

EED 350
K-6 MATHEMATICS METHODS
Tuesday 5:45-9:45 (one Saturday class on 12/5/08 - 8:30-12:30)
Fall Trimester 2009

Course Credits: 1
Course Prerequisites: Admission to Education Department
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Course Information: Course syllabus can be found at the following site:
<http://augnet.augsburg.edu>
Course Description: Examination and preparation of materials and resources for teaching mathematics at the kindergarten and elementary levels.
Fieldwork experience – 10 hours.

Education Department Mission Statement:

The Augsburg College Education Department commits itself to developing future educational leaders who foster student learning and well-being by being knowledgeable in content, being competent in pedagogy, being ethical in practice, building relationships, embracing diversity, reflecting critically, and collaborating effectively.

Mission Themes Assessed in this Course: Being competent in pedagogy.

Applicable Minnesota Standards of Effective Practice:

- Standard 1 – Subject Matter: A teacher must understand the central concepts, tools of inquiry, and structures of the discipline taught and be able to create learning experiences that make these aspects of subject matter meaningful for students.
- Standard 3 – Diverse Learning: A teacher must understand how students differ in their approaches to learning and create instructional opportunities that are adapted to students with diverse backgrounds and exceptionalities. (MT – Competent in Pedagogy)
- Standard 4 – Instructional Strategies: A teacher must understand and use a variety of instructional strategies to encourage student development of critical thinking, problem solving, and performance skills. (MT – Competent in Pedagogy)
- Standard 5 – Learning Environment: A teacher must be able to use an understanding of individual and group motivation and behavior to create learning environments that encourage positive social interaction, active engagement in learning, and self-motivation.
- Standard 6 – Communication: The teacher uses knowledge of effective verbal, nonverbal, and media communication techniques to foster active inquiry, collaboration, and supportive interaction in the classroom.

- Standard 7 – Planning Instruction: The teacher plans and manages instruction based upon knowledge of subject matter, students, the community, and curriculum goals. (MT – Competent in Pedagogy)
- Standard 8 – Assessment: The teacher understands and uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual, social, and physical development of the learner.
- Standard 9 – Reflection and Professional Development: A teacher must be a reflective practitioner who continually evaluates the effects of choices and actions on others, including students, parents, and other professionals in the learning community, and who actively seeks out opportunities for professional growth.

Course Objectives and Orientation: The students in the course will:

Knowledge:

- Exhibit the ability to problem solve in content areas such as: geometry, measurement, computation, fraction, etc. and knowledge of various methods for teaching these concepts (MSEP 1.I, 4.E, 4.K, 6.J)
- Exhibit knowledge of standards-based assessment (MSEP 8.B, 8.D)
- Exhibit knowledge of the characteristics, uses, advantages, and limitations of different types of assessments including criterion-referenced, norm-referenced instruments, traditional, standardized and performance-based tests, observation systems, and assessments of student work (MSEP 8.B, 8.D)
- Exhibit knowledge of measurement theory and assessment-related issues, including validity, reliability, bias, and scoring concerns (MSEP 8.B, 8.D)
- Exhibit knowledge of the NCTM Standards and their relationship to the Minnesota Graduation Standards (MSEP 1.I)

Skills:

- Exhibit the ability to effectively plan, teach, and assess developmentally appropriate lessons in the area of mathematics (MSEP 3.K, 3.M, 4.C, 4.E, 4.K, 6.J, 6.K, 7.B, 8.E, 8.G, 8.H)
- Use technology (calculator, computer software – Excel, Logo, NCTM Illuminations) to enhance your productivity and plan effective learning environments and experiences supported by technology (NETS)
- Exhibit knowledge of how to create an environment that is culturally sensitive and equitable for all students (MSEP 5.G, 5.O)
- Exhibit knowledge of instructional materials, technology (internet resource sites for teachers, computer software, and calculators), and instructional strategies that encourage all students to learn mathematics (MSEP 4.C, 4.L, 1.G)

Disposition:

- Exhibit a philosophy for how to teach mathematics that reflects what is currently known about how children learn (MSEP 9.D)

Technology Requirements:

- Evaluate the reliability and validity of Internet-based resources.
- Make a spreadsheet (with formulas) using Excel.

Field Experience Requirement:

This course requires a 10 hour field experience in an elementary classroom setting during math instruction time. Dennis Greseth, Augsburg Education faculty member, will assist in locating a service learning placement.

