

**NEOSHO COUNTY COMMUNITY COLLEGE
MASTER COURSE SYLLABUS**

COURSE IDENTIFICATION

Course Code/Number: MATH 113

Course Title: College Algebra

KRSN: MAT 1010
(Kansas Regents Shared Number)

Please visit the Kansas Board of Regents website for more information.

Division: Applied Science (AS) Liberal Arts (LA) Workforce Development (WD)
 Health Care (HC) Lifetime Learning (LL) Nursing Developmental

Credit Hour(s): 3

Effective Date: Spring 2017

Assessment Goal Per Outcome: 70%

COURSE DESCRIPTION

This is a standard College Algebra course designed for students that have successfully completed Algebra I and Algebra II in high school. It will satisfy the general education requirement for College Algebra and will transfer to all Kansas Regents institutions. This class is also for students earning an A or B in Intermediate Algebra MATH 112. Topics covered are: polynomials, rational expression and radicals, equations and inequalities, absolute value, functions and graphs, rational functions, exponential and logarithmic functions, conic sections, matrices and systems of equations and inequalities. Students will be expected to have access to and use graphing calculator (TI-83 is recommended).

MINIMUM REQUIREMENTS/PREREQUISITES AND/OR COREQUISITES

For specific placement requirements for this class, please refer to the Mandatory Placement Policy in the College Catalog.

TEXTS

* The official list of textbooks and materials for this course is found on [myNeosho](#).

Click this link to go to [myNeosho](#) and look up your course in the schedule to find materials for it.

GENERAL EDUCATION OUTCOMES

1. Practice Responsible Citizenship through:
 - identifying rights and responsibilities of citizenship,
 - identifying how human values and perceptions affect and are affected by social diversity,
 - identifying and interpreting artistic expression.
2. Live a healthy lifestyle (physical, intellectual, social) through:
 - listing factors associated with a healthy lifestyle and lifetime fitness,
 - identifying the importance of lifetime learning,
 - demonstrating self-discipline, respect for others, and the ability to work collaboratively as a team.
3. Communicate effectively through:
 - developing effective written communication skills,
 - developing effective oral communication and listening skills.
4. Think analytically through:
 - utilizing quantitative information in problem solving,
 - utilizing the principles of systematic inquiry,
 - utilizing various information resources including technology for research and data collection.

COURSE OUTCOMES/COMPETENCIES

The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents.

Analysis and Graphing of Functions and Equations

- Use functional notation.
- Recognize and distinguish between functions and relations (equations).
- Use concepts of symmetry, intercepts, left- and right-hand behavior, asymptotes, and transformations to sketch the graph of various types of functions (constant, linear, quadratic, absolute value, piecewise-defined, square root, cubic, polynomial, rational, exponential, and logarithmic) or relations (circle) given in description.
- Determine the domain and range of a function.
- Write the equation that describes a function (for types given above) or circle given its description.
- Use graphs of functions for analysis.
- Find arithmetic combinations and composites of functions.
- Find the inverse of a function.

Solutions of Equations and Inequalities

- Solve equations listed in the third bullet above, i.e., literal equations, quadratic equations by factoring and the quadratic formula, equations involving rational expressions, equations

involving radicals, and equations involving absolute value expressions, along with equations involving exponential or logarithmic functions.

- Solve inequalities of the following types: linear (in one and two variables), polynomial, rational, absolute value.
- Solve systems of inequalities by graphing.
- Apply equations from the first bullet in this core outcome to real-world situations, including but not limited to depreciation, growth and decay, and max/min problems.
- Examine and analyze data, make predictions/interpretations, and do basic modeling.
- Solve systems of equations by various methods, including matrices.

These competencies are mandatory and will be assessed within the following outcomes as defined by Neosho County Community College.

