

CALIFORNIA STATE UNIVERSITY, SAN MARCOS
COLLEGE OF EDUCATION
Spring 2009

EDMS 543 –Mathematics Education in Elementary Schools
Monday: 7:30 A.M. – 2:15 P.M. University Hall 444
CRN: 20288

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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 on-going service. Our practices demonstrate a commitment to student-centered education, diversity, collaboration, professionalism, and shared governance. *(Adopted by COE Governance Community, October, 1997).*

California Teacher Performance Assessment (CalTPA)

Beginning July 1, 2008 all California credential candidates must successfully complete a state-approved system of teacher performance assessment (TPA), to be embedded in the credential program of preparation. At CSUSM this assessment system is called the CalTPA or the TPA for short.

To assist your successful completion of the TPA a series of informational seminars are offered over the course of the program. TPA related questions and logistical concerns are to be addressed during the seminars. Your attendance to TPA seminars will greatly contribute to your success on the assessment.

Additionally, COE classes use common pedagogical language, lesson plans (lesson designs), and unit plans (unit designs) in order to support and ensure your success on the TPA and more importantly in your credential program.

The CalTPA Candidate Handbook, TPA seminar schedule, and other TPA support materials can be found on the COE website provided at the website provided:
<http://www.csusm.edu/coe/CalTPA/ProgramMaterialsTPA.html>

COURSE DESCRIPTION

This course focuses on how children develop mathematical understanding; children's mathematical thinking; curriculum development; methods, materials, planning, organization and assessment in various elementary school curricula; and curriculum integration. Methods of cross-cultural language and academic development are integrated into the course.

Course Prerequisites

Admission to the Multiple Subject/CLAD Teacher Credential Program is a prerequisite.

Course Objectives

1. Using reflective writings, teacher candidates will provide ongoing evidence of good depth of understanding as well as application to the classroom, of chosen ideas from weekly assigned readings.
2. Using the interview process to apply the pedagogical content knowledge that is being learned in the course, teacher candidates will improve their use of inquiry for assessment purposes by focusing on students' thinking about mathematics to better understand elementary level students with different understandings and plan appropriate interventions.
3. By merging theory and practice in order to enable their future students to understand a mathematical topic and make connections among ideas related to this topic, teacher candidates will participate in the design, construction, and presentation of a reform-minded mathematical activity that focuses on students' mathematical thinking.
4. By compiling an effective list of resources on a predetermined math topic, teacher candidates will demonstrate evidence that they are able to provide students with access to a balanced and comprehensive mathematics curriculum that promotes and enhances student learning and understanding, and provides conceptual understanding of the logic and structure of mathematics, problem-solving skills, and computational and procedural skills.
5. By reflecting on and weaving what has been learned in the course during the semester regarding mathematics standards, reform-minded mathematics ideas, constructivist teaching and learning methods which enhance how children think and problem solve, teacher candidates will analyze the curriculum that is currently being implemented in their practicum classroom.

FOCUS QUESTIONS

These focus questions will serve as a guide throughout this course. They will direct our thinking and study as we learn more about teaching children mathematics. When you complete this course, you should have knowledge, understanding, and experiences that will help you answer these questions:

1. How do children develop mathematical understanding, competence, and confidence?
2. How does the culture of the classroom affect mathematical communication and learning?
3. How does the teacher help all children become successful in learning mathematics?
4. How will you continue to develop your mathematical understanding, confidence, and competence?
5. How does the teacher analyze the curriculum in relation to State Mathematical Content Standards?

Unique Course Requirements

Students will be required to have access to children in grades K-6 for the purpose of conducting a series of math interviews to learn about how children think and problem solve.

Each student will be required to implement and videotape a lesson in his or her observation classroom.

Required Texts

- Van de Walle, J. A. (2007). *Elementary and middle school mathematics: Teaching developmentally* (6th ed). Boston: Pearson Education, Inc.
ISBN: 0-205-48392-5
The text has a companion Web site at: http://wps.ablongman.com/ab_vandewalle_math_5.
- California Department of Education (2000). *Mathematics framework for California public schools, kindergarten through grade twelve* (2000 Revised Ed.). Sacramento, CA: Author. This document can be found on the WWW at:
<http://www.cde.ca.gov/re/pn/fd/documents/mathematics-frame.pdf>. The Web site contains a downloadable PDF file. There are also copies in the library for checkout.
 - Taskstream account is required.

You are required to access the following Web sites and materials for this course.

