Fall 2018 **Elementary Algebra (MAT 095)** **YR**

Text: *Elementary and Intermediate Algebra*, 5th ed. by Baratto & Bergman. You may choose to either use an electronic version of the text of a print copy of the text (ISBN 0073384461)

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Course Description: This Elementary Algebra developmental course prepares **YOU** for college level courses. Designed to build understanding and skills in algebra, it also provides embedded pre-algebra support. The course develops understanding of number system, different representations of numbers, operations on numbers, including numbers expressed in scientific notation. The course introduces functions, their graphs, and modeling relationships between quantities using functions. Topics also include solving equations and manipulating expressions with integer exponents, radicals, solving, analyzing and modeling linear equations, systems of linear equations. Pythagorean Theorem and geometric formulas are used to solve real world problems.

Required Materials:

* Elementary and Intermediate Algebra, 5th ed.
* Access Kit for ALEKS software
* Notebook with at least 3 sections or binder
* Pencils and Calculator

Course Content:

Chapter 0. Prealgebra Review
- 0.1 A Review of Fractions
- 0.2 Real Numbers
- 0.3 Adding and Subtracting
- 0.4 Multiplying and Dividing
- 0.5 Exponents and the Order of Operations

Chapter 1. From Arithmetic to Algebra
- 1.1 Transition to Algebra
- 1.2 Evaluating Algebraic Expressions
- 1.3 Simplifying Algebraic Expressions
- 1.4 Solving Equations with the Addition Property
- 1.5 Solving Equations with the Multiplication Property
- 1.6 Combining the Rules to Solve Equations
- 1.7 Linear Inequalities

Chapter 2. Functions and Graphs
- 2.1 Formulas and Problem Solving
- 2.2 Sets and Set Notation
- 2.3 Two-Variable Equations
- 2.4 The Cartesian Coordinate System
- 2.5 Relations and Functions
- 2.6 Tables and Graphs

Chapter 3. Graphing Linear Functions
- 3.1 Graphing Linear Functions
- 3.2 The Slope of a Line
- 3.3 Linear Equations

Chapter 4. Systems of Linear Equations
- 4.1 Graphing Systems of Linear Equations
- 4.3 Systems of Equations in Two Variables

Chapter 5. Exponents and Polynomials
- 5.1 Positive Integer Exponents
- 5.2 Integer Exponents and Scientific Notation
- 5.3 An Introduction to Polynomials
- 5.4 Adding and Subtracting Polynomials
- 5.5 Multiplying Polynomials
- 5.6 Dividing Polynomials (Objective 1 only)

Chapter 7. Radicals and Exponents
- 7.1 Roots and Radicals (Objectives 1, 2, 4)

Measurements:

HW(collected and graded for completion) – 10%,
Quizzes –30%,
2 tests, each test – 15%,
Final Exam – 30%.

Grade equivalents: A 93 – 100, A- 90 – 93, B+ 87 -89, B 83 – 86, B- 80 – 82,C+ 77 – 79, C 73 – 76, C- 70 – 72, D+ 67 – 69. D 63 – 66. D- 60 – 62, below 60? **F** for **F**rowning **F**ace

Course Objectives:

After the successful completion of the course the student must be able to:

1. Rational Numbers – At the end of this course, a student should be able to

a) Identify and distinguish between rational and irrational numbers
b) Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2, $\sqrt{8}$)

2. Expressions and Equations with Polynomials, Rational and Radical Expressions, and Integer Exponents – At the end of this course, a student should be able to

a) Interpret parts of an expression, such as terms, factors, and coefficients and evaluate expressions for a given replacement value(s)
b) Add, subtract, and multiply polynomials. Divide polynomials by a monomial
c) Construct and interpret equations as two expressions set equal to each other
d) Manipulate formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's Law $V = IR$ to highlight resistance R
e) Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$)
f) Use square root symbols to represent solutions to equations of the form $x^2 = p$, where p is a positive rational number
g) Evaluate square roots of perfect squares
h) Know that numbers such as $\sqrt{2}$ are irrational
i) Express very large or very small quantities in scientific notation
j) Perform operations with numbers expressed in scientific notation

3. Linear Equations in One Variable – At the end of this course, a student should be able to

a) Solve linear equations and inequalities in one variable
b) Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms
c) Create linear equations and inequalities in one variable and use them to solve real world applications
d) Recognize examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions

4. Linear Equations in Two Variables – At the end of this course, a student should be

able to

a) Interpret the rate and unit rate as the slope of the graph
b) Derive the equation $y = mx + b$ for a line intercepting the vertical axis at b *and having a slope of* m
c) Identify parallel and perpendicular lines based on their slopes
d) Graph a linear equation in two variables
e) Construct a linear equation to model a linear relationship between two quantities. Determine and interpret the rate of change and initial value from a description of a relationship or from two (x, y) values, including reading these from a table or graph
f) Construct linear equations given a graph, a description of a relationship, or two input-output pairs (include reading these from a table) using point-slope form and slope-intercept form

5. Systems of Linear Equations – At the end of this course, a student should be able to

a) Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs
b) Solve systems of two linear equations in two variables algebraically (using both substitution and addition methods), graphically (by hand and/or technology), Solve simple cases by inspection. *For example,* $3x + 2y = 5$ *and* $3x + 2y = 6$ *have no solution because* $3x + 2y$ *cannot simultaneously be* 5 *and* 6
c) Recognize systems of linear equations with one solution, infinitely many solutions, or no solutions
d) Solve real-world problems leading to two linear equations in two variables

6. Functions – At the end of this course, a student should be able to

a) Understand that a function is a rule that assigns to each input exactly one output and that the graph of a function is the set of ordered pairs consisting of an input and the corresponding output
b) Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line
c) Use functions to model linear relationships between quantities
d) Use function notation. Evaluate functions for inputs in their domains
e) Graph linear functions and show intercepts
f) Recognize that linear functions have a constant rate of change and interpret the rate of change in the context of the problem

7. Applications – At the end of this course, a student should be able to

a) Apply geometric formulas for two and three-dimensional figures such as rectangles, circles, rectangular solids, cylinders, spheres, etc.
b) Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two dimensions

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Disabilities : If you have a disability that may affect your progress in this course, please meet with a Disability Service Provider (DSP) as soon as possible. Please note that accommodations cannot be provided until you provide written authorization from a DSP.

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Matt Liscum, Counselor (860) 215-9265 Room A113	• Learning Disabilities • ADD/ADHD • Autism Spectrum

Have fun in learning!