California State University San Marcos
COLLEGE OF EDUCATION

EDMS 543
TEACHING MATHEMATICS IN THE ELEMENTARY SCHOOL
Summer 2003 – Section 1 – CRN #30099 (3 units)
Dr. Sharon Whitehurst-Payne
May 27, 2003 – August 12, 2003

Class meets:	Tuesdays, 6:00 p.m. to 9:30 p.m.
Office hours:	By appointment
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Course goals: The purpose of this course is to prepare students to teach mathematics in the elementary school, emphasizing collaboration, reflective practice, effective teaching of diverse learners, and appropriate use of technology. By the end of this course students should be able to do the following:

1. Be familiar with current national and state recommendations regarding the teaching of elementary school mathematics, and plan instruction that follows these recommendations. In particular, students will become familiar with state standards for elementary school mathematics.
2. Examine their beliefs regarding the goals and content of elementary school mathematics.
3. Apply principles of learning theory to the teaching of mathematics.
4. Utilize methods to help students develop an understanding of concepts and facts, not just rote memorization.
5. Utilize methods to help all students understand mathematics and become confident in their ability to do mathematics.
6. Be aware of issues regarding equity in teaching and learning mathematics.
7. Realize the importance of positive student attitudes toward mathematics.
8. Explain and support the importance of manipulatives and activities in the teaching and learning of mathematics.
9. Be familiar with a wide variety of activities, manipulative materials, and children's books for use in mathematics instruction, and for incorporating assessment as part of instruction.
10. Assess students' mathematical thinking and various levels of understanding of mathematics concepts and procedures, and plan instruction based on those understandings.
11. Understand the scope and sequence of the elementary school mathematics curriculum.

12. Communicate with parents about math curriculum and ways they can help their children at home.

Required Course Materials and Supplies:

Elementary School Mathematics: Teaching Developmentally
(4^{th} ed.), Van de Walle.
An E-mail account

Course requirements:

1. Class attendance and participation
2. Completion of assigned readings
3. Satisfactory score on the final exam
4. Satisfactory completion of the following assignments:
   -Mathematics autobiography
   -Reflective summaries
   -Alternative algorithms
   -Math menu activities
   -A three sequence of math lessons, demonstrating planning, implementation, and reflection, including communication with and activities for parents. You may incorporate your literature.
   -Use the Internet as a resource
5. Student assessment interview case study: Interview a student and assess the student's skills and knowledge in mathematics.
6. Math literature book: Class will develop a rubric to determine assessment prior to assignment being done.

Description of assignments:

1. Mathematics autobiography. Write at least four paragraphs. Include the following: a. Describe your experiences in mathematics. b. Describe a student you have worked with who was having difficulty with mathematics. c. Compare/contrast your experience with the student's. d. Explain what you must do to reach that student. Define your attitude towards mathematics.
2. Reflective Summaries: The purpose of this assignment is to encourage you to read and reflect upon some of the critical issues surrounding the teaching and learning of mathematics. Prior to each class, there will be assigned readings from the textbook. You should complete these readings, and then summarize and reflect on those readings. Your reflective summaries, which should be sent to me by e-mail by noon on the day of the class, should demonstrate that you have read and thought about the material. The time you spend before class reading and thinking about the issues related to the teaching and learning of mathematics will provide substantial benefit to your overall learning in this class. Your reflections should be one strong, informative paragraph.
3. Alternative Algorithm Assignment. The purposes of this assignment are to develop an appreciation for the fact that different cultures have found alternative but correct algorithms from those commonly used in the United States, and to reinforce the view that the algorithms we have come to use are

simply a matter of convention and should be seen as "a way," not "the way." Your assignment is to find an alternative algorithm for one of the arithmetic operations that is either currently used or was used by people from another country or culture. An excellent source for this assignment would be the upper grades of an elementary school where the students might ask their parents, grandparents, or other relatives how they learned to add, subtract, multiply, or divide. You have the choice of submitting this assignment in writing or presenting it orally in class (approximately 5 minutes long). Your report for this assignment should include the following information:

- Where you found the algorithm
- Where the algorithm is or was used
- A clear explanation of the algorithm and how it works
- An explanation of why the algorithm works. (One way to do so is to compare it to an algorithm you use now.)

