

ARAPAHOE COMMUNITY COLLEGE SYLLABUS

Course Number: MAT 121

Title: College Algebra

Credits: 4

Instructor:

Phone:

E-mail:

Office Location (if applicable):

Office Hours (if applicable):

Online Student Evaluation Process:

E-mail Policy:

Important Dates:

Last day to drop with refund (include date):

Last day to withdraw without refund (include date):

Catalog Description:

Includes a brief review of intermediate algebra, equations and inequalities, functions and their graphs, exponential and logarithmic functions, linear and non-linear systems, selection of topics from among graphing of the conic sections, introduction to sequences and series, permutations and combinations, the binomial theorem, and theory of equations.

Prerequisite: MAT 106 Survey of Algebra or a CPT score of at least 85 in the Elementary Algebra area or an ACT score of 23.

Co-requisite: None

Text: *Beecher, Penna, and Bittinger, College Algebra* 3rd edition, Addison Wesley. 2008.

Required Course Materials: Text and Texas Instruments TI-83/84 or TI-86 graphing calculator. *The math department has a limited number of these calculators available for lease: ask your instructor for details. In addition, some calculators are available for use in the Library.*

Optional Course Materials: MathXL. DVD's for this course are available in the library and the Math Support Room.

Grading Criteria:

Makeup Policy:

Attendance Policy:

Student Success Center for all ACC students: Peer and professional tutoring in Room M2720 now includes student tutors, math support, and the Writing Center in one location to provide academic assistance for all your classes.

ACC math instructors provide help with concepts, homework, online resources and graphing calculator workshops. Students may watch course related videos and DVDs in the library. For information, contact the Student Success Center at 303-797-5669 or email Mathhelp@arapahoe.edu

Academic Honesty Statement

Arapahoe Community College is committed to academic honesty and scholarly integrity. The College can best function and accomplish its mission in an atmosphere of the highest ethical standards. All members of the College community are expected and encouraged to contribute to such an environment by observing all accepted principles of academic honesty. Academic dishonesty includes but is not limited to: plagiarism, cheating, fabrication, grade tampering, misuse of computers and other electronic technology, and facilitating academic dishonesty. Those found in violation may also be subject to potential disciplinary sanctions under the Arapahoe Community College Code of Conduct

ACC Safety

The safety and security of all our students, faculty, staff and visitors is of the utmost importance to the Campus Police Department. We rely on each of you to be an additional set of ears and eyes to help maintain campus safety. Please be diligent in your efforts to report suspicious or unusual behavior or circumstances to the Campus Police Department. Trust your instincts when something doesn't look, seem or feel right and tell someone. The Campus Police can be reached at 303-797-5800 or in M2600 on the second floor behind Information Central. Additional safety information can be found on the website at:

<http://www.arapahoe.edu/studentsvcs/campuspolice/index.html>

Online Course Evaluations: As this course nears completion, you will have the opportunity to complete a confidential evaluation of the class online. Login instructions will be sent to your 'student.ccs.edu' e-mail address. Your feedback is important, and ensures that ACC continues to offer quality instruction that meets your needs. Please take time to complete the survey – I appreciate your feedback.

E-mail Communication: Effective 1/20/09 electronic correspondence from ACC employees will go to your student email account *only*. When you activate your account you can forward emails to an e-mail account that you already have. To activate your student e-mail account, go to <http://www.arapahoe.edu> and click on the "Activate Student E-mail" link. Questions? Please call 303-797-5621.

Contact Information for Learning Support Services

Library	M2500 303-797-5090
Technical Support	797-5700 x3199
Writing Center	M2855 303-797-5830

Advising/Counseling	M2010 303-797-5651
Instructional Testing Center	M2280 303-797-5993
Bookstore	M1200 303-797-5676
Computer Lab	M1650 303-797-5907
Tutorial Services	M2710 303.797.5669
Career Center	M2025 303-797-5805
eLearning	303-797-5700 x6700

Topical Outline:

Chapter 1: Graphs, Functions, and Models

- 1.1 Introduction to Graphing
- 1.2 Functions and Graphs
- 1.3 Linear Functions, Slope, and Applications
- 1.4 Equations of Lines and Modeling
- 1.5 More on Functions
- 1.6 The Algebra of Functions
- 1.7 Symmetry and Transformations

