- Course Information -

University:	University of Nebraska at Omaha
College:	Arts and Sciences
Curriculum:	Mathematics
Number:	1310
Type:	Lecture
Title:	Intermediate Algebra
Short title:	1310
Effective term:	Spring 2014
Graduate non-degree students:	Allowed
Can course be taken for credit multiple times?	No

- Credit Hours Information -

Type:	Fixed
Hours:	3

- Duplicate Information -

Curriculum:	Not applicable

- Cross-listing and/or Dual-listing (UG/G) Information -

Courses:	Not applicable

- 1.0 Course Description Information -

1.1 Catalog description:

This course presents properties of real numbers, linear equations and graphing, systems of equations, linear inequalities, quadratic equations, polynomials, algebraic fractions, exponents and radicals and logarithms.

1.2 Prerequisites of the course:

Students must have an ACT Math sub score of at least 19 within the last 5 years or a COMPASS Test score of at least 3 within the last 2 years or MATH 1000 within the last 2 years with a grade of C- or better.

1.3 Overview of content and purpose of the course:

This course is intended for non-math or non-computer science majors, to fulfill the university general requirement in mathematics. The specific requirements may vary within the different colleges and departments within the university.

1.4 Unusual circumstances of the course:

None

- 2.0 Course Justification Information -

2.1 Anticipated audience / demand:

Students who need to satisfy the Math General Education requirement or a prerequisite for another course.

2.2 Indicate how often this course will be offered and the anticipated enrollment:

This course will be offered every fall, spring, and summer with an anticipated enrollment of 900 students per year.

2.3 If it is a significant change to an existing course please explain why it is needed:

This is not a significant change.

- *3.0 Objective Information* -Is this course part of or being proposed for the General Education curriculum?

Yes, General Education area: Fundamental Academic Skills - Mathematics

3.1 List of performance objectives stated as student learning outcomes:

Students will become proficient in:

- Solving and graphing linear equations, inequalities and absolute value problems.
- Performing mathematical operations on polynomials, as well as factoring of polynomials.
- Evaluating and simplifying rational expressions.
- Performing mathematical operations on expressions involving roots and radicals.
- Solving quadratic equations and nonlinear inequalities.
- Developing linear equations given information regarding slope and points, solving linear equations, and applying linear equations.
- Evaluating inverse functions, exponential functions, and logarithmic functions.

3.2 General Education Student Learning OutcomesAfter completing the course, successful students shall be able to do the following:

3.2.1 Student Learning Outcome *(Describe how the course meets the SLO(s).)*
Mathematics : demonstrate competency in quantitative reasoning that applies algebra;

Students demonstrate competency in quantitative reasoning that applies algebra by:

- Translating word problems into algebraic expressions and equations.
- Using logic and deduction to create a proper mathematical statement to solve a given real-world scenario.

3.2.2 Student Learning Outcome *(Describe how the course meets the SLO(s).)*
Mathematics : demonstrate competency in symbolic reasoning in the solution to real-world problems;

Students demonstrate competency in symbolic reasoning in the solution to real-world problems by:

- Solving and graphing linear equations.
- Understanding what the variable must represent when reading a real-world problem.

3.2.3 Student Learning Outcome *(Describe how the course meets the SLO(s).)*
Mathematics : demonstrate competency in computational reasoning as it relates to the application of algebraic processes and concepts;

Students demonstrate competency in computational reasoning as it relates to the application of algebraic processes and concepts by:

- Performing mathematical operations on mathematical expressions involving roots, radicals, or logarithms and understanding that under certain conditions, problems will not have an answer.
- Evaluating and simplifying rational expressions and understanding that under certain conditions, problems will not have an answer.

3.2.4 Student Learning Outcome *(Describe how the course meets the SLO(s).)*
Mathematics : demonstrate an ability to solve real-world problems using quantitative, logical, or computational approaches that are typical of mathematical thinking.

Students demonstrate an ability to solve real-world problems using quantitative, logical or computational approaches that are typical of mathematical thinking by:

- Evaluating functions and understanding that a given input value will yield a specific output value.
- Solving and graphing linear equations, inequalities and absolute value problems and understanding that following a series of steps in the correct order will give the correct answer for each problem at hand.

- 4.0 Content and Organization Information -

4.1 List the major topics central to this course:

1. Equations and Inequalities in One Variable
    a. Linear Equations and Inequalities
    b. Compound Inequalities; Absolute Value
    c. Formulas and Problem Solving
2. Graphs and Functions
    a. The Rectangular Coordinate System and Graphing
    b. Relations, Functions, Function Notation, and their Graphs
    c. Linear Equations and Inequalities in Two Variables
3. Systems of Linear Equations and Inequalities in Two Variables and Problem Solving
4. Polynomial Expressions and Functions
    a. Rules of Exponents
    b. Adding, Subtracting, Multiplying, and Dividing Polynomials
5. Factoring
    a. Greatest Common Factor and Factor by Grouping
    b. Factoring Trinomials
    c. Special-Case Factoring and a General Factoring Strategy
    d. Polynomial Equations and Models
6. Rational Expressions, Equations, and Functions
    a. Adding, Subtracting, Multiplying, and Dividing Rational Expressions

    b. Complex Rational Expressions
    c. Rational Equations and Models
7. Radicals and Rational Exponents
    a. Radical Expressions and Functions
    b. Rational Exponents and Simplifying Radical Expressions
    c. Operations with Radicals
    d. Radical Equations and Models
    e. Complex Numbers
8. Quadratic Equations and Functions
    a. Solving Quadratic Equations
    b. Applications and Modeling of Quadratic Functions
9. Exponential and Logarithmic Functions; Properties of Logarithms

- 5.0 Teaching Methodology Information -

5.1 Methods:

Class meets once a week for 75 minutes. In class, the teacher will cover important concepts, work especially difficult problems, and guide students through the work that will be done each week. The teacher will discuss study strategies and help students to avoid common errors. Students are responsible for 3 flexible hours in the Math Lab, with Teaching Assistants, using Math Lab software. All homework, quizzes, tests and a cumulative final exam will be done on the UNO Math Lab software.

5.2 Student role:

Students will be expected to attend weekly classes, participate in class, do all homework, quizzes, and tests. Students are responsible each week for 3 flexible hours in the Math Lab working with Teaching Assistants doing homework, quizzes, and tests.

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- 6.0 Evaluation Information -Students should be provided the actual list of projects, basis for determining the final grade, and grading scale at the beginning of each course.

6.1.1 Describe the typical types of student projects that will be the basis for evaluating student performance:

Students will be graded on class participation, homework, quizzes, four unit tests, and a final exam. After completing all homework and quizzes, students should prepare for tests and the final exam by repeatedly practicing until they can get all exercises correct without any assistance from learning aids, notes, or books. Practice Tests and a Practice Final Exam are available through the Math Lab software for each test and will be open throughout the semester.

6.1.2 In submitting this course for the general education curriculum, it is understood that the department will be responsible for providing a regular assessment report of how each of the student learning objectives shown in 3.2.1-3.2.4 are being met. The format for this report will be specified by the UNO Assessment Committee.

6.2 Describe the typical basis for determining the final grade (e.g., weighting of various student projects):

Weighting of student projects will be determined by the instructor and communicated to students at the start of the term. What follows is one possible example:

Class participation 10%

Homework 10%

Quizzes 10%

Tests 45%

Final Exam 25%

6.3 Grading type:

Letter grades

A+ 95 and up

A 90 - 94

A- 88 - 89

B+ 85 - 87

B 80 - 84

B- 78 - 79

C+ 75 - 77

C 70 - 74

D+ 65 - 69

D 60 - 64

F Below 60

- 7.0 Resource Material Information -

7.1 Textbook(s) or other required readings used in course:

Trigsted, Kirk, Randy Gallaher, and Kevin Bodden. *Intermediate Algebra eTest Reference*. Stamford: Pearson, 2011.

7.2 Other student suggested reading materials:

7.3 Current bibliography and other resources:

Bittinger, Marvin L., David J. Ellenbogen, and Barbara L. Johnson. *Intermediate Algebra: Concepts & Applications, 9th ed*. Upper Saddle River: Pearson, 2012.

Bittinger, Marvin L., David J. Ellenbogen, and Barbara L. Johnson. *Intermediate Algebra: Graphs &*

Models, 4th ed. Upper Saddle River: Pearson, 2011.

Blitzer, Robert F. *Intermediate Algebra for College Students, 6th ed*. Upper Saddle River: Pearson, 2012.

Clark, Mark, and Cynthia Anfinson. *Intermediate Algebra: Connecting Concepts through Applications*. Stamford: Cengage Learning, 2011.

Dugopolski, Mark. *Intermediate Algebra, 7th ed*. New York: McGraw-Hill, 2011.

Kaufmann, Jerome E., and Karen L. Schwitters. *Intermediate Algebra, 9th ed*. Stamford: Cengage Learning, 2010.

Lehmann, Jay. *Intermediate Algebra: Functions & Authentic Applications, 4th ed*. Upper Saddle River: Pearson, 2010.

Lial, Margaret, John Hornsby, and Terry McGinnis. *Intermediate Algebra, 11th ed*. Upper Saddle River: Pearson, 2011.

Martin-Gay, Elayn. *Intermediate Algebra, 6th ed*. Upper Saddle River: Pearson, 2012.

Rockswold, Gary K., and Terry A. Kreiger. *Intermediate Algebra with Applications and Visualization, 4th ed*. Upper Saddle River: Pearson, 2012.

- 8.0 Other Information -

8.1 Accommodations statement:

Accommodations are provided for students who are registered with UNO Disability Services and make their requests sufficiently in advance. For more information, contact Disability Services (MBSC 111, Phone: 402.554.2872, TTY: 402.554.3799) or visit the web at http://www.unomaha.edu/disability.

8.2 Other:

* 8.3 Author(s):

Mary R. Dennison, Lecturer, Director of the UNO Mathematics Laboratory and Debbie Challman, Academic Coordinator, UNO Mathematics Department

- Course Information -

University:	University of Nebraska at Omaha
College:	Arts and Sciences
Curriculum:	Mathematics for Teachers
Number:	2000
Type:	Lecture
Title:	Mathematics for Elementary School Teachers I
Short title:	Math for Elem Teachers I
Effective term:	Fall 2013
Graduate non-degree students:	Allowed
Can course be taken for credit multiple times?	No

- Credit Hours Information -

Type:	Fixed
Hours:	3

- Duplicate Information -

Curriculum:	Not applicable

- Cross-listing and/or Dual-listing (UG/G) Information -

Courses:	Not applicable

- 1.0 Course Description Information -

1.1 Catalog description:

A course for prospective elementary school teachers that involves mathematical reasoning, conjecturing, problem-solving, and connecting mathematical thought to its applications. Topics include fractions, decimals, arithmetic operations, and proportional reasoning.

1.2 Prerequisites of the course:

C- or better in MATH 1310 and passing the PPST.

1.3 Overview of content and purpose of the course:

This course represents a collection of topics, developed specifically for elementary teachers, not covered in other Math courses.

1.4 Unusual circumstances of the course:

No unusual circumstances. Effective and current methods of instruction for the elementary classroom will be utilized as the course combines content and pedagogy in mathematics.

- 2.0 Course Justification Information -

2.1 Anticipated audience / demand:

This course is intended for sophomore level elementary education majors.

2.2 Indicate how often this course will be offered and the anticipated enrollment:

This course is offered every fall, spring, and summer with an anticipated enrollment of 25 students per section offered (75 per fall and spring semester).

2.3 If it is a significant change to an existing course please explain why it is needed:

The change is significant. We had previously listed the wrong course objectives and content orgranization listed for this course. The performance objectives and the content organization were those from MTCH 2010.

- *3.0 Objective Information* -Is this course part of or being proposed for the General Education curriculum?
No

3.1 List of performance objectives stated as student learning outcomes:
The Student will:

1. Use problem-solving approaches to investigate, understand, and solve problems of mathematical content.

2. Acquire confidence in using mathematics meaningfully.

3. Develop a deep and flexible understanding of the meaning of fractions, decimals, and percentages.

4. Develop a deep and flexible understanding of the different arithmetical operations as applied to whole number, fractions, and decimals.

5. Develop understanding of common arithmetic properties (such as the associative property) and how to use them to develop number sense.

6. Develop a solid understanding of how to solve problems using proportional reasoning.

3.2 General Education Student Learning OutcomesAfter completing the course, successful students shall be able to do the following:

- *4.0 Content and Organization Information* -
4.1 List the major topics central to this course:
Fractions

- The Meaning of Fractions
- Equivalent Fractions
- Comparing Fractions
- Percents

Addition and Subtraction

- Interpretations of Addition and Subtraction
- Commutative and Associative Properties of Addition and Subtraction
- Standard Algorithms for Addition and Subtraction
- Adding and Subtracting Fractions
- Adding and Subtracting Negative Numbers

Multiplication

- Interpretations of Multiplication
- Commutative and Associative Properties of Multiplication
- The Distributive Property
- Properties of Arithmetic and Mental Math and Single Digit Multiplication Facts
- Why the Common Algorithm for Multiplication works
- Multiplying Fractions
- Multiplying Decimals
- Multiplying Negative Numbers

Division

- Interpretations of Division
- Division and Fractions and Division with Remainder
- Why Division Algorithms Work
- Fraction Division from a "How Many Groups" perspective
- Fraction Division from a "How Many in each Group" perspective
- Dividing Decimals

Ratios and Proportions

- Motivating and Defining Ratio and Proportional Relationships
- Solving Proportional Problems by Reasoning with Multiplication and Division
- Unit Rates and Values of a Ratio
- Proportional Relationships versus Inversely Proportional Relationships
- Percent Increase/Percent Decrease

- *5.0 Teaching Methodology Information* -

5.1 Methods:

1. Instruction involving small groups, cooperative learning, activity based learning (utilizing computers and manipulatives) and modified lectures.