4. Math menu activity: Find or develop one activity either for skill or concept development and set-up and conduct a station for this activity in class. Assume some concept development on your chosen topic has already been done. Topics will be selected in class. Prepare enough copies to distribute one each to class members and instructor.
5. Student Assessment Case Study: Interview a student and assess the student's skills and knowledge in mathematics.
6. Final Exam: The exam will consist of short-answer and short-essay questions related to the course objectives and based on class discussions, activities, and readings.
7. Lesson Plans: The purposes of this assignment are as follows:
   - To think through a mathematical content area in terms of the big conceptual ideas, the relationship between those ideas, and the associated procedural knowledge;
   - To prepare a three-day-long unit plan to teach this content to a small group of students or the whole class, including ways to assess what students learned from this unit;
   - To reflect on your lessons and make suggestions for revisions and improvements;
   - To incorporate children's literature in mathematics teaching; and
   - To practice ways to involve parents in their children's mathematics learning.

8. Literature Book: Develop a literature book to be used with a math lesson.

Course Grading Policy:

Each assignment meeting the requirements specified above will earn an "A", an assignment must be better than average in some way. For example, relating classwork and/or readings to an assignment, using extra creativity, thinking of a way to apply an idea in the classroom, or doing an excellent job of constructive a game would make an assignment better than average. In general, an "A" requires quality "above and beyond" the requirements.

All assignments turned in late will lose 10% of their total point value. Each spelling or grammatical error in a written assignment will result in a 2% deduction from your score for that assignment.

Grade Calculation:

Attendance and participation	10%
Math autobiography	5%
Reflective summaries	10%
Alternative algorithm	5%
Math menu activities	10%
Student Assessment	15%
Final exam	15%
Math lesson plans	15%
Literature book	15%
Total	100%

Grading **Scale for Course Grades**

A = 95-100	C+ = 77-79
A- = 90-94	C = 74-76
B+ = 87-89	C- = 70-73
B = 84-86	

Students who have not submitted all assignments by Tuesday August 12, 2003 will receive a grade of "Incomplete". Please note that each unexcused absence decreases your overall percent by 5%. For example, three unexcused absences would result in a potential maximum grade of B (85).

Class Sessions

Class Session 1 – 5/27/03
Topics: Course introduction; Syllabus, Standards, Lesson plans.
Reading Assignments: Chapters 1, 4 (pp.44-50a), 22; Appendices A & B.
Written Assignment due: Math autobiographies.

Class Session 2 – 6/3/03
Topics: Doing math, Developing understanding
Reading Assignments: Chapters 2, 3.
Written Assignment due: RS2, RS3.
Alternative Algorithms: Demonstration.
Math Menu Activities: Demonstration.

Class Session 3 – 6/10/03
Topics: Building assessment into instruction; Early number concepts and number sense; Teaching all children
Reading Assignments: Chapters 5, 6, 23
Written Assignment due: RS 5, RS 6, RS 23
Alternative Algorithms: Group 1
Math Menu Activities: Group A (Chapter 6)

Class Session 4 – 6/17/03
Topics: Meaning of operations using children's literature. Technology and School Mathematics.
Reading Assignments: Chapters 24, 7
Written Assignment due: RS 24, RS 7, Website activity
Alternative Algorithms: Group 2
Math Menu Activities: Group B

Class Session 5 – 6/24/03
Topics: Basic Facts, Place value.
Reading Assignments: Chapters 8, 9
Written Assignment due: RS 8, RS 9; Individual student assessment case
Alternative Algorithms: Group 3
Math Menu Activities: Group C

Class Session 6 – 7/1/03
Topics: Algorithms
Reading Assignments: Chapter 10
Written Assignment due: RS 10
Alternative Algorithms: Group 4
Math Menu Activities: Group D

Class Session 7 – 7/8/03
Topics: Fractions concepts.
Reading Assignments: Chapter 12
Written Assignment due: RS 12
Alternative Algorithms: Group 5
Math Menu Activities: Group E

Class Session 8 – 7/15/03
Topics: Fractions computation, Decimals and percent.
Reading Assignments: Chapters 13 &14
Written Assignment due: RS 13 & RS14
Alternative Algorithms: Group 6
Math Menu Activities: Group F

Class Session 9 – 7/22/03
Topics: Algebra; Supporting mathematics instruction through children's literature
Written Assignment due: RS 19; Math literature books; (50% student presentations)
Alternative Algorithms: Group 7
Math Menu Activities: Group G

Class Session 10 – 7/29/03
Topics: Functions, Real Numbers
Reading Assignments: Chapters 20, 21
Written Assignment due: RS 20, RS 21; Lesson plans; (50% student presentations of literature books)
Alternative Algorithms: Group 8
Math Menu Activities: Group H

Class Session 11 – 8/5/03 – Online Class
Topics: Measurement, Geometry, Probability
Reading Assignments: Chapters 16 (selected topics), 17 (pp.306-324), 18 (selected topics)
Written Assignment due: RS 16, RS 17, RS 18

Class Session 12 – 8/12/03
Final Exam