All students will be expected to demonstrate their ability (using appropriate technology) to do the following:

1. Manipulate and simplify algebraic expressions.
 - a. Factor polynomials
 - b. Simplify exponent and radical expressions
 - c. Simplify logarithmic expressions using the rules of logarithms
 - d. Evaluate expressions by substituting given values for the variable(s)
 - e. Perform arithmetic of polynomial and rational expressions.
2. Recognize and employ the basic language and algebra of functions.
 - a. Identify and distinguish between functions and relations
 - b. Apply and interpret function notation
 - c. Write the equation of a function or relation (circle) given its description (this description may entail transformations)
 - d. Determine the domain and range of a function.
 - e. Derive arithmetic combinations, composites, and inverses of functions
3. Solve equations, inequalities, and systems of various types.

This includes solving:

- a. Linear equations
- b. Quadratic equations by the factoring method and the quadratic formula
- c. Rational equations
- d. Radical equations
- e. Equations involving absolute value
- f. Exponential and Logarithmic equations
- g. General higher degree polynomial equations
- h. Literal equations
- i. Linear, polynomial, rational, and absolute value inequalities
- j. Systems of two or more equations by elimination, substitution, or using matrices
- k. Systems of inequalities by graphing methods.

4. Utilize concepts of symmetry, intercepts, left- and right-end behavior, asymptotes, and transformations to sketch and interpret the graphs of functions or relations of the following types:
 - a. Circles
 - b. Constant functions
 - c. Linear functions
 - d. Quadratic functions
 - e. Absolute Value functions
 - f. Piecewise-defined functions
 - g. Square root functions
 - h. Cubic functions
 - i. Higher degree polynomial functions (degree four or higher)
 - j. Rational functions
 - k. Exponential functions
 - l. Logarithmic functions
5. Apply solution techniques and function theory to application problems, including “idealized” real world scenarios.
 - a. Translate application problems into one or more equations, inequalities, or functions.
 - b. Solve applications of depreciation, growth and decay, and maximum/minimum problems.
 - c. Use functions and their graphs to model, solve, or predict outcomes for real world problems.

MINIMUM COURSE CONTENT

The following topics must be included. However, the course is not limited to these topics. The order of topics is up to the discretion of the instructor.

Prerequisites

Review of Real Numbers and Their Properties
Exponents and Radicals
Polynomials and Special Products
Factoring Polynomials
Rational Expressions
The Rectangular Coordinate System and Graphs

Equations, Inequalities, and Mathematical Modeling

Graphs of Equations
Linear Equations in One Variable
Modeling with Linear Equations
Quadratic Equations and Applications

Complex Numbers
Other Types of Equations
Linear Inequalities in One Variable
Other Types of Inequalities

Functions and Their Graphs

Linear Equations in Two Variables
Functions
Analyzing Graphs of Functions
A Library of Parent Functions
Transformations of Functions
Combinations of Functions: Composite Functions
Inverse Functions

Polynomial Functions

Quadratic Functions and Models
Polynomial Functions of Higher Degree
Polynomial and Synthetic Division
Zeros of Polynomial Functions
Mathematical Modeling and Variation

Rational Functions and Conics

Rational Functions and Asymptotes
Graphs of Rational Functions
Conics (Optional)
Translations of Conics (optional)

Exponential and Logarithmic Functions

Exponential Functions and Their Graphs
Logarithmic Functions and Their Graphs
Properties of Logarithms
Exponential and Logarithmic Equations
Exponential and Logarithmic Models

Systems of Equations and Inequalities

Linear and Nonlinear Systems of Equations
Two-Variable Linear Systems
Multivariable Linear Systems
Partial Fractions (optional)
Systems of Inequalities
Linear Programming

Matrices and Determinants

Matrices and Systems of Equations
Operations with Matrices (optional)
The Inverse of a Square Matrix (optional)
The Determinant of a Square Matrix (optional)
Applications of Matrices and Determinants (optional)

Miscellaneous-

Counting Principles (optional)

Probability (optional)

STUDENT REQUIREMENTS AND METHOD OF EVALUATION

See the syllabus supplement for a specific course section for details of student requirements and method of evaluation.

GRADING SCALE

A: 90-100

B: 80-89

C: 70-79

D: 60-69

F: below 60%

See the syllabus supplement for a specific course section for details of grading scale.