2. Students will be active participants in class discussions and involved in classroom presentations.

3. 3 classroom hours/week

5.2 Student role:

Students must participate in classroom discussion and activities.

- *6.0 Evaluation Information* -Students should be provided the actual list of projects, basis for determining the final grade, and grading scale at the beginning of each course.

6.1.1 Describe the typical types of student projects that will be the basis for evaluating student performance:

Students will be submitting group projects indicating depth and breadth of comprehension material, taking take-home and in-class exams, entering daily journal writings, performing in-class activities, doing homework assignments, and submitting a portfolio summarizing the semesters work.

6.2 Describe the typical basis for determining the final grade (e.g., weighting of various student projects):

The final grade will come predominately from in class and take home exams (approximately 80% of the final grade. The rest of the grade will come from homework, in class quizzes, class participation, and other assignments

6.3 Grading type:

Letter grades

The grading scale will be determined by the instructor and distributed to students at the start of the term. What follows is one possible example:

A+: 98-100% B+: 86-88% C+: 76-78% D+: 66-69% F: Below 60%

A : 93-97% B : 83 – 85% C : 70-75% D : 60-65%

A-: 89-92% B- : 79-82%

- *7.0 Resource Material Information* -

7.1 Textbook(s) or other required readings used in course:

Mathematics for Elementary Teachers, 4th Edition, Sybilla Beckmann, Pearson

7.2 Other student suggested reading materials:

none

7.3 Current bibliography and other resources:

Effects of Teachers' Mathematical Knowledge for Teaching on Students' Achievement, H.C. Hill, B. Rowan, & D.L; Ball. American Educational Research Journal, 42(2), 371-406, 2005.

Fraction Bars, A. Bennett, Jr. & P. Davidson; Palo Alto, CA: Creative Publications, 1991.

Mathematics for Elementary Teachers, 2^{d}edition, S. Beckman; Boston, MA: Pearson Education, 2007.

No Common Denominator: The Preparation of Elementary Teachers in Mathematics in America's Education Schools, National Council on Teacher Quality; Retrieved August 1st, 2008.

Reasoning About Numbers and Quantities, J. Sowder, L. Sowder, & S. Nickerson; New York: W.H. Freeman, 2007.

Reading the Numbers: A Survival Guide to the Measurements, Numbers, and Sizes Encountered in Everyday Life, M. Blacksma; New York: Penguin Group, Viking Penguin Inc., 1989.

The Art of Problem Posing, S. Brown & W. Walter; Philadelphia: Franklin Institute Press, 1991.

The Effects of Different Undergraduate Mathematics Courses on the Content Knowledge and Attitude towards Mathematics of Pre-service Elementary Teachers, M. Matthews & W. Seaman; Issues in Undergraduate Mathematics Preparation of School Teachers: The Journal, 1. Retrieved October 15th, 2008.

The Mathematical Education of Teachers, CBMS series on Issues in Mathematics Education, Vol. #11. Conference Board of the Mathematical Sciences; Providence, RI: American Mathematical Society, 2001.

The Mathematical Tourist: Snapshots of Modern Mathematics, I. Peterson; New York: W.H. Freeman and Company, 1988.

- *8.0 Other Information* -

8.1 Accommodations statement:

Accommodations are provided for students who are registered with UNO Disability Services and make their requests sufficiently in advance. For more information, contact Disability Services (MBSC 111, Phone: 402.554.2872, TTY: 402.554.3799) or visit the web at http://www.unomaha.edu/disability.

8.2 Other:

* 8.3 Author(s):

Michael Matthews

Math 2000 – Mathematics for Elementary School Teachers Fall 2013
Section 002: Class Number 17810: MW: 5:30 – 6:45: DSC 255

Instructor: Ms. Korth

Office Hours: MW, 5:15-5:30, 6:45-7:15, room DSC 255
Telephone: 658-5585 (cell) (I don't mind phone calls or texts)
Email: jessica.korth@ops.org

Welcome to Math 2000! It is a pleasure to be involved with the mathematics education of elementary education majors. I will be teaching relevant mathematics in a manner that involves much more than "knowing the right formula". Rather, you will be constantly asked to explain the mathematics, to discuss your strategies, and to develop deep mathematical ideas. It is not enough to just 'tell how to do' the mathematics to children in school, instead 'teach why' mathematics is. This course is about developing conceptual understanding of the mathematics you will be teaching.

My long-term goal is helping you find a love for mathematics and to become a superb mathematics teacher at the elementary school level. I want you to have a deep understanding of the mathematics you teach and the ability to communicate this understanding to your students. In order for this to occur, you will be spending a great deal of time on this course.

Math 2000 will be a challenging course, but you will have lots of support. Please email me anytime or come to my office hours to discuss any questions or concerns at any time during the semester. The **Math-Science Learning Center** offers peer assisted, independent study in the form of peer tutoring, facilitated study groups and supplemental instruction. The MSLC is here to help all UNO students free of charge. Students wishing to work with a peer-tutor simple need to stop by - no appointment is necessary for most courses. Course-by-course hours of availability can be found on the MSLC website. For assistance, please visit the MSLC at 107 Durham Science Center, www.unomaha.edu/MSLC or call 554-3534.

Your success is a measure of my success. Here are some strategies for us to reach our goal together:

1) **Be an active participant in class. Much of this class is taught through class activities.**
2) **Read the section before doing problems. Refer to notes taken in class to clarify points from the book.**
3) **Do all practice problems before attempting homework assignments. Refer to solutions after attempting them yourself.**
4) **Keep up with homework! Come see me, to go over homework questions together.**
5) **Come to class prepared. Bring book, activities manual and any needed supplies.**
6) **Practice working with pattern blocks at home and in class. Things that are unfamiliar are challenging.**

7) **After completing a new section, go back and read each previous section (since the last test) and do 1-2 problems from each section.**
8) **Start preparing for tests one week prior to the test date. Go back through all notes and problem sets to review and identify areas that need more attention. Come to my office to discuss those areas and receive help.**
9) **After tests are returned, take them home and carefully go over all problems, making certain that you understand problems that you had missed. Come in to get help on any areas.**

Prerequisites: Completion of Math 1310 and a satisfactory score on the PPST.

Textbook: Mathematics for Elementary Teachers with Activities, 4th edition, Beckmann **(required)**

Pattern Blocks: We will use them throughout the course.

Attendance is mandatory. You are allowed only 3 **absences** for the course. **If you have more than 3 absences (excused or unexcused), your final course grade will automatically be lowered.** If there are extenuating circumstances requiring your absence, you must see the instructor. If you are absent on a test day, a make-up exam is not guaranteed. It is given at the discretion of the instructor only with adequate notification and justification. Make-up quizzes are NOT given. **Students are expected to be prompt and to stay in class for the entire class period. Leaving the classroom while class is in session can be disruptive and is disrespectful to the instructor and the other class members. If you are more than 10 minutes tardy 3 times during the semester, it will count as one absence.**

Homework is mandatory. You cannot learn mathematics unless you do mathematics. Homework quizzes will be given **often and the 2 lowest scores will be dropped**. No make-up homework quizzes are given. The cumulative score on homework quizzes will be equivalent to one test grade.

Course grade: The grade will be determined based on performance on three tests (50 pts each), homework quizzes (50 pts), participation (10 pts), & a comprehensive final (75 pts).

The following grade scale will be used:

A+: 95-100%	B+: 85-89%	C+: 76-79%	D+: 67-69%	F: below 60%
A: 90-94%	B: 80-84%	C: 70-75%	D: 60-66%	

NOTE: If Math 2000 is not successfully completed after the 2nd attempt, individuals must petition the Elementary Mathematics Committee to enroll for the third and final time.

THE LAST DAY TO WITHDRAW WITH A "W" IS Nov 8.

Math 2000 tentative schedule

Margaret Buerman Fall 2013 (Excel Spreadsheet)

* optional extra credit problems

date	section(s)	assignment due next class meeting
26-Aug	2.1	read section 2.2, problems from handout
28-Aug	2.2	P. 57: 1,2,4,5,9
30-Aug	2.2	P. 57: 7,10,15,16,20,*21, read section 2.3
4-Sep	2.3	P.67: 1,3,4,22,23,*24, read section 2.4
6-Sep	2.4	P.77: 1,2,3,4,11, read section 2.5
9-Sep	2.4,2.5	P.77: 6,7,17, P.87: 1,2
11-Sep	2.5	P.87; 3,4,9,10,15,*23, read section 3.1
13-Sep	3.1	P.99: 1,3,5,6,8, read section 3.2
16-Sep	3.2	P.109: 1,2,3,4,5
18-Sep	3.2	P.110: 6,7,8,10,11,*12, read section 3.3
20-Sep	3.3	P.117:1,2,3,7,11, read section 3.4
23-Sep	3.4	P.129: 1,.10,12,13,16
25-Sep	3.4	P.129: 2,3,11,17,19,*25, read section 3.5
27-Sep	3.5	P.137: 1,2,3,4
30-Sep	review	
2-Oct	exam 1	read section 4.1
4-Oct	4.1,4.2	P.145: 1,2,3,4,8, read section 4.2
7-Oct	4.2,4.3	P.148: 1,2, P.159: 1,2,3, read section 4.3
9-Oct	4.3	P.160: 5,10,13,14,18,*25,read section 4.4
11-Oct	4.4	P.171: 1,4,5,6,7, read section 4.5
14-Oct	4.4,4.5	P.P.171: 9,10, P.179: 3,4,7
16-Oct	4.5	P.180: 5,8,10,13,16,*17, read section 4.6
18-Oct	4.6	P.188: 2,4,7,10,12, read section 5.1
23-Oct	5.1	P.200: 1,5,8,11,14,*18, read section 5.2
25-Oct	5.2	P.207: 1,3,6,9,10,read section 5.3
28-Oct	5.3	P.210: 1,2,3
30-Oct	review	
1-Nov	exam 2	read section 6.1
4-Nov	6.1	P.227: 1,2,3,4,6, read section 6.2
6-Nov	6.2	P.233: 1,2,3,4,7,*9, read section 6.3
8-Nov	6.3	P.246: 2,3,4,5,8,19, read section 6.4
11-Nov	6.4	P.255: 1,2,3,4,6, read section 6.5

13-Nov	6.4,6.5	P.255: 8,10,P.263: 2,3,4
15-Nov	6.5	P.263: 5,6,8,9,11, read section 6.6
18-Nov	6.6	P.271: 2,3,4,5,6
20-Nov	review	
22-Nov	exam 3	read section 7.1
28-Nov	7.1	P.283: 1,3,4,8,9, read section 7.2
2-Dec	7.2	P.291: 1,3,5,11,15, read section 7.3
4-Dec	7.3	P.297: 2,4,6,7,19, read section 7.5
6-Dec	7.5	P.311: 1,2,4,5,6,7,*14
	final	
9-Dec	review	
	final	
13-Dec	review	

Math 2000 – Mathematics for Elementary School Teachers Spring 2013
Tuesday and Thursday, 1:00 – 2:15 pm, DSC 255

Instructor: Dr. Rech

Homework HELP time: 12:00 – 1:00 pm, TR, DSC 208
I am available in my office for office hours on MW, 1:00 – 2:00

COME SEE ME!!! I am your BEST resource. YOU are each other's next best resource. Use me and each other!!

Office: DSC #229

Telephone: 402-554-2827, 402-426.2753 (home), 402.515.2446 (cell)
Email: jrech@unomaha.edu

I am honored and privileged to have you in Math 2000. It is a pleasure to be involved with the mathematics education of elementary education majors. I will be teaching relevant mathematics in a manner that involves much more than "knowing the right formula". Rather, you will be constantly asked to explain the mathematics, to discuss your strategies, and to develop deep mathematical ideas. It is rarely enough to know the "right formula" in mathematics. This course is about developing conceptual understanding of the mathematics you will be teaching. It is a very rigorous course.

My long term goal is nothing short of helping you become a superb mathematics teacher at the elementary school level. I want you to be one who stands out from the crowd because of your deep understanding of the math you teach and the ability to communicate this understanding to your students. In order for this to occur, you'll be spending a great deal of time on this course. I want to have you be an excellent MATH TEACHER at the end of this course!

Your success is a measure of my success. Here are some strategies for us to reach our goal together:

1) **Be an active participant in class. Much of this class is taught through class activities.**
2) **Read the section before doing problems. Refer to notes taken in class to clarify points from the book.**
3) **Do all practice problems before attempting homework assignments. Refer to solutions after attempting them yourself.**
4) **Keep up with homework! Come see me, to go over homework questions together.**
5) **Come to class prepared. Bring book, activities manual and any needed supplies.**
6) **Practice working with pattern blocks at home and in my office. Things that are unfamiliar are challenging.**

7) **After completing a new section, go back and read each previous section (since the last test) and do 1-2 problems from each section.**
8) **Start preparing for tests one week prior to the test date. Go back through all notes and problem sets to review and identify areas that need more attention. Come to my office to discuss those areas and receive help.**
9) **After tests are returned, take them home and carefully go over all problems, making certain that you understand problems that you had missed. Come in to get help on any areas.**

Prerequisites: Completion of Math 1310 and a satisfactory score on the PPST.

Textbook: Mathematics for Elementary Teachers, 3rd ed, Beckmann **(required)**

Activites Manual for Mathematics for Elementary Teachers, Beckmann **(required)**

Pattern Blocks: Required (We will use them extensively during the course. You will become pattern block experts!!)

