



ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: Natural Sciences & Business

COURSE: MTH 0103 College Algebra Supplement

Date: Spring 2021

Credit Hours: 2

Prerequisite(s): Appropriate score on Accuplacer

Delivery Method:

<input checked="" type="checkbox"/> Lecture	2 Contact Hours (1 contact = 1 credit hour)
<input type="checkbox"/> Seminar	0 Contact Hours (1 contact = 1 credit hour)
<input type="checkbox"/> Lab	0 Contact Hours (2-3 contact = 1 credit hour)
<input type="checkbox"/> Clinical	0 Contact Hours (3 contact = 1 credit hour)
<input type="checkbox"/> Online	
<input type="checkbox"/> Blended	

Offered: Fall Spring Summer

IAI Equivalent – **Only for Transfer Courses**–go to <http://www.itransfer.org>:

CATALOG DESCRIPTION:

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.

GENERAL EDUCATION GOALS ADDRESSED

[See last page for Course Competency/Assessment Methods Matrix.]

Upon completion of the course, the student will be able:

[Choose up to three goals that will be formally assessed in this course.]

- To apply analytical and problem-solving skills to personal, social, and professional issues and situations.
- To communicate successfully, both orally and in writing, to a variety of audiences.
- To construct a critical awareness of and appreciation for diversity.
- To understand and use technology effectively and to understand its impact on the individual and society.
- To develop interpersonal capacity.
- To recognize what it means to act ethically and responsibly as an individual and as a member of society.
- To recognize what it means to develop and maintain a healthy lifestyle in terms of mind, body, and spirit.
- To connect learning to life.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

[Outcomes related to course specific goals. See last page for more information.]

Upon completion of the course, the student will be able to:

1. Demonstrate the skills needed to solve systems of equations in 2 and 3 variables.
 - 1.1. Solve linear systems by graphing, addition or substitution.
 - 1.2. Determine that a linear system has no solution.
 - 1.3. Determine if a linear system has an infinite number of solutions.
2. Demonstrate a working knowledge of polynomials.
 - 1.1. Add and subtract polynomials.
 - 1.2. Multiply two or more polynomials.
 - 1.3. Special products.
 - 1.4. Divide polynomials.
3. Demonstrate a working knowledge of the rules of exponents.
 - 3.1 Evaluate expressions raised to zero power.
 - 3.2 Evaluate expressions raised to negative powers.
 - 3.3 Use product and quotient rules to evaluate expressions containing exponents.
 - 3.4 Use the power rules to evaluate expressions containing exponents.
4. Demonstrate the ability to graph linear equations.
 - 4.1 Graph points on a Cartesian coordinate system.
 - 4.2 Graph linear equations in two variables.
 - 4.3 Determine the slope of a line.
 - 4.4 Determine whether two lines are parallel, perpendicular, or neither.
5. Demonstrate the ability to write equations of lines.
 - 5.1 Determine the equation of a line given two points on the line.
 - 5.2 Determine the equation of a line given the slope and one point on the line.

6. Demonstrate the ability to factor polynomials.
 - 6.1 Factor out the greatest common factor from an expression.
 - 6.2 Factor by grouping.
 - 6.3 Factor the difference of two squares.
 - 6.4 Factor the sum or difference of two cubes.
 - 6.5 Factor trinomials.
 - 6.6 Factor expressions that contain combinations of the above types of factoring.
 - 6.7 Solve quadratic equations by factoring.
7. Demonstrate the ability to manipulate rational expressions and solve equations that contain rational expressions.
 - 7.1 Identify values for which a rational expression is undefined.
 - 7.2 Simplify rational expressions.
 - 7.3 Add, subtract, multiply and divide rational expressions.
 - 7.4 Solve equations containing rational expressions.
8. Demonstrate a working knowledge of functions.
 - 8.1 Define and identify relation and function.
 - 8.2 Identify domain and range.
 - 8.3 Evaluate functions.
 - 8.4 Write linear functions.
 - 8.5 Graph linear functions.
9. Demonstrate the ability to solve absolute value equations and inequalities.
 - 9.1 Solve absolute value equations and inequalities.
 - 9.2 Graph linear inequalities in two variables.
10. Demonstrate a working knowledge of rational exponents, radicals, and complex numbers.
 - 10.1 Find roots.
 - 10.2 Use fractional exponents to simplify expressions.
 - 10.3 Simplify radicals.
 - 10.4 Solve radical equations.
 - 10.5 Write complex numbers using i notation.
11. Demonstrate the ability to solve quadratic equations.
 - 11.1 Solve quadratic equations by the square root method.
 - 11.2 Solve quadratic equations by the quadratic formula.
 - 11.3 Graph quadratic equations

