

**Math 150: Mathematics for the Elementary School Teacher I**  
**Winter Semester, 2013**  
**M,W,R,F 10-10:50 (Section 1) and M,W,R,F 11-11:50 (Section 2)**  
**Both meet in WS 3616**

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| <b>Course Instructor:</b> | Dr. Stephen Smith                      |
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| Office Hours:             | M, W, Th, F 1-2:30; or by appointment* |

NOTE: This course is on EduCaT. Some documents for the course may be posted there for you to print out for use during class time. Some assignments, along with clarifications or elaborations of assignments, may be posted there. Also, check your [nmu.edu](http://nmu.edu) email account **regularly** for emails about the course.

\* On Tuesdays I usually have meetings at times that vary week-to-week so cannot schedule regular office hours. However, on most Tuesdays I am able to make arrangements to meet at some time during the day.

**Brief Description of the Course:**

This course is designed to examine elementary school mathematics from an advanced standpoint. That is, we will not be learning the mathematics of the elementary grades (you should already know that!). Rather, we will be studying the rules of elementary mathematics and why they operate as they do. The emphasis is on the development of the system of real numbers and the language, models, concepts, and operations associated with it. Quantitative thinking skills are developed through applications and problem solving situations.

**Prerequisite:** A "C" or better in MA 100 or equivalent recommendation on the math placement exam.

**Course Objectives:**

I assume that all of you know the computational algorithms for much of the mathematics we will study in this course. I hope that you will begin to develop what LiPing Ma calls "Profound Understanding of Fundamental Mathematics" (PUFM). In her book, *Knowing and Teaching Elementary Mathematics* (1999), Ma says PUFM "goes beyond being able to compute correctly and to give a rationale for computational algorithms." Thus, we will explore *why* algorithms work as they do. In doing so, we will develop flexibility in: decomposing numbers; figuring out how to recombine numbers to perform operations, and thinking about operations in terms of the actions they model.

Much of the course will be devoted to engagement in *doing mathematics*. In large part, mathematics is about abstraction and generalization. Solving individual problems by themselves is not learning mathematics. After solving one or more problems, students (at every age and grade level) must think about and use what they learn in that process to extend their

understanding of mathematics in general. This is done through analyzing methods of solution--what worked & why, what didn't work and why not. I hope that you develop a new perspective on (and, for many, a new appreciation for) mathematics. Through this process, I expect you will develop new perspectives on the teaching of mathematics.

While I hope you will find the course helpful in thinking about *how* to teach mathematics, this is a **mathematics** content course and NOT a methods course.

### **Textbooks and Materials required:**

*Mathematics for Elementary School Teachers*, O'Daffer, Charles, Cooney, Dorsey, & Schielack, (2008) 4th Ed., Pearson.

A scientific calculator. This is *required* for all in-class tests and quizzes. **Do NOT expect to borrow a calculator from me or from a classmate—you will not be permitted to do so.**

**Cellphone calculators will NOT be allowed.**

### **Student Responsibilities:**

- Attend every class session. Roll will be taken daily. The in-class activities are essential for developing a deeper mathematical understanding which is not developed by merely reading the text or looking at someone else's notes.
- Do all reading and problem assignments--both those to be turned in and those recommended (you will be responsible for concepts, conventions, and language presented in both types of assignments **even if not covered directly during class**).
- Allocate study time. Studying involves more than merely doing assignments. You should also spend time outside of class thinking about lectures & in-class activities. What made sense? What didn't? If X is true for this case, why is it (not) true for another case? Do these ideas extend to similar objects? & so forth.
- Work with other members of the class. While you will generally turn in individual assignments, I STRONGLY ENCOURAGE you to work on them with others.
- Be willing to "think outside the box." Be willing to try things that may not work. As the saying goes, we learn from our mistakes.
- If you have questions, ask them--in class, in office hours, or via e-mail. I'm not good at answering questions that are not asked.
- When I ask questions in class, volunteer your ideas. Students who participate in class--whether the mathematics in their ideas turns out to be right or wrong--generally do better than students who remain silent. There is NO penalty for wrong answers during class discussions.
- Appropriate Classroom Laptop Use: Although laptops in class open up new learning possibilities for students, sometimes students utilize them in ways that are inappropriate. No instant messaging, e-mailing, surfing the Internet, playing games, writing papers, doing homework, etc. during class time. Acceptable uses include taking notes and working on assigned in-class activities, projects, and discussions that may be enhanced by laptop use. It

is easy for your laptop to become a distraction to you and to those around you. Inappropriate uses will be noted (silently) and will result in loss of a grade in participation points. If you use your laptop during class, at the end of the class period you will be expected to email me the notes you typed in class (I will not ask for them but will keep records of those who do/do not.).

- Do NOT use your cell phone during class—including for texting. A student using his/her cell phone is not participating in the classroom activities—his/her attendance and participation points will reflect this. Anything can wait a maximum of 50 minutes. (Consider whether you would want your future students texting while you are teaching. The same applies here.) Note that, just because you have the phone in your lap & your hands below the surface of the desk does not mean I cannot tell that you are texting.

**Assessment:**

Some form of formal assessment will take place most every week. Formal assessment includes: collected homework, announced/pop quizzes, and tests.

- Homework will be turned in at the start of class on the due date. Homework is to be done neatly and completed on a clean, whole sheet(s) of paper. If you tear sheets out of a notebook, remove the rat tails. In other words, homework is to look like a professional has submitted it.
- There will be three (3) in-class tests and a cumulative final. *Tentative* dates for tests are Feb. 8, Mar. 1, & Apr. 5. (Note: Mar. 1 is the day before Spring Break begins. Tell your parents, rides, etc. you have a test that day & cannot leave for Spring Break early.)
- The final is a two hour cumulative exam and will be on Tuesday, April 30 from 10AM-12:00 PM for section 1 (10 AM class) & Thursday, May 2 from 10AM-12:00 PM for section 2 (11 AM class). Finals for both sections are in 3616 WS.
- All material in the course is cumulative and once covered in class or assigned is fair game for any test or quiz.

You will be graded on classroom participation. A participant not only attends class every day (and arrives on time), but is prepared and actively contributes to learning activities. It is your responsibility to notify me in advance if you are unable to attend. Absences and tardiness negatively affect your grade. Absences for medical reasons require a note from your health care provider.

**The lowest Homework and lowest Quiz grade will be dropped (if doing so helps your grade). No make-ups or late work on Homework or Quizzes will be allowed. A make-up for a missed test will be given only under exceptional circumstances and with my prior approval.**

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|---------------------------|------------|
| Homework (5 @20 pts each) | 80 points  |
| Quizzes (5 @ 20 pts each) | 80 points  |
| Tests (3 @ 100 pts each)  | 300 points |
| Cumulative final          | 200 points |

|               |           |
|---------------|-----------|
| Participation | 40 points |
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Grading Scale

|   |                  |    |               |    |               |
|---|------------------|----|---------------|----|---------------|
| A | 93-100 percent   | A- | 90-92 percent | B+ | 88-89 percent |
| B | 83-87 percent    | B- | 80-82 percent | C+ | 77-79 percent |
| C | 70-76 percent    | C- | 67-69 percent | D  | 60-66 percent |
| E | below 60 percent |    |               |    |               |

If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Dean of Students Office at 2001 C. B. Hedgcock Building (227-1700). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.