Calculator: Recommended (NOTE: Your phone cannot be used as your calculator on tests.)

Homework/Class notebooks: It is strongly recommended that you take good notes in class and organize them in a math notebook. **Your homework should also be contained in a separate homework notebook (not in your textbook).** A great deal of material is taught in this course, and organization is critical for success.

Blackboard will be used to communicate information to you and to provide some materials needed in the course. To access your Blackboard account for this course, go to the UNO home page (www.unomaha.edu) and click on the myUNO portal (formerly Blackboard). Math 2000 will be listed as an available course for this semester.

I will occasionally be emailing you to get important information to you. I automatically email to your UNO email account. **Please check your UNO email account regularly**.

Attendance is mandatory. I can't teach you anything if you're not present. You are allowed only 2 **absences** for the course. **If you have more than 2 absences, your final course grade may be lowered.** If there are extenuating circumstances requiring your absence, you must see the instructor. If you are

absent on a test day, a make-up exam is not guaranteed. It is given at the discretion of the instructor only with adequate notification and justification.

Students are expected to stay in class for the entire period. Do NOT leave class during the middle of the period. ***Leaving the classroom while class is in session can be disruptive and is disrespectful to the instructor and the other class members. No cell phones/texting are to be used during class.***

Homework is mandatory. You cannot learn mathematics unless you do mathematics. Homework will be collected each period & graded for completion. Quizzes over homework will often be given. No make-up quizzes.

Course grade: The grade will be determined based on performance on 3 tests (51% of course grade), homework completion (10% of grade), homework quizzes (10% of course grade), class participation (5% of grade) and a cumulative final exam (24% of course grade).

The following grade scale will be used:

A+: 98-100%	B+: 87-89%	C+: 76-79%	D+: 66-69%	F: below 60%
A : 94-97%	B : 83-86%	C : 70-75%	D : 60-65%	
A-: 90-93%	B-: 80-82%			

- Course Information -

University:	University of Nebraska at Omaha
College:	Arts and Sciences
Curriculum:	Mathematics for Teachers
Number:	2010
Type:	Lecture
Title:	Mathematics for Elementary Teachers ll
Short title:	Math for Elem Teachers II
Effective term:	Fall 2013
Graduate non-degree students:	Allowed
Can course be taken for credit multiple times?	No

- Credit Hours Information -

Type:	Fixed
Hours:	3

- Duplicate Information -

Curriculum:	Not applicable

- Cross-listing and/or Dual-listing (UG/G) Information -

Courses:	Not applicable

- 1.0 Course Description Information -

1.1 Catalog description:

This course represents a collection of topics, developed specifically for elementary school teachers, not covered in other courses.

1.2 Prerequisites of the course:

MATH 2000 with a grade of C- or better.

1.3 Overview of content and purpose of the course:

This course includes geometry, measurement, number theory, algebra, and statistic topics and their conceptual development as they relate to what is taught in the elementary classroom. Topics include polyhedra, polygons, constructions, size changes, planar curves and curved surfaces, measurement, area, volume, factors, primes, equations, expressions, measures of central tendency and spread.

1.4 Unusual circumstances of the course:

none

- 2.0 Course Justification Information -

2.1 Anticipated audience / demand:

This course is designed to meet the needs of those students who will be elementary classroom teachers.

2.2 Indicate how often this course will be offered and the anticipated enrollment:

This course is offered every fall, spring, and summer with an anticipated enrollment of 30 students per section (90 per fall and spring semester).

2.3 If it is a significant change to an existing course please explain why it is needed:

The changes include a change to the prefix from MATH to MTCH and an updated list of major topics central to the course.

- 3.0 Objective Information -Is this course part of or being proposed for the General Education curriculum?

No

3.1 List of performance objectives stated as student learning outcomes:

Students will understand the underlying concepts necessary to teach geometry, measurement, number theory, algebra, and statistic topics within the elementary classroom.

3.2 General Education Student Learning OutcomesAfter completing the course, successful students shall be able to do the following:

- *4.0 Content and Organization Information* -

4.1 List the major topics central to this course:

Number Theory

- Factors and Multiples
- Even and Odds
- Divisibility Tests
- Prime Numbers
- Greatest Common Factor and Least Common Multiple

Algebra

- Numerical Expressions
- Expressions with Variables
- Equations
- Solving Equations
- Solving Algebra Story Problems with Strip Diagrams and with Algebra
- Sequences

Geometry

- Angles
- Circles and Spheres
- Triangles, Quadrilaterals, and other Polygons

Measurement

- Fundamentals of Measurement
- Length, Area, and Volume
- Converting between one Unit of Measurement to Another

Areas of Shapes

- Moving and Additivity Principles of Area
- Areas of Triangles
- Areas of Parallelograms and other Shapes

Solid Shapes and their Surface Area

- Polyhedra and Other Solid Shapes
- Patterns and Surface Area

Geometry of Motion and Change

- Reflections, Translations, and Rotations
- Symmetry

Statistics

- Formulating Statistical Questions, Gathering Data, and Using Samples

- The Center of Data: Mean, Median, and Mode
- Summarizing, Describing, and Comparing Data Distributions

Probability

- Basic Principles
- Counting the Number of Outcomes
- Probability in Multi-Stage Experiments
- Using Fraction Arithmetic to Calculate Probabilities

- *5.0 Teaching Methodology Information* -

5.1 Methods:

This course is to be taught in a manner that has increased emphases on images, ideas, reasons, goals, and relationships. The focus is to be on the big ideas, to realize that mathematics is not about getting answers to questions, but about developing insight into relationships and structures. Students will be engaged in complex problems to develop deep understanding, instead of meaninglessly memorizing procedures for solving them.

5.2 Student role:

Students must participate in class and complete outside projects, including activities. Students will be required to do extensive writing. To demonstrate mastery of a concept, students must be able to organize ideas and understandings. Explanations of work must be complete, conceptual, and coherent. Assignments will contain questions and activities, some completed individually, some within small groups.

Expected time commitment: 3 hours per week plus 6 hours per week outside of class for homework, projects, and activities as assigned.

- *6.0 Evaluation Information* -Students should be provided the actual list of projects, basis for determining the final grade, and grading scale at the beginning of each course.

6.1.1 Describe the typical types of student projects that will be the basis for evaluating student performance:

Evaluation will be based on tests, class assignments, student performance on projects, and classroom participation.

6.2 Describe the typical basis for determining the final grade (e.g., weighting of various student projects):

Classroom tests and assignments will represent approximately 80% of the course grade with 20% of the grade for projects, activities outside of class, and classroom participation.

6.3 Grading type:

Letter grades

A+: 98-100% B+: 86-88% C+: 76-78% D+: 66-69% F: Below 60%

A: 93-97% B: 83 – 85% C: 70-75% D: 60-65%

A-: 89-92% B-: 79-82%

- *7.0 Resource Material Information* -

7.1 Textbook(s) or other required readings used in course:

Beckmann, Sybilla. *Mathematics for Elementary Teachers, 4th edition*. Massachusettes: Pearson Eduaction, 2012.

7.2 Other student suggested reading materials:

Curriculum and Evaluation Standards for School Mathematics; National Council of Teachers of Mathematics, 1989.

Internet and supplemental activities.

7.3 Current bibliography and other resources:

Beckmann, Sybilla. *Mathematics for Elementary Teachers, 2rd edition*. Boston, MA: Pearson Education, 2008.

Bennett, Albert B. Jr., and Patricia S. Davidson. *Fraction Bars*. California: Creative Publications, 1973.

Billstein, Rick, Shlomo Libeskind, and Johnny Lott. *A Problem Solving Approach for Elementary School Teachers, 9th edition*. Massachusetts: Addison-Wesley, 2006.

Blacksma, Mary. *Reading the Numbers: A Survival Guide to the Measurements, Numbers, and Sizes Encountered in Everyday Life*. New York: Penguin Group, 1989.

Brown, Stephen, and Marion Walter. *The Art of Problem Posing*. Philadelphia: Franklin Institute Press, 1991.

Musser, Gary, Blake Peterson, and William Burger. *Mathematics for Elementary Teachers: A Contemporary Approach*. New Jersey: Wiley, 2008.

Peterson, Ivars. *Islands of Truth: A Mathematical Mystery Cruise*. New York: W.H. Freeman, 1991.

Peterson, Ivars. *The Jungles of Randomness*. New Jersey: Wiley, 1997.

Peterson, Ivars. *The Mathematical Tourist: Snapshots of Modern Mathematics*. New York: W.H. Freeman and Company, 1988.

Sowder, Judy, Larry Sowder, and Susan Nickerson. *Reasoning About Numbers and Quantities*. New York: W.H. Freeman, 2007.

- *8.0 Other Information* -

8.1 Accommodations statement:

Accommodations are provided for students who are registered with UNO Disability Services and make their requests sufficiently in advance. For more information, contact Disability Services (MBSC 111, Phone: 402.554.2872, TTY: 402.554.3799) or visit the web at http://www.unomaha.edu/disability.

8.2 Other:

*8.3 Author (s): Michael Matthews

SYLLABUS Fall 2013
Math 2010 Mathematics for Elementary Teachers II
5:30-6:45pm TR DSC 255

Instructor: Katie Garcia **Office Hours**: TR 4:30-5:30
DSC 255 or by appointment
402-554-6027 (or 402-554-3430 to leave message)
kjgarcia@unomaha.edu
Best contact: Katie.Garcia@ops.org

Prerequisite: Completion of Math 2000 within the last 2 years with a grade of C- or better.

Materials: Mathematics for Elementary Teachers, 3rd edition, by Sybilla Beckmann, and Activities Manual. A compass, protractor, ruler (with both inches and centimeters), scissors, graph paper, and a scientific calculator will be needed during the course.

Purpose: This course is intended to provide elementary education majors with a deeper understanding of topics in number theory, algebra, statistics, probability, geometry and geometric measurement. The goal is not only to get the right answers but to make sense of the mathematics, "explaining why," and be able to convey it to others.

"Those who can, do. Those who *understand*, teach." Lee S. Shulman

Course Requirements:

1. Regular attendance and participation

2. 3 tests (the 3rd test is a mix of the last new material plus the cumulative final)

3. Homework assignments and quizzes

Attendance is mandatory. Discussions and in-class activities are vital to learning the material. If you miss a test for a legitimate (e.g. death in the family or hospitalization) and verifiable reason (**and** prompt notification is given), the instructor will give a make-up test. Otherwise, a zero will be given for the missed test. If you know in advance that you will miss a test (i.e. a school function), then you must give notification **before** the test; otherwise you will not be allowed to make-up the missed test.

Homework problems are assigned for each section covered. **Homework assigned for the week will be due typically on the following Tuesday**. Homework will be graded for effort and completion and is worth 10 points each week. You will receive feedback on selected problem(s) from each section. Questions should be answered completely and in well-structured sentences. Good mathematical explanations are essential to success in this course. **A short quiz will be given on many/most Thursdays** and will reflect the class activities, assigned homework, definitions and/or principles. **There are no make-ups for quizzes, but the lowest quiz grade will be dropped.**

Grading Policy:

3 Tests	80% of grade
Homework	10% of grade *One low grade dropped
Quizzes	10% of grade *One low grade dropped

*Note: In Blackboard, a column titled "Weighted Grade In Progress" will be calculating your weighted grade, with lowest scored dropped as the semester progresses. Refer to this to track your accurate in-progress grade.

Grading Scale (Percentage)

A+: 100 - 97.5	A: 97.4 – 92.5	A-: 92.4 – 90
B+: 89.9 – 87.5	B: 87.4 – 82.5	B-: 82.4 - 80
C+: 79.9 – 77.5	C: 77.4 – 72.5	C-: 72.4 – 70
D+: 69.9 – 67.5	D: 67.4 – 60	

**Note that the College of Education accepts only C- grades or higher.

Accommodations: Accommodations are provided for students who are registered with Disability Services and make their requests sufficiently in advance. Contact me as soon as you can regarding any accommodations.

Suggestions:

- Read the textbook—before and after the material is covered in class.
- Complete assigned problems immediately after material is covered in class.
- Come to class.
- Participate fully and ask questions during class.
- Come to office hours: *Located in our classroom (if no class meets immediately prior) or in DSC 208
- Get help from the tutors in the MSLC.
- Put serious effort into the homework. Try the practice problems without looking at the solutions first.
- Email any problems or questions. This is your education. I want you to be successful.
- Work in groups on homework and studying for tests.
- Ask for help.

