MAT 095 - 12067 Elementary Algebra 3 Credits
Three Rivers Community College Spring 2014

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COURSE DESCRIPTION
This course extends the basic algebra skills acquired in MATH 075. The topics include: signed numbers, solving first-degree equations, exponents, polynomials, factoring, graphing, systems of linear equations, inequalities, radicals and scientific notation. (This course does not count towards the minimum requirements for graduation.

PREREQUISITE
Acceptable placement score or Math 075 with a "C" grade or better.

The prerequisite for Intermediate Algebra (Math 137) is a "C" grade or better in Math 095 which translates to at least a 75 average.

TEXTBOOK
Elementary & Intermediate Algebra: Graphs & Models 4th edition – Bittinger, Ellenbogen, Johnson

MAT095 Course Outcomes

1. Rational Numbers:

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:

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:

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:

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:

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:

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:

a) Apply geometrical 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

Mathematical Practices

1) Make sense of problems and persevere in solving them.
2) Reason abstractly and quantitatively.
3) Construct viable arguments and critique the reasoning of others.
4) Model with mathematics.
5) Use appropriate tools strategically.
6) Attend to precision.
7) Look for and make use of structure.
   Look for and express regularity in repeated reasoning

Sections Covered

1.1: Introduction to Algebra
1.8: Exponential Notation and Order of Operations
2.1: Solving Equations
2.2: Using the Principles Together
2.3: Formulas
2.4: Applications with Percent
2.5: Problem Solving
2.6: Solving Inequalities
2.7: Solving Applications with Inequalities
Exam 1
3.1: Reading Graphs, Plotting Points, and Scaling Graphs
3.2: Graphing Equations
3.3: Linear Equations and Intercepts
3.4: Rates
3.5: Slope
3.6: Slope-Intercept Form
3.7: Point-Slope Form
3.8: Functions
Exam 2
4.1: Systems of Equations and Graphing
4.2: Systems of Equations and Substitution
4.3: Systems of Equations and Elimination
4.4: More Applications Using Systems
4.5: Solving Equations by Graphing
5.1: Exponents and Their Properties
5.2: Negative Exponents and Scientific Notation
5.3: Polynomials and Polynomial Functions
Exam 3
5.4: Addition and Subtraction of Polynomials
5.5: Multiplication of Polynomials
5.6: Special Products
5.8: Division of Polynomials
Cumulative Final Exam

Attendance/Homework/Requirements

It is strongly suggested that students make every effort to attend ALL classes. Homework will be assigned on a daily basis (for practice only – not graded). You also have the option of using My Math Lab (www.mymathlab.com). The code is **bergwell20505**. We will discuss this more in class. Students are **NOT** allowed to use a calculator on exams, so practicing homework without one is recommended.

Methods of Evaluation/Make-ups

Exams will be announced at least one week in advance. You will also have quizzes that will typically be given at the end of Wednesday classes (no book, notes). There are no quiz make-ups, however I will drop your lowest two quiz scores. You can do the odd homework problems in the textbook or the problems on mymathlab.com for practice (not graded).

Grades

Exams – 60%
Quizzes – 20%
Final Exam – 20%

CLASS AVERAGE	FINAL GRADE
90 -100	A- / A
80 - 89	B- / B+
70 - 79	C- / C+
60 - 69	D- / D+
Below 60	F

Statement on Disabilities

If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact the Disabilities Counseling Service at 383-5240. To avoid any delay in the receipt of accommodations, you should contact the counselor as soon as possible. Please note that I cannot provide accommodations based upon disability until I have received an accommodation letter from the Disabilities Counselor. Your cooperation is appreciated.

Class Cancellation

The Three Rivers web site provides a full listing of radio and television stations that alert students to school closings and delays. Go to: www.trcc.commnet.edu and click on General Information and Weather Procedures.