California State University San Marcos
College of Education
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EDMS 543B – Mathematics Education in Elementary Schools (3 units)

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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.

REQUIRED MATERIALS

- California Department of Education (2000). *Mathematics content standards for California public schools, Kindergarten through grade twelve*. Sacramento, CA: Author. This document can be found on the WWW at: http://www.cde.ca.gov/standards/ The Web site contains both HTML versions and a downloadable PDF file. (I highly encourage students to purchase this publication). There are copies in the library for check out.

- 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 (2-7) http://www.cde.ca.gov/statetests/star/resources/blueprints.html.

- Van de Walle, John A. (2004). *Elementary and middle school mathematics: Teaching developmentally* (5th Edition). Boston: Pearson Education, Inc. The text has a companion Web site at: http://wps.ablongman.com/ab_vandewalle_math_5.

- Choate, J. S. (2000). *Successful inclusive teaching: Proven ways to detect and correct special needs.* Boston: Allyn and Bacon

COURSE DESCRIPTION

Learning to teach mathematics well is difficult and, therefore, you must expect that this course will only begin your education in learning how to teach mathematics. This course is but one stage in what is hoped will be a continuing evolution of you as a mathematics teacher. The focus of this course will be on (1) developing an understanding of the current practices in mathematics, (2) learning to teach content specific concepts using effective and appropriate strategies, and (3) practicing how to teach for mathematical understanding. Enfolded into this course will be curriculum development, developing an understanding of children's content specific thinking, creating a classroom environment that promotes the investigation and growth of mathematical ideas, and developing strategies to ensure the success of all students in multi-cultural settings.

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(a): Pedagogical Preparation for Subject-Specific Content Instruction by MS Candidates (Mathematics)

Teacher Performance Expectation (TPE) Competencies:

This course is designed to help teachers seeking the Multiple Subjects Credential to develop the skills, knowledge, and attitudes necessary to assist schools and district in implementing an effective program 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. The following TPE's are addressed in this course:

Primary Emphasis:

- TPE 1a-Subject Specific Pedagogical Skills for MS Teaching (Mathematics)

Secondary Emphases:

- TPE 2-Monitoring Student Learning During Instruction
- 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

ASSIGNMENTS

Detailed assignment sheets (course packet) will be provided for every assignment below. The course calendar/topics schedule is attached to this syllabus.

Reading Reflections

(20%) - Each week students will write a "meaningful" reflection on the material assigned to be read for that week. These reflections should be one page in length (use an "11" font, spacing of 1.5, with **only** your name and class session number as a heading), and should clearly articulate your thoughts **on the assigned readings** and how you might **specifically apply** what you learned from the articles as a teacher in the classroom. Please do not repeat verbatim from the readings.

Student Interviews (Critical Assessment Task – CATs)

(20%) - You and one of your classmates will conduct a series of three different student interviews based on questions provided in class. 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.

Mathematical Resources & Lesson (Critical Assessment Task – CATs)

(35%) – Working in small groups, your team will first compile resources on a predetermined mathematical topic (20%) and then design a lesson that you will present in an elementary class (or ours as if we were your students) (15%). 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.

Curriculum Assignment (Critical Assessment Task – CATs)

(**20%) –** Students will review the mathematics curriculum currently being used in your classroom (e.g., a textbook) at one grade level and write a short paper that investigates the curriculum alignment with the CA Content Standards and current high stakes assessments. Students will also provide their 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).

Active Participation and Collaboration (5%) – Defined as **actively** engaging in **all** class discussions and activities, students will be evaluated daily. A positive attitude is an important component for establishing the definition for active participation and collaboration. From 0-5 points can be earned in this category depending on the degree of the student's active participation and collaboration.

A COURSE PACKET WITH ASSIGNMENT DETAILS AND SCORING RUBRICS WILL BE PROVIDED ELECTRONICALLY TO EACH STUDENT.

INFUSED COMPETENCIES

CLAD
In 1992, the College of Education voted to infuse Cross-cultural, Language and Academic Development (CLAD) competencies across the curriculum. The CLAD competencies are attached to the syllabus and the competencies covered in this course are highlighted.

