COURSE OUTLINE

Mathematics 119
Intermediate Algebra I for STEM

Catalog Statement

MATH 119 is the first course of a two-semester sequence of Intermediate Algebra. Topics include: fundamental laws, curve plotting, linear equations, fractional exponents, radical and rational expressions and equations, factoring, functions, Cramer's rule, algebra of functions, graphs of functions, and systems of linear equations and inequalities. This course is equivalent to the first part of MATH 101.

Total Lecture Units: 2.0
Total Laboratory Units: 1.0
Total Course Units: 3.0

Total Lecture Hours: 32.0
Total Laboratory Hours: 48.0
        Total Laboratory Hours To Be Arranged: 0.0
Total Faculty Contact Hours: 80.0

Prerequisite: Placement is based on a composite of test scores and academic background or satisfactory completion of MATH 141, MATH 146, or MATH 246B.

Note: This course may not be taken for credit by students who have completed MATH 101, 131, or 219C. A maximum of 3 units will be granted for MATH 119, 219A, 219B, and 219C. A maximum of 5 units will be granted for MATH 119 and MATH 101, 131, 219A, 219B, 219C, 220A, and 220B.

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 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 Exit Standards

Upon successful completion of the coursework, the student will be able to:
- solve absolute value equations and inequalities;
- solve linear equations and compound inequalities;
- graph lines;
- perform operations with polynomials;
- simplify complex fractions;
- perform operations with radical expressions;
- simplify expressions with rational exponents;
- divide synthetically;
- solve rational equations;
- solve equations with radicals;
- find the equation of a line parallel or perpendicular to a given line;
- solve a system of linear equations using elimination, substitution, and Cramer's rule;
- solve systems of linear inequalities;
- find the composition of two functions;
- solve applied problems.

Course Content   Total Faculty Contact Hours = 80.0
The Real Number System (**2 lecture hours, 2 lab hours**)
    Sets and the real number system
    Equality and properties of real numbers
    Inequalities and graphs of sets of real numbers
    Arithmetic of real numbers
Equations and Inequalities (**5 lecture hours, 9 lab hours**)
    Linear equations and their solutions
    Applications
    Formulas and literal equations
    Absolute value equations
    Linear inequalities
    Inequalities with absolute values
Graphs of Lines, Equations of Lines, and Variation (**5 lecture hours, 7 lab hours**)
    The rectangular coordinate system
    The slope of a line
    Equations of lines

Graphs of linear inequalities in two variables
Introduction to functions
The algebra of functions, composition of functions
Proportion and variation
Systems of Equations and Inequalities **(5 lecture hours, 7 lab hours)**
Solution by graphing
Solution by substitution
Solution by elimination
Solution of three equations in three variables
Determinants
Cramer's Rule
Applications
Systems of linear inequalities
Exponents, Polynomials, and Factoring **(5 lecture hours, 8 lab hours)**
Exponents and scientific notation
Adding and subtracting polynomials
Multiplying polynomials and dividing polynomials
Synthetic division
The greatest common factor and factoring by grouping
The difference of two squares; the sum and difference of two cubes
Factoring trinomials
Solving equations by factoring
Applications
Rational Expressions **(5 lecture hours, 8 lab hours)**
Simplifying rational expressions
Multiplying and dividing rational expressions
Adding and subtracting rational expressions
Complex fractions
Equations containing rational expressions
Applications
Difference quotients
Rational Exponents and Radicals **(5 lecture hours, 7 lab hours)**
Rational exponents
Radical expressions
Adding and subtracting radical expressions
Multiplying and dividing radical expressions
Solving equations with radicals
Applications of radicals
Complex numbers

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);
- group assignments and projects (e.g. group projects to solve "challenging" problems).

Methods of Evaluation

The following methods of evaluation may be used in this course:
- quizzes;
- five to eight exams are required;
- a comprehensive final exam is required.

Textbook

Tussy, Alan, and R. David Gustafson. *Intermediate Algebra:* Glendale Community
College. 5th ed. Boston: Cengage Learning, 2016. Print.
8th Grade Textbook Reading Level. ISBN: 978-1-111-56767-5

Student Learning Outcomes

Upon successful completion of the required coursework, the student will be able to:
- solve equations and inequalities (linear, absolute value, rational, radical, systems);
- simplify algebraic expressions (exponential, polynomial, rational, radical);
- graph functions (linear, rational, radical);
- use mathematical models to solve application problems (linear, rational, systems).