Northern Michigan University
Department of Mathematics & Computer Science
MA 353-01 Methods and Materials in the Teaching of Elementary School Mathematics (80761)
W 1:00 – 3:50 WS 3616

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Office Hours: MWRF 12:00 – 1:00, or by appointment

*** ”Walk-in’s” are welcome as long as I do not have a prior commitment. E-mail is a good way to contact me to ask questions or voice your concerns related to the class.

Prerequisites:
Admission to the methods phase of teacher education, MA150 and MA151 (passing both classes with a C or better).

Course Description:
A course designed to acquaint prospective elementary teachers with contemporary methods and materials employed in the teaching of mathematics in the elementary school. Field experiences are required.

Note: This course must be taken as a block with ED 312 and ED 318.
This class also uses WebCT so please make sure you can access it.

Course Goals:
MA353 is required of all education majors. It focuses on the methods and materials employed in the teaching of mathematics in the elementary school, grades K-8. A 10- to 12-hour field experience for each student is arranged with the local elementary schools.

The goal of MA353 is to prepare elementary education majors to be successful teachers of elementary school mathematics. The course is meant to help students see how the mathematical concepts and theory they learned in the prerequisite courses provide a foundation for the content taught in elementary school; and how the mathematics, together with teaching objectives and learning theories, suggest different instructional methodologies. Students who successfully complete MA353 will have an overview of the elementary mathematics curriculum and will be familiar with a variety of teaching methods. Moreover, they will learn enough about research in mathematics education, about the role of technology in teaching, and about controversial issues in teaching of mathematics to be knowledgeable and contributing members of the teacher profession.

Through the various readings, discussions, activities, and interactions with elementary school children, the students will begin to build a philosophical foundation for the teaching of elementary school mathematics.

Course Objectives:
The students will
A. examine the changing emphasis of the curriculum as described in current and relevant publications such as the "Agenda for Action", and NCTM's "Curriculum and Evaluation Standards for School Mathematics" and "Principles and Standards for School Mathematics".
B. learn to use manipulatives and models to help children develop mathematical concepts.
C. understand the importance of problem solving as a focal point in the elementary school mathematics curriculum.
D. learn to use an active, hands-on approach in the teaching of geometry and measurement.
E. utilize mental computation and estimation.
F. identify the role of calculators and computers in the teaching of elementary school mathematics and use them in their own learning.
G. become aware of the need to involve children in the higher order thinking skills.
H. examine and participate in the different modes of instruction.
I. realize the characteristics of a spiraled curriculum.
J. identify teaching techniques that are appropriate for elementary school mathematics and justify these choices using learning theory and research.
K. develop a repertoire of examples, models, activities, and games for teaching elementary school mathematics.
L. learn a strategy approach to teaching basic facts.
M. become aware of the need for professional involvement beyond the classroom.
N. implement many of the above objectives through field experiences.

Texts and Other Requirements:
1. Van de Walle, J. (2007). *Elementary and Middle School Mathematics*, 6th edition, Pearson Education, Inc. (ISBN 0-205-48392-5)
2. *Principles and Standards for School Mathematics*, The National Council of Teachers of Mathematics, Reston, VA: 2000. Sign up for the 120-day free access to full document at http://standards.nctm.org/.
3. Download *Curriculum Focal Points for Prekindergarten through Grade 8* (full document) at http://nctm.org/standards/focalpoints.aspx?id=282 (50 pages).
4. *Michigan Curriculum Framework*. Information on the Framework is available at http://www.michigan.gov/documents/MichiganCurriculumFramework_8172_7.pdf.

Optional Requirements:
5. Become a member of the National Council of Teachers of Mathematics (NCTM) before the end of the term. The current cost of student membership is $39, which includes an online subscription to one school journal. Student membership applications are available on-line at http://nctm.org.

Appropriate Classroom Laptop Use:
Although having a laptop in class opens up new learning possibilities for students, sometimes students utilize it in ways that are inappropriate. Refrain from 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, you will be expected to email me the notes you typed in class at the end of the class period (I will not ask for them but will keep records of those who do/do not).