Chapter 2: Functions, Equations, and Inequalities

- 2.1 Linear Equations, Functions, and Models
- 2.2 The Complex Numbers
- 2.3 Quadratic Equations, Functions, and Models
- 2.4 Analyzing Graphs of Quadratic Functions
- 2.5 More Equation Solving
- 2.6 Solving Linear Inequalities

Chapter 3: Polynomial and Rational Functions

- 3.1 Polynomial Functions and Models
- 3.2 Graphing Polynomial Functions
- 3.3 Polynomial Division; The Remainder and Factor Theorems
- 3.4 Theorems about Zeros of Polynomial Functions
- 3.5 Rational Functions

- 3.6 Polynomial and Rational Inequalities
- 3.7 Variation and Applications

Chapter 4: Exponential and Logarithmic Functions

- 4.1 Inverse Functions
- 4.2 Exponential Functions and Graphs
- 4.3 Logarithmic Functions and Graphs
- 4.4 Properties of Logarithmic Functions
- 4.5 Solving Exponential and Logarithmic Equations
- 4.6 Applications and Models: Growth and Decay; Compound Interest

Chapter 5: System of Equations and Matrices

- 5.1 Systems of Equations in Two Variables
- 5.2 Systems of Equations in Three Variables
- 5.3 Matrices and Systems of Equations
- 5.4 Matrix Operations
- 5.5 Inverses of Matrices
- 5.6 Determinants and Cramer's Rule (OPTIONAL)
- 5.7 Systems of Inequalities and Linear Programming (OMIT Linear Programming)
- 5.8 Partial Fractions (OMIT)

Chapter 6: Conic Sections

- 6.1 The Parabola
- 6.2 The Circle and the Ellipse
- 6.3 The Hyperbola
- 6.4 Nonlinear Systems of Equations and Inequalities

Chapter 7: Sequences, Series, and Combinatorics

- 7.1 Sequences and Series
- 7.2 Arithmetic Sequences and Series
- 7.3 Geometric Sequences and Series
- 7.4 Mathematics Induction (Optional)
- 7.5 Combinatorics: Permutations
- 7.6 Combinatorics: Combinations
- 7.7 The Binomial Theorem
- 7.8 Probability (Optional)

Competencies:

Upon completion of the course the students should be familiar with:

- I. Be familiar with set notations, subsets of the real numbers and properties of real numbers.
- II. Perform algebraic manipulations including working with exponents, radicals, polynomial operations, factoring and algebraic fractions.
- III. Present methods for solving first and second degree equations and inequalities and related topics.
- IV. Solve the following types of equations: linear, quadratic, equations involving radicals, equations in quadratic form and equations involving absolute value.
- V. Work with formulas including formula evaluation and solving a formula for any of the variables.
- VI. Read and analyze problems in the form of word problem applications and obtain solutions using equations.
- VII. Solve first degree inequalities, higher degree inequalities and inequalities involving absolute value.
- VIII. Recognize and graph linear functions, rational functions, absolute value functions, and graph inequalities in two variables.
- IX. Work with function notation and demonstrate knowledge of the meaning "function".
- X. Demonstrate an understanding of function composition, one-to-one functions and inverse functions.
- XI. Examine, evaluate and graph exponential functions.
- XII. Examine, evaluate and graph logarithmic functions.
- XIII. Work problems and solve equations containing exponential and logarithmic functions.
- XIV. Explore a variety of techniques used to solve linear and non-linear systems of equations.
- XV. Use at least two of the following techniques to solve linear and non-linear systems of the equations: substitution, addition, Gaussian elimination, Cramer's rule.
- XVI. Have some familiarity with matrices and operations involving matrices.
- XVII. Graph systems of inequalities.
- XVIII. Graph conic sections including circles, parabolas, ellipses and hyperbolas.
- XIX. Identify the conic section represented by a given second degree equation.
- XX. Introduce various topics related to sequences and series.
- XXI. Work with series notation and sequence formulas, and counting principles.
- XXII. Apply the Binomial Theorem.
- XXIII. Demonstrate an understanding of proof by mathematical induction.
- XXIV. Present topics in theory equations.
- XXV. Perform synthetic division.
- XXVI. Use the Remainder Theorem and the Factor Theorem to factor and evaluate polynomials.
- XXVII. Solve polynomial equations using the Rational Root Theorem and/or approximation techniques.
- XXVIII. Write and speak clearly and logically in presentations and essays.
- XXIX. Demonstrate the ability to select and apply contemporary forms of technology to solve problems or compile information.