, model, and analyze linear inequalities in real world situations.

Corresponding Evidence of Learning

- Solve a linear inequality symbolically, graphically, and numerically.
- Express the solution of a linear inequality symbolically, graphically, and interval notation.
- Construct and apply linear inequalities to real world situations, develop solutions to those situations, and interpret the solution in the context of the problem.
- Graphically solve a system of linear inequalities.

Core Competency: Act

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • implement effective problem-solving, decision-making, and goal-setting strategies 	<ul style="list-style-type: none"> • Practice 	

Core Competency: Think

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • analyze data, ideas, patterns, principles, perspectives 	<ul style="list-style-type: none"> • Assess 	<ul style="list-style-type: none"> • Knowledge recall quiz • Locally developed exam - objective • Locally developed multiple choice exam • Problem-solving quiz
<ul style="list-style-type: none"> • employ the facts, formulas, procedures of the discipline 	<ul style="list-style-type: none"> • Assess 	<ul style="list-style-type: none"> • Knowledge recall quiz • Locally developed exam - objective • Locally developed multiple choice exam • Problem-solving quiz

Core Competency: Communicate

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> • Instruct 	

Learning Outcome 5:

The student will be able to recognize, model, and analyze systems of linear equations in real world situations.

Corresponding Evidence of Learning

- Solve a system of linear equations graphically, numerically, and through symbolic methods including substitution and elimination.
- Recognize inconsistent and dependent system of equations.
- Construct and apply systems of linear equations to real world situations, develop solutions to those situations, and interpret the solution in the context of the problem.

Core Competency: Think

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • employ the facts, formulas, procedures of the discipline 	<ul style="list-style-type: none"> • Assess 	<ul style="list-style-type: none"> • Knowledge recall quiz • Locally developed exam - objective • Locally developed multiple choice exam • Problem-solving quiz

<ul style="list-style-type: none"> draw well-supported conclusions 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
Core Competency: Communicate		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> Instruct 	
Core Competency: Act		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> apply disciplinary knowledge, skills, and values to educational and career goals 	<ul style="list-style-type: none"> Practice 	

Learning Outcome 6:

The student will be able to recognize and analyze polynomials in real world situations.		
Corresponding Evidence of Learning		
<ul style="list-style-type: none"> Identify the various features of a polynomial such as its type and degree. Perform all arithmetic operations on polynomials. Solve a polynomial equation symbolically (using factoring), graphically, and numerically. Apply polynomials to real world situations, develop solutions to those situations, and interpret the solution(s) in the context of the problem. 		
Core Competency: Act		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> implement effective problem-solving, decision-making, and goal-setting strategies 	<ul style="list-style-type: none"> Practice 	
Core Competency: Think		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> analyze data, ideas, patterns, principles, perspectives 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
<ul style="list-style-type: none"> employ the facts, formulas, procedures of the discipline 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
Core Competency: Communicate		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> Instruct 	

Learning Outcome 7:**The student will be able to recognize, model, and analyze rational expressions in real world situations****Corresponding Evidence of Learning**

- Perform all arithmetic operations on rational expressions.
- Recognize and determine vertical asymptotes of rational expressions.
- Solve an equation containing rational expressions symbolically, graphically, and numerically while excluding any extraneous solutions.
- Construct and apply equations containing rational expressions to real world situations, develop solutions to those situations, and interpret the solution in the context of the problem.

Core Competency: Think

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • employ the facts, formulas, procedures of the discipline 	<ul style="list-style-type: none"> • Assess 	<ul style="list-style-type: none"> • Knowledge recall quiz • Locally developed exam - objective • Locally developed multiple choice exam • Problem-solving quiz

Core Competency: Act

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • implement effective problem-solving, decision-making, and goal-setting strategies 	<ul style="list-style-type: none"> • Practice 	

Core Competency: Communicate

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> • Instruct 	

Core Competency: Think

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> • analyze data, ideas, patterns, principles, perspectives 	<ul style="list-style-type: none"> • Assess 	<ul style="list-style-type: none"> • Knowledge recall quiz • Locally developed exam/objective • Locally developed multiple choice exam • Problem-solving quiz

Learning Outcome 8:**The student will be able to recognize and analyze radical expressions in real world situations****Corresponding Evidence of Learning**

- Simplify radical expressions of various indices and perform any arithmetic operations involving radicals.
- Apply rules of exponents to simplify a radical expression.
- Apply to real life situation and state the solution in the context of the problem.
- Recognize, interpret, and perform all arithmetic operations on complex numbers, including problems that result in complex number solutions.

Core Competency: Think		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> employ the facts, formulas, procedures of the discipline 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
<ul style="list-style-type: none"> draw well-supported conclusions 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
Core Competency: Communicate		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> Instruct 	
Core Competency: Act		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> apply disciplinary knowledge, skills, and values to educational and career goals 	<ul style="list-style-type: none"> Practice 	

Learning Outcome 9:

The student will be able to recognize, model, and analyze quadratics in real world situations		
Corresponding Evidence of Learning		
<ul style="list-style-type: none"> Solve quadratic equations symbolically (using factoring, property of roots, and quadratic formula), graphically, and numerically. Determine the concavity, vertex, axis of symmetry, x and y-intercepts (if they exist), and use this information to produce a graph of a quadratic. Apply to real life situation and state the solution in the context of the problem. 		
Core Competency: Think		
Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> employ the facts, formulas, procedures of the discipline 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
<ul style="list-style-type: none"> analyze data, ideas, patterns, principles, perspectives 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
Core Competency: Communicate		
Indicators	Level of Integration	Method of Assessment

<ul style="list-style-type: none"> Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> Instruct 	
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Learning Outcome 10:

The student will be able to use the graphing calculator to enhance and visualize mathematical concepts.

Corresponding Evidence of Learning

- Perform all arithmetic operations using the graphing calculator.
- Graph any given function or equation using an appropriate window.
- Generate a table of a given function or equation.
- Demonstrate knowledge of a variety of graphing utility features.

Core Competency: Think

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> Reinforce and enhance course materials by introducing technology 	<ul style="list-style-type: none"> Assess 	<ul style="list-style-type: none"> Knowledge recall quiz Locally developed exam - objective Locally developed multiple choice exam Problem-solving quiz
<ul style="list-style-type: none"> Reinforce and enhance course materials by introducing technology 	<ul style="list-style-type: none"> Practice 	

Core Competency: Communicate

Indicators	Level of Integration	Method of Assessment
<ul style="list-style-type: none"> Communicates within the subject matter effectively and correctly 	<ul style="list-style-type: none"> Instruct 	

Shared Assessment(s) in this Course

- Knowledge recall quiz
- Locally developed multiple choice exam
- Locally developed exam - objective
- Problem-solving quiz

Office of the Vice President for Academic Affairs & Chief Learning Office
Valencia Community College
Orlando, Florida
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