MTHM 201: Mathematics in Elementary Schools I

Section 001, Fall 2012

11:30-12:45 Monday and Wednesday, Richardson 273

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Office Hours: M 2:30-4:00

 W 9:45-11:15

Course Description

This course is intended for undergraduate students seeking certification to teach early childhood and elementary school (P-3, K–5). The course will provide prospective early childhood and elementary teachers with opportunities to develop deep, connected understandings of (1) content included in the Counting and Cardinality, Number and Operations, and Operations and Algebraic Thinking strands of Pre-K through grade 5 school mathematics; (2) factors that influence student learning of that content, and (3) characteristics of instruction that are effective in promoting development of student understanding of that content.

Throughout the course, you will explore mathematics content as participants in classroom activities that model the Standards for Mathematical Practice outlined in the Common Core State Standards for Mathematics. Research has shown that students learn mathematical concepts more soundly when they are given opportunities to struggle with solving problems, to communicate and share their ideas with each other, and to interact with different representations of mathematical objects, especially representations that are concrete and visual. In accordance with this research, instruction in the course will be student-centered and inquiry-based. It will provide opportunities for cooperative learning, and will incorporate the use of concrete and virtual manipulatives. This course will not only show you how these instructional techniques and materials can be used in the classroom, but also it will give you first-hand experience with these as you participate as a learner in this class.

In addition to a focus on mathematical content, course activities will provide you with opportunities to become familiar with research on how students learn mathematics and to consider ways in which this knowledge can be integrated into your future teaching. In summary, the activities in this course will help you to develop knowledge, understandings, and skills useful for teaching elementary mathematics.

Objectives:

* demonstrate and communicate a deep understanding of counting and cardinality, number and operations, and algebraic thinking;
* demonstrate an understanding of what it means to think mathematically;
* become familiar with the Common Core State Standards for Mathematics (CCSSM). Be able to interpret the Standards and draw conclusions about the relationship of mathematical tasks to the CCSSM.
* use and reflect on the educational value of manipulatives/technology when working with concepts;
* demonstrate an understanding of the way in which students’ understandings of content develops over time;
* identify the conceptual challenges students face in learning the content examined;
* evaluate instructional tasks for their potential to foster deep understanding of mathematics

Content and Scope:

The course will examine mathematical content and student learning of this content, the nature of mathematics (e.g. what does it mean to do mathematics), and evaluation of instructional tasks (e.g. what makes a problem useful for assessing some particular understanding).

Mathematical topics explored will include:

* Place value and number systems,
* Fractions, decimals, percents, and the relationships among them,
* Arithmetic operations and the relationships among them,
* Pattern exploration and representation.

This course will likely feel different than other math classes you may have taken. It will not emphasize memorizing procedures, but will instead focus on critical thinking, making connections, and coordinating between different representations. Your contributions will be an essential aspect of each class. I ask that you bring with you an open mind. Be ready to be creative, to share your ideas, to ask questions, and to think about elementary mathematics in new ways. Not only will this mindset help you to be successful in (and hopefully enjoy) this class, it will also help you develop the disposition to help students engage in critical thinking about mathematics.

Textbook:

## *Elementary and Middle School Mathematics: Teaching Developmentally*, 8th ed. Van De Walle, Karp, Bay-Williams. ISBN 978-0132612265.

In addition to the textbook, numerous other resources will be posted on Blackboard.

Attendance Policy:

Your active participation and contributions are essential. Attendance is mandatory and attendance will be taken at the beginning of each class. Excessive absences will have a negative impact on your ability to participate in our professional community.

*Late work will not be accepted.* *Exams cannot be made up and assignments cannot be turned in late; you will receive a 0 any missed exam or assignment. However, your homework assignment with the lowest grade will be dropped without question.* *In-class assessments can only be made up for extreme circumstances that are communicated to me in advance or with notification from the Dean of Students office* [Student Center, 4th floor, Suite 400, (973) 655-4118].

Demonstrating Learning:

The following activities will help you learn, and let you and I know how you are doing in the course and your final grade will be based on the following percentages:

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| --- | --- |
| Homework and Classwork | 34% |
| In-class assessments Tests  Quizzes | 24%12% |
| Project | 15% |
| Final Exam | 15% |

Homework and Classwork (34%)

Homework will be assigned and collected frequently, and will be an important means of learning. It will take multiple forms such as doing mathematics problems, examining artifacts of teaching and learning, and reading and reflecting on articles. Most homework will not come from the textbook. In-class assignments may be graded as well. You may share ideas on homework or seek other resources (e.g. look up how to do something on the internet), but you should clearly indicate this on your work (i.e. at the end of a problem, you could say “I worked with [name] on this problem” or “I got [specific ideas] from [website url].” Each of you must write up your assignments independently; copying someone else’s work is *plagiarism* *and academically dishonest*.

In-class assessments (36%): Tests (24%), Quizzes (12%)

There will be at least three quizzes (each worth 4% of your grade) and two tests (each worth 12%) that will be completed individually in class, with dates announced in advance. The purpose of the quizzes is primarily to provide low-risk opportunities for self-assessment at various points during the course. *In-class assessments can only be made up for extreme circumstances that are communicated to me in advance.*

If for any reason (such as bad weather), school is *officially* closed on the day of an assessment, it will be given during the next class period. The anticipated dates of the tests are: October 10th and November 17th. The tentative dates for the quizzes are: September 24th, October 24th, and November 28th.

Project (4%)

To give you an authentic learning experience, related to course content and applied to an educational setting, you will complete a project in a local elementary school classroom. The project will involve examining a mathematical task with respect to big ideas and multiple ways that students might approach the task. In addition, you will devote approximately one and a half hours to working with mathematics students on the task. More details will be given on the project as we cover the course content.

Final Exam (24%)

The final exam will be cumulative and will take place during our officially scheduled time, on Monday, December 17th from 1:00-3:00.

The grading scale is a standard 10-point scale with +/- given in accordance with the Montclair State University grading policies:

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| --- | --- |
| 93–100 | A |
| 90–92 | A- |
| 87–89 | B+ |
| 83–86 | B |
| 80–82 | B- |
| 77–79 | C+ |
| 73–76 | C |
| 70–72 | C- |
| 67–69 | D+ |
| 63–66 | D |
| 60–62 | D- |
| 59 and below | F |

**Blackboard:**

I will be posting all class-related materials on Blackboard, and *you are responsible for checking both Blackboard and your official University email several times per week*. You can access Blackboard by going to http://blackboard.montclair.edu. Use the same password you use to access your Montclair-based email account. I will be using Blackboard as a way of disseminating information and assignments. You may also gain access to current grade information on Blackboard after each test. If you do not use Montclair’s email system, please arrange to have your email forwarded to your active account. The Office of Information and Technology (<http://oit.montclair.edu>) can help you with any questions about your Blackboard account.

**Contacting me:**

Email is generally the best way to get in touch with me. I encourage you to take advantage of my office hours. You can make an appointment with me if you cannot make the scheduled times.

I look forward to working with each of you. Have a great semester!