ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: Natural Sciences and Business

COURSE: MTH 0103 College Algebra Supplement

Date: Spring 2022

Credit Hours: 2

Complete all that apply or mark "None" where appropriate:

Prerequisite(s): None

Enrollment by assessment or other measure? ☒ Yes ☐ No
If yes, please describe: Appropriate score on the Accuplacer.

Corequisite(s): Must be taken concurrently with MTH 1003

Pre- or Corequiste(s): None

Consent of Instructor: ☒ Yes ☐ No

Delivery Method:

☒ **Lecture**	**2 Contact Hours**	**(1 contact = 1 credit hour)**
☐ **Seminar**	**0 Contact Hours**	**(1 contact = 1 credit hour)**
☐ **Lab**	**0 Contact Hours**	**(2-3 contact = 1 credit hour)**
☐ **Clinical**	**0 Contact Hours**	**(3 contact = 1 credit hour)**
☐ **Online**		
☐ **Blended**		
☐ **Virtual Class Meeting (VCM)**		

Offered: ☒ **Fall** ☒ **Spring** ☐ **Summer**

CATALOG DESCRIPTION and IAI NUMBER (if applicable):
This course covers pre-requisite skills necessary to be successful in MTH 1003 College Algebra and is taught concurrently with MTH 1003. The course integrates mathematical content with instruction in the study/critical thinking skills necessary for successful completion of MTH 1003 College Algebra. Emphasis will be placed on work with systems of linear equations in 2 & 3 variables, absolute value equations/inequalities, polynomials, factoring, functions, rational expressions/equations, exponents, radicals,

and quadratic equations. Additional topics to be addressed include time management, note-taking, study skills, math anxiety, test prep/test-taking/test analysis, problem-solving, personal responsibility, self-motivation, and self-management. The grade in this course is not computed in G.P.A. or applicable to any degree or certificate program for graduation.

ACCREDITATION STATEMENTS AND COURSE NOTES:
None

COURSE TOPICS AND CONTENT REQUIREMENTS:

I. Systems of equations
   a. Solve by graphing
   b. Solve by addition
   c. Solve by substitution
II. Relations & functions
   a. Relations
   b. Functions
   c. Evaluate
   d. Graphing
III. Absolute Value equations/inequalities
   a. Absolute value equations
   b. Absolute value inequalities
   c. Graph inequalities in 2 variables
IV. Exponents & polynomials
   a. Add & subtract polynomials
   b. Multiply polynomials
   c. Divide polynomials
   d. Zero exponent
   e. Negative exponents
   f. Product & quotient rules for exponents
   g. Power rule for exponents
V. Factoring polynomials
   a. Greatest common factor
   b. Factor by grouping
   c. Trinomials
   d. Special products
   e. Multi-step factoring
   f. Solve equations by factoring
VI. Rational expressions/equations
   a. Simplifying rational expressions
   b. Multiply & divide rational expressions
   c. Add and subtract rational expressions
   d. Solve equations containing rational expressions
VII. Roots & radicals
   a. Rational exponents
   b. Simplify radicals

c. Solve radical equations
d. Complex numbers

VIII. Quadratic equations & functions
a. Square root method
b. Quadratic formula
c. Graphing quadratics

IX. Success Strategies
a. Personal responsibility
b. Self-motivation
c. Self-management
d. Time management
e. Note-taking
f. Study skills
g. Test-taking strategies
h. Critical thinking/problem solving

INSTRUCTIONAL METHODS:

- Lectures
- Guest speakers
- Small groups/one-on-one discussion
- Class participation & activities

EVALUATION OF STUDENT ACHIEVEMENT:

- Class attendance
- In-class activities
- Discussion boards
- Homework assignments

INSTRUCTIONAL MATERIALS:

Textbooks

*There will be no textbook or online supplement required for purchase by the student. Instructors will pull content from existing physical resources as listed in the reference section or use Open Educational Resources. MTH 0103 instructors will also have access to the College Algebra e-book and corresponding College Algebra assignments in MyMathLab or other such platform in use by the instructor. This access will be provided by the MTH-1003 instructor whose class section is linked to the Supplemental section.

Resources

- Scientific calculator
- Links to course-specific topics

LEARNING OUTCOMES AND GOALS:

Institutional Learning Outcomes

☐ 1) Communication – to communicate effectively;

☒ 2) Inquiry – to apply critical, logical, creative, aesthetic, or quantitative analytical reasoning to formulate a judgement or conclusion;

☐ 3) Social Consciousness – to understand what it means to be a socially conscious person, locally and globally;

☒ 4) Responsibility – to recognize how personal choices affect self and society.

Course Outcomes and Competencies

1. Demonstrate the skills needed to solve systems of equations in 2 and 3 variables.
    1. Solve linear systems by graphing, addition or substitution.
    2. Determine that a linear system has no solution.
    3. Determine if a linear system has an infinite number of solutions.
2. Demonstrate a working knowledge of polynomials.
    1. Add and subtract polynomials.
    2. Multiply two or more polynomials.
    3. Special products.
    4. Divide polynomials.
3. Demonstrate a working knowledge of the rules of exponents.
    1. Evaluate expressions raised to zero power.
    2. Evaluate expressions raised to negative powers.
    3. Use product and quotient rules to evaluate expressions containing exponents.
    4. Use the power rules to evaluate expressions containing exponents.
4. Demonstrate the ability to graph linear equations.
    1. Graph points on a Cartesian coordinate system.
    2. Graph linear equations in two variables.
    3. Determine the slope of a line.
    4. Determine whether two lines are parallel, perpendicular, or neither.
5. Demonstrate the ability to write equations of lines.
    1. Determine the equation of a line given two points on the line.
    2. Determine the equation of a line given the slope and one point on the line.
6. Demonstrate the ability to factor polynomials.
    1. Factor out the greatest common factor from an expression.
    2. Factor by grouping.
    3. Factor the difference of two squares.
    4. Factor the sum or difference of two cubes.
    5. Factor trinomials.
    6. Factor expressions that contain combinations of the above types of factoring.
    7. Solve quadratic equations by factoring.
7. Demonstrate the ability to manipulate rational expressions and solve equations that contain rational expressions.
    1. Identify values for which a rational expression is undefined.
    2. Simplify rational expressions.

3. Add, subtract, multiply and divide rational expressions.
4. Solve equations containing rational expressions.

8. Demonstrate a working knowledge of functions.
    1. Define and identify relation and function.
    2. Identify domain and range.
    3. Evaluate functions.
    4. Write linear functions.
    5. Graph linear functions.
9. Demonstrate the ability to solve absolute value equations and inequalities.
    1. Solve absolute value equations and inequalities.
    2. Graph linear inequalities in two variables.
10. Demonstrate a working knowledge of rational exponents, radicals, and complex numbers.
    1. Find roots.
    2. Use fractional exponents to simplify expressions.
    3. Simplify radicals.
    4. Solve radical equations.
    5. Write complex numbers using i notation.
11. Demonstrate the ability to solve quadratic equations.
    1. Solve quadratic equations by the square root method.
    2. Solve quadratic equations by the quadratic formula.
    3. Graph quadratic equations