MATH 5001
Arithmetic and Problem Solving
A course for prospective elementary school teachers
Fall 2009 Syllabus

MW 4:40-6:15pm in Life Sciences C112

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Office Hours: MW 1:30 – 2:30 or by appointment

Text: *Mathematics for Elementary Teachers , **second** edition, (purple with zebras)* and the accompanying *Class Activities* manual by Sybilla Beckmann.
Please bring the activity manual to class.

Schedule:

- Regular Homework Assignments
- Tentative Test and Quiz Dates:
  - Wednesday, Sept 2, QUIZ
  - Wednesday, Sept 23 TEST
  - Monday, Oct 12 QUIZ
  - Monday, Oct 19 TEST
  - Wednesday, Oct 28 QUIZ
  - Monday, Nov 16 TEST

Other Important Dates
- Monday, Sept 7, Labor Day
- Friday, Oct 30, Fall Break
- November 23-27, Thanksgiving
- Tuesday, Dec 8, Friday Schedule
- **Wed, Dec 16 FINAL EXAM 3:30-6:30**

Course topics:

Chapter 2: Numbers and the Decimal System
Chapter 3: Fractions
Chapter 4: Addition and Subtraction
Chapter 5: Multiplication
Chapter 6: Multiplication of Fractions, Decimals, and Negative Numbers
Chapter 7: Division (chapter 7 only through section 7.3)

Course objectives:

- To strengthen and deepen knowledge and understanding of arithmetic, how it is used to solve a wide variety of problems, and how it leads to algebra. In particular, to strengthen the understanding of and the ability to explain why various procedures from arithmetic 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 show that many problems can be solved in a variety of ways.

Preparation for your teaching: This course is part of your preparation to become an elementary school teacher who will teach math. Our focus in this course is on the mathematics content itself and not the methods by which you will help children learn math. Even so, a number of the activities we will do in class can readily be modified for use in elementary school (or middle school). However, we will often go beyond what is feasible with typical students in elementary school. This is to help you understand the

material more deeply and to prepare you to guide your students toward "where the math goes next."

Class work:

As a teacher, you will have the important responsibility of helping your students understand mathematical ideas and ways to solve math problems. To help prepare you, I will often ask you to explain a mathematical idea, a line of reasoning, or why a solution method is valid to a classmate or to the whole class. As a teacher you will also need to determine how your students are thinking about mathematical ideas so that you can address misconceptions and build on what your students know. This means you will need to listen carefully to your students' mathematical ideas. So in class, I will ask you to listen carefully to other students' methods of solution, and we will sometimes ask you to restate or ask a question about another student's idea, or whether you agree or disagree with a statement. Class time is a time for us to think ideas through and to evaluate the ideas. Even answers that ultimately prove to be incorrect can provide invaluable learning opportunities when we determine where the flaws lie. Class participation counts as 5% of your grade. To receive a full participation score, your work must consistently exhibit several or all of the following.

- Show interest in mathematical ideas
- Show interest in different ways of approaching mathematical ideas
- Listen carefully to different ways of solving a problem
- Carefully evaluate a proposed method of solution
- State whether you agree or disagree with a statement (you may feel more comfortable saying you "respectfully disagree")
- Show interest in learning with and from others

Homework:

Your homework must be typed. You may write by hand any equations, pictures, diagrams, etc.)

I encourage you to work on homework assignments with your classmates. Of course, you must adhere to UGA's Academic Honesty Policy. Therefore, always write your homework up on your own, using your own words to express the ideas you have *discussed* with others. It is not academically honest to simply read someone else's work and then put it in your own words. Instead, when you work with others, you must participate in the development and refinement of the ideas by discussing them. All partners should "give and take" in the discussion. It is not academically honest to allow others to copy your work.

Homework is due at the beginning of class. Late homework will not be accepted. Please contact me as soon as possible if you are unable to hand in an assignment due to an illness or emergency. I will drop up to 2 assignments for which you have a valid excuse.

In grading your work we will be looking for the extent to which it meets the following criteria:

- The work is factually correct, or nearly so, with only minor, inconsequential flaws.
- The work addresses the specific question or problem that was posed. It is focused, detailed, and precise. Key points are emphasized. There are no irrelevant or distracting points.
- The work could be used to teach a student: either a child or another college student, whichever is most appropriate.
- The work is clear, convincing, and logical. An explanation should be convincing to a skeptic and should not require the reader to make a leap of faith.
- Clear, complete sentences are used. Mathematical terms and symbols are used correctly. If applicable, supporting pictures, diagrams, and/or equations are used appropriately and as needed.
- The work is coherent.

Explain all your solutions unless there are explicit instructions not to.

Reading and "don't hand in" assignments: Expect to have a reading assignment due after every class. The reading is designed to help you shore up the ideas discussed in class and be ready for the topic to be discussed in the next class. The "don't hand in" assignments will consist mainly of problems whose solutions are given in the book. You should work the problems first without looking at the solutions and then read the solutions and compare them with your own. It's a good idea to discuss the "don't hand in" problems with a study group. Expect weekly short quizzes on the "don't hand in" problems and the reading.

No calculators allowed: Since our focus in this course is on how and why various procedures in arithmetic work, the use of calculators is not allowed unless explicitly stated otherwise.

Grades:
Your work will be graded on a 10 point scale, with points assigned as follows:

# of points	**description**	**characteristics**
10 points	exemplary	work that could serve as a model for other students
9 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

Grading Scale		**Final Grades**	
tests	35%	A	93-100%
quizes, total	15%	A-	90-92
class participation	5%	B+	87-89
homework	20%	B	83-86
comprehensive final exam	25%	B-	80-82
		C+	77-79
		C	73-76
		C-	70-72
		D	60-69
		F	Below 60

You may not use cell phones, laptops of other communication devices during class.