

MAT 121 COLLEGE ALGEBRA Fall, 2013

College Algebra – CRN: 21226 – Section: G11

Class 7:45 am - 9:00 am MWF Ed Beaty Hall BH133 Aug 19, 2013 - Dec 06, 2013

INSTRUCTOR: Dr. Harry S. (Steve) Mills, EDBH 134K, 970-339-6238, E-mail: Use mail tool on MyAims course website. (Go to <http://www.aims.edu>, Login to MyAims, Click on My Courses tab, Click on College Algebra, Click on Classlist from the main Navigation bar and finally click on "Mills, Harry.") Emergency e-mail: steve.mills@aims.edu

Catalog Description:

Includes equations and inequalities, functions and their graphs, exponential and logarithmic functions, linear and non-linear systems, graphing of the conic sections, introduction to sequences and series, permutations and combinations, the binomial theorem, theory of equations and an introduction to matrices and determinants. 4 credit hours

Prerequisites:

Math ACT 23 within last two years; "C" or better in MAT 106 or 099 within the last year, 40 or above on Accuplacer College Math Test.

TEXT: Dugopolski, Mark. **College Algebra.** Fifth Edition. Addison-Wesley Publishing Company. 2011

General Ed Competencies:

This course satisfies the following State GE categories: Critical Thinking, Technology, and Mathematics.

This course satisfies the following Aims GE categories: Critical Thinking, Problem Solving, and Communication (Oral and Written).

Learning Outcomes:

- A. Be familiar with set notations, subsets of the real numbers and properties of real numbers.
- B. Perform algebraic manipulations including working with exponents, radicals, polynomial operations, factoring and algebraic fractions.
- C. Solve the following types of equations: linear, quadratic, equations involving radicals, equations in quadratic form and equations involving absolute value.
- D. Work with formulas including formula evaluation and solving a formula for any of the variables.
- E. Read and analyze problems in the form of word problem applications and obtain solutions using equations.
- F. Solve first degree inequalities, higher degree inequalities and inequalities involving absolute value.
- G. Recognize and graph linear functions, rational functions, absolute value functions, and graph inequalities in two variables.
- H. Work with function notation and demonstrate knowledge of the meaning "function".
- I. Demonstrate an understanding of function composition, one-to-one functions and inverse functions.
- J. Evaluate and graph exponential functions.
- K. Evaluate and graph logarithmic functions.

- L. Work problems and solve equations containing exponential and logarithmic functions.
- M. 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.
- N. Have some familiarity with matrices and operations involving matrices.
- O. Graph systems of inequalities.
- P. Graph conic sections including circles, parabolas, ellipses and hyperbolas.
- Q. Identify the conic section represented by a given second degree equation.
- R. Work with series notation and sequence formulas, and counting principles.
- S. Apply the Binomial Theorem.
- T. Demonstrate an understanding of proof by mathematical induction.
- U. Present topics in theory of equations.
- V. Perform synthetic division.
- W. Use the Remainder Theorem and the Factor Theorem to factor and evaluate polynomials.
- X. Solve polynomial equations using the Rational Root Theorem and/or approximation techniques.
- Y. Write and speak clearly and logically about topics related to algebra.
- Z. Demonstrate the ability to select and apply contemporary forms of technology to solve problems or compile information in the study of algebra.

GRADES: Four Categories:

1. Homework – 20%
2. Practice Tests – 20% .
3. Midterm Test – 30%
4. Final Test – 30%

1. **Homework** will be assigned and collected every lecture. Homework solutions will be posted on the website, either publisher-provided or by my hand. Nobody's trying to trick anybody or rob points. One extra homework requirement I have is that you write out the directions for a given stretch of type problems.

We will work on our first homework assignment together in class, to show just what is expected, for instance, *paper without lines on it*, only write on one side of each page, leave margins, staple in top left corner...)

I want your collected homework to be a 1-stop study guide, with the questions and how you worked them together on the same page, in your hand. (You don't have to re-write directions if the same type-problem stretches onto another page.)

2. **Practice Tests** will be administered at the end of each chapter. They will be the source of type-questions found on the Midterm and Final. I will give a minimum of 50 minutes to complete each Practice Test. On the day of each test, you will receive the last graded homework you received from me. You will have an opportunity to ask questions about the last assignment and turn it in before the Practice Test.

I will always include a bonus question from the last section of homework, preferably one

that requires synthesis of the chapter content. Show you're smarter than the average bear.

The meaning of the chart below is as follows: An 85 will curve to a 90. An 84 will curve to a 79. A 70 will curve to an 80. A 55 will curve to a 70. A 40 will curve to a 60. All other scores will fall somewhere in between, according to a piecewise-linear scheme.

Curve on Practice Tests:

- A – 85 – 100%
- B – 70 – 84%
- C – 55 – 69%
- D – 40 – 55%

3. **Midterm Test:** A week after the last test before midterms week, a midterm covering all material up to the prior practice test will be administered. One or more bonus questions will appear on the Midterm from new material covered during the intervening week.
4. **Final Test: WEDNESDAY, DECEMBER 4TH, 7:10 A.M. – 9:00 A.M. THIS MEANS COMING IN 35 MINUTES EARLIER THAN REGULAR CLASS TIME!!!**

The Final Test is comprehensive, covering everything from the whole semester.

How I Expect Class to Operate:

I will operate as if you have already read and taken notes on each section, before I discuss the material. I will assume you have attempted the homework before I speak about the new material. You don't want my talk to be your first exposure to the material, although this is a typical student habit. You want to have questions about the homework ready for the lecture, assuming we don't cover it the way you need.

While I will present some of the theory formally, I will try to work examples and operate heuristically (problem-solving mode). The more we can cut to the how-to's, the more we can work in class, and the less lecturing I will have to do. The lazy way is for me to talk for an hour and 15 minutes. Let us not be lazy – or at least be lazy in a SMART way, since reading ahead is actually more efficient, because you kind of know where we are and where we're going. This uses less time than coming to class an empty cup.

Standard Syllabus Policies and Students with Disabilities:

Info for students with disabilities is found under the ADA link (for *some* reason, I'm sure) on the Standard Syllabus Policies Page:

<http://www.aims.edu/inside/policies/standard-syllabus/>

Statements on standard procedures and student conduct are also found on the Standard Syllabus Policies page. You should familiarize yourself with the resources, there.