MAPPING LEARNING OUTCOMES TO GENERAL EDUCATION GOALS

[For each of the goals selected above, indicate which outcomes align with the goal.]

Goals	Outcomes
First Goal	
#1 Critical Thinking	<ul style="list-style-type: none"> • Determine that a linear system has no solution. • Determine if a linear system has an infinite number of solutions.

	<ul style="list-style-type: none"> • Determine whether two lines are parallel, perpendicular, or neither. • Determine the equation of a line given two points on the line. • Determine the equation of a line given the slope and one point on the line. • Identify values for which a rational expression is undefined. • Determine the equation of a line parallel to a given line.
--	--

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

INSTRUCTIONAL METHODS:

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

INSTRUCTIONAL MATERIALS:

Scientific calculator

*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.

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:

- | | |
|-----------|-----------------------------|
| A= 90-100 | 1. Class attendance 40% |
| B= 80-89 | 2. In-class activities 30% |
| C= 70-79 | 3. Homework assignments 20% |
| D= 60-69 | 4. Other 10% |
| F= 0-59 | |

OTHER REFERENCES

Developmental Mathematics, 1st edition, by M. Lial, J. Hornsby, T. McGinnis
Beginning & Intermediate Algebra, 6th edition, by M. Lial, J. Hornsby, T. McGinnis
On Course, 3rd edition, by S. Downing
Winning at Math, 4th edition, by P. Nolting
Managing the Mean Math Blues, 2nd edition, by C. Ooten, K. Moore
Math Study Skills, 1st edition, by A. Bass
Focus on Community College Success, 1st edition, by C. Staley

Course Competency/Assessment Methods Matrix

MTH 0103		Assessment Options																														
For each competency/outcome place an "X" below the method of assessment to be used.	Assessment of Student Learning	Article Review	Case Studies	Group Projects	Lab Work	Oral Presentations	Pre-Post Tests	Quizzes	Written Exams	Artifact Self Reflection of Growth	Capstone Projects	Comprehensive Written Exit Exam	Course Embedded Questions	Multi-Media Projects	Observation	Writing Samples	Portfolio Evaluation	Real World Projects	Reflective Journals	Applied Application (skills) Test	Oral Exit Interviews	Accreditation Reviews/Reports	Advisory Council Feedback	Employer Surveys	Graduate Surveys	Internship/Practicum /Site Supervisor Evaluation	Licensing Exam	In Class Feedback	Simulation	Interview	Written Report	Assignment
	Direct/ Indirect	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D						
Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.																																
Demonstrate the skills needed to solve systems of equations in 2 and 3 variables.				X								X		X					X													X
Demonstrate a working knowledge of polynomials.				X								X		X					X													X
Demonstrate a working knowledge of the rules of exponents.				X								X		X					X													X
Demonstrate the ability to graph linear equations.				X								X		X					X													X
Demonstrate the ability to write equations of lines.				X								X		X					X													X
Demonstrate the ability to factor polynomials.				X								X		X					X													X

Demonstrate the ability to manipulate rational expressions and solve equations that contain rational expressions.				X												X	X					X											X
Demonstrate a working knowledge of functions.				X												X	X					X										X	
Demonstrate the ability to solve absolute value equations and inequalities.				X												X	X					X										X	
Demonstrate a working knowledge of rational exponents, radicals, and complex numbers.				X												X	X					X										X	
Demonstrate the ability to solve quadratic equations.				X												X	X					X										X	