

Math 5001/7001: Arithmetic and Problem Solving, Spring 2009

Instructor information

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Classes

Monday, Wednesday, Friday **either** 10:10-11:00 **or** 12:20-1:10, in Room 238 of the Poultry Science Building

Adding/dropping/switching sections

The deadline for dropping the class is **Tuesday Jan 13** (or Thursday Jan 15 for the graduate-level class Math 7001). The deadline for adding, or switching sections is **Wednesday Jan 14** (or Friday Jan 16 for Math 7001). You should make all changes using OASIS. If you have an urgent reason to switch sections, or add the class, and you are unable to do so before these deadlines, then please come and see me, *after the deadline*.

Textbook

You will need two books for this class. The good news is that the same books will also be used in Math 5002/7002 and Math 5003/7003 if you go on to take those.

- *Mathematics for Elementary Teachers*, by Sybilla Beckmann, second edition, 2008.
- the *Activities Manual* that accompanies the textbook.

You should bring the Activities Manual to every class. You do not need to bring the actual textbook. You will use that for reading and homework exercises.

Course topics

- Problem solving (chapter 1)
- Numbers and the decimal system (chapter 2)
- Fractions (chapter 3)
- Addition and subtraction (chapter 4)
- Multiplication (chapter 5)
- Multiplication of fractions, decimals and negative numbers (chapter 6)
- Division (chapter 7, only through section 7.2 or 7.3)

The course focuses on helping you understand deeply the arithmetic taught in elementary school and a bit beyond.

Course objectives

The aim of this course is to strengthen and deepen your knowledge and understanding of arithmetic, and how it is used to solve a variety of problems. In particular, we hope that after the class, you will understand and be able to explain why various procedures from arithmetic work, and see that many problems can be solved in a variety of ways. We will focus on helping you communicate clearly about mathematics, both orally and in writing.

This class is part of the preparation for you to become an elementary school teacher. Math is particularly important for elementary school children to learn well because so much of the math in middle and high school depends on a good understanding of basic concepts. Children that do not have good mathematical foundations in elementary school often have a lot of trouble with algebra and frequently do not finish high school, thus limiting their career opportunities.

This class is not about the methods that you will use to teach math to elementary school children, you will learn those methods in other classes. Instead, we will focus on giving you a deep understanding of the concepts you will be teaching. You can never teach something well unless you understand it well yourself, so that is our main aim. We also hope that you will find this class interesting and engaging, since it is about thinking clearly and asking for the reasons why things work, and not just about learning methods by heart.

Class work

Much of the class time will be spent discussing, as a class, how to solve various problems, or how to understand basic mathematical ideas. You will need to listen carefully to what other students are saying and think about whether you agree or disagree with them. You will also have opportunities to talk about problems with your neighbors, and present your ideas to the class. You are encouraged to share your thoughts freely with the class, and **nothing you say in class will ever negatively affect your grade**. You will do better overall if you are engaged and interacting with the class, even when you don't fully understand.

Because the interactive work in class is an important part of learning and being able to explain math, **class attendance is compulsory**. In the event of illness or emergency, please contact me as soon as possible. I will be keeping track of attendance and students with regular unexcused absences will be dropped from the class.

Homework

You should expect to have a written assignment due at *the beginning* of every class. **All assignments must be typed**. Any pictures or diagrams that accompany your answers may be drawn by hand, but other than that, handwritten homework will not be accepted. Most assignments will be fairly short, but we expect them to be written carefully, making sure to use correct and precise language to express your ideas. Your work will be graded according to the following criteria:

- The work should be factually correct, or nearly so, with only minor, inconsequential flaws.
- The work should address the specific question or problems that was posed. It should be focused, detailed and precise. Key points should be emphasized. There should be no irrelevant or distracting points.

- The work should be clear, convincing and logical. It should "make sense" and be appropriate for explaining the problem to a fellow student.
- Clear, complete sentences should be used. Mathematical terms and symbols should be used correctly.

In particular, you should **always explain your solutions** unless there are explicit instructions not to.

You are encouraged to form study groups and to work on homework assignments with your classmates. Of course, you should always adhere to UGA's Academic Honesty Policy. You must always write up homework on your own, and in your own words. Collaboration is allowed in order to help you learn. Copying someone else's ideas (even putting them in your own words) does not help you learn and will not help you do well on the tests and final exam.

Late homework will not be accepted. If you have a valid excuse, you should let me know as soon as possible, and we will excuse you from up to 3 assignments in this case.

Reading

You will usually have a reading assignment due for each class. These are important and you are expected to read the assigned material carefully. It will usually help you with the homework. There will also often be "do, but don't hand in" assignments that are meant to give you extra practice. It's a good idea to discuss these with your study group.

Tests and quizzes

There will be three mid-term tests (each lasting for a whole class) and several short quizzes (of about 15-20 minutes). These will test you on the reading and homework assignments (including the "do, but don't hand in" problems). There will be a comprehensive final exam (3 hours long) during the final exam period.

Special Aid

Students with disabilities or other special needs who require classroom accommodations or other arrangements must make this known to me as soon as possible at the beginning of the semester, and be registered with the Disability Resource Center. You should have a letter from them detailing any extra time on tests, or other additional assistance you are entitled to.

Grading

Your final grade for the class will be given by weighting your grades on the homework and exams as follows: All of your work will be graded on a scale out of 10 points as follows:

- 10 points: correct work that is careful and thorough
- 8 points: good, solid work that is largely correct
- 6 points: work that has merit but also has significant shortcomings
- 4 points: work that shows effort but is seriously flawed
- 0 points: no work submitted, or no serious effort shown

Your final grade for the class will be given by weighting your grades on the homework and exams as follows:

- tests: 39% (3 tests, each worth 13%)
- quizzes: 16% total
- homework: 20%
- final exam: 25%

Letter grades will be assigned *approximately* according to the following system:

- A: above 9.3
- A-: 9.0–9.3
- B+: 8.7–9.0
- B: 8.3–8.7
- B-: 8.0–8.3
- C+: 7.7–8.0
- C: 7.3–7.7
- C-: 7.0–7.3
- D: 5.0–7.0
- F: below 5.0

Support

There are many sources of help and support if you are having difficulty with the class, material or anything else. These include:

- your fellow students (I highly recommend that you form study groups for this class and discuss the work regularly with each other, this is a great way to learn. If you don't know any of the other students in the class, or can't find study partners, please let me know and I'll try to help);
- come to my office hours (times to be announced);
- send me an email (you are always welcome to email me about any aspect of the class, and I will try to help as much as I can). In particular, if you would like to set up an appointment to meet outside of my office hours, just let me know;
- independent tutoring: the Math Department maintains a list of tutors in case you would like to have some regular one-on-one tutoring for the class, this page can be found at:

http://www.math.uga.edu/undergraduate/student_services.html

There are also links there to drop-in tutoring that might be helpful.

Please do not feel shy about asking for help, or just checking that you understand something correctly.

Math 7001 students

Students taking the graduate-level class Math 7001 will have some additional homework exercises. These will be posted on the website a week before they are due.