

COURSE OUTLINE

Mathematics 146 Elementary Algebra II

Catalog Statement

MATH 146 is a continuation of MATH 145 and completes the topics traditionally covered in the first year of algebra in secondary school. This course covers the fundamental operations of algebra including factoring, rational expressions, roots and radicals, and quadratic equations.

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: Satisfactory completion of MATH 145, MATH 245B or MATH 144.

Note: This course may not be taken for credit by students who have completed MATH 141 or MATH 246B. A maximum of 4 units of credit will be granted for MATH 141, MATH 145, MATH 146, MATH 245A, MATH 245B, MATH 246A and MATH 246B.

Course Entry Expectations

Prior to enrolling in the course, the student should 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 a line;
- solve linear systems;
- use algebra to solve applied problems;
- use function notation.

Course Exit Standards

Upon successful completion of the required 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;
- factor polynomials;
- add, subtract, multiply, and divide algebraic fractions;
- solve rational equations;
- use algebra to solve applied problems;
- use the properties of radicals to simplify radicals;
- add, subtract, multiply, and divide radicals;
- solve radical equations;
- solve quadratic equations by factoring, completing the square, and using the quadratic formula;
- graph quadratic functions and circles;
- use the distance formula to find the distance between two points.

Course Content

Total Faculty Contact Hours = 64.0

Review of Elementary Algebra I (1.5 lecture hours, 4.5 lab hours)

Linear equations and inequalities
Linear equations and inequalities in two variables
Systems of linear equations
Exponents and polynomials

Factoring (3.5 lecture hours, 10.5 lab hours)

The greatest common factor
Factoring by grouping
Factoring trinomials
The difference of two squares
Solving equations by factoring
Applications
Factoring cubes

Rational Expressions (4 lecture hours, 12 lab hours)

Reducing rational expressions to lowest terms
Multiplication and division of rational expressions
Addition and subtraction of rational expressions
Equations involving rational expressions
Applications
Complex fractions
Proportions and variation

Roots and Radicals (3.5 lecture hours, 10.5 lab hours)

Definitions and common roots
Properties of radicals
Simplified form for radicals

Addition and subtraction of radical expressions
Multiplication and division of radicals
Equations involving radicals
More Quadratic Equations (**3.5 lecture hours, 10.5 lab hours**)
Solving using the square root method
Solving by completing the square
The quadratic formula
Complex numbers
Complex solutions to quadratic equations
Graphing parabolas
Distance formula and graphing circles

Methods of Instruction

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

- lecture/discussion;
- group work/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);
- group assignments and projects (e.g. group project to solve “challenging” problems).

Methods of Evaluation

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

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

Textbook

Tussy, Alan, and R. David Gustafson. *Elementary Algebra*: Glendale Community College. 5th ed. Mason: Cengage, 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 various algebraic expressions (rational, radical);
- solve equations and inequalities (rational, radical, quadratic);
- graph various functions and relations (quadratic, circles);
- use mathematical models to solve application problems (quadratic, rational, radical);
- factor polynomials.