Required Text:***Elementary and Middle School Mathematics***

6th edition by John A. Van De Walle 2007 Pearson Education, Inc.

Assessment Summary:

Assessment Tool	Activities/Documents	Program Standards
Reading Reflections	.demonstrate basic knowledge of mathematics education theory and practice	MSEP 5.G, 5.O, 9.D
Internet Investigations Research Project	.experience resources available on the internet	MSEP 4.C, 4.L
Mathematics Teaching	.assessing student prior knowledge;	MSEP 1.G, 3.K, 3.M, 4.C, 4.E, 4.K, 6.J, 6.K
Lesson Plan(s)	.planning outcomes, activities, and assessment; .reflecting on teaching method, student learning, and how current research in mathematics education is tied to practice	MSEP 7.B, 8.E, 8.G, 8.H. 8.B, 8.D

Assessment Descriptions: The following is a brief description of the assignments for the course. Detailed instructions will be provided.

- **Reading Reflections:** For each reading assignment, you will complete an online quiz using a Companion Website that corresponds to the textbook. The purpose of these quizzes is to encourage reflection on important concepts in the readings. The website is: www.ablongman.com/vandewall6e
- **Problems of the Week:** Most weeks, you will be assigned a problem to solve in a way that makes sense to you. You will record your thinking, as well as your solution. During class time, you will be asked to share your process and your answer with classmates. The purpose is to have you experience authentic problem solving as you will ask students do to in your future classrooms.
- **Quantitative Reasoning Project:** Using the Minnesota Department of Education website, you will analyze and display data regarding one district's results on the Minnesota Comprehensive Assessments for 2008. The purpose of this assignment is to prepare you to use student data in meaningful ways. This project is part of a graduation requirement in Quantitative Reasoning.
- **Field Experience Assignments:** You will complete 10 hours assisting in a classroom. During this time, you will assess 2 students on their skill level with basic arithmetic facts and provide a written reflection on the students' performance. If you are unable to assess students within your field experience classroom, you may find individuals outside of school to complete the assessments. The reflection paper will include the assessment plan, evaluation of the student understanding demonstrated, and a proposed plan for the next instructional steps you would take with the student(s).

- **Model Lesson:** You will be assigned a lesson from a standards-based curriculum. After studying the lesson, you will submit your own lesson plan to the instructor for feedback. You will model the lesson during the assigned class period.
- **Website Review:** You will review a number of interactive websites that can be used in mathematics instruction. For each site, you will write a few sentences summarizing the nature of the activity.
- **Algorithm Quizzes:** You will learn a variety of non-traditional algorithms (step-by-step) procedures for performing multi-digit addition, subtraction, multiplication, and division. The quizzes will assess your ability to model these algorithms precisely and with understanding for your future students.

Grading Procedure:

Grades will be based on your assignments, participation in class, and your attendance. You are required to complete all assignments. Individual assignments will be assessed according to specifically stated criteria checklists as well as the overall quality criteria listed below.

Exceeds Standard: work that is highly imaginative; demonstrates critical thought; unique; has substantial application to one’s own teaching experience; goes above and beyond requirements; is creative; demonstrates both breadth and depth; shows individual’s personality; is professional in presentation and appearance; demonstrates considerable effort.

Meets Standard: work that is well organized and complete; effectively and clearly presented; demonstrates clear understandings; applies what has been learned to classroom situations; clearly shows connections; is detailed; is thoughtful and supported with ideas and/or facts.

Below Standard: work meets minimum requirements; includes general information but lacks descriptive detail; has some application to teaching situations; it lacks originality; presentation/appearance are not of professional quality; shows minimal effort.

Does Not Meet Expectations: work that is missing parts or information; is sloppy and poorly organized; demonstrates only surface understandings; no evidence of application to teaching situations; poorly written; directions not followed.

Final Evaluation (Course Grade):

Grading Scale:

Reading Responses	55 points
Problems of the Week	25 points
Quantitative Research Project	15 points
In-Class Teaching/Lesson Plan	25 points
Website Review	10 points
Algorithm Quizzes	20 points
Field Experience Paper	15 points
Attendance/Participation	<u>35 points</u>
	200 points

(4.0): 186-200 points Exceptional
(3.5): 180-185 points Consistently exceeds standard expectations
(3.0): 175-179 points Thorough
(2.5): 170-174 points Consistently meets standard expectations
(2.0) 165-169 points Adequate
(1.5) up to 164 points Does not meet standard expectations
Course grades falling below 2.0 will not be accepted toward licensure in education.

