

COURSE OUTLINE

Mathematics 145 Elementary Algebra I

Catalog Statement

MATH 145 is designed to cover the fundamental operations of algebra normally included in the first semester of a year course taught in secondary school, and includes signed numbers, solutions to linear equations, algebraic manipulations, exponents, polynomials, graphing linear equations, and solving linear systems. This course is designed for students who have studied algebra for less than one year or have not studied algebra recently.

Total Lecture Units: 1.0

Total Laboratory Units: 1.0

Total Course Units: 2.0

Total Lecture Hours: 16.0

Total Laboratory Hours: 48.0

Total Laboratory Hours To Be Arranged: 0.0

Total Faculty Contact Hours: 64.0

Prerequisite: Placement is based on a composite of test scores and academic background or satisfactory completion of MATH155 or MATH 255D.

Note: This course may not be taken for credit by students who have completed MATH 141, 144, or 245B. A maximum of 2 units of credit will be granted for MATH 145, and 245A and 245B.

Course Entry Expectations

Prior to enrolling in the course, the student should be able to:

- add, subtract, multiply, and divide whole numbers;
- add, subtract, multiply, and divide fractions;
- convert fractions to decimals;
- add, subtract, multiply, and divide decimals;
- convert decimals to percents;
- convert fractions to percents;
- find a percent of a number and what percent one number is of another;
- add, subtract, multiply, and divide signed numbers;
- use the correct order of operation;
- use a calculator to perform arithmetic operations;
- evaluate expressions;
- add and subtract expressions;
- find area and perimeter of squares, rectangles, triangles, and circles;
- solve equations using the addition property of equality;
- solve equations using the multiplication property of equality;

- solve first degree applications.

Course Exit Standards

Upon successful completion of the coursework, the student will be able to:

- add, subtract, multiply and divide real numbers;
- solve linear equations and inequalities;
- solve absolute value equations and inequalities;
- simplify exponential expressions;
- add, subtract, multiply and divide polynomials;
- graph linear equations and inequalities;
- find the equation of the line passing through 2 points;
- solve linear systems using 3 different methods;
- use algebra to solve applied problems;
- use function notation.

Course Content

Total Faculty Contact Hours = 64.0

Review of Real Numbers (2 lecture hours, 6 lab hours)

Notation and symbols
Adding and subtracting real numbers
Properties of real numbers
Multiplying and dividing real numbers
Subsets of the real numbers
Addition and subtraction with fractions

Linear Equations and Inequalities (4 lecture hours, 12 lab hours)

Simplifying expressions
Addition property of equality
Multiplication property of equality
Solving linear equations
Formulas
Applications
Linear and compound inequalities
Absolute value equations and inequalities

Linear Equations and Inequalities in Two Variables (3 lecture hours, 9 lab hours)

Graphing ordered pairs
Solutions to linear equations in two variables
Graphing linear equations in two variables
Graphing using intercepts
The slope of a line
Finding the equation of a line
Linear inequalities in two variables

Systems of Linear Equations (3 lecture hours, 10 lab hours)

Solving systems of equations by graphing
Solving systems of equations by elimination
Solving systems of equations by substitution

Applications of systems of equations
Solving systems of three equations in three variables
Exponents and Polynomials (**4 lecture hours, 11 lab hours**)
Multiplication with exponents
Division with exponents
Operations with monomials
Addition and subtractions of polynomials
Multiplication with polynomials
Binomial squares and other special products
Dividing polynomials
Functions and function notation

Methods of Instruction

The following methods of instruction may be used in the course:

- classroom lecture and discussion;
- group work and discussion;
- online video lectures.

Out of Class Assignments

The following out of class assignments may be used in this course:

- homework (e.g. problem sets related to course content);
- reading assignments (e.g. study skills related to mathematics).

Methods of Evaluation

The following methods of evaluation may be used in this course:

- quizzes;
- four to seven chapter exams are required;
- a comprehensive final exam is required.

Textbooks

Tussy, Alan, and R. David Gustafson. *Elementary Algebra*: Glendale Community College. 5th ed. Boston: Cengage Learning, 2016. Print.
8th Grade Textbook Reading Level. ISBN: 978-1-111-56766-8

Student Learning Outcomes

Upon successful completion of the required coursework, the student will be able to:

- simplify polynomial expressions;
- solve linear and absolute value equations and inequalities, and solve systems of equations;
- graph linear functions;

- use mathematical models including linear equations and systems of equations to solve application problems.