- National Council of Teachers of Mathematics (2000). *Principles and standards for school mathematics*. Reston, VA: Author. This document can be found at:
<http://standards.nctm.org/>
- Star Test Blueprints for Standards Items (grades 2-7)
<http://www.cde.ca.gov/ta/tg/sr/documents/bpcstmath2to7.pdf>

Authorization to Teach English Learners

This 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 SB 2042 Program Standards, August 02)

Teacher Performance Expectation (TPE) Competencies

The course objectives, assignments, and assessments have been aligned with the CTC standards for the 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:

CTC Standards Alignment:

The course objectives, assignments, and assessments have been aligned with the CTC standards for Multiple Subjects Credential. The following standards are a primary emphasis in this course:

- **Standard 3:** Relationship between Theory and Practice
- **Standard 4:** Pedagogical Thought and Reflective Practice
- **Standard 5:** Equity, Diversity and Access to the Core Curriculum for All Children
- **Standard 8A:** Pedagogical Preparation for Subject-Specific Content Instruction by MS Candidates (Mathematics)

Teacher Performance Expectation (TPE) Competencies:

Primary Emphases:

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

Secondary Emphases:

- TPE 3-Interpretation and Use of Assessments
- TPE 4-Making Content Accessible
- TPE 5-Student Engagement
- TPE 6a-Developmentally Appropriate Practices in Grades K-3
- TPE 6b-Developmentally Appropriate Practices in Grades 4-8
- TPE 6d- Developmentally Appropriate Teaching Practices for Special Education:
Teaching the Special Education Population in the General Education
Environment
- TPE 7-Teaching English Learners
- TPE 8-Learning About Students
- TPE 9-Instructional Planning
- TPE 10-Instructional Time
- TPE 11-Social Environment
- TPE 13-Professional Growth
- TPE 14-Educational Technology in Teaching and Learning

College of Education 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 one class session (2 hours and 45 minutes) or are late (or leave early) more than two sessions, you cannot receive a grade of "A". If you miss one and a half class sessions, your **highest** possible grade may be a "C+".

If possible, please discuss with the instructor any extenuating circumstances that will cause you to miss class prior to your absence. Attendance will be taken at each class session. Furthermore, grades on assignments turned in late will be lowered unless **prior arrangements** have been made with the instructor. Absence is no excuse for not turning in assignments, as they may be sent electronically (e-mail) to the instructor.

Students with Disabilities Requiring Reasonable Accommodations

Students must be approved for services by providing appropriate and recent documentation to the Office of Disable 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.

Course Requirements and Grading Standards

ASSIGNMENTS (The relative weight for each assignment is indicated as a percentage of the total course grade)

Detailed assignment guidelines and scoring rubrics (course packet) will be provided electronically to each student for all written assignments below. The course calendar/topics schedule is attached to this syllabus.

Reading Assignments/Reflections including Standards and Assessment Activities (10%)

Using the mandatory assigned readings, your experiences from your tutoring and observations, each week students should clearly articulate your thoughts on how you might **specifically apply** what you learned to how you plan to teach mathematics to your students. Please do not repeat verbatim from the readings. In addition, students will work in groups to present the standards for a particular grade level after readings.

Math Menu Activity/Alternative Activity (5%)

Each student will be responsible for presenting an individual activity to engage the class in either an alternative algorithm or a math menu activity.

Student Interviews (20%)

You will conduct two different student interviews based on questions provided in class. Each interview is worth 10 points. For each interview, you will pose mathematical problems to any one student at a predetermined grade level. 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' answers, and to provide you with an opportunity to interact with students. You will also interview your cooperating teacher to help you formulate your thoughts about your preparation as a teacher. Instruments will be provided to serve as a foundation.

Lesson Design (includes Technology Plan and Reference list) (55%)

You will first compile resources on a predetermined mathematical topic (15%) and then design a lesson that you will present and videotape in an elementary class (20%). The purpose of this activity is to help you learn how to design effective mathematical activities, to provide you with an opportunity to begin compiling mathematical resources, and to provide an opportunity for you to practice teaching mathematics in an authentic classroom setting.

Individual Creative Projects (5%)

Literature book/Creative project: Develop (conceptualize and draft) a children's literature book/creative project that can be used to teach a mathematics concept and present it to the class. As a part of your personal and professional growth, you will begin to understand the context of how to design materials that provide access to all students and stimulate students' imagination in facilitating the learning of mathematics.

Active Attendance, Participation, Collaboration, and Professionalism (5%)

Defined as actively engaging and contributing in **all** class discussions and activities, students will be evaluated **daily**. Correspondingly attendance is an essential ingredient. [Deviations must be discussed with the instructor.] A prime example of the manifestation will occur during the presentations on the standards. A positive attitude is an important component for establishing the definition for active participation and collaboration. In addition, the student will be expected to exhibit professional behavior and demeanor at all times.

All University Writing Requirement

All CSU students must demonstrate competency in writing skills as a requirement for graduation. At Cal State San Marcos, students complete the graduation writing assessment through the All-University Writing Requirement. This requirement mandates that every course at the University must have a writing component of at least 2,500 words (approximately 10 pages). **The writing requirement for this course will be met through weekly writings, student interview analyses, and the creation of a lesson plan and mathematical resources.**

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 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.

