

## CALIFORNIA STATE UNIVERSITY SAN MARCOS COLLEGE OF EDUCATION

### EDMS 543B – Elementary Mathematics Education

Spring 2008

Monday 13:00-15:45, UNIV 257

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#### College of Education Mission Statement

The mission of the College of Education community is to collaboratively transform public education by preparing thoughtful educators and advancing professional practices. We are committed to diversity, educational equity, and social justice, exemplified through reflective teaching, life-long learning, innovative research, and ongoing service. Our practices demonstrate a commitment to student-centered education, diversity, collaboration, professionalism, and shared governance. (Adopted by the COE Governance Community October, 1997)

#### Course Description and Objectives

EDMS 543 focuses on curriculum development, methods, techniques, materials, planning, organization and assessment in various elementary school curricula, and curriculum integration. Methods of cross-cultural language and academic development will be integrated into the course. *Requires participation/observation in the public schools.*

Learning to teach mathematics well is challenging and, therefore, this course will only begin your education in learning how to teach mathematics. This course is but one stage in your process of becoming a mathematics teacher. We are expected to: (a) deepen our understanding of the mathematics taught at the elementary level, including such topics as place value, base systems, number theory, fractions, proportions, statistics, and algebra, (b) develop an understanding of the current issues and practices in mathematics education, (c) develop a familiarity with the NCTM and California learning standards, (d) develop an understanding of children's content specific thinking or the psychology of mathematical learning, (e) learn to teach content specific concepts using effective and appropriate strategies, including the educational use of technology, (f) practice how to teach for mathematical understanding, and (g) develop strategies to create a classroom environment that promotes the investigation and growth of mathematical ideas and to ensure the success of all students in multi-cultural settings.

#### Course Prerequisites

- Admission to the Multiple Subject Credential Program
- Commitment to help children understand and do mathematics

#### Required Materials

- Van de Walle, J. A. (2007). *Elementary and middle school mathematics: Teaching developmentally* (6<sup>th</sup> Ed.). Boston: Pearson Education, Inc.
- California Department of Education (2005). *Mathematics framework for California public schools: Kindergarten through grade twelve*. Sacramento, CA: Author. This document can be found at <http://www.cde.ca.gov/ci/ma/cf/index.asp>.
- Several other readings may be required and will be available for download.

#### Recommended Materials

- Carpenter, T. P., Fennema, E., Franke, M. L., Levi, L., & Empson, S. B. (1999). *Children's mathematics: Cognitively guided instruction*. Portsmouth, NH: Heinemann.

- Carpenter, T. P., Franke, M. L., & Levi, L. (2003). *Thinking mathematically: Integrating arithmetic & algebra in elementary school*. Portsmouth, NH: Heinemann.
- Lampert, M. (2001). *Teaching problems and the problems of teaching*. New Haven, CT: Yale University Press.
- National Council of Teachers of Mathematics (2000). *Principles and standards for school mathematics*. Reston, VA: Author. An overview of this document can be found at <http://standards.nctm.org/> (NCTM members have full access).
- STAR Test Blueprints for Standards Items: <http://www.cde.ca.gov/ta/tg/sr/blueprints.asp>

### **Authorization to Teach English Language Learners**

The CSUSM credential program has been specifically designed to prepare teachers for the diversity of languages often encountered in California public school classrooms. The authorization to teach English learners is met through the infusion of content and experiences within the credential program as well as additional coursework. Students successfully completing this program receive a credential with authorization to teach English learners. (Approved by CCTC in SB2042 Program Standards, August 2002)

### **Teacher Performance Expectation (TPE) Competencies**

The course objectives, assignments, and assessments have been aligned with the CTC standards for Multiple Subject Credential. This course is designed to help teachers seeking a California teaching credential to develop the skills, knowledge, and attitudes necessary to assist schools and district in implementing effective programs for all students. The successful candidate will be able to merge theory and practice in order to realize a comprehensive and extensive educational program for all students. You will be required to formally address the following TPEs in this course:

Primary Emphasis:

- TPE 1a-Subject Specific Pedagogical Skills for MS Teaching (Mathematics)
- TPE 2-Monitoring Student Learning During Instruction

### **CSUSM Writing Requirement**

The CSUSM writing requirement of 2500 words is met through the completion of course assignments. Therefore, all writing will be looked at for content, organization, grammar, spelling, and format.