Tentative Class Schedule and Homework Assignments

	Date	Section	Homework	
			Practice Problems	Problems
Week 1	Tues. 8/27	8.1	3, 4	1, 3, 4, 6, 8
		8.2 start	1, 2, 4, 5, 7	2, 4, 6, 11, 12, 15, 18
	Thurs. 8/29	8.2 cont'd		
		8.3	3, 4, 5	2, 3, 5
Week 2	Tues. 9/3	8.4	2, 3	1-3, 5, 6, 9, 11
	Thurs. 9/5	8.5	1, 2	1, 3, 4, 6, 9, 11, 12, 13
Week 3	Tues. 9/10	9.1	1, 2, 8, 9	1, 2, 3, 6, 14, 22, 23, 24
	Thurs. 9/12	9.2	1, 3, 5	1, 2, 4, 13, 14, 15, 17
		9.3 start		
Week 4	Tues. 9/17	9.3 cont'd	1, 2	1, 2, 3, 7
		9.4	1, 2, 3	2, 4, 8, 14, 15, 17
	Thurs. 9/19	9.5	1, 2, 3	1, 2, 5, 15, 16, 18, 25
Week 5	Tues. 9/24	Review		
	Thurs. 9/26	**Test 1**		
Week 6	Tues. 10/1	10.2	1, 2, 3, 5, 6, 8	1, 3, 6, 7, 8, 9
	Thurs. 10/3	10.5	2-8, 10-12	5, 6, 8, 12, 14
Week 7	Tues. 10/8	11.1	5, 9, 11, 12	1, 2, 3, 4
		11.2	2	1, 4
	Thurs. 10/10	11.4	1, 3, 4, 8, 9	3, 5, 6, 11, 13, 18, 24, 25
Week 8	Tues. 10/15	12.1	1-3	1, 3, 5
		12.2	1-3	1, 2, 3, 5, 7
	Thurs. 10/17	12.3	1-4	2, 3, 4, 6, 7, 9, 10
		12.4	4	4, 5, 9, 11, 12
Week	Tues. 10/22	**UNO Fall Break – no classes**		

9	Thurs. 10/24	13.1	2, 3, 4	2, 3, 4
Week 10	Tues. 10/29	13.2	5, 6, 7, 9	1, 3, 5, 8, 9
	Thurs. 10/31	Review		
Week 11	Tues. 11/5	**Test 2**		
	Thurs. 11/7	14.1	1, 2, 3	1, 4, 5, 7, 9, 10, 12
	Fri. 11/8	**Last day to withdraw with a "W"**		
Week 12	Tues. 11/12	14.2	1, 3, 4, 5	2, 3, 4, 7-11, 14
	Thurs. 11/14	15.3	2, 7, 8, 9	3, 6, 9, 12, 15, 16, 18
Week 13	Tues. 11/19	15.4	3, 4	1, 8, 10, 12
	Thurs. 11/21	16.1	1, 2, 3, 4	1, 3, 4, 5
Week 14	Tues. 11/26	16.2	1, 2, 3, 5, 6	1, 2, 3, 5, 6, 8
	Thurs. 11/28	**Thanksgiving Break – no classes**		
Week 15	Tues. 12/3	16.3	1, 3, 4, 5	1-6, 9, 10, 12, 14
	Thurs. 12/5	16.4	1, 2	1, 2, 3, 4, 12, 13, 14
Week 16	Tues. 12/10	Review		
	Thurs. 12/12	Review		
Finals Week	Tues. 12/17 5:30pm	**Test 3(Final)**		

Note: Practice Problems do **not** need to be turned in. However, you are responsible for knowing how to answer any practice problem. The Practice Problems can help you complete the assigned problems for each section.

Michael Matthews Fall 2013 MATH 2010

Section Covered	T/Th Schedule	Activities	Practice Exercises	Problems: Bold means challenge problem	Teacher Info
8.1/ begin 8.2	1/7/2013	8.1: 8A; 8.2: 8E, 8F, 8G	8.1: 3,4;8.2: 4,5,7	8.1: 1,4,6,**9**;8.2: 6,11,12, 15,17,18;	
8.2/8.3	1/9/2013	Finish 8.2; 8.3: 8K, 8L	8.3: 3,4,5	8.3:**1**,2-5,7;	Copies of the Factor Game
8.4/start 8.5	1/14/2013	8.4:8N,8O	8.4:2,3	8.4:1-3, 5, 6, 9,**11**	
Finish 8.5	1/16/2013	8.5:8Q	8.5: 1,2	8.5: 1,3,4,6, **9**,**11**,12, 14,15	
9.1	1/23/2013	9.1:9A, 9B, 9E	9.1:1,2,8,9	9.1:1,5,**7**,14,23,24,25	
9.2/Start 9.3	1/28/2013	9.2: 9G, 9H,9I,9K;9.3:9L,9M	9.2:1,3,4,5;9.3:1,2	9.2:1,4,8,**13**,14,15;9.3:1,2,4,6,7	Find your partner activity prep
9.4	1/30/2013	9.4:9O,9Q	9.4:1-3	9.4:2,4,8,**14**,21,25	Bring little somethings
9.4 Day 2	2/4/2013	9.4: Finish 9Q, Practice HW	N/A	You pick any four from: 1, 3, 5, 10, 12, 15, 16, 17, 18, 27, 28, 29 **(Any one can be challenge)**	
9.5	2/6/2013	9.5:9R,9T,9V	9.5:1-3	9.5:1,2,5,15,16,18,25	
Test	2/11/2013			Take Home Test #1	
10.2	2/13/2013	10.2: 10J, 10K, maybe one other	10.2: 1, 2, 3, 5, 6, 8	10.2: 1, 3, 6, 7, **8**, 9	Sticky Notes, Masking Tape
10.4, Start 10.5	2/18/2013	10.4: 10R, 10S, 10U	10.4: 1,3,4	10.4: 1,**2**,5	A bunch of nickels and pennies
10.5	2/20/2013	10.5: 10V, 10W, 10Y, 10Z	10.5: all	10.5:2, 3, 5,6, 8,12, 13,**14**,15	Playing Cards
11.1/11.2	2/25/2013	11.1: 11A, 11B; 11.2: 11D	11.1: 5,7,9,11,12, 11.2: 2	11.1: 1,2,**3**,4,5,8; 11.2: 1, 4	weird tape measure
11.4	2/27/2013	11.4:11F, 11I, 11K	11.4:1,3,4,8,9	11.4:3,4,6,9, 13,**15**,18,24,**25**	

12.1/12.2	3/4/2013	12.1: 12A; 12.2: 12B, 12C	12.1:all,12.2: all	12.1:1,3,5;12.2:1,3,5,**7**	
12.3/12.4	3/6/2013	12.3:12D, 12E, 12F,12G;12.4:12H	12.3: 1,3,4;12.4:4	12.3:2,3,4,**6**,7,9,11;12.4:4,**5**,9,11	
13.1	3/11/2013	13.1:13A,13B,13E	13.1:2,3,5	13.1:1,2,3,**4**,8	Toothpick and modeling clay, polydrons,
Test	3/13/2013			Take Home Test #2	
Spring Break	3/18/2013				
Spring Break	3/20/2013				
14.1	3/25/2013	14.1: 14A, 14B, 14F	14.1: 1-3	14.1: 1,4,**5**,7,9,10,12	
14.2	3/27/2013	14.2: 14G, 14I, maybe one other	14.2: 1,3,4,5	14.2: 2,3,4,7, **8**, 9, 10, 11,14,**15**	
15.1	4/1/2013	15.1: 15B, 15C, 15D	15.1: 1-3	15.1: 1-4,7,**8**	Linking Cubs, Paper Bags
15.3	4/3/2013	15.3:15L,15M,15P	15.3:2,7,8,9	15.3: 3,6,7,9,12,**15**,**16**,18	Bring Linking Cubes
15.4	4/8/2013	15.4:15T,15U,15V,15W	15.4:2,3,4	15.4:1,5,8,9, 10, **12**	Bring Linking Cubes
16.1	4/10/2013	16.1:16A,16B,16D	16.1:1-4	16.1:1,3,4,**5**	
16.2	4/15/2013	16.2:16F,16G	16.2:1,2,3,5,6	16.2:1,2,3,5,6,**8**	Paper bags, Linking Cubes, Sticky Notes, Paper Clips
16.3	4/17/2013	16.3:16H,16I,16K	16.3:1,3,4,5	16.3:4,5,6,9,12,**14**	Paper bags, Linking Cubes, Sticky Notes, Paper Clips
16.4	4/22/2013	16.4: 16L, 16M	16.4: 1-3	16.4: 1,2,5,13,14,16	Paper Bags, Linking Cubes
Final Exam	5/1/2013				

Math 2010 – Math for Elementary Teachers II Summer 2013
Monday and Thursday, 5:30 – 8:20 pm, DSC 255

Instructor: **Dr. Rech**

Office Hours: On class nights, I will be in my office, DSC 229 by 4:00 & in our room by 4:30 pm

COME SEE ME!!! I am your BEST resource.

Office: DSC #229

Telephone: 402-554-2827, 402-426.2753 (home), 402.515.2446 (cell)
Email: jrech@mail.unomaha.edu

I am honored and privileged to have you in Math 2010. I will be teaching relevant mathematics in a manner that involves much more than "knowing the right formula". Rather, you will be constantly asked to explain the mathematics, to discuss your strategies, and to develop deep mathematical ideas. It is rarely enough to know the "right formula" in mathematics. This course is about developing conceptual understanding of the mathematics you will be teaching. It is a very rigorous course.

My long term goal is nothing short of helping you become a superb mathematics teacher at the elementary school level. I want you to be one who stands out from the crowd because of your deep understanding of the mathematics you teach and the ability to communicate this understanding to your students. In order for this to occur, you will be spending a great deal of time on this course. I anticipate you will spend approximately 15-20 hours per week on this course. I want to help you in the course, and more importantly, I want to have you be an excellent MATH TEACHER at the end of this course!

Math 2010 will be a challenging course, but you will have lots of support. I want you to be successful and I am willing to help you as much as possible. This is a team effort!

Your success is a measure of my success. Here are some strategies for us to reach our goal together:

1) **Be an active participant in class. Much of this class is taught through class activities.**
2) **Read the section before doing problems. Refer to notes taken in class to clarify points from the book.**
3) **Do all practice problems before attempting homework assignments. Refer to solutions after attempting them yourself.**
4) **Keep up with homework! Come see me, to go over homework questions together.**
5) **Come to class prepared. Bring book, activities manual and any needed supplies.**
6) **Practice working with materials at home and in my office. Things that are unfamiliar are challenging.**

7) **After completing a new section, go back and read each previous section (since the last test) and do 1-2 problems from each section.**
8) **Start preparing for tests one week prior to the test date. Go back through all notes and problem sets to review and identify areas that need more attention. Come to my office to discuss those areas and receive help.**
9) **After tests are returned, take them home and carefully go over all problems, making certain that you understand problems that you had missed. Come in to get help on any areas.**

Prerequisites: Completion of Math 2000.

Textbook: Mathematics for Elementary Teachers, 3rd ed, Beckmann **(required)**

Activites Manual for Mathematics for Elementary Teachers, Beckmann **(required)**

Compass, straight edge, tape, scissors: Required for constructions

Pattern Blocks: Required

Calculator: Recommended (NOTE: Your phone cannot be used as your calculator on tests.)

Inquiry-Based Learning will be used extensively in this class. This means you will be discovering the math together, rather than being a passive observer! You are expected to fully participate within your group and present problems/ideas to the class, as a whole. **Ten percent of your course grade** will be attributed to your level of contributions to your group and to the entire class. We will work from the Activity Manual nightly – do all work in there!!

Homework: Your homework will be collected & graded for completion every night. When it is returned, keep it in a 3-ring binder to keep all material organized! A great deal of material is taught in this course, and organization is critical for success. Do ALL practice problems before attempting homework problems – they are your best guide!

Blackboard will be used to communicate information to you and to provide some materials needed in the course. To access your Blackboard account for this course, go to the UNO home page (www.unomaha.edu) and click on the myUNO portal (formerly Blackboard). Math 2010 will be listed as an available course for this semester.

I will occasionally be emailing you to get important information to you. I automatically email to your UNO email account. **Please check your UNO email account regularly**.

Attendance is mandatory. I can't teach you anything if you're not present. You are allowed only 1 **absence** for the course. **If you have more than 1 absence, your final course grade will automatically be lowered.** If there are extenuating circumstances requiring your absence, you must see the instructor. If you are absent on a test day, a make-up exam is not guaranteed. It is given at the discretion of the instructor only with adequate notification and justification.

Students are expected to stay in class for the entire evening. Departure prior to the conclusion of the evening's class, will result in an "absent" being recorded for the night.

Leaving the classroom while class is in session can be disruptive and is disrespectful to the instructor and the other class members. Two breaks will be given during the class period. No cell phones are to be used during class.

Quizzes will be given frequently, and the cumulative total will be 10% of your course grade.

Course grade: The grade will be determined based on performance on two tests (40% of course grade), homework completion (10% of course grade), quiz scores (10% of course grade), class participation and class presentations (10%), and a test covering the last portion of the course, as well as comprehensive material from the entire course (30% of course grade).

The following grade scale will be used:

A+: 98-100%	B+: 87-89%	C+: 77-79%	D+: 67-69%	F: below 60%
A : 94-97%	B : 83-86%	C : 73-76%	D : 60-66%	
A-: 90-93%	B-: 80-82%	C-: 70-72%		

TENTATIVE CLASS SCHEDULE

NOTE: During week 3, Memorial Day is a University holiday, and the campus is closed. We will be meeting on Tuesday, 5/28 instead.

Week		Monday	Thursday
1	**5/13-5/19**	8.1 – 8.3	8.4-8.5
2	**5/20-5/26**	9.1 – 9.3 Quiz	9.4 – 9.5, Review
3	**5/28-6/2**	**Test #1,** 10.2 NOTE: Class on Tues.	10.4 – 10.5
4	**6/3-6/9**	11.1,11.2,11.4 Quiz	12.1-12.3
5	**6/10-6/16**	12.4, 13.1 Quiz	**TEST #2**, 14.1
6	**6/17-6/23**	14.2, 15.1, 15.3	15.4, 16.1, 16.2 Quiz
7	**6/24-6/30**	16.3, 16.4 Quiz	**FINAL EXAM**

- Course Information -

University:	University of Nebraska at Omaha
College:	Education
Curriculum:	Teacher Education
Number:	4330
Type:	Lecture
Title:	Teaching of Mathematics: Elementary
Short title:	Teaching of Math- Elementary
Effective term:	Summer 2013
Graduate non-degree students:	Allowed
Can course be taken for credit multiple times?	No

- Credit Hours Information -

Type:	Fixed
Hours:	3

- Duplicate Information -

Curriculum:	Not applicable

- Cross-listing and/or Dual-listing (UG/G) Information -

Courses:	Not applicable

- 1.0 Course Description Information -

1.1 Catalog description:

This course is designed to prepare elementary teacher candidates as mathematics education professionals at the elementary level. The course utilizes "hands-on" discussion and laboratory oriented activities where participants actively practice instructional topics and techniques related to the learning of mathematics at the elementary level. The course will further prepare pre-service elementary teachers to be dedicated practitioners, reflective scholars, and responsible citizens, who can meet the instructional challenges of their profession, as it relates to the student learning of mathematics in a modern and changing world.

