

University of Arkansas – Fort Smith

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General Syllabus:

MATH 1403.X College Algebra (Expanded Format)

Credit Hours: 3

Lecture Hours: 5

Prerequisite: MATH 1203 Intermediate Algebra or MATH 1091 Transition to College Algebra or required placement score.

Effective: Spring 2007

I. Course Information:

A. Catalog Description

This course covers the same topics as the traditional College Algebra, but in an expanded time format allowing for increased guided learning activities and learner/instructor interaction.

B. Additional Information

Topics include modeling and problem solving using linear, quadratic, polynomial, rational functions, exponential, and logarithmic functions, equations, and inequalities; graphing, systems of equations, and matrices.

This is the lowest level mathematics course acceptable for a bachelor's degree in Arkansas' public colleges and universities. It is also the first college level course leading to higher mathematics courses required for majors in mathematics, engineering business, and several pre-professional fields.

A graphing calculator is required.

This expanded format version of College Algebra will be treated as equivalent to the traditional version of College Algebra for fulfilling graduation requirements at UA Fort Smith, and will be accepted for three hours of transfer credit equivalent to College Algebra at transfer institutions.

II. Student Learning Outcomes

A. Subject Matter:

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

1. Identify different types of polynomial equations and inequalities and solve those equations and inequalities using appropriate methods.
2. Distinguish between functional and non-functional relations. Identify domains, ranges and other characteristics; including zeros, extrema and intercepts, of functional and non-

- functional relations.
3. Graph polynomial, rational, exponential and logarithmic functions with and without graphing technology.
 4. Model various applications using algebraic and transcendental functions to accurately reflect real world phenomenon. Students will then interpret and analyze the results of their models.
 5. Determine and interpret asymptotic behavior in rational functions.
 6. Solve systems of equations, including the use of matrix methods.

B. General Education:

College algebra enhances student abilities in the following general education areas:

Quantitative Reasoning

Level: Introduction

Enhancing the quantitative reasoning ability of students is the primary focus of the College Algebra course. All course exercises and examinations require the student to interpret and/or draw inferences regarding quantitative relations in tabular, graphical, and formula models.

Analytical Skills and Scientific Literacy

Level: Introduction

Students learn to recognize patterns associated with basic formula models, and to interpret parameters in a given formula within the context of the modeled situation. Course examinations and assignments require students to apply algebraic techniques in identifying possible and/or optimal solutions to problems drawn from a wide variety of disciplines.

The scientific principles that express our understanding of the physical universe, and upon which technological advances are based, are often expressed in the language of algebraic formulas. Students must utilize formulas drawn from scientific and technical disciplines to solve problems and make predictions regarding future behavior.

Communication

Level: Introduction

Students learn to read and dissect real world applications. Applications in college algebra are mathematical problems that are expressed in written statements. Students will have to read and comprehend the written statements, and translate those statements into mathematical statements. Furthermore after they have completed the problem, they will be expected to translate the mathematical statements back into written statements.

III. Major Course Topics:

- A. Equations and inequalities
- B. Functions and their graphs.
 - i. Polynomial functions: zeroes and extrema.
 - ii. Rational functions: Asymptotic behavior.
 - iii. Exponential and logarithmic functions.

- C. Mathematical Models
- D. Systems of equations and inequalities.
- E. Matrix methods for solving systems of equations.