### **Requirements**

*Participation and Disposition (10 points)* – You are expected to actively participate in discussions, group work, presentations, and hands-on activities throughout the course. A positive professional disposition includes a willingness to consider and discuss new ideas objectively, curiosity, perseverance, and seriousness about improving one's self as a teacher. It can also include a sense of humor and social intelligence (e.g., the tact and ability to make others feel comfortable and to contribute).

*Student Interviews (30 points)* – You need to conduct three student interviews based on questions provided in class and/or your own invention. You need to choose three mathematical topics from the following seven areas: (1) number concepts, (2) addition/subtraction, (3) multiplication/division, (4) fraction, (5) measurement/geometry, (6) data analysis/probability, and (7) algebra. The purpose is to get you to begin thinking about students' mathematical understanding, to learn how to effectively pose questions and interpret the meaning of students' responses, and to provide you with an opportunity to interact with students. For each interview, you need to submit a 2 to 3-page report. Please also include the child's written work (if available). You can work with a peer in the interviewing process, but each needs to write his/her own report. In addition, you need to share/present your interview findings in class.

*Mathematics Lesson Plan (25 points)* – The purpose of this assignment is to help you learn how to design effective mathematical activities and lessons and to provide an opportunity for you to practice teaching mathematics. Working in small groups of 3-4 members, your team will design one standard-based lesson (approximately 40 minutes) that you will present in an elementary school mathematics class. The same lesson plan can be submitted to Dr. Erika Daniels (EDMS 522B) if you address both writing and mathematics standards. While the lesson plan is group work, each of you needs to implement the lesson at the school you are observing. A draft of the lesson should be submitted for review before the lesson is

taught to students. The draft of the lesson is worth 15 points, and the final version is worth 10 points. Your teaching performance will not affect your grade.

*Small Group Mathematics Learning Activity (10 points).* The class will form groups of 5-6 members, and each group will be assigned one of the following areas in the elementary school curriculum: (1) place value, (2) whole-number computation, (3) fractions, (4) rational numbers, (5) measurement & geometry, (6) data analysis & probability, and (7) algebra. Each group member needs to design a 10-minute learning activity in the assigned area and to conduct the activity in a small group setting in the EDMS 543 class. In addition, you need to write a description of the learning activity and provide teaching tips on the class WebCT, where a collection of approximately 30 learning activities will be available for your future teaching.

*Curriculum Review (15 points)* – Working in a small group of 3-4 members, your team will review the mathematics curriculum currently being used in a local school (e.g., a unit in a textbook) at one grade level. You will investigate the curriculum alignment with the CA Content Standards and key concepts in this EDMS 543 class. You can also provide your general thoughts and concerns related to the curriculum (e.g., how the curriculum might need to be altered to make strong connections between mathematical concepts and procedures). You will need to share your reviews in class by means of a Powerpoint presentation (to be submitted on WebCT). You do not need to write a paper for this project.

*Reflections (10 points)* – You need to write two reflection papers. The first reflection consists of questions about the nature of mathematics and your prior experience with mathematics. The second reflection pertains to your vision of teaching mathematics. The questions for reflection are available on the class WebCT.

Detailed information about the assignments will be given in class. You need to submit the assignments (except children's work) at the course WebCT (access from <https://webct6.csusm.edu>). You are responsible for ensuring that assignments are submitted correctly and on time. Late assignments will receive a reduction in points unless *prior arrangements* have been made with the instructor.

The grade on a late assignment will be deducted 1 point per day unless *prior arrangements* have been made with the instructor.

