

Math 500 I: Arithmetic and Problem Solving

Dr. Aaron Weinberg

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About the Course

Most of your math courses so far have been primarily about practicing procedures (like dividing fractions or solving for x). In order to help your students learn mathematics, you will need to not only be adept at these procedures, but you will need to understand *why* and *how* they work, have a deep understanding of arithmetic so you can understand your students' difficulties and alternative algorithms, be a strong problem-solver, and a good communicator.

We will discuss decimal numbers and place value, fractions, percents, addition, subtraction, multiplication, and division. The textbook for the course is *Mathematics for Elementary School Teachers* (by Sybilla Beckmann, Pearson Education, Inc. 2005) and the accompanying activities manual. Topics will come from Chapters 1-7 of the text.

Math 500I is a *math content* course for future teachers. We will discuss standard approaches to arithmetic problems as well as the methods invented by children. However, you will learn about concepts on a deeper level than you might ask your future students. You will also consider ideas and perspectives that might not be appropriate for your students, but these ideas and perspectives will help you to better guide your students' learning.

My Contact Information

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Office Hours: Mondays 2-3PM, Wednesdays 10-11AM, Thursdays 2-3PM, and by appointment

Email Contact: Please feel free to email me. I will respond to emails **within one business day**.

Expectations and Assignments

Participation: This class is centered on student activities. You will work on these activities individually and in a small group, and you will discuss your questions and solutions in a small group and with the whole class. The nature of the class makes it essential that you actively participate in the class.

WebCT Homework: This homework will be assigned 1-2 times per week and will be submitted via WebCT. **Submissions are due by 7 AM the morning of the next class meeting.** You should also be prepared to discuss the daily homework at the beginning of the next class after it is assigned.

Reading: Readings from the text, which follow class work, will be assigned on a regular basis. At the end of each section of the text, there are *Practice Problems*, a set of problems with brief solutions. Along with reading the text, you should work through the practice problems and read their solutions.

Graded Homework: Each week I will assign 1-2 homework problems to be turned in. Graded homework must be submitted by 3pm the day it is due. If you are not in class, it is your responsibility to get homework assignment to me. **No late homework will be accepted.**

Quizzes, Tests, Midterm and Final Exam: There will be 1 quiz, 3 short tests, a midterm exam, and a final exam given in this class.

The dates of the quiz, tests and midterm exam will be announced in class, 1-2 weeks ahead of time. If you are unable to come to a quiz, test, or exam, please contact me as soon as possible. The final exam will be cumulative.

Academic Honesty

I encourage you to discuss the daily homework and graded homework with your classmates and with me. However, you should write your homework on your own and in your own words. You should not allow anyone to copy your work.

All work for this course must meet the standards contained in “A Culture of Honesty.” You are responsible for informing yourself about those standards. More information about academic honesty can be found at <http://www.uga.edu/ovpi/honesty/acadhon.htm> .

Grades

Your final score for the course will be out of 200 points, broken down as follows:

- *12 points: Participation*
Your class participation will be evaluated 3 times during the semester; each evaluation is out of 4 points. See the attached guidelines for more on how this grade will be determined.
- *9 points: WebCT Homework*
There will be approximately 20 WebCT assignments throughout the semester, with (the top) 18 counting for credit. For each satisfactorily completed assignment, you will receive ½ point. These assignments are *NOT* graded, but you will not receive credit for a response that shows little or no effort.
- *35 points: Graded Homework*
There will be approximately 15 graded homework assignments, with the top 14 counting for credit. Each assignment will be graded according to the attached guidelines, out of 5 points. For your final grade, each homework will be out of 2.5 points—½ of the score written on your paper.
- *55 points: Quiz, Tests, and Exams*
There will be one quiz, worth 10 points, 3 short tests each worth 15 points, one midterm exam worth 32 points, and a final exam worth 56 points.
- *1 point: Completion of Course Evaluation.*

Evaluations for this course are done online at the end of the semester. The evaluations are completely anonymous and I will not see them until after I have submitted your final grades. I will receive a list of students who have completed the evaluation—but not your comments—at the end of the semester so that I can factor this into your grade.