1.2 Prerequisites of the course:

MATH 1310, MATH 2000, MATH 2010, EDUC 2510, EDUC 2520, PPST; Co-requisite TED 4340.

1.3 Overview of content and purpose of the course:

The course, which is for all teacher candidates seeking certification at the elementary school level, is a survey of the critical topics of mathematics instruction in the elementary and middle school level; as well as a focused study of the most effective, research-based methods and strategies for teaching these modern mathematics topics. Using the conceptual framework of a dedicated practitioner, reflective scholar, and responsible citizen, this class will strive to empower teachers to become creative and effective leaders in the student learning of mathematics. The course will also strive to help teachers facilitate a learning of mathematics that is multidisciplinary, technology rich, and multiculturally appropriate.

It is important to note that advances in mathematics education have taken place within a wider context of change within our society. We are said to be in what has been called the "Information Age", where information is replacing land, labor, and capital as the most important societal commodity (Heid, 2005). Technology and mathematics are helping us exist more effectively in this new age, allowing us to communicate, manage, organize, and manipulate information efficiently. It is within the context of this dynamic new age that educators are suggesting the need to dramatically change the existing mathematics curriculum to better prepare all students for their lives within this age (Fuson, Kalchman & Bransford, 2005).

Mathematics education in particular has been substantially impacted by the educational demands of the Information Age. No longer can we simply teach our students a sequence of facts, algorithms, and basic skills through a set of isolated classes. Today, students must be prepared to actively draw on mathematics as a tool to investigate and solve real life

problems. As described by the National Council of Teachers of Mathematics, "knowing mathematics is doing mathematics" (NCTM, 2000) and mathematics instruction is now one of "high quality, focused, and thoughtful" instruction (NCTM, 2006).

In particular, educational technology advances have greatly impacted the teaching of mathematics (Association of Mathematics Teacher Educators, 2006). For example, powerful spreadsheets have become a very useful mathematical instruction device related to problem solving and arithmetic (Sinclair & Crespo, 2006), and access to the Internet is changing the teaching of many advanced mathematical topics including algebra (Heid, 1995). Such advances are also greatly changing the ways that we assess mathematical achievement and understanding, as represented by new approaches in instruction and assessment (Education of the States, 2003).

As our society advances, our perceptions of what we should teach our students related to mathematics education is changing. The National Council of Teachers of Mathematics (NCTM) has published (2000) a set of specific standards which attempt to outline clearly the curricular changes confronting mathematics education in the Information Age. This document, detailing Principals and Standards for School Mathematics, suggests significant changes in how all students, at all levels, should learn about mathematics. A further document by the NCTM called Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics details mathematics focus areas for each grade level (2006). Integral to these documents is the NCTM's perception of mathematics as a very active and investigative discipline. Each of the various categories of grade level standards discussed in the 2000 document (Pre-K-2, 3-5, 6-8, 9-12), reinforce mathematics as a discipline for problem solving, reasoning, communication, and connections between disciplines. In essence, the standards seek to produce students who are active and self-directed learners, and who can draw upon mathematics as a fundamental power in solving real life problems.

1.4 Unusual circumstances of the course:

- *2.0 Course Justification Information* -

2.1 Anticipated audience / demand:

The anticipated audience includes all teacher candidates seeking a degree and certification in elementary education. It is a required course in their program.

2.2 Indicate how often this course will be offered and the anticipated enrollment:

The course will be offered with multiple sections each fall and spring semester and during the summer with an anticipated enrollment of 25 students in each section.

2.3 If it is a significant change to an existing course please explain why it is needed:

Updated for accreditation purposes.

- *3.0 Objective Information* -Is this course part of or being proposed for the General Education curriculum?

No

3.1 List of performance objectives stated as student learning outcomes:

The course objectives are related to the propositions of the National Board for Professional Teaching Standards (NBPTS) and the Interstate New Teacher Assessment and Support Consortium (InTASC) principles.

1. Review, extend, and enrich teacher candidate background in basic mathematical concepts (InTASC 4; NBPTS 2).

2. Select methods and materials which are appropriate for teaching mathematics in elementary schools (InTASC 1,7,8; NBPTS 3).

3. Effectively use a variety of methods and materials to teach math concepts (InTASC 7,8; NBPTS 1,5).

4. Become familiar with a variety of assessment procedures appropriate to mathematics education at the elementary level (InTASC 6; NBPTS 3)

5. Learn to use scientific calculators, hand-held computing devices, Internet websites, laptop computers, and other emerging technologies in the instruction of mathematics (InTASC 3,7,8; NBPTS 3).

6. Become aware of the professional responsibilities and resources related to teaching mathematics in the elementary school (InTASC 9,10; NBPTS 4,5)

7. Become aware of the teacher's role as dedicated practitioner, reflective scholar, and responsible citizen, and the activities and strategies in mathematics education that support such a role (InTASC 6,7,9,10; NBPTS 3,5).

8. Become aware and know how to instruct the National Council of Teachers of Mathematics professional standards for elementary school mathematics (InTASC 1,2,4,5,6; NBPTS 1,2).

9. Become aware of some basic concerns and information related to multicultural education in the mathematics classroom (InTASC 2,3,9; NBPTS 1,3).

10. Become familiar with the various roles of technology in supporting the learning of mathematics, including the use of technology in the integration of STEM related topics and applications (InTASC 4,5,7,8; NBPTS 2,3).

11. Become aware of the substantial resources available on the Internet for helping plan, enhance and enrich the learning of mathematics and its effective instruction (InTASC 1,2,4,7,8; NBPTS 2,3,5).

12. Be aware of the global perspective of mathematics, as a common language (InTASC 9; NBPTS 4).

13. Further develop a professional set of "dispositions" for teachers, including: (InTASC 9,10; NBPTS 4,5)

• Interpersonal skills

• Valuing diverse perspectives

• Respecting privacy and confidentiality

• Commitment to reflection

• Commitment to lifelong learning

• Enthusiasm for learning

14. Develop a working knowledge of the use of national, state, and local standards in the planning of mathematics instruction and in support of an effective mathematics learning environment (InTASC 4,7; NBPTS 1,3).

3.2 General Education Student Learning OutcomesAfter completing the course, successful students shall be able to do the following:

- *4.0 Content and Organization Information* -

4.1 List the major topics central to this course:
The following topics will be covered in the course:

1. Considering the needs of today's elementary level mathematics instruction.

2. The National Council of Teachers of Standards

3. The National Council of Teachers of Mathematics Focal Points

4. Mathematics as problem solving

5. Mathematics as communication

6. Mathematics as reasoning

7. Mathematical connections

8. Representation and mathematics learning

9. Diagnosing student misconceptions in mathematics

10. Facilitating the learning of place value concepts

11. Facilitating the learning of student "number sense"

12. Facilitating the learning of patterns and relationships

13. Facilitating the learning of whole number operations

14. Facilitating the learning of decimals

15. Facilitating the learning of estimation

16. Facilitating the learning of fractions

17. Facilitating the learning of percents

18. Facilitating the learning of integers

19. Facilitating the learning of probability and statistics

20. Facilitating the learning of geometry

21. Facilitating the learning of measurement

22. Building spatial sense in students

23. Multicultural concerns and mathematics education

24. Learning mathematics with a global perspective

25. The elementary teacher and the "myths" of mathematics instruction

26. The use of technology in the elementary mathematics classroom

27. The core use of standards and "NCTM Focal Points" within the learning environment

28. Blending mathematics instruction with other disciplines

- *5.0 Teaching Methodology Information* -

5.1 Methods:

Daily class activities or competency tasks will be introduced at the beginning of each period by the course instructor. After the initial introduction period of each class, teacher candidates will work in a lab type of setting to continue class activities. Teacher candidates are encouraged to help each other and work together on course activities and projects. Working ahead is permitted on many of the individualized projects, computer activities, calculator activities, and course mini-projects. Tests will cover all class activities and assigned readings and will be taken as a class as indicated on the course schedule. If a lower grade is received on a course test, the material should be restudied and a second make-up test may be taken individually before the next testing period, for partial credit on some questions. Please keep track of all completed course activities on a duplicate of the instructor's copy of the course schedule. All course materials and all activities must be eventually completed by the last day of the regularly scheduled semester, before finals.

5.2 Student role:
It is the philosophy of this course then, to have teacher candidates learn how to become "dedicated practitioners, reflective scholars, and responsible citizens" by participating in a course environment that models these principles and the related approaches to instruction. Thus, teacher candidates will primarily "learn by doing" in the course, and be involved in activities that dynamically seek to prepare them as effective mathematics educators in a context of the new NCTM standards, the Information Age, and our changing society.

- *6.0 Evaluation Information* -Students should be provided the actual list of projects, basis for determining the final grade, and grading scale at the beginning of each course.
6.1.1 Describe the typical types of student projects that will be the basis for evaluating student performance:
The semester grade will be determined by the amount and quality of work in the following types of assignments:

1. Daily Class Activities and Attendance: Class activities and group practice will be initiated and usually completed in class daily. Teacher candidates are required to participate in all group activities and are responsible for each assigned reading, and for working on all assigned practice activities. Upon completion of the group activities, an instructor should be called over to check the daily activity. Teacher candidates may then proceed to individualized lab time. All three parts of the daily class activities, 1) group activities, 2) readings, and 3) practice, will be included on the course exams.

2. Course Section Tests: Three section tests are scheduled periodically in the course and cover the group activities, readings, and practice sheets. A test may be retaken once, and the retake grade substituted for the original test grade. However, individual retake grades may only reach a maximum (usually 85%). Before taking the make-up exam, the teacher candidate will be asked to correct their mistakes from the first test and will be assigned additional review activities if needed. The makeup test must be taken during the next testing period.

3. Course Final Exam: The course final exam will be comprehensive in nature, and open book, open notes. It will be given during finals week and will be primarily multiple choice and short answer. No retakes on the final exam are permitted.

4. Course Mini-Projects: Teacher candidates will be required to select projects from a set approved course mini-projects. Mini-projects may be completed during individualized lab times or outside of class. Mini-projects will be graded on a 1 to 30 point scale, with 30 representing high quality. If a teacher candidate wishes to revise the project for additional points, the project must be resubmitted before the end of the semester. Teacher candidates should have instructors check and record projects during the testing periods.

5. Course Technology Assignments: The teacher candidates are required to develop and upload four different technology assignments into their UNO online portfolio. These assignments will be started in class, and will involve four different topics, including the following: 1) Math/Science PowerPoint, 2) Equity/Diversity Connection, 3) Assessment Rubric, 4) Pedagogy/Lesson Plan. Students are responsible for finishing the project and uploading it to their online portfolio.

6. Lunch Bunch Field Experiences: The teacher candidate also needs to teach four lessons in front of K-12 students, which are organized as a "Lunch Bunch" collaborative teaching activity at a local elementary school. The field experiences will generally come out of regular class time, and will also count for the TED 4340 Elementary Science Methods class. The teacher candidate is also responsible for uploading a picture and description to their portfolio of one example field activity or lesson.

7. Attendance: Attendance at class sessions is required, and teacher candidates will receive one point for each hour they attend class and sign the class attendance roster. Due to the collaborative and group nature of the course, good attendance is critical for class activities to be most effective. If you know you will be absent, please notify the course instructor before the absence if at all possible.

6.2 Describe the typical basis for determining the final grade (e.g., weighting of various student projects):
Course evaluation is based on an extensive point-grading scheme that is also outlined on the course grading/criteria sheet distributed to classes, and may vary slightly for a particular instructor of a course section. The following are the common maximums for each evaluation category:

300 Course Section Tests (100 points each)

120 Course Mini-Projects (30 points each)

200 Course Technology Assignments (50 points each)

240 Course Final Exam (240 points)

100 Lunch Bunch / Field Points (20 points each)

40 Course Attendance (1 point each hour)

1000 Total Points Possible

6.3 Grading type:
Letter grades
The final grades will be assigned based on the following number of total points:

1000-980 Grade of A+ (4.00)

979-920 Grade of A (4.00)

919-900 Grade of A- (3.67)

899-880 Grade of B+ (3.33)

879-820 Grade of B (3.00)

819-800 Grade of B- (2.67)

799-780 Grade of C+ (2.33)

779-720 Grade of C (2.00)

719-700 Grade of C- (1.67)

699-680 Grade of D+ (1.33)

679-600 Grade of D (1.00)

599-0 Grade of F

- *7.0 Resource Material Information* -

7.1 Textbook(s) or other required readings used in course:
The following materials are required. A set of resource Internet sites will also be distributed upon start of the course, which the teacher candidate may find helpful.