### **Grading Scale**

Grades will be based on the following grading scale:

A = 93% - 100%	A- = 90% - 92%	B+ = 87% - 89%	B = 83% - 86%
B- = 80% - 82%	C+ = 77% - 79%	C = 73% - 76%	C- = 70% - 72%
D = 60% - 69%	F = below 60		

### **Attendance Policy**

Due to the dynamic and interactive nature of courses in the College of Education, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the instructor. Individual instructors may adopt more stringent attendance requirements. Should the student have extenuating circumstances, s/he should contact the instructor as soon as possible. (*Adopted by the COE Governance Community, December, 1997*).

If you miss two class sessions or are late (or leave early) more than four sessions, you will not receive a grade of "A". If you miss four class sessions, your highest possible grade is a "C+". Please discuss with me any extenuating circumstances that will cause you to miss class *prior* to your absence. Attendance will be taken at each class session.

### **CSUSM Academic Honesty Policy**

"Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. All written work and oral presentation assignments must be original work. All ideas/materials that are borrowed from other sources must have appropriate references to the

original sources. Any quoted material should give credit to the source and be punctuated with quotation marks.

Students are responsible for honest completion of their work including examinations. There will be no tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole."

Incidents of Academic Dishonesty will be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University.

### **Plagiarism**

As an educator, it is expected that each student will do his/her own work, and contribute equally to group projects and processes. Plagiarism or cheating is unacceptable under any circumstances. If you are in doubt about whether your work is paraphrased or plagiarized see the Plagiarism Prevention for Students website <http://library.csusm.edu/plagiarism/index.html>. If there are questions about academic honesty, please consult the University catalog.

### **Students with Disabilities Requiring Reasonable Accommodations**

Students must be approved for services by providing appropriate and recent documentation to the Office of Disabled Student Services (DSS). This office is located in Craven Hall 5205, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with their instructor during office hours or, in order to ensure confidentiality, in a more private setting.

### **Use of Technology**

Students are expected to demonstrate competency in the use of various forms of technology (i.e. word processing, electronic mail, WebCT6, use of the Internet, and/or multimedia presentations). Specific requirements for course assignments with regard to technology are at the discretion of the instructor. Keep a digital copy of all assignments for use in your teaching portfolio. Most assignments will be submitted online, and some will be submitted in hard copy as well. Details will be given in class.

### **Electronic Communication Protocol**

Electronic correspondence is a part of your professional interactions. If you need to contact the instructor, e-mail is often the easiest way to do so. It is my intention to respond to all received e-mails in a timely manner. Please be reminded that e-mail and on-line discussions are a very specific form of communication, with their own nuances and etiquette. For instance, electronic messages sent in all upper case (or lower case) letters, major typos, or slang, often communicate more than the sender originally intended. With that said, please be mindful of all e-mail and on-line discussion messages you send to your colleagues, to faculty members in the College of Education, or to persons within the greater educational community. All electronic messages should be crafted with professionalism and care.

Things to consider:

- Would I say in person what this electronic message specifically says?
- How could this message be misconstrued?
- Does this message represent my highest self?
- Am I sending this electronic message to avoid a face-to-face conversation?

In addition, if there is ever a concern with an electronic message sent to you, please talk with the author in person in order to correct any confusion.

### Tentative Schedule

Please note that modifications may occur at the discretion of the instructor. Student's cooperation and flexibility in response to changes will be noted as part of the participation assessment.