Attendance: Because much of the learning in this course occurs in class, your regular attendance is essential. You are allowed 3 absences without penalty. **Your absence is recorded independent of your reason for missing class, so use these absences wisely!** For each additional absence after the first 3 absences, 2 points will be deducted from your cumulative score for the class. For each additional absence after the first 6 absences, 5 points will be deducted from your cumulative score.

Your final score will determine your grade for the class as follows:

Grade	Final Score	Grade	Final Score
A	≥ 190	C+	≥ 154
A-	≥ 182	C	≥ 147
B+	≥ 175	C-	≥ 140
B	≥ 168	D	≥ 120
B-	≥ 161	F	< 120

This syllabus is a general plan for the course. However, we may deviate from the syllabus; I will announce any changes in class.

We are to regard the mind, not as a piece of iron to be laid upon the anvil and hammered into any shape, nor as a block of marble in which we are to find the statue by removing the rubbish, or as a receptacle into which knowledge may be poured; but as a flame that is to be fed, as an active being that must be strengthened to think and to feel—and to dare, to do, and to suffer.

Mark Hopkins (1836)

Participation/Daily Homework Rubric

Preparation	1	Arrives to class on time. Brings activity manual to class.
	1/2	On multiple occasions, arrives to class late or does not have activity manual.
	0	Frequently arrives to class late or does not have activity manual.
Small Group Work	3/2	Listens respectfully to other students. Frequently participates in the conversation by offering solutions or asking questions.
	1	Listens respectfully to other students. Occasionally participates in the conversation by offering solutions or asking questions.
	1/2	Listens respectfully to other students.
	0	Does not participate in small group discussion.
Class Discussion	3/2	Listens respectfully to other students. Frequently participates in the conversation by offering ideas or asking questions.
	1	Listens respectfully to other students. Occasionally participates in the conversation by offering ideas or asking questions.
	1/2	Listens respectfully to other students.
	0	Does not participate in the class discussion.

Although participation is graded out of 4 points, you can earn up to 4 ½ points by frequently contributing to our discussions.

While we ultimately want to arrive at the “right answer” it is much more important for us to *understand* class topics. Answers or explanations that aren’t completely “correct” are extremely valuable because they help us all understand concepts, and provide a good starting point for further explanation or a perspective that others have not thought of, or you may highlight an obstacle that many others face. By asking a question you may bring up an issue that many students are having trouble with or challenge other students by forcing them to better explain their ideas.

All students are expected to be courteous and respectful to others during any class discussion.

Graded Homework Rubric

5 Excellent	<ul style="list-style-type: none">• Work is mathematically correct or has only minor, inconsequential errors.• Work addresses the question(s) asked and provides a detailed and focused explanation to support solution. Key ideas are emphasized and only relevant information is included.• Explanations are well-reasoned and convincing, with no logical gaps.
4 Good	<ul style="list-style-type: none">• Work is largely mathematically correct.• Work addresses the question asked and provides a detailed explanation to support solution.• Arguments are well-reasoned, with only minor logical gaps.
3 Basic	<ul style="list-style-type: none">• Work has mathematical merit but may contain significant errors.• Work addresses the question(s) and gives some explanation.• Explanation may contain significant logical gaps or is difficult to follow.
2 Needs Improvement	<ul style="list-style-type: none">• Work contains significant mathematical errors.• Explanation is minimal or illogical.
0	<ul style="list-style-type: none">• No work turned in or no effort shown.

All graded homework should be typed. However, you are welcome to write in any mathematical symbols and hand-draw any pictures you wish to include.

Graded homework is due by 3pm the day it is due. If you are not in class to turn it in, it is your responsibility to get it to me. No late homework will be accepted.