

Northern Michigan University
Mathematics & Computer Science Department
MA353 Methods and Materials in the Teaching of Elementary School Mathematics
T 1:00 – 3:50pm (12094) West Science 3616
R 1:00 – 3:50pm (10449) West Science 3616

Instructor: Dr. Carol Bell

Office: New Science Facility 1113

Office Phone: (906) 227-1603

e-mail: cbell@nmu.edu

Office Hours: T 4:00 – 5:00, R 11:00-1:00, 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.

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.

Texts and Other Requirements:

1. Van de Walle, J., Karp, K., Bay-Williams, J. (2013). *Elementary and Middle School Mathematics Teaching Developmentally*, 8th edition, Pearson Education, Inc. (ISBN: 978-0-13-290097-3)
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. *Common Core State Standards for Mathematics*, http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf (93 pages).
5. *Mathematics Grade Level Content Expectations*. Full document at http://www.michigan.gov/documents/MathGLCE_140486_7.pdf.

Optional Requirements:

6. 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>.

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 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.

Learning Outcomes:

Upon successful completion of this course, a student should be able to:

1. 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"
2. Learn to use an active, hands-on approach in the teaching of mathematical concepts
3. Develop a repertoire of examples, models, activities, and games for teaching elementary school mathematics
4. Learn to use manipulatives and models to help children develop mathematical concepts
5. Integrate problem solving into the teaching of elementary school mathematics
6. Identify the role of calculators and computers in the teaching of elementary school mathematics and use them in their own learning

Evaluation of these learning outcomes will be done through assignments, quizzes, field work experience, and the final exam.

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 are to be typed or neatly handwritten. 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 (20%)

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.

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 sweats, shorts or blue jeans and no open-toed shoes. 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. Outlined below is additional information about your required field work experiences.

- 1) Once a week beginning no later than the week of January 28th you will help in an elementary classroom at Lakeview Elementary School in Negaunee. You must provide your own transportation to the school. If you do not have your own vehicle or you can make arrangements for a ride share. Marq-Tran (<http://www.marq-tran.com/>) provides transportation to Negaunee so check the schedule. You will be required to log your time and write a reflection of what you did and learned during this experience (e.g., what strategies did you use to help the students, what mathematics did you teach and learn, how did the session help you grow as a professional). Please turn in your field work reflections as they are completed. There are five reflections required: (1) reflection based on observation of classroom teaching, (2) reflection based on work with diverse learners, (3) reflection based on one-on-one work with a student, (4) reflection based on teaching a lesson developed with guidance from your host teacher, (5) reflection based on observation of a class in another grade than what you are assigned.
- 2) As part of the Block II requirements, you will participate in a one-week field experience at Bothwell Middle School (BMS). Included in your BMS 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. Please note that the week at Bothwell Middle School is scheduled for April 8 – 11. In addition, there are Block II

meetings that you are required to attend. These meetings will all be held in the Whitman Commons Room. Please save the following dates:

- March 11 (11:00-12:00) – Bothwell Week Informational Meeting
- March 29 (10:00-12:00) – Mandatory Working Meeting
- April 5 (10:00-12:00) – Mandatory Working Meeting

II. Lesson Plans, Problems, and Peer Teaching (40%)

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 some of your lessons to your peers in the class.

You will also receive several mathematics 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?

Each of you will be given a mathematical concept to research and then teach to the class.

III. Quizzes (10%)

All quizzes will consist of questions from the chapter readings and/or material discussed in class. There are no make-ups for the quizzes. Your lowest quiz grade will be dropped.

IV. Final Exam (30%)

- The final exam will consist of two parts: (1) a written reflection of your BMS fieldwork and course experience, which will be a take-home portion and (2) an in-class written exam which will be given during our scheduled final exam time.

Tuesday class: Tuesday, April 30th 12:00 – 1:50

Thursday class: Thursday, May 2nd 12:00 – 1:50

- Failure to answer all questions on the take-home portion of 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).

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

NMU's Non-Discrimination Statement

Northern Michigan University does not unlawfully discriminate on the basis of race, color, religion, sex, national origin, age, height, weight, marital status, familial status, handicap/disability, sexual orientation, or veteran status in employment or the provision of services, and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities an equal opportunity to participate in all programs and activities.

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.

Important Deadlines

- Last day to drop with 100% refund (No grade): Monday, January 14th, 5:00p.m.
- Last day to drop with "W" grade: Friday, March 29th

PLEASE TURN OFF ALL CELL PHONES DURING CLASS OR SWITCH THE MODE TO VIBRATE.