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

Special Education
Consistent with the intent to offer a seamless teaching credential in the College of Education, this course will demonstrate the collaborative infusion of special education competencies that reflect inclusive educational practices.

Technology
This course infuses technology competencies to prepare our candidates to use technologies, emphasizing their use in both teaching practice and student learning.

ATTENDANCE POLICY

The attendance policy of the College of Education: Due to the dynamic and interactive nature of courses in the COE, 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. If you miss two class sessions or are late (or leave early) more than three sessions, you cannot receive a grade of "A". If you miss three class sessions, your highest possible grade is a "C+". Should you have extenuating circumstances, contact the instructor as soon as possible. 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. Furthermore, grades on assignments turned in late will be lowered unless **prior arrangements** have been made with the instructor.

PLAGIARISM AND CHEATING

Please be sure to read and understand the university policy on plagiarism and cheating, as it will be strictly enforced. Academic dishonestly will not be tolerated and will result in a failing grade for this course and will be reported to the University.

Students with Disabilities Requiring Reasonable Accommodations
Students are approved for services through the Disabled Student Services Office (DSS). This office is located in Craven Hall 5205 and can be contacted by phone (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.

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

A..... 93% - 100 %
A-……90% - 92%

B+……. 88% - 89%
B..... 83% - 87 %
B-…….. 80% - 82%

C+……. 78% - 79%
C..... 73% - 77 %
C-……... 70% - 72%

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.

SB 2042 – Authorization to Teach English Learners Competencies

TEST 1: LANGUAGE STRUCTURE AND FIRST- AND SECOND-LANGUAGE DEVELOPMENT	TEST 2: METHODOLOGY OF BILINGUAL, ENGLISH LANGUAGE DEVELOPMENT, AND CONTENT INSTRUCTION	TEST 3: CULTURE AND CULTURAL DIVERSITY
I. Language Structure and Use: Universals and Differences (including the structure of English)	**I. Theories and Methods of Bilingual Education**	**I. The Nature of Culture**
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.** Intragroup differences (e.g., ethnicity, race, generations, and micro-cultures)
D. Word meaning (semantics) *	**II. Theories and Methods for Instruction In and Through English**	**D.** Physical geography and its effects on culture
E. Language in context *	**A.** Teacher delivery for <u>both</u> English language development <u>and</u> content instruction *	**E.** Cultural congruence
F. Written discourse *	**B.** Approaches with a focus on English language development *	**II. Manifestations of Culture: Learning About Students**
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 ***
II. Theories and Factors in First- and Second-Language Development	**III. Language and Content Area Assessment**	**C. How teachers can use what they learn about their students (culturally responsive pedagogy)***
A. Historical and current theories and models of language analysis that have implications for second-language development and pedagogy	**A. Purpose**	**III. Cultural Contact**
B. Psychological factors affecting first- and second-language development	**B. Methods ***	**A.** Concepts of cultural contact
C. Socio-cultural factors affecting first- and second-language development	**C. State mandates**	**B.** Stages of individual cultural contact
D. Pedagogical factors affecting first- and second-language development *	**D. Limitations of assessment ***	**C.** The dynamics of prejudice
E. Political factors affecting first- and second-language development	**E. Technical concepts ***	**D.** Strategies for conflict resolution

Curriculum Review 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 MS Assignment)	Candidate's analysis of the curriculum will demonstrate little to no understanding of how to teach the state adopted academic content standard in mathematics.	Candidate's analysis of the curriculum will demonstrate some understanding of how to teach the state adopted academic content standard in mathematics.	Candidate's analysis of the curriculum will demonstrate considerable understanding of how to teach the state adopted academic content standard in mathematics.	Candidate's analysis of the curriculum will demonstrate exceptional understanding of how to teach the state adopted academic content standard in mathematics.
TPE 4 Making Content Accessible	Candidate's analysis of the curriculum will demonstrate little to no understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum.	Candidate's analysis of the curriculum will demonstrate some understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum	Candidate's analysis of the curriculum will demonstrate considerable understanding in the use of pedagogical strategies that will provide all students access to the mathematics curriculum	Candidate's analysis of the curriculum 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 in Grades K-3 & 4-8	Candidate's analysis of the curriculum will demonstrate little to no understanding in the use of developmentally appropriate teaching practices.	Candidate's analysis of the curriculum will demonstrate some understanding in the use of developmentally appropriate teaching practices	Candidate's analysis of the curriculum will demonstrate considerable understanding in the use of developmentally appropriate teaching practices	Candidates's analysis of the curriculum will demonstrate exceptional understanding in the use of developmentally appropriate teaching practices