GRADING SCALE: Grades for this course will be based on the following grading scale:

A.....	94% - 100 %
A-.....	90% - 93%
B+.....	88% - 89%
B.....	83% - 87 %
B-.....	80% - 82%
C+.....	78% - 79%
C.....	73% - 77 %
C-.....	70% - 72%

Exemplary "A" Students:

- Demonstrate serious commitment to their learning, making full use of the learning opportunities available and searching out the implications of their learning for future use.
- Complete all assignments thoroughly and thoughtfully toward the goal of developing in-depth math projects.
- Make insightful connections between all assignments and their developing overall understanding of mathematical concepts; they continually question and examine concepts in a genuine spirit of inquiry.
- Students show a high level of achievement of course goals.

"B" Students:

- Simply comply with the course requirements and expectations.
- Complete all assignments, usually thoroughly and thoughtfully.
- Usually connect assignments to their developing overall understanding of mathematical concepts; may be satisfied with accepting their learning as it is received without deeply examining concepts or seeking a higher level of understanding.
- Students show reasonable achievement of course goals.

“C” Students:

- Demonstrate an inconsistent level of compliance to course requirements and expectations.
- Complete all assignments with limited thoroughness and thoughtfulness.
- Make limited connections between assignments and their developing overall understanding of mathematical concepts; may not be open to examining concepts on a deeper level and may actually dismiss the importance of such inquiry.
- Attempt, but show limited progress in achieving course goals.

Remember! You are required to maintain a B average (3.0 GPA) in your teacher education courses to receive a teaching credential in the State of California.

Lesson Design Assignment
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	Developing	Nearly Meets	Meets	Exceeds
TPE 1, 1a Subject Specific Pedagogical skills for MS Teaching Assignment (Teaching Mathematics in a Multiple Subject Assignment)	Candidates' lesson plan and presentation demonstrates little to no understanding of how to teach the state adopted academic content standard in mathematics	Candidates' lesson plan and presentation demonstrates some understanding of how to teach the state adopted academic content standard in mathematics	Candidates' lesson plan and presentation demonstrates considerable understanding of how to teach the state adopted academic content standard in mathematics	Candidates' lesson plan and presentation demonstrates exceptional understanding of how to teach the state adopted academic content standard in mathematics
TPE 4 Making Content Accessible	Candidates' lesson plan and presentation will demonstrate little to no understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum	Candidates' lesson plan and presentation will demonstrate some understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum	Candidates' lesson plan and presentation will demonstrate considerable understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum	Candidates' lesson plan and presentation will demonstrate exceptional understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum
TPE 6, 6a, 6b Developmentally Appropriate Teaching Practices – Grades K-3 & 4-8	Candidates' lesson plan and presentation will demonstrate little to no understanding in the use of developmentally appropriate teaching practices.	Candidates' lesson plan and presentation will demonstrate some understanding in the use of developmentally appropriate teaching practices.	Candidates' lesson plan and presentation will demonstrate considerable understanding in the use of developmentally appropriate teaching practices.	Candidates' lesson plan and presentation will demonstrate exceptional understanding in the use of developmentally appropriate teaching practices.

Secondary TPE's for this Assignment

- TPE 2 – Monitoring Student Learning During Instruction
- TPE 5 – Student Engagement
- TPE 9 – Instructional Planning
- TPE 10 – Instructional Time
- TPE 11 – Social Environment

Lesson Resources Assignment
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	Developing	Nearly Meets	Meets	Exceeds
TPE 4 Making Content Accessible	Candidates' resources and descriptions will demonstrate little to no understanding of how instructional resources can help provide all students with access to a balanced and comprehensive curriculum.	Candidates' resources and descriptions will demonstrate some understanding of how instructional resources can help provide all students with access to a balanced and comprehensive curriculum.	Candidates' resources and descriptions will demonstrate considerable understanding of how instructional resources can help provide all students with access to a balanced and comprehensive curriculum.	Candidates' resources and descriptions will demonstrate exceptional understanding of how instructional resources can help provide all students with access to a balanced and comprehensive curriculum.