Bibliography:

Burns, Marilyn. (2000) *About Teaching Mathematics*. Math Solutions Publications Sausalito, CA.

Donovan, M. Suzanne, and John D. Bransford eds. (2005) *How Students Learn: History, Mathematics, and Science in the Classroom*, National Academies Press, Washington D.C.

Ma, Liping. (1999) *Knowing and Teaching Elementary Mathematics*. Lawrence Erlbaum Associates. Mahwah, N.J.

National Council of Teachers of Mathematics (NCTM). (2000) *Principles And Standards for School Mathematics*. NCTM.

Algebra and Algebraic Thinking in School Mathematics, NCTM

<http://www.nctm.org>

Journal for Research in Mathematics Education. NCTM.

Navigations Series, NCTM

Teaching and Learning of School Algorithms in School Mathematics, NCTM

Teaching Children Mathematics NCTM.

Stigler, James, and James Hiebert (1999) *The Teaching Gap*, The Free Press

Attendance Policy: Regular class attendance is expected. State of Minnesota licensing rules regarding teacher certification require teacher education students to develop and exhibit professional-level knowledge, skills, and attitudes, including professional work habits (called task management), during their teacher training program. For this reason, and the fact that most of the class demonstration sessions cannot be made up, it is strongly recommended you attend all class meetings. If you must miss a class meeting, please speak with the instructor ahead of time.

Honesty Policy: The Augsburg College policy on academic honesty applies to this course. You will be asked to acknowledge your compliance with this policy in class. Unless otherwise stated, the assignments you hand-in are assumed to be your own individual work. Please refer to the Augsburg Student Guide for details.

Late Work Policy: It is expected that students will submit their work on time, according to the course schedule and/or date given in class. Late assignments may receive lowered point value. Nevertheless, it is always better to submit assignments late than not at all.

Other Student Rights: Students with diagnosed learning disabilities or physical handicaps may have legal rights to course modifications. Please identify yourself to the instructor so that she may assist you in reaching your learning goals. All students have the right to use the Augsburg College Counseling Center and Student Development staff services, as well as to receive tutoring assistance from the Writing Lab.

Technology Expectations:

The Education Department expects these entry-level technology skills from our pre-service teachers:

- Read and answer e-mail regularly and in a timely fashion, using your Augsburg College email address.
- When required, attach documents to email.
- Make active use of online course resources .
- Access and use online file space (e.g., AugNet/Netware space).
- Use word processing for assignments. We require that they be done in Microsoft Word and that they are run through Spell Check.
- Have the ability to access and navigate the Internet.

Students who do not possess these skills should contact personnel in the student Computer lab for help in developing these skills. Students will receive training in Augsburg specific software in college orientation program and/or in beginning coursework. Augsburg computer labs all have Microsoft Word for those students who do not have access to this software elsewhere.

Attached Course Schedule: A tentative course schedule is attached. As the course proceeds, this schedule is subject to change to meet the students' needs. Students will be notified of changes during class time and adjustments will be made to the syllabus on the course website.

Course Schedule:

Fall 2009 – Tentative Schedule

Topics for discussion	Reading Assignment: Complete by next class	Written Assignments: (Due by the next class period unless otherwise noted.)	Pts.
9/15 *Standards Based Math *Problem solving	1: Teaching Math. In the Era of the NCTM Standards 2: Exploring What It Means to Do Mathematics (pp. 12-14 only) 3: Developing Understanding in Mathematics 4: Teaching through Problem Solving 21: Geometric Thinking and Geometric Concepts	Reading Response #1: Online quiz: Chapter 21	5
		Problem of the Week: Chapter 2: Read pp. 12-14. Do Trapezoids on p. 20 on graph paper. (Download graph paper from online site.)	5
		Lesson Plan: Submit a plan for the lesson you will be teaching in class.	10
		Quantitative Reasoning Project (Due 12/6)	15
		Website review (Due 12/6)	10
9/29 *Geometry	9: Early Number Concepts and Number Sense 11: Helping Children Master the Basic Facts	Reading Response #2: Online quiz: 9 Online quiz: 11	5 5
		Problem of the Week: Start and Jump Numbers: Searching for Patterns – p. 14 (Use given website)	5
		In-Class lesson: Teach an assigned lesson during assigned class time (Dates will vary)	15
10/13 *Number Sense *Operation Sense *Facts	10: Developing Meanings for Operations 12: Whole-Number Place Value 13: Strategies for Whole-Number Computation	Reading Response #3: Online quiz: 10 Online quiz: 12 Online quiz: 13	5 5 5
		Problem of the Week: Pizzas- p. 20 Illustrate on graph paper	5
		Field Experience: Basic Facts Assess two students on basic facts, write an evaluation and learning plan for each student. (Due: 11/11)	15