Assessment Format:
All assignments will be available in WebCT under Assignments. All assignments are to be typed. When you refer to a book, article, or other source, you must provide a full citation. When you use resources to generate ideas for lesson plans, etc., you must provide a citation. (If you are unsure what to include, look at the citations in our text. Web citations must be complete enough for me to easily access the same webpage.) Late assignments will be penalized 10% per day that they are not submitted.

I. Class Attendance/Participation/Field Experience (25%)

Since each class represents a significant amount of group discussion and interaction, it is essential for you to attend every class. In the event of an EMERGENCY, you will be expected to complete additional work to compensate for the absence. The make-up work for the class missed will consist of:

1. Development of an additional lesson plan *or*
2. Short written assignment on the subject(s) discussed in class during absence.

Class participation is expected. If you are preparing to be a teacher, communicating effectively with others in the classroom setting is critical to your professional development. Included in your class participation grade will be quizzes over the assigned readings from the text. Quizzes will be available in WebCT and you must complete it prior to class time on the day it is due.

You must participate in all field work experiences. Please remember to wear professional attire while you are in the schools. At a minimum, this means no shorts or blue jeans. Also, you will be expected to wear a name badge identifying you and your affiliation at all times. You will be expected to know and follow any additional rules required by the school. Included in your field experience grade is that each group completes a scope and sequence that includes all group members' names, your host teacher's name, and the room number where he or she teaches.

II. Lesson Plans (25%)

A variety of lesson plans will be completed that coincide with the Michigan Curriculum Framework and the NCTM Principles and Standards. If time permits, you will have the opportunity to participate in mini-teaching one of your lessons to your peers in the class.

III. Short Written Assignments (10%)

Short written assignments based on readings or in-class discussions will be assigned. Each short written assignment will consist of no more than two pages (double-spaced, size 12 font). One page should be a summary of the reading or discussion, and the other page should be devoted to your reaction to what you have read or what we discussed and the possible implications for you as a teacher. Articles should be cited using APA format. A web site can be used as a supplementary source but not as a primary source, unless you are citing an on-line periodical. Please use current periodicals, with none older than 1999.

IV. Problems (20%)

You will receive several mathematical problems to solve throughout the semester. The purpose of these problems is to help you gain a deeper understanding of different mathematical concepts and to get you to begin thinking about mathematics in a problem solving context. The solutions to the problems should be neat and organized, just as you would write solutions to problems for your own students. Along with a complete solution to each problem, you should respond to the following questions: (1) How did the problem deepen my understanding of mathematics? (2) What did I learn about mathematical problem solving? (3) What did I learn about teaching mathematics?

V. Final Exam (20%)

- The final exam will be a take-home exam and will be distributed on our last class day. It is due on or before the date of our scheduled final exam, which is Wednesday, December 10 (4:00 – 5:50pm).
- Failure to answer all questions on the final exam will result in one whole letter grade lower than your earned grade (for example, an A would be reduced to a B). In addition, the instructor reserves the right to reduce the student's grade if the final exam contains too many errors.

The quality of our public education system depends in large measure on the quality of classroom teaching. You will be the model of excellence and professionalism for your students. As you complete each assignment, imagine that it will be reviewed not only by me, but also by prospective employers and parents of your future students. Please strive for excellence – not just go through the motions to complete a program requirement.

Grading Scale (%): Your course grade will be based on the percentages outlined under Assessment Format. Corresponding grades as a percentage of the total are listed below.

100 – 95.0: A	86.4 – 82.5: B	76.4 – 72.5: C	66.4 – 62.5: D
94.9 – 89.5: A-	82.4 – 79.5: B-	72.4 – 69.5: C-	62.4 – 59.5: D-
89.4 – 86.5: B+	79.4 – 76.5: C+	69.4 – 66.5: D+	59.4 – 0: F

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Anyone having civil rights inquiries may contact the Equal Opportunity Office, 502 Cohodas Hall, telephone number 906-227-2420.

Disability Services
If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Disability Services Office at 2001 C. B. Hedgcock (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.