



**COURSE OUTLINE**

**DIVISION: Natural Science and Business**

**COURSE: MTH 1003 College Algebra**

Date: Spring 2019

Credit Hours: 3

Prerequisite(s): 1) Math 0920 Intermediate Algebra Foundation of Stem mathematics and Math 0908 Geometry, both with a "C" or better, or the equivalent college course; or 2) Another approved placement option.

Delivery Method:  **Lecture**                    **3 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**

Offered:  **Fall**     **Spring**     **Summer**

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

**CATALOG DESCRIPTION:**

This course is primarily for students who need to continue on in mathematics in a Non-Stem math course. Topics of study include: review of fundamental algebraic operations, radicals, systems of equations, higher degree equations, inequalities, absolute values, exponential functions, logarithms functions, and matrices. Credit is not given for this course and for MTH 1005.

## 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 appreciate 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:

Outcome 1 - Students will be able to demonstrate knowledge of the fundamental concepts of algebra.

Competency 1.1 - Students will be able to identify the subsets of the real number system.

Competency 1.2 - Students will be able to calculate with various real numbers.

Competency 1.3 - Students will be able to simplify radical expressions and expressions involving rational exponents.

Competency 1.4 - Students will be able to perform basic operations on polynomials and special products.

Competency 1.5 - Students will be able to factor expressions.

Competency 1.6 - Students will be able to simplify fractional expressions.

Outcome 2 - Students will be able to demonstrate knowledge of linear and quadratic equations and inequalities.

Competency 2.1 - Students will be able to solve linear equations.

Competency 2.2 - Students will be able to solve word problems involving linear equations.

Competency 2.3 - Students will be able to solve quadratic equations.

Competency 2.4 - Students will be able to solve applied problems involving quadratic equations.

Competency 2.5 - Students will be able to solve quadratic type equations.

Competency 2.6 - Students will be able to solve radical equations.

Competency 2.7 - Students will be able to solve linear, quadratic, and rational inequalities.

Competency 2.8 - Students will be able to perform basic operations on complex numbers.

Outcome 3 - Students will be able to demonstrate knowledge of functions.

Competency 3.1 - Students will be able to identify functions.

Competency 3.2 - Students will be able to graph functions.

Competency 3.3 - Students will be able to identify and graph linear functions.

Competency 3.3 - Students will be able to combine functions by addition, multiplication, and composition.

Competency 3.5 - Students will be able to find the inverse of one-to-one functions.

Competency 3.6 - Students will be able to solve problems involving variation.

Outcome 4 - Students will be able to demonstrate knowledge of polynomial functions.

Competency 4.1 - Students will be able to identify and graph quadratics.

Competency 4.2 - Students will be able to identify and graph higher degree polynomial functions.

Competency 4.3 - Students will be able to find rational zeros of polynomial functions.

Competency 4.4 - Students will be able to find all zeros of polynomial functions.

Outcome 5 - Students will be able to demonstrate knowledge of other functions.

Competency 5.1 - Students will be able to identify and graph rational functions.

Competency 5.2 - Students will be able to identify and graph exponential functions.

Competency 5.3 - Students will be able to identify and graph logarithmic functions.

Competency 5.4 - Students will be able to simplify expressions using properties of exponential and logarithmic functions.

Competency 5.5 - Students will be able to solve exponential and logarithmic equations.

Competency 5.6 - Students will be able to solve applied problems using exponential and logarithmic functions.

Outcome 6 - Students will be able to demonstrate knowledge of systems of equations and inequalities.

Competency 6.1 - Students will be able to identify and solve systems of linear equations by substitution and graphing.

Competency 6.2 - Students will be able to solve systems of linear equations by elimination.

Competency 6.3 - Students will be able to solve systems of linear equations by Gauss-Jordan elimination.

Competency 6.4 - Students will be able to solve non-linear systems by any method.

Competency 6.5 - Students will be able to solve applied problems using systems of equations.

Competency 6.6 - Students will be able to solve systems of inequalities by graphing methods.

## 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	
To apply analytical and problem solving skills to personal, social, and professional issues and situations.	1. Students will be able to demonstrate knowledge of the fundamental concepts of algebra. 2. Students will be able to demonstrate knowledge of linear and quadratic equations and inequalities. 3. Students will be able to demonstrate knowledge of functions. 4. Students will be able to demonstrate knowledge of polynomial functions. 5. Students will be able to demonstrate knowledge of other functions. 6. Students will be able to demonstrate knowledge of systems of equations and inequalities.
Second Goal	
Third Goal	

### COURSE TOPICS AND CONTENT REQUIREMENTS:

- I. Fundamental Concepts of Algebra
  - A. Real Number System
  - B. Properties of exponents
  - C. Basic operations on polynomials
  - D. Factoring polynomials
  - E. Simplifying rational expressions
  
- II. Linear and Quadratic Equations and Inequalities
  - A. Linear equations and their graphs and applications
  - B. Quadratic equations, their graphs and applications
  - C. Complex numbers
  - D. Radical and Quadratic type equations
  - E. Inequalities - linear, quadratic and rational
  
- III. Functions
  - A. Cartesian plane - distance formula and graphing
  - B. Linear functions and their graphs
  - C. Combination of functions
  - D. Inverse functions
  - E. Mathematical Models – variation

- IV. Polynomial Functions
  - A. Quadratic functions
  - B. Higher degree polynomial functions
  - C. Polynomial division
  - D. Real zeros
  - E. Complex zeros
  - F. Approximation of irrational zeros
  
- V. Other Functions
  - A. Rational functions
  - B. Exponential functions
  - C. Logarithmic functions
  - D. Properties of exponential and logarithmic functions
  - E. Solving exponential and logarithmic equations
  - F. Applications of rational, exponential and logarithmic functions
  
- VI. Systems of Equations and Inequalities
  - A. Systems of linear equations in two variables
  - B. Systems of linear equations in three more variables
  - C. Matrices used in solving linear systems of equations
  - D. Systems of inequalities

**INSTRUCTIONAL METHODS:**

1. Lecture
2. Class discussion
3. Class participation
4. Audio-visual aids - calculator, overheads, computer, etc.
5. Homework, Quizzes and Exams

**INSTRUCTIONAL MATERIALS:**

1. Text - College Algebra, Blitzer, Prentice Hall
2. Test generation software.
3. Printed test bank.
4. Online Videos.
5. MyMathLab
6. Computer for demonstrations.

**STUDENT REQUIREMENTS AND METHODS OF EVALUATION:**

- A= 90-100
- B= 80-89
- C= 70-79
- D= 60-69
- F= 0-59

**OTHER REFERENCES**

College Algebra, Sullivan, Prentice Hall.

### Course Competency/Assessment Methods Matrix

(Dept/# Course Name)	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										
1. Students will be able to demonstrate knowledge of the fundamental concepts of algebra.				X		X	X	X						X																						X
2. Students will be able to demonstrate knowledge of linear and quadratic equations and inequalities.				X		X	X	X						X																						X
3. Students will be able to demonstrate knowledge of functions.				X		X	X	X						X																						X
4. Students will be able to demonstrate knowledge of polynomial functions.				X		X	X	X						X																						X

5. Students will be able to demonstrate knowledge of other functions.				X			X	X	X				X										X			X
6. Students will be able to demonstrate knowledge of systems of equations and inequalities.				X			X	X	X				X										X			X