A random selection of students enrolled in College Algebra courses will be required to successfully complete a standardized testing by the end of the semester. A schedule of possible exam dates and times will be provided by your instructor. Failure to successfully complete the exam will result in a withhold of grades.

ASSESSMENT OF STUDENT GAIN

The purpose of assessing student learning at Neosho County Community College is to ensure the educational purposes of the institution are met and appropriate changes are made in program development and classroom instruction to allow for student success. The instructor(s) of this course will determine the methods of assessment most appropriate and complete an assessment report at the end of the course.

ATTENDANCE POLICY

1. NCCC values interactive learning which promotes student engagement in the learning process. To be actively engaged, the student must be present in the learning environment.
2. Unless students are participating in a school activity or are excused by the instructor, they are expected to attend class. If a student's absences exceed one-eighth of the total course duration, (which equates to one hundred (100) minutes per credit hour in a face-to-face class) the instructor has the right, but is not required, to withdraw a student from the course. Once the student has been dropped for excessive absences, the registrar's office will send a letter to the student, stating that he or she has been dropped. A student may petition the chief academic officer for reinstatement by submitting a letter stating valid reasons for the absences within one week of the registrar's notification. If the student is reinstated into the class, the instructor and the registrar will be notified. Please refer to the Student Handbook/Academic Policies for more information

3. Absences that occur due to students participating in official college activities are excused except in those cases where outside bodies, such as the State Board of Nursing, have requirements for minimum class minutes for each student. Students who are excused will be given reasonable opportunity to make up any missed work or receive substitute assignments from the instructor and should not be penalized for the absence. Proper procedure should be followed in notifying faculty in advance of the student's planned participation in the event. Ultimately it is the student's responsibility to notify the instructor in advance of the planned absence.

ACADEMIC INTEGRITY

NCCC expects every student to demonstrate ethical behavior with regard to academic pursuits. Academic integrity in coursework is a specific requirement. Definitions, examples, and possible consequences for violations of Academic Integrity, as well as the appeals process, can be found in the College Catalog, Student Handbook, and/or Code of Student Conduct and Discipline.

ELECTRONIC DEVICE POLICY

Student cell phones and other personal electronic devices not being used for class activities must not be accessed during class times unless the instructor chooses to waive this policy.

NOTE

Information and statements in this document are subject to change at the discretion of NCCC. Students will be notified of changes and where to find the most current approved documents.

ACCOMMODATIONS

If you are a student with a disability who may need accommodation(s), in compliance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) of 1990, please notify the Dean of Student Services in the Student Services Office, Sanders Hall, 620-432-0304, on the Chanute Campus, or the Dean for the Ottawa and Online Campuses, 785-248-2798, on the Ottawa Campus as soon as possible. You will need to bring your documentation for review in order to determine reasonable accommodations, and then we can assist you in arranging any necessary accommodations.

NON-DISCRIMINATION POLICY

The following link provides information related to the non-discrimination policy of NCCC, including persons with disabilities. Students are urged to review this policy.

<http://www.neosho.edu/Departments/NonDiscrimination.aspx>

SEXUAL MISCONDUCT POLICY (TITLE IX)

At NCCC, it is the responsibility of an instructor to help create a safe learning environment in the classroom, including both physical and virtual classrooms. All instructors are considered mandatory reporters at NCCC, therefore any information regarding sexual misconduct that is shared by a student in one-on-one meetings with the instructor must be reported to appropriate personnel at the College. Instructors will keep the information private to the greatest extent possible, but it is not confidential. Generally, climate surveys, classroom writing assignments or discussions, human subjects research, or events such as Take Back the Night events do not provide notice that must be reported to the Coordinator by employees, unless the reporting party clearly indicates that they wish a report to be made.

The following link provides information related to the sexual misconduct policy of NCCC, including resources, reporting options, and student rights. Students are urged to review this policy.

<http://www.neosho.edu/TitleIX.aspx>

COURSE NOTES

All students will be expected to have a graphing calculator (TI-83/84 or 83/84+ recommended).