Secondary TPE's for this Assignment

- TPE 1a – Subject-Specific Pedagogical Skills for MS Teaching Assignments (Teaching Mathematics in a MS Assignment)
- TPE 5 – Student Engagement

Student Interviews Assignment
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	Developing	Nearly Meets	Meets	Exceeds
TPE 1, 1a Subject Specific Pedagogical skills for MS Teaching Assignment (Teaching Mathematics in a Multiple Subject Assignment)	Candidate's assessment and recommendations from the student interview demonstrates little to no understanding of how to teach the state adopted academic content standard in mathematics	Candidate's assessment and recommendations from the student interview demonstrates some understanding of how to teach the state adopted academic content standard in mathematics	Candidate's assessment and recommendations from the student interview demonstrates considerable understanding of how to teach the state adopted academic content standard in mathematics	Candidate's assessment and recommendations from the student interview demonstrates exceptional understanding of how to teach the state adopted academic content standard in mathematics
TPE 2 Monitoring Student Learning During Instruction	Candidate's assessment and recommendations from the student interview demonstrates little to no understanding of how to monitor student learning and how to effectively make use of this information when teaching.	Candidate's assessment and recommendations from the student interview demonstrates some understanding of how to monitor student learning and how to effectively make use of this information when teaching.	Candidate's assessment and recommendations from the student interview demonstrates considerable understanding of how to monitor student learning and how to effectively make use of this information when teaching.	Candidate's assessment and recommendations from the student interview demonstrates exceptional understanding of how to monitor student learning and how to effectively make use of this information when teaching.
TPE 3 Interpretation and Use of Assessments	Candidate demonstrates little to no understanding of how to effectively assess students' content knowledge through the use of student interviews.	Candidate demonstrates some understanding of how to effectively assess students' content knowledge through the use of student interviews.	Candidate demonstrates considerable understanding of how to effectively assess students' content knowledge through the use of student interviews.	Candidate demonstrates exceptional understanding of how to effectively assess students' content knowledge through the use of student interviews.
TPE 4 Making Content Accessible	Candidate's recommendations from the student interview demonstrates little to no understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum	Candidate's recommendations from the student interview demonstrates some understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum	Candidate's recommendations from the student interview demonstrates considerable understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum	Candidate's recommendations from the student interview demonstrates exceptional understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum

Secondary TPE's for this Assignment

- TPE 5 – Student Engagement
- TPE 6, 6a, 6b – Developmentally Appropriate Practices in Grades K-3 & Grades 4-8.
- TPE 8 – Learning about Students and TPE 9 – Instructional Planning

Date	Topic and Assignments (Tentative)	Readings
1.26.09	Introduction to Mathematics Education: Developing Mathematical Understanding Characteristics of Effective Classrooms: Overview of Instructional Practices Problem Solving and sample alternative algorithms	2 - Exploring What It Means to do Mathematics 3 -Developing Understanding in Mathematics 4 – Teaching Through Problem Solving
2.2.09	CA Mathematics Content Standards (CA and NCTM) Group presentations of assigned standards Designing Instructions Assessment- Connecting Instruction with Assessment (Interviews) Discussion of Classroom Teacher Input Reflections	This document is available on: http://www.cde.ca.gov/re/pn/fd/documents/mathematics-frame.pdf . 6 – Building Assessment into Instruction 7 – Teaching Mathematics Equitably to All Children Appendices A & B Article on teaching mathematics equitably to all students per student’s choice
2.9.09	Number Concepts and Operations Number Concepts interview due Reflections Alternative Algorithms	9 - Developing Early Number Concepts and Number Sense 10 - Developing Meanings for the Operations 11-Helping Children Master the Basic Facts
2.16.09 **	Place Value and Whole Number Computation Either Addition/Subtraction Interview OR Multiplication/Division Interview (Not both) due Place Value Lesson Presentation Whole Number Computation Lesson Presentation Reflections; Alternative Algorithms	12 - Whole-Number Place-Value Development 13 - Strategies for Whole Number Computation
2.23.09 **	Fractions Constructing Understanding of Fractions; Fraction Computation Fraction interview due Fraction lesson presentation Reflections; Alternative Algorithms	16 -Developing Fraction Concepts 17 - Computation with Fractions
3.2.09 **	Measurement & Geometry- Customary and Metric system Measurement and/or Geometry interviews due Measurement and/or Geometry lessons presentation TPE workshop Reflections Alternative Algorithms	20 -Developing Measurement Concepts 21 – Geometric Thinking and Geometric Concepts
3.9.09 **	Probability & Data Analysis – Developing meaningful experiences Exploring concepts of chance, simple and independent events Data Analysis & Probability interview due Probability & Data Analysis lesson presentation	22 – Concepts of Data Analysis 23 - Exploring Concepts of Probability
3.16.09 **	Algebraic Reasoning and Functions – Exploring patterns, variables, and equations. Developing function concepts. Algebraic concepts will be discussed weekly. Summary Algebra interview due Algebra lesson presentation Presentation of Creative Projects	15 – Algebraic Thinking: Generalizations, Patterns and Functions Summary 24 – Developing Concepts of Exponents, Integers, and Real Numbers
Technology	This competency will be infused throughout the course. Use this chapter as an ongoing reference.	8 – Technology & School Mathematics