	Reading Assignment: Complete by next class	Written Assignments: (Due by the next class period unless otherwise noted.)	Pts.
10/27 *Number : Addition/ Subtraction	16: Developing Fraction Concepts 17: Computation with Fractions	Reading Response #4 Online quiz: 16 Online quiz: 17 Prepare for algorithm quiz on Addition and Subtraction (take in class on 11/11) [Reminder: Field Experience – Basic Facts paper due on 11/11)	5 5 10
11/10 *Number: Multiplication/ Division	22: Concepts of Data Analysis 23: Exploring Concepts of Probability	Reading Response #5: Online quiz: 22 Online quiz: 23 Problem of the Week: Best Chance of Purple – p. 18 Prepare for algorithm quiz on Multiplication and Division (take in class on 11/25)	5 5 5 10
11/24 *Data and Probability	15: Algebraic Thinking: Generalizations, Patterns, and Functions	Reading Response #6 Online quiz: 15 Problem of the Week: Two Machines, One Job - p. 15 [Reminder: Quantitative Reasoning assignment due on 12/6) [Reminder: Website Review due: 12/6]	5 5
12/5 *Algebraic Thinking		Due: ____ Field Experience Time Record and Student Assessment Form ____ Quantitative Reasoning ____ Website Review General Attendance and Participation: 5 points per class period	35

My lesson is: _____

My date to teach my lesson is: _____

7/13/2008

Due Date	Fall 2008 – Assignments:	Pts. Possible	Points Earned	Comments
<u>9/29</u>	<u>Reading Response #1:</u> Online quiz – Chapter 21 <u>Problem of the Week: Trapezoids</u> <u>Lesson Plan</u>	5 5 10		Total ____/20
<u>10/13</u>	<u>Reading Response #2:</u> <ul style="list-style-type: none"> • Online quiz - 9 • Online quiz – 11 <u>Problem of the Week: Start and Jump Numbers</u>	5 5 5		Total ____/15
<u>10/27</u>	<u>Reading Response #3:</u> <ul style="list-style-type: none"> • Online quiz - 10 • Online quiz – 12 • Online quiz – 13 <u>Problem of the Week: Pizzas</u>	5 5 5 5		Total ____/20
<u>11/10</u>	<u>Reading Response #4:</u> <ul style="list-style-type: none"> • Online quiz - 16 • Online quiz – 17 <u>Algorithm Quiz: Addition/Subtraction</u> (in class) <u>Field Experience: Basic Facts Paper</u>	5 5 10 15		Total ____/35
<u>11/24</u>	<u>Reading Response #5:</u> <ul style="list-style-type: none"> • Online quiz - 22 • Online quiz – 23 <u>Problem of the Week: Best Chance of Purple</u> <u>Algorithm Quiz: Multiplication/Division</u> (in class)	5 5 5 10		Total ____/25
<u>12/5</u>	<u>Reading Response #6:</u> <ul style="list-style-type: none"> • Online quiz – 15 <u>Problem of the Week: Two Machines, One Job</u> <u>Quantitative Reasoning Project</u> <u>Website Review</u>	5 5 15 10		Total ____/35
	<u>Attendance and Participation</u> ____ _ <u>Service Hours Submitted</u> <u>In-Class Lesson</u> (Due dates vary)	35 Yes/No 15		Total ____/50 TOTAL ____/200

Tentative plans for determining final grades - (4.0): 186-200 (3.5): 180 -185 points (3.0): 175 -179 points
(2.5) 170 -174 points (2.0) 165 - 169points (1.5) up to 165 points