

Syllabus for MATH 7003

Algebra and Problem Solving

Term: Spring 2010

Time: T 5:00 PM - 7:45 PM

Room: Boyd 322

Credit Hours: 3

Instructor: Bree Ettinger

E-mail: bree@math.uga.edu

Office Hour: By Appointment

Call #: 60-442

Text: Mathematics for Elementary Teachers , second edition, and the accompanying Class Activities manual by Sybilla Beckmann, published by Addison-Wesley.

Course topics:

- Fractions, ratio and proportion (sections 7.4 - 7.6): Division of fractions: why the "invert and multiply" procedure is valid. Division of decimals. Understanding ratio and proportion in terms of fractions and in terms of multiplication and division.
- Algebra and functions (chapter 13): patterns, sequences, formulas, and equations. Solving algebra word problems with and without variables. Functions and their graphs. Relating qualitative descriptions of functions to their graphs.
- Solving, posing and modifying problems (especially within sections 7.4 - 7.6 and chapter 13). Because fractions, decimals, and percents are traditionally difficult topics to teach, part of the course will be devoted to solving, posing, and modifying problems involving fractions, decimals, and percents, especially problems that are relevant to and helpful for the teaching of these topics.
- Number Theory (chapter 12): Factors and multiples, greatest common divisor and least common multiple. Prime numbers. Divisibility tests. Even and odd.
- Basic descriptive statistics (chapter 14): Designing investigations and gathering data. Common ways to display data. The average and the median. Percentiles.
- Probability (chapter 15): Basic principles of probability. Using tree diagrams and using the meaning of fraction multiplication to understand simple probability calculations.

Course objectives: To strengthen and deepen knowledge and understanding of fractions, ratios, probability and statistics, elementary number theory and algebra, and how they are used to solve a wide variety of problems. In particular, to strengthen the understanding of and the ability to explain why various procedures and formulas in mathematics work. To strengthen the ability to communicate clearly about mathematics, both orally and in writing. To promote the exploration and explanation of

mathematical phenomena. To solve problems in a variety of ways, including informal methods, such as with pictures, as well as standard methods in mathematics. To learn to pose and modify mathematical problems.

Rubric: Your work will be graded on a 10 point scale, and we will assign points as follows:

# of points	Description	Characteristics
10.5 points	exemplary	work that could serve as a model for other students
10 points	very good	correct work that is careful and thorough
8 points	competent	good, solid work that is largely correct
6 points	basic	work that has merit but also has significant shortcomings
4 points	emerging	work that shows effort but is seriously flawed
0 points	no credit	no work submitted, or no serious effort shown

Grades:

4 Quizzes	40%
Class Participation	5%
Field Assignment	10%
Homework	15%
Final Exam	30%

Materials needed: Please bring your activity manual to class. You might like to have a set of colored pencils since we will often draw simple pictures in the process of solving problems.

Attendance: Attendance is mandatory. Because this class meets only once a week missing one class means you missed an entire week of class. During class we will clarify important and complex points, observe you working problems, and answer your questions.

Policy on Academic Honesty: As a University of Georgia student you have agreed to abide by the University's academic honesty policy , "A Culture of Honesty," and the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty" found at www.uga.edu/honesty.

The main goal of the course is to learn to communicate mathematical concepts in your own words. I encourage you to discuss the problems with each other. However be sure that you write up all of your answers on your own without help from anyone else.

Note: This course syllabus provides a general plan for the course; deviations may be necessary.