Date	Session/Topic	Assignment to be completed BEFORE Class Session
1/28/08	1. Introduction to mathematics education	
2/4/08	2. Developing children's mathematical understanding	Van de Walle ch. 2, 3 <b>Reflection 1 due</b>
2/11/08	3. (a) Problem solving (b) Literacy in mathematics learning	Van de Walle ch. 4 Article 1: <i>Why study vocabulary in math class?</i> (Murray, 2004)
2/18/08	4. Number concepts	Van de Walle ch. 9, 10 <b>Number concepts interview due*</b>
2/25/08	5. (a) Cognitively Guided Instruction (CGI) (b) Curriculum showcase and review, 1 <sup>st</sup> round	Van de Walle ch. 11 <b>Curriculum review due (1<sup>st</sup> round)</b>
3/3/08	6. Place value (Group 1 presentation**)	Van de Walle ch. 12 <b>Add/sub interview due*</b>
3/10/08	7. Whole-number computation (Group 2 presentation**)	Van de Walle ch. 13 <b>Mult/div interview due*</b>
3/17/08	8. Fractions (Group 3 presentation**)	Van de Walle ch. 16, 17 <b>Lesson plan draft due</b>
3/24/08	9. Rational numbers: Decimals & percents (Group 4 presentation**)	Van de Walle ch. 18 <b>Fractions interview due*</b>
3/31/08	Cesar Chavez Day/Spring break	No class
4/7/08	10. (a) Ratios and proportions (b) Curriculum showcase and review, 2 <sup>nd</sup> round	Van de Walle ch. 19 <b>Curriculum review due (2<sup>nd</sup> round)</b>
4/14/08	11. Measurement & Geometry (Group 5 presentation**)	Van de Walle ch. 20, 21 <b>Measurement/Geo interview due*</b>
4/21/08	12. Lesson plan presentation	
4/28/08	13. Data analysis & probability (Group 6 presentation**)	Van de Walle ch. 22, 23 <b>Lesson plan due</b> <b>Data anal/probability interview due*</b>
5/5/07	14. Algebraic reasoning	Van de Walle ch. 15 <b>Algebra interview due*</b> <b>Reflection 2 due</b>

\* You just need to choose three of these seven topics for student interviews. The due dates vary. If you choose to do an interview on addition/subtraction, then your paper is due on 3/3. If you want to do an interview on algebra, then your paper is due on 5/5.

\*\* After the presentation of your *mathematics learning activity*, you should submit this assignment within a week. For example, if you present an activity on fractions on 3/17, the description and teaching tips are due on 3/24.

**SB 2042 - AUTHORIZATION TO TEACH ENGLISH LEARNERS COMPETENCIES**

<b>PART 1: LANGUAGE STRUCTURE AND FIRST- AND SECOND-LANGUAGE DEVELOPMENT</b>	<b>PART 2: METHODOLOGY OF BILINGUAL, ENGLISH LANGUAGE DEVELOPMENT, AND CONTENT INSTRUCTION</b>	<b>PART 3: CULTURE AND CULTURAL DIVERSITY</b>
<b>I. Language Structure and Use: Universals and Differences (including the structure of English)</b>	<b>I. Theories and Methods of Bilingual Education</b>	<b>I. The Nature of Culture</b>
A. The sound systems of language (phonology)	A. Foundations	A. Definitions of culture
B. Word formation (morphology)	B. Organizational models: What works for whom?	B. Perceptions of culture
C. Syntax	C. Instructional strategies	C. Intra-group differences (e.g., ethnicity, race, generations, and micro-cultures)
D. Word meaning (semantics)	<b>II. Theories and Methods for Instruction In and Through English</b>	D. Physical geography and its effects on culture
E. Language in context	A. Teacher delivery for both English language development and content instruction	E. Cultural congruence
F. Written discourse	B. Approaches with a focus on English language development	<b>II. Manifestations of Culture: Learning About Students</b>
G. Oral discourse	C. Approaches with a focus on content area instruction (specially designed academic instruction delivered in English)	A. What teachers should learn about their students
H. Nonverbal communication	D. Working with paraprofessionals	B. How teachers can learn about their students
I. Language Change		C. How teachers can use what they learn about their students (culturally responsive pedagogy)
<b>II. Theories and Factors in First- and Second-Language Development</b>	<b>III. Language and Content Area Assessment</b>	<b>III. Cultural Contact</b>
A. Historical and current theories and models of language analysis that have implications for second-language development and pedagogy	A. Purpose	A. Concepts of cultural contact
B. Psychological factors affecting first- and second-language development	B. Methods	B. Stages of individual cultural contact
C. Socio-cultural factors affecting first- and second-language development	C. State mandates	C. The dynamics of prejudice
D. Pedagogical factors affecting first- and second-language development	D. Limitations of assessment	D. Strategies for conflict resolution
E. Political factors affecting first- and second-language development	E. Technical concepts	<b>IV. Cultural Diversity in U.S. and CA</b>
		A. Historical perspectives
		B. Demography
		C. Migration and immigration