1. Principles and Standards for School Mathematics

Available freely over the Internet at: http://nctm.org

2. Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics

Available freely over the Internet at: http://nctm.org

3. Course Activity Sheets - TED 4330 Methods of Teaching Mathematics

Photocopied Activity Sheets from Oh-K Printing at 46th and Dodge Streets

(Price is approximately $15)

4. Scientific Calculator, Protractor, Ruler, Compass Tools

Mathematics tools will be needed periodically, and a variety of options exist for purchasing or borrowing these mathematics related tools.

7.2 Other student suggested reading materials:
1. Technology-Supported Mathematics Learning Environments

2005 Yearbook of the National Council of Teachers of Mathematics

2. National Science Education Standards

National Research Council, 1996

7.3 Current bibliography and other resources:
American Educational Research Association. (2005). *Studying teacher education: The report of the AERA panel on research and teacher education*. Edited by M. Cochran-Smith and Zeichner, K.M. Mahwah, New Jersey: Lawrence Erlbaum Associates.

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- *8.0 Other Information* -

8.1 Accommodations statement:

Accommodations are provided for students who are registered with UNO Disability Services and make their requests sufficiently in advance. For more information, contact Disability Services (MBSC 111, Phone: 402.554.2872, TTY: 402.554.3799) or visit the web at http://www.unomaha.edu/disability.

8.2 Other:

8.2.1 Plagiarism Policy

"Use of borrowed ideas, information, or language without appropriate citation is plagiarism. This is a serious academic offense. UNO Faculty members do not accept plagiarized work. When plagiarism is egregious, faculty members are encouraged to give a grade of F for the course and to report the incident to the department chair, the dean, and the office of Academic and Student Affairs. Students who plagiarize more than once are subject to severe disciplinary action." (Ethical Use of Print and Online Sources in Academic Papers University of Nebraska, April 2010)

In addition to plagiarism, there is a reuse of products issue which relates to academic integrity. Whenever a student desires to recycle a product or assignment from a previous course and wishes to use it to fulfill a new assignment in a different course, there are at least these two conditions which must apply. First, the student must be forthcoming about the reuse and seek advance approval from one or more instructors. Second, as a general rule, the product cannot be simply reused

but must be extended significantly beyond its original form, and the nature of that extension must be fully communicated to and approved by the instructor(s). (Plagiarism Policy adopted by Teacher Education April 6, 2011)

8.2.2 LiveText Statement

"An active LiveText account may be a required resource for this course. LiveText is used by the College of Education to maintain our accreditation, demonstrate the quality of our academic programs, improve teaching and learning, and manage various field experiences. As a student, you also have the ability to use your account for secure online storage of your academic work, and to create digital documents such as electronic portfolios or reflective journals, which can be shared with prospective employers or other audiences.You can purchase your account online with a credit or debit card at www.livetext.com. LiveText may be a required resource in several different courses throughout your program, and you can use the same account for any course that requires it for up to five years, so you only need to purchase the account one time. If you already have an active LiveText account, you do not need to purchase another one. After five years you can extend your membership if you continue to need it for additional coursework or would like to maintain it for your personal use."

* 8.3 Author(s):

Dr. Elliott Ostler / Kathy Bittner

Elementary Math Methods

Fall 2013 – Syllabus

Dr. Vicki Lentfer

RH 308K

554-3413

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Office Hours: Wednesday 1:00-4:00pm or by appointment

Elementary Mathematics Methods is designed to help you develop understanding of the basics of instructional planning and assessment in elementary mathematics. Through the course of the semester, you will learn how to adapt your discipline-specific knowledge into thoughtful, engaging, reform-based mathematics lessons that will help all students learn. This course is meant to be reflective in nature to help you think through what you're seeing in the classrooms in which you are working and what it means to you as a teacher. We will also consider what it means to apply the information and skills you learn and discuss in this course to your own classroom. This class should provide you with a philosophical lens and the practical tools for your own classrooms. All assignments are designed with this in mind.

Purpose of the Course

The purpose of the course is the following:

· To help you develop your own understanding of what mathematics is, how children learn math, and how to analyze your students' mathematical thinking.

· To help you develop a repertoire of teaching strategies that is congruent with your beliefs regarding mathematics.

· To help you familiarize yourself with current curricular trends.

· To help you foster a community of learners that includes ALL students.

We will revisit and explore the mathematics of middle and high school curricula and examine the mathematics in these materials from a pedagogical point of view. Students will utilize the methods and strategies under investigation by applying them in actual classroom settings through current classroom assignments (practicum or current professional experiences).

You will NOT leave this course feeling completely prepared to teach mathematics. There is always more to learn, and a large part of that learning will occur in your own classroom. This course will help you take advantage of those learning situations.

Course Expectations

Attendance and Participation

You are preparing for a profession in which your daily presence is imperative to the success of your students and your attendance in this class represents that commitment. I will do my best to bring in as many voices to our discussions as possible, but I ask that you also monitor your own contributions to class. If you have spent more time listening, speak up. Listen up if you have spent more time speaking. Attendance and participation are worth 10% of your final grade. If you must miss class, *you must notify me prior to class*. Please note that *more than one absence of any kind will adversely affect your course grade.*

Absences and Tardiness

Because of the nature of the material discussed and investigated in class, class cannot be made-up. I am aware that situations may arise that are unavoidable. If this is the case, you are expected to notify **me** ***prior*** to class that you will be unable to attend. Additional work may be assigned to replace the missed class time.

If you miss class:

- You should contact me directly to discuss what you missed.
- Late work is not accepted

If you miss more than one class, your grade will be lowered by a full letter grade for each class period missed. Likewise, promptness is also important. Please do not be late, as this only delays the beginning of class for others and is insensitive to those who are prompt. I count tardies as well as early departures as half absences. If there is any conflict in your schedule, please discuss this with me as soon as possible.

Preparation

Come to class having completed the reading and assignments for that day and be prepared to participate actively in class discussions and activities, as well as to listen carefully and respectfully to your colleagues. Please understand that the workload for this course is heavy, yet essential to reach the course goals. Much of what we do in class will require collaboration, so I will be creating opportunities for you to work together and serve as resources for each other's learning.

All students will be expected to actively participate in small and large group discussions as well as in their practicum placements. Please prepare for class by reading assignments carefully and by reflecting upon issues of importance to you. You should be prepared to draw on the readings for personal-reaction writings, small group activities, and/or whole class discussions.

Much of the success of this course depends on the level of interaction and participation. Your contributions in the way of regular attendance, completion of readings, completion of in-class writings, willingness to discuss, and group participation are essential not only for this course, but also for the development of your teaching career.

Late Work Policy

All assignments are due prior to or at the beginning of class on the appropriate due date. Late work will only be accepted without penalty if you have contacted me prior to the due date, discussed the situation, and I have agreed to make an alternative due date. If there is no communication prior to the date, late work will not be accepted. The key here is to make sure that you are in communication with me – the earlier the better.

Practicum

This course has a significant practicum component. To help you come to understand how modern schools and mathematics classrooms function and to bring the theories we discuss in class into practice, you will work 40 hours over the course of a semester in an elementary classroom.

Attendance at your practicum assignment is a core element of this course to help prepare you for the realities of classroom practice. Successful completion of practicum involves full attendance each week (or making up any missed hours/days), acceptable evaluations by your practicum teachers, and competent performance on field-based assignments from this course. Remember that you represent the College of Education and yourself when you are in your practicum placements. Your professionalism should be apparent in your punctuality, dress, and preparedness, among other things. Your professionalism will also reflect in your final course grade.

Assignments

Assignments for this course have been carefully developed to scaffold your ability to meet these standards; that is, to thoughtfully plan, enact, and reflect upon inquiry-based mathematics lessons.

Most of your assignments will be submitted via email (vlentfer@unomaha.edu) so that you can receive feedback more quickly, and so your peers can also review your work.

***Unless otherwise specified, all assignments should be in .doc format, and the document title should follow the following template: Lastname_AssignmentTitle.doc (e.g. Lentfer_Reflection1.doc) using 12 pt Times with 1" margins. Assignments are due before 5pm the day of class unless otherwise noted.

Since you are training to become teaching professionals, you need to practice preparing documents that are ready for students, fellow teachers, administrators, and parents to read. All email communications with me should be written formally, as though you were communicating with a parent or administrator. All assignments handed in should be carefully proofread and should contain no spelling or grammatical errors; multiple errors will adversely impact your grade for that assignment. Likewise, any correspondence that is unprofessional will reflect in your final course grade.

Blackboard

An essential mode of communication in this course will be blackboard. You are expected to check blackboard at least weekly, leaving comments to threaded discussions as part of your attendance and participation grade. I will post course announcements, reminders, handouts, and lesson plans to blackboard, and I will also use it to circulate electronic copies of course materials. Links will take you to important reference points.

Grading

You will receive many opportunities to receive feedback from your instructor and peers on your course work through the course of the semester. It is in your best interest to make best effort before turning in these drafts, so that your final product can be the best it can be.

Final grades will be assigned in the following manner, in accordance with the proportions of credit for each assignment shown in the table:

Grading scale:

975-1000 = A+

925-974= A

900-924= A-

875-899= B+

825-874= B

800-824= B-

775-799= C+

725-774= C

700-724 = C-

675-699= D+

625-674= D

600-624= D-

599 and below = F

Practicum 400 points

- 4 lessons - 200 points
- Disposition - 100 points
- DAR Reflection - 100 points
- Total = 400 points

Portfolio 500 points

- Final Portfolio (Binder) - 320 points
- Presentation - 180 points
- Reflection - Self-Reflection

Disposition 100 points

Course Assignments

Disposition/Participation – DUE: Ongoing

In class, all students are expected to ACTIVELY participate in small and large group discussions. The purpose of these discussions is to help us as individuals, and as a group, develop meaningful interpretations of the ideas conveyed in the readings. Being a "full participant," means that you come to class having carefully read the articles and that you are prepared with questions, comments, and criticisms based on the readings. Much of the success of this course (i.e. your learning and the learning of your colleagues) depends on the interaction

and participation of everyone throughout the semester. This includes professionalism and a teacher candidate's disposition.

The candidate will be evaluated on a daily basis which may include, but not limited to, interactions in the classroom, the practicum, and all interactions with the instructor, peers, instructional coach, practicum teacher, K-12 students, and any instance related to the University. If the instructor, instructional coach, or the practicum teachers have any concerns, a conference record form will be submitted to the Field Placement Office. Also, if there are serious concerns or the concerns continue, the teacher candidate may be in jeopardy of repeating the course work. This is a serious component and one in which each candidate will need to consider seriously.

Method of Assessment: **Disposition Rubric**

100 Points

Practicum DUE:

During the semester you will deliver a minimum of four lessons in a designated metro-area school. You will be graded over the four lessons (200 points), Disposition (100 points), and Reflection (100 points). The lessons will be due September 17. You will be released from class during the practicum. The practicum will be from October 1 - October 31.

Method of Assessment: Lesson Rubric, Disposition Rubric, DAR Rubric

400 points

Portfolio - DUE: December 3

The portfolio will be based on particular topics. This project is a chance to write a lesson plan for each grade level over one particular topic. The portfolio will provide a guide for lessons/activities for the teacher candidate's classroom. We will discuss what makes a good teachable lesson plan. The lessons will need: objectives, knowledge, skills, big ideas, six fully developed lessons, assessments, guiding questions, real world relationships, literacy, inquiry-based learning project(s), and technology and/or manipulative(s).

This project is in conjunction with the Lesson Presentation. It is a collaborative project in which each member of the class will contribute their lessons to create one comprehensive portfolio. You will choose one mathematical topic and will create six lessons covering that same topic for grades 1, 2, 3, 4, 5, 6.

See the rubric for all components that must be included.

Method of Assessment: Portfolio Rubric

320 Points

Lesson Presentation (Portfolio Continued) - DUE: Ongoing - Beginning Week 2 or 3

To promote further synthesis of course topics, each of you will be expected to facilitate one of the class sessions during the semester. Guest teaching will be undertaken in pairs as well as individual; will involve advance planning of the readings, identification of main discussion threads, and design of related activities to promote interest in the topic.

Your activity will coincide with the particular content for a week. You will be developing a student-centered, inquiry-based activity to teach the content for that week. You will need to incorporate technology and/or a manipulative(s).

You will focus on providing your peers with a tool for learning the content (one that they might later use in their own class) highlighting not only the content but also a particular pedagogical tool or exercise (you will not be doing a lecture over the topic).

****You will choose one of the lessons you created for your Portfolio and present on the appropriate day. This portion is in conjunction with the Portfolio.**

You will plan for your activity to take approximately 25 minutes:

- 30 minute presentation
    - 10 minute lesson
    - 2 minute transition
    - 2 minute group/activity expectations
    - 16 minute activity/wrap up

**See Portfolio Expectations on Blackboard for further detail.

Method of Assessment: Lesson Presentation Rubric & Self-Reflection

180 Points

Possible supplementary assignments may include:

Problem-Solving Portfolio

Article Critiques

Real World Connection Activities

Peer Teaching - instructional strategies, assessments, and questioning techniques

Assessment Portfolio

Manipulative & Technology Lessons/Activities

University Policies

Plagiarism

According to the Bylaws of the board of Regents at the University of Nebraska (Sections 2.9 and 4.1(i)), jurisdiction over violations of academic dishonesty rests with the individual colleges while the faculty are entrusted with the determination of a violation and its resolution.

The Teacher Education Department recognizes the rights of faculty members to carry out their entrusted duties but also recognizes the need to present a unified face on the subject of plagiarism and to have consistent application of disciplinary actions. The Department Plagiarism Policy advises the faculty on a consistent approach to addressing plagiarism in course syllabi and provides guidelines for addressing violations of the plagiarism policy.

