

**Northeastern State University**  
College of Mathematics, Science and Nursing  
Department of Mathematics  
Tahlequah, OK

**INSTRUCTOR:**

Mr. Karl M. Kruczek , Office: Science 232  
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**COURSE TITLE AND NUMBER:**

**CLASS DAYS & TIME:**

MATH 1513 College Algebra

1 - 1:50 pm MWF

**PREREQUISITES:**

ACT Math sub-score of 19 or higher OR score of 75 or higher on CPE OR grade C or better in Math 0133 OR score of 75 or higher on CPT

**CATALOG DESCRIPTION OF COURSE:**

Linear and quadratic equations and inequalities; relations, functions, inverse functions; exponential and logarithmic functions; systems of equations; zeros of polynomials and determinants; permutations, combinations and the binomial theorem, as well as other selected topics.

**COURSE PURPOSE:**

This course provides the mathematical development of the concept of a function, examines the basic types of functions ( linear, quadratic, polynomial, exponential, logarithmic) and provides examples from a wide variety of applications ranging from business to the social sciences as well as in education and the natural sciences. The universal usefulness of this concept in most fields of study is why College Algebra is a required course for most majors.

**STUDENT LEARNING OUTCOMES:**

The student will be expected to achieve the following objectives:

1. Communicate with appropriate mathematical symbols.
2. Solve equations and inequalities of the following types: linear, quadratic, absolute value, radical, polynomial, rational, exponential, logarithmic, containing 2 or 3 variables.
3. Define a function, identify and graph the various types of functions and perform algebraic operations on functions.

4. Model and solve real-world problems using linear, quadratic, polynomial, rational exponential and logarithmic functions.
5. Analyze how changing the parameters of functions affects the graphs of functions.
6. Convert between algebraic and graphical representations of rational, radical, absolute value, exponential and logarithmic relations.
7. Compute efficiently using the appropriate method - calculator, paper/pencil algorithms, or mental calculation

**INSTRUCTIONAL MATERIALS: (Required Textbook)**

College Algebra, 5th ed., Dugopulski

**INSTRUCTIONAL PROCEDURES:**

The expected course outcomes will be realized through a variety of instructional strategies to aid the students' construction of cognitive schemas . Those strategies include, but are not limited to, the following: expository-discussion, demonstration, inquiry, and group activities. The instructor also will integrate appropriate multi-media technology and invite guest speakers, for the purpose of enriching the students total experience.

**College Algebra**

**P. Prerequisites**

- P5. Factoring Polynomials
- P7. Complex Numbers

**I. Equations, inequalities and modeling**

- A. Equations in One variable
- B. Constructing Models to Solve Equations
- C. Equations and Graphs in Two Variables
- D. Linear Equations in Two Variables
- E. Quadratic Equations
- F. Linear and Absolute Value Inequalities

***Major Examination #1***

**II. Functions (and their graphs)**

- A. Functions
- B. Graphs of Relations and Functions
- C. Families of Functions, Transformations and Symmetry
- D. Inverse Functions
- E. Constructing Functions with Variations

***Major Examination #2***

**III. Polynomial/ Rational Functions**

- A. Quadratic Functions and Inequalities
- B. Complex Numbers
- C. Zeros of Polynomial Functions
- D. Theory of Equations

- E. Miscellaneous Equations
- F. Graphs of Polynomial Functions
- G. Rational Functions and Inequalities

**Major Examination #3**

**IV. Exponential and Logarithmic Functions**

- A. Exponential Functions and their Graphs
- B. Logarithmic Functions and their Graphs
- C. Rules of Logarithms
- D. More Equations and Applications

**V. Systems of equations**

- A. Systems of Equations in Two Variables
- B. Systems of Equations in Three Variables

**Major Examination #4**

**STUDENT PERFORMANCE ACTIVITIES: (Attendance/Punctuality)**

Consistent and punctual attendance is both expected and required for your successful completion of the course. Students will be expected to make up any homework missed as a result of absence, whether or not the absence was justified. Excessive absences will reduce the final grade for the course. Four absences will result in a grade reduction of one letter grade. Seven; two letter grades, and nine or more will result in an automatic "F" for the course.

**ASSIGNMENT DUE DATES:**

Homework assignments are due at the beginning of the class period on the date indicated when the assignment is given. Homework may or may not be taken up, but students are encouraged to check their answers with the ones given in the back of the textbook. Reading assignments are considered preparation for the lecture period. The student is responsible for **all** material assigned even if not discussed in class.

**STUDENT EVALUATION:**

Grades will be based upon formal written examinations, quizzes, technology and a writing project

4 Examinations during term.....	400 points
Quizzes/Homework.....	100 points
Final Examination is the 4 <sup>th</sup> test	

1. At least 24 quizzes and/or homework grades of 10 points each will be taken throughout the semester. No makeups on missed quizzes.
2. The projects will be assigned during the second half of the semester. They will give students an opportunity to use graphing calculators/ computer software, and allow

students to consider one application problem in depth and write about their findings.

3. Performance on examinations and subsequent cumulative course averages will be based upon standard definitive grade values as indicated below:

90 - 100 = A

60 - 69 = D

80 - 89 = B

Below 60 = F

70 - 79 = C

4. The final examination will be administered on Monday December 6<sup>th</sup> at 1 pm.
5. Students are advised that the last date during the semester when they may drop a course with an automatic "W" will be **November 4<sup>th</sup>, 2010**. If you decide to drop after this date, you will receive the grade you have earned up to the drop date. The grade of "W" will be assigned if your grade is a "D" or higher; and an "F" will be assigned if you stop attending and have not turned in assignments or have not taken scheduled exams prior to the drop date.
6. Students wishing to visit with the professor about their standing in the class may visit him in his office which is located in the Science Building, Room SC - 232. Office hours are posted on his door.

**ADDITIONAL INFORMATION:**

Please go to <http://offices.nsuok.edu/academicaffairs/SyllabiInformation.aspx> for required information pertaining to:

1. Academic Misconduct
2. American Disabilities Act Compliance
3. Inclement Weather/Disaster Policy
4. Teach Act
5. Accessibility
6. Release of Confidential Information