

# Northwest Arkansas Community College

## Division of Mathematics and Science

### Discipline Code

MATH

### Course Number

1203

### Course Title

College Algebra

### Catalog Description

An overview of the fundamental concepts of algebra with an emphasis on functions and equation solving. Functions and equations covered will include (but are not limited to) absolute value, square root, polynomial, rational, exponential, and logarithmic. Systems of linear equations and inequalities as well as quadratic inequalities will also be covered. Technology will be used throughout the course to supplement and enhance understanding.

### Prerequisites

One of the following:

A grade of "C" or better in MATH 0214 (Foundations of Algebra: STEM) or MATH 0103 (Intermediate Algebra) or a course equivalent to one of these.

Appropriate score on the ACT Math section or Accuplacer - Next Generation (see placement chart).

### Credit Hours

3 credit hours

### Contact hours

3 contact hours

### Load hours

3 load hours

### Target Audience/Transferability

College Algebra (or a higher course for which College Algebra is a prerequisite) is contained in many STEM degree plans, as well as some in the healthcare and business fields. This course is included in the Arkansas College Transfer System (ACTS) as MATH 1103. Verify suitability for your degree plan with an advisor if you are unsure or have questions.

### Learning Outcomes

Upon successful completion of MATH 1203 students should be able to do the following, incorporating technology where applicable:

- 1) Recognize and perform operations (evaluation, arithmetic, composition, finding inverses) with functions. Graph, apply transformations, and analyze basic (identity, absolute value, reciprocal, squaring/cubing, square root/cube root) functions.
- 2) Construct and analyze the equations and graphs of linear (including piecewise) and quadratic

functions and solve related equations and inequalities.

3) Construct and analyze the equations and graphs of polynomial functions of degree 3 and higher and solve related equations.

4) Construct and analyze the equations and graphs of rational and radical functions and solve related equations.

5) Construct and analyze the equations and graphs of exponential and logarithmic functions and solve related equations.

6) Solve systems of linear equations by Gaussian or Gauss-Jordan elimination using matrices and graph the solution to a system of linear inequalities in 2 variables.

7) Solve application problems related to the above outcomes.

## Topics list

1. Recognizing relations and functions
2. Graphing relations and functions
3. Using and applying function transformations
4. Identifying characteristics and key attributes of functions and their graphs
5. Writing equations of lines
6. Understanding and applying slope and rate of change
7. Solving linear equations and inequalities
8. Performing operations and compositions with functions
9. Performing operations with complex numbers
10. Solving quadratic equations and inequalities
11. Finding the zeros and factored form of polynomial functions
12. Finding inverse functions
13. Applying the properties of logarithms
14. Solving radical and rational equations
15. Solving exponential and logarithmic equations
16. Solving systems of linear equations and inequalities
17. Using models and solving applications
18. Using technology to aid in solving certain problems

## Learning activities

- Courses must, at a minimum, cover the core learning outcomes for each topic. Faculty may add to these outcomes, but may not omit any of them.
- Laboratory exercises should average between 2-3 hours a week and include histology, the human skeleton, whole mammal dissection, and sheep brain dissection
- Lab safety orientation and enforcement of safety protocols is the responsibility of each faculty. A standard lab safety PowerPoint will be provided to faculty for training. Scoring 100% on a mandatory department-provided lab safety quiz is required before students may participate in lab.
- Since developing student higher order thinking skills and information literacy are essential outcomes of this course, all instructors should include learning activities that develop these outcomes in their courses and identify them in course syllabi. Instructors should describe how these activities will be evaluated in their course syllabi and/or reflected in their gradebooks.

## Assessments

Each instructor will include a set of departmental final exam questions on his or her final exam.

These questions will be in direct support of the Student Learning Outcomes. The questions need to represent at least 10% of each student's overall grade in the course and will be graded according to a

standard grading rubric. Department-wide results for these questions will be reported when final grades are turned in.

**Revision Date** January 8, 2020