In this course, you will submit written work in which you make use of information and ideas found in print or online sources. Whenever you use material from another writer, it is important that you quote or paraphrase appropriately and *cite the source.*

Never let it appear that ideas and information gleaned from other sources are your own. The UNO Academic Integrity policy defines plagiarism as "presenting the work of another as one's own (i.e., without proper acknowledgment of the source) and submitting . . . academic work in whole or in part as one's own when such work has been prepared by another person or copied from another person."

Failure to cite sources appropriately is plagiarism, a serious academic offense. Plagiarized work will not be accepted. Consequences for plagiarism are up to the discretion of the instructor; they may range, for example, from rewriting all or part of a paper to a grade of F for the course. Students who plagiarize more than once are subject to disciplinary action, which may include expulsion from the university.

If you have a question about using or citing another writer's work, DO NOT GUESS. Check with your instructor or a consultant at the UNO Writing Center. Bring a printout of the original source and your paper to the consultation.

Ethical Use of Print and Online Sources in Academic Papers

Because the essential function of a university is to develop and disseminate knowledge and because the creation of knowledge is a collective activity, members of a university community frequently write in response to the work of other writers. All of us – undergraduates, graduate students, and professors – acquaint ourselves with information and ideas by reading print and digital texts created by others, and we write in order to analyze, synthesize, evaluate, and/or extend that body of knowledge.

The use of sources is an important academic skill. During your years at the university, you should become proficient in locating sources, evaluating them for relevance and credibility, integrating information and ideas from other texts into your own work, and *citing sources using the conventions appropriate to your major discipline.* Whenever you write a paper drawing upon outside sources, the ethical standards of the university require that you acknowledge any information, idea, or language that originates with another writer.

Quotation

If you copy material verbatim *from any source*, whether print or digital, you must (1) put quotation marks around the verbatim material and (2) provide a citation to its source. Be very careful to copy quoted material accurately.

Paraphrase

"Paraphrase" does not mean copying someone else's sentences with a few changes in the wording. Instead, it means putting another writer's ideas into your own words, crafting your own sentences, and using the ideas to advance your own line of thought. When you paraphrase, cite the source.

Citation

Style manuals such as those of the American Psychological Association (APA) and the Modern Language Association (MLA) offer extensive guidelines on using and citing quoted and paraphrased material. These and other style guidelines are available in any good writing handbook and at Purdue University's Online Writing Lab: <http://owl.english.purdue.edu/>

Plagiarism

Use of borrowed ideas, information, or language without appropriate citation is plagiarism. This is a serious academic offense. UNO faculty members do not accept plagiarized work. When plagiarism is egregious, faculty members are encouraged to give a grade of F for the course and to report the incident to the department chair, the dean, and the office of Academic and Student Affairs. Students who plagiarize more than once are subject to severe disciplinary action.

If you have a question about using or citing another writer's work, DO NOT GUESS. Check with your instructor or a consultant at the UNO Writing Center. Bring a printout of the original source and your paper to the consultation.

Course Description

1.1 Catalog Description: This course is designed to provide experiences for pre-service teacher candidates to acquire the skills, knowledge, and dispositions necessary for creating effective learning environments in secondary level mathematics classrooms. Ultimately, the critical components of the course will enhance teacher candidates' knowledge and dispositions as dedicated practitioners, reflective scholars, and responsible citizens who can meet the challenges of their profession in a changing world.

1.2 Prerequisites of the course: Prerequisites include successful completion of TED 3550 and the PPST.

1.3 Overview of the Content and Purpose of the Course:

This is a course which is designed to prepare secondary and middle school mathematics teachers for assuming a role as a mathematics education professional. It is designed as a "hands-on", discussion, oriented class where participants actively practice instructional topics and techniques that they learn in the course. The course seeks to prepare teacher candidates for the changing mathematics curriculum of an Information Age society, and a dynamic classroom role as a dedicated scholar, reflective practitioner, and responsible citizen.

1.4 For Whom the Course is Intended: The course is intended for all teacher candidates seeking professional certification to teach secondary level mathematics in the state of Nebraska.

1.5 Unusual circumstance of the Course: None

2.0 Course Justification Information

2.1 Anticipated Audience/Demand: The anticipated audience includes all teacher candidates in the discipline of secondary mathematics.

2.2 Indicate how often this course will be offered and anticipated enrollments:

One section of the course will be offered during the Fall semester of each academic year and will have an anticipated enrollment of 15-20 students.

2.3 If it is a significant change to an existing course, please explain why it is needed:

No changes

3.0 Objective Information:

3.1 List of performance objectives stated in learning outcomes:

The objectives and content of the course map to the Interstate New Teacher Assessment and Support Consortium Standards, and are identified in parentheses following each objective.

At the completion of the course the teacher candidate should be able to:

1. Understand and be able to integrate **the NCTM Principles and Standards for School Mathematics** at the high school (9-12) and middle school (6-8) levels (INTASC 1).

2. To identify, study, and practice some strategies for setting up learning situations to meet the NCTM Principles and Standards in a typical classroom (INTASC 2).

3. To understand and practice a facilitating instructional role as the **orchestrator of the learning environment** in a mathematics classroom (INTASC 2).

4. To understand the potential of **computer and information technologies** including the Internet in the mathematics classroom (INTASC 5).

5. To become familiar with the workings of the **Macintosh and IBM Microcomputers** (INTASC 5).

6. To become familiar with **hand-held computers**, such as Palm devices (INTASC 5).

7. To develop a Mathematics Education Resource Notebook for collecting and organizing useful instructional ideas (INTASC 4).

8. To develop and deliver effective instruction by using appropriate **assessment, prescription, implementation, and evaluation** techniques associated with mathematics education (INTASC 8,9).

9. To develop a personal philosophy of mathematics which includes a view of mathematics as problem solving, reasoning, communication, and connection (INTASC 6,9,10).

10. To be aware of some basic concerns and information related to **multicultural education** in the mathematics classroom (INTASC 3).

11. To be aware of the **global** perspective of mathematics, as a common language that we all share (INTASC 9,10).

12. Further develop a professional set of **"dispositions"** for teachers, including:

(INTASC 6,7,9,10)

- Interpersonal skills
- Valuing diverse perspectives
- Respecting privacy and confidentiality
- Commitment to reflection
- Commitment to lifelong learning
- Enthusiasm for learning

13. Develop a working knowledge of the use of **national, state, and local standards** in the planning of instruction and in support of the math learning environment (INTASC 4,7).

5.0 Teaching Methodology:

5.1 Methods to be Used: Group discussion, lectures, demonstrations, group and individual laboratory work, journal reading, written reports and oral presentations will all play a part of the teaching and learning activities associated with the course.

5.2 Teacher Candidate Role in the Course and Theoretical Background: Advances in mathematics education have taken place within a wider context of change within our society. We are said to be well entrenched in what has been coined as the **"Information Age"**, where information is replacing land, labor, and capital as the most important societal commodity (Stonier, 1983). Technology and mathematics are helping us exist more effectively in this new age, allowing us to communicate, manage, organize, and manipulate information efficiently. It is within the context of this dynamic new age that educators are suggesting the need to dramatically change the existing curriculum to better prepare all students for their lives within this age (McGee,1987).

Mathematics education in particular has been substantially impacted by the educational demands of the Information Age. No longer can we simply teach our students a sequence of facts, algorithms, and basic skills through a set of isolated classes. Today, students must be prepared to actively draw on mathematics as a tool to investigate and solve real life problems. As described by the National Council of Teachers of Mathematics, **"knowing mathematics is doing mathematics"** (NCTM Curriculum Standards, 1989). Most importantly, the Principles and Standards for School Mathematics (2000), provides teachers and teacher candidates alike, an aggressive vision of mathematics instruction that is high quality, and engaging for our students.

Educational technology advances have greatly impacted the teaching of mathematics. For example, powerful spreadsheets have become a very useful mathematical instruction device related to problem solving and arithmetic (Masalski, 1990), and graphing calculators are revolutionalizing the teaching of many advanced mathematical topics including algebra (Heid, 1995). Such advances are also greatly changing the ways that we assess mathematical achievement and understanding, as represented by new standards in assessment (NCTM, 1995).

As our society advances, our perceptions of what we should teach our students related to mathematics education is changing. The National Council of Teachers of Mathematics (NCTM), has recently published (2000) a set of specific principles and standards which attempt to outline clearly the curricular changes confronting mathematics education in the Information Age. This document, called **Principles and Standards for School Mathematics**, suggests significant improvements in how all students, at all levels, should learn about mathematics. Integral to this document is the NCTM's perception of mathematics as a very active and investigative discipline. Each of the categories of grade level standards discussed in the document (PreK-2, 3-5, 6-8, and 9-12), emphasize mathematics as a discipline for problem solving, reasoning, communication, and connections between disciplines. In essence, the principles and standards seek to produce students who are active and self-directed learners, and who can draw upon mathematics as a fundamental power in solving real life problems.

It is the philosophy of this course then, to have students learn how to become **Orchestrators of the Learning Environment** by participating in a course environment that models this approach to instruction. Thus, students will primarily "learn by doing" in the course, and be involved in activities that dynamically seek to prepare them as effective mathematics educators in a context of the new NCTM **principles and standards**, the Information Age, and our changing society.

5.3 Contact Hours: 45

7.0 Resource Material Information:

The following materials are tentatively suggested, several of the materials are optional, and may be borrowed from the instructor when desired. A set of resource Internet sites will also be distributed upon start of the course, which the teacher candidate may find helpful.

7.1 Textbook or other required readings used in the course:

1. Huetinck, L., & Munshin, S. N., (2008). *Teaching mathematics for the 21st Century: Methods and activities for grades 6-12.* Upper Saddle River, New Jersey: Pearson Education, Inc.

7.2 Other Suggested Reading Materials

1. National Science Education Standards. National Research Council, 1996
2. Problem Solving in School Mathematics. (1991). *1980 Yearbook of the National Council of Teachers of Mathematics*. Reston, VA: Author

7.3 Current Bibliography

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Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. American Educational Research Journal, 32, 465-491.

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8.0 **ADA Provisions**

In accordance with the provisions of the ADA, if you require any special assistance or adaptations to participate in this course, please contact your instructor immediately.

Teaching of Mathematics - Elementary (TED 4330)

Instructor:
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University/College:	University of Nebraska at Omaha, College of Education
Curriculum:	Teacher Education
Number:	4330
Type:	Lecture/Activity/Discussion/Field Experiences
Title:	Teaching of Mathematics in the Elementary Grades
Short title:	Teaching of Mathematics - Elementary
Effective term:	Fall 2013

- 1.0 Course Description Information -
1.1 Catalog description:

This course is designed to prepare elementary teacher candidates as mathematics education professionals at the elementary level. The course utilizes "hands-on" discussion and laboratory oriented activities where participants actively practice instructional topics and techniques related to the learning of mathematics at the elementary level. The course will further prepare pre-service elementary teachers to be dedicated practitioners, reflective scholars, and responsible citizens, who can meet the instructional challenges of their profession, as it relates to the student learning of mathematics in a modern and changing world.

1.2 Prerequisites of the course:

MATH 1310, MATH 2000, MATH 2012, EDUC 2510, 2520, PPST. The co-requisite is TED 4340

1.3 Overview of content and purpose of the course:

The course, which is for all teacher candidates seeking certification at the elementary school level, is a general survey of the critical topics of mathematics instruction in the elementary and middle school level; as well as a focused study of the most effective, research-based methods and strategies for teaching mathematics topics that are generally aligned with current national, state, and district standards. Using the conceptual framework of a dedicated practitioner, reflective scholar, and responsible citizen, this class will strive to empower teachers to become creative and innovative leaders in the student learning of mathematics. The course will also strive to help teachers to facilitate a learning of mathematics that is multidisciplinary, technology rich, and multi-culturally appropriate.

On a national level, there is a growing concern that the United States is not producing enough professionals in science, technology, engineering, and mathematics (STEM) to meet our needs, especially as compared to many other countries around the world. National reports, such as the 2010 *Rising Above the Gathering Storm Revisited*, paint an alarming picture and emphasize the need for good teachers at all levels (National Academy of Sciences, 2010). For example, the ACT now reports that 78% of high school graduates are not ready for entry-level college classes (American College Testing, 2008). At the same time, projections indicate a need for several million new college graduates with STEM degrees by 2018 (Carnevale, Smith, & Stoll, 2011). Needs in Nebraska reflect this trend, with an estimated demand of 48,000 new STEM positions by 2018 (U.S. Innovations, 2011). Good elementary teachers in mathematics are critical to the STEM pipelines (Banilower, Smith, Weiss, Malzahn, Campbell, Weis, 2013; Fairweather, 2010; National Governors Association, 2012; National Research Council, 2011).

It is important to note that advances in mathematics education have taken place within a wider context of change within our society (National Academy of Sciences, 2010). We are said to be in what has been called the "Information Age", where information is replacing land, labor, and capital as the most important societal commodity (Heid, 2005). Technology and mathematics are helping us to exist more effectively in this new age, allowing us to communicate, manage, organize, and manipulate information efficiently. It is within the context of this dynamic new age that educators are suggesting the need to dramatically change the existing mathematics curriculum to better prepare all students for their lives within this age (Fuson, Kalchman & Bransford, 2005, National Research Council, 2011).

Mathematics education in particular has been substantially impacted by the educational demands of the Information Age. No longer can we simply teach our students a sequence of facts, algorithms, and basic skills through a set of isolated classes. Today, students must be prepared to actively draw on mathematics as a tool to investigate and solve real life problems. As described by the National Council of Teachers of Mathematics, "knowing mathematics is doing mathematics" (NCTM, 2000) and mathematics instruction is now one of "high quality, focused, and thoughtful" instruction (NCTM, 2006). In particular, educational technology advances have greatly impacted the teaching of mathematics (Association of Mathematics Teacher Educators, 2006). Mobile technologies such as the iPad and Android tablet computers, and numerous smart phones (such as the iPhone), are particularly exciting in this context, and now include inexpensive applications or “apps” that represent a significant potential for the STEM education classroom (Vogel, Kennedy, Kwok, 2009, National Research Council, 2011).

As our society rapidly advances, our perceptions of what we should teach our students related to mathematics education is changing, and we must continue to work together to keep pace with national needs (National Governors Association, 2012). The United States government is becoming increasingly concerned by STEM Education to the point that President Obama, in his 2011 State of the Union Address, identified STEM education concerns as our nation’s new “Sputnik moment.” This class thus helps to address this national imperative at the elementary level, and seeks to help future elementary teachers to enthusiastically teach mathematics more effectively, and to be a part of the national effort to teach all STEM topics more contextually, and to contribute to our nation’s STEM pipelines.

- 2.0 Course Justification Information -

2.1 Anticipated audience / demand:

The course is intended for all teacher candidates seeking certification at the elementary school level to teach mathematics.

2.2 Indicate how often this course will be offered and the anticipated enrollment:

The course will be offered with one or more sections during the fall, spring and summer semesters with an anticipated enrollment of no more than 25 students in each section.

- 3.0 Objective Information

3.1 List of performance objectives stated as student learning outcomes:

The course objectives are related to the propositions of the National Board for Professional Teaching Standards (NBPTS) and the Interstate New Teacher Assessment and Support Consortium (INTASC) principles.

1. Review, extend, and enrich teacher candidate background in basic mathematical concepts and their instruction (INTASC 1; NBPTS 2).
2. Select methods and materials that are appropriate for teaching mathematics in innovative ways in elementary schools (INTASC 4; NBPTS 3).
3. Effectively use a variety of methods and materials to teach mathematics concepts (INTASC 4,6; NBPTS 1,5).
4. Become familiar with current assessment, prescription, implementation, and evaluation procedures appropriate to mathematics education at the elementary level and emerging trends in assessment (INTASC 8; NBPTS 3)
5. Learn to use mobile computing devices, Internet websites and various computer resources in the instruction of mathematics (INTASC 4; NBPTS 3).
6. Become aware of the professional responsibilities and resources related to teaching mathematics in the elementary school (INTASC 9; NBPTS 4,5)
7. Become aware of the teacher's role as dedicated practitioner, reflective scholar, and responsible citizen, and the student engagement activities and strategies in mathematics education that support such a role (INTASC 5,9; NBPTS 3,5).
8. Become aware and know how to interpret the National Council of Teachers of Mathematics professional and other standards, such as Common Core and Nebraska State Standards for elementary school mathematics (INTASC 1,2,4; NBPTS 1,2).
9. Become aware of some basic concerns and information related to multicultural education in the mathematics classroom (INTASC 3; NBPTS 1).
10. Become familiar with the various roles of technology in supporting the learning of mathematics (INTASC 7; NBPTS 2).

11. Become aware of the substantial resources available on the Internet and within mobile technologies such as tablet computers for helping to plan, enhance and enrich the learning of mathematics and its effective instruction by elementary teachers (INTASC 7; NBPTS 2,5).
12. Be aware of the global perspective of mathematics, as a common language among humans for focused problem solving (INTASC 9; NBPTS 4).
13. Further develop a professional set of "dispositions" for teachers, including: (INTASC 9,10; NBPTS 4,5)
    - Interpersonal skills
    - Valuing diverse perspectives
    - Respecting privacy and confidentiality
    - Commitment to reflection
    - Commitment to lifelong learning
    - Enthusiasm for learning
14. Develop a working knowledge of the integration of STEM-related national, state, and local standards in the support of an effective STEM interdisciplinary learning environment at the elementary level (INTASC 4,7; NBPTS 1).

3.2 General Education Student Learning Outcomes:

After completing the course, successful students shall be able to do the following:

a. Understand elementary mathematics instruction and research-based instructional strategies
b. Understand basic misconceptions for various mathematics topics at the elementary levels
c. Understand the contexts of technology use in interdisciplinary STEM instruction
d. Be able to address student misconceptions and mistakes in mathematics understanding
e. Be able to apply strategies for elementary mathematics instruction for student learning
f. Be able to develop lessons that engage and excite students about learning mathematics
g. Be able to present lessons that engage all students, respectful of their cultures and contexts
h. Be able to understand fundamental strategies for being an effective and caring math teacher
i. Be able to design lessons that empower students to be effective learners of mathematics

- 4.0 Content and Organization Information -
4.1 List the major topics central to this course:

The following topics will be covered in the course.

1. Considering the needs of today's elementary level mathematics instruction.
2. The National Council of Teachers of Mathematics Standards
3. The State of Nebraska and Common Core Mathematics Standards
4. Mathematics as problem solving
5. Mathematics as communication
6. Mathematics as reasoning
7. Mathematical connections
8. Representation and mathematics learning
9. Diagnosing student misconceptions in mathematics
10. Facilitating the learning of place value concepts

11. Facilitating the learning of student "number sense"
12. Facilitating the learning of patterns and relationships
13. Facilitating the learning of whole number operations
14. Facilitating the learning of decimals
15. Facilitating the learning of estimation
16. Facilitating the learning of fractions
17. Facilitating the learning of percent
18. Facilitating the learning of integers
19. Facilitating the learning of probability and statistics
20. Facilitating the learning of geometry
21. Facilitating the learning of measurement
22. Building spatial sense in students
23. Multicultural concerns and mathematics education
24. Learning mathematics with a global perspective
25. The elementary teacher and the "myths" of mathematics instruction
26. The use of technology in effective elementary mathematics classroom
27. The assessment and alignment of standards within the learning environment
28. Blending mathematics instruction with other STEM disciplines

- 5.0 Teaching Methodology Information -

5.1 Methods:

Daily class activities tasks will be introduced at the beginning of each period by the course instructor (with the exception of October field activities). After the initial introduction period of each class, teacher candidates will work in a lab type of setting to continue class activities. Teacher candidates are encouraged to help each other and to work together on course activities and projects. Working ahead is permitted on many of the individualized projects, computer activities, and course mini-projects. Tests and mini-quizzes will cover all class activities and any assigned readings and will be taken as a class periodically, and about every two weeks. Students are asked to keep track of all completed course activities on a duplicate of the instructor's copy of the course schedule, and to place projects to be submitted within a dropbox, and field-based assignments into Livetext. Some extra credit points will also be available for extra assignments. All course materials and all activities must be eventually completed by the last day of the regularly scheduled semester, before finals, and placed into the student's Dropbox, or emailed to the instructor.

5.2 Student role:

Students are expected to attend class regularly and to submit assignments in a timely manner. Although assignments may be turned in late, a 5% reduction in the grade on a particular assignment will be assessed for each day that the assignment is late. Students are strongly encouraged to work ahead on assignments whenever possible. It is the philosophy of this course then, to have teacher candidates learn how to become "dedicated practitioners, reflective scholars, and responsible citizens" by participating in a course environment that models these principles and the related approaches to instruction. Thus, teacher candidates will primarily

"learn by doing" in the course, and be involved in activities that dynamically seek to prepare them as effective mathematics educators in a context of national standards, rapidly advancing technology, and our changing society.

- *6.0 Evaluation Information* -Students should be provided the actual list of projects, basis for determining the final grade, and grading scale at the beginning of each course.

6.1.1 Describe the typical types of student projects that will be the basis for evaluating student performance:

1. Daily Class Activities and Attendance: Class activities and group practice will be initiated and usually completed in class daily. Teacher candidates are required to participate in all group activities and are responsible for each assigned reading, and for working on all assigned practice activities. All three parts of the daily class activities, 1) group activities, 2) readings, and 3) practice, will be included on the course mini-quizzes and the two exams.

2. Course Mini-Quizzes: Five mini-quizzes are scheduled periodically in the course and cover the group activities, readings, and practice sheets. Some mini-quizzes will be taken in class, and others will be take home assessments, typically due at the next class period.

3. Course Midterm and Final Exam: The course midterm and final exam will be comprehensive in nature, and open book, open notes. The midterm will be given at the end of September and the Final exam will be given during finals week and will be primarily open response.

4. Math Sponge Activities: Teacher candidates will be required to create five math "sponge" activities that can be used with small groups of students for roughly 5 minutes. Math sponge activities will be created outside of class, and can be modified from other activities, either done in class, or found on the Internet. The sponge activities must be significantly modified by the student if authored by someone else. Math sponge activities will be graded on a 1 to 20 point scale, with 20 representing high quality. If a teacher candidate wishes to revise the project for additional points, the project must be resubmitted before the end of the semester. Teacher candidates must post their sponge activities as electronic versions and post them into the class Dropbox (in their named folder), and let the instructor know that the project has been posted by email. Any posted file must have a descriptive name, and the student's initials.

5. Lunch Bunch Field Experiences: During October, the teacher candidate also needs to teach weekly lessons in front of K-12 students, which are organized as a "Lunch Bunch" collaborative teaching activity at a local elementary school. The field experiences will generally come out of regular class time, and will be similar to the TED 4340 Elementary Science Methods class. For each teaching episode, the teacher candidate is also responsible for developing a brief lesson plan, poster and reflection for each of the teaching activity. The lesson plan and reflection needs to be uploaded to Livetext.

7. Attendance: Attendance at class sessions is required, and teacher candidates will receive points for each time they attend class and sign the class attendance roster. Due to the

collaborative and group nature of the course, good attendance is critical for class activities to be most effective. If you know you will be absent, please notify the course instructor before the absence if at all possible.

6.2 Describe the typical basis for determining the final grade (e.g., weighting of various student projects):

Course evaluation is based on an extensive point-grading scheme and may vary slightly for a particular graded activity. The following are the common maximums for each evaluation category:

100	Course Mini-Quizzes (20 points each for five mini-quizzes)
300	Course Midterm and Final Exam (150 points each of two tests)
100	Math Sponge Activities (25 points each x four activities)
400	Lunch Bunch / Field Points (four episodes with small groups of students) *Part A: Teaching episode with students (25 points each) x 4* *Part B: Lesson Plans – (25 points each) x 4* *Part C: Posters – (25 points each) x 4* *Part D: Reflections – (25 points each) x 4*
100	Course Attendance (3 points each hour)
1000	**Total Points Possible**

6.3 Grading type: Project-Based

Letter grades associated with total points earned:
Student grades will be computed based upon the number of points earned out of the total of 1000 points available for the class.

970-1000 points = A+
930-969 points = A
900-929 points = A-
870-899 points = B+
830-869 points = B
800-829 points = B-
770-799 points = C+
730-769 points = C
700-729 points = C-
670-699 points = D+
630-669 points = D
600-629 points = D-
590 points and below = F

- 7.0 Resource Material Information -

7.1 Textbook(s) or other required readings used in course:

Many free materials and resources will be made available by the instructor to all course students and placed within the class Dropbox. In addition, these published resources are also available that the student may find helpful:

1. *Principles and Standards for School Mathematics*
   Available freely over the Internet at: http://nctm.org

2. *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics*
   Available freely over the Internet at: http://nctm.org

7.2 Other student suggested reading materials:

1. *Technology-Supported Mathematics Learning Environments*
   2005 Yearbook of the National Council of Teachers of Mathematics

2. *National Science Education Standards*
   National Research Council, 1996

7.3 Current bibliography and other resources:

Useful Websites:

PhET STEM Learning and Interactive Simulations (http://phet.colorado.edu)
Nebraska Department of Education (http://www.nde.state.ne.us)
The University of Nebraska at Omaha Library (http://library.unomaha.edu/)
Energy Literacy: Energy, the Economy, and the Environment (http://www.energy-literacy.org/)
Principles and Standards for School Mathematics (http://nctm.org)
Common Core State Standards for Mathematics
(http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf)
National Research Council's Framework for K-12 Science Education
(http://www.nap.edu/catalog.php?record_id=1316)
Next Generation Science Standards (http://www.nextgenscience.org/)
Edutopia (http://www.edutopia.org/)
Elementary Math Games (http://www.elementarymathgames.net)

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- 8.0 Other Information -

8.1 Accommodations statement:

Reasonable accommodations are provided for students who are registered with UNO Disability Services and make their requests sufficiently in advance. For more information, contact Disability Services (EAB 117, phone 402.554.2872, TTY: 402.554.3799) or go to the website: www.unomaha.edu/disability.

8.2 Plagiarism Policy:

"Use of borrowed ideas, information, or language without appropriate citation is plagiarism. This is a serious academic offense. UNO Faculty members do not accept plagiarized work. When plagiarism is egregious, faculty members are encouraged to give a grade of F for the course and to report the incident to the department chair, the dean, and the office of Academic and Student Affairs. Students who plagiarize more than once are subject to severe disciplinary action." (Ethical Use of Print and Online Sources in Academic Papers University of Nebraska, April 2010)

In addition to plagiarism, there is a reuse of products issue which relates to academic integrity. Whenever a student desires to recycle a product or assignment from a previous course and wishes to use it to fulfill a new assignment in a different course, there are at least these two conditions which must apply. First, the student must be forthcoming about the reuse and seek advance approval from one or more instructors. Second, as a general rule, the product cannot be simply reused but must be extended significantly beyond its original form, and the nature of that extension must be fully communicated to and approved by the instructor(s). (Plagiarism Policy adopted by Teacher Education April 6, 2011)