Secondary TPE's for this Assignment

- TPE 9 – Instructional Planning
- TPE 10 – Instructional Time

Lesson Presentation Assignment
EDMS 543

	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
EDMS 543

	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 Interview Assignment
EDMS 543

	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
- TPE 9 – Instructional Planning

DATE	EDMS 543B COURSE TOPICS (M)	Van De Walle text chapters
01/26/04	Course Introduction Why do we do mathematics? (Big picture) Conceptual vs. procedural knowledge Characteristics of Effective Classrooms: Overview of Instructional Practices	1- Teaching Mathematics in the Context of the Reform Movement 2 - Exploring What It Means to do Mathematics
02/02/04	Developing understanding—How do kids learn? Teaching through problem solving Discussion of Cognitively Guided Instruction	3 -Developing Understanding in Mathematics 4 -Teaching Through Problem Solving
02/09/04	Interviews Assessment – Connection instruction with assessment Discussion of how children learn through problem solving development	5 -Building Assessment into Instruction 6 - Planning in the Problem-Based Classroom
02/16/04	Mathematics Content Standards for California Public Schools **Group presentations of assigned standards** CA Mathematics Standards Star Test Blueprint	This document is available on: http://www.cde.ca.gov/standards/
02/23/04	Special Populations: Creating Inclusive Classrooms Multiple Representations and meeting the needs of all students **Article summary/critique on Math and Special Populations due**	7 - Teaching All Children Mathematics Article on math & special needs
03/01/04	Number Sense I: **PRACTICE INTERVIEW DUE** What it means and how we can help children develop it.	9 - Developing Early Number Concepts and Number Sense
03/08/04	Number Sense II: Classification of word problems for addition, subtraction, multiplication, and division. How all children can construct efficient mental tools for fact mastery.	10 - Developing Meanings for the Operations 11 - Helping Children Master the Basic Facts
03/15/04	Number Sense III: Developing understanding of place value **Place Value Interview due**	12 - Whole-Number Place-Value Development
03/22/04	Number Sense IV: Developing flexible methods of computation, mental strategies, and estimation. Building estimation skills **Add/Subtraction OR Multiplication/Division classroom presentation** **Addition/Subtraction OR Multiplication/Division interview due (turn in only one interview)**	13 - Strategies for Whole Number Computation 14 – Computational Estimation with Whole Numbers
03/29/04	Fractions I Constructing understanding of fractions; fraction computation **Fraction classroom presentation #1 (grades K-4 lesson choice)** Fractions II **Fraction classroom presentation #2 (grades 5-8 lesson choice)** **Fraction interview due**	15 -Developing Fraction Concepts 16 - Computation with Fractions
04/05/04	Measurement - Customary and metric system **Measurement classroom presentation** **Measurement interview due**	19 -Developing Measurement Concepts
04/12/04	Geometry – Developing geometric reasoning and spatial sense **Geometry classroom presentation** **Geometry interview due**	20 - Geometric Thinking and Geometric Concepts
04/19/04	Probability & Data Analysis – Developing meaningful experiences in gathering and displaying statistical data. Exploring concepts of chance, simple and independent events. **Probability & Data Analysis classroom presentation** **Probability & Data Analysis interview due**	21 - Exploring Concepts of Probability and Data Analysis
04/26/04	Algebraic Reasoning and Function – Exploring patterns, variables, and equations. Developing function concepts. **Algebra classroom presentation** **Last day to turn in curriculum assignment**	22- Algebraic Reasoning 23 – Exploring Functions
05/03/04	Wrap-up **TPE 1A summary due**	
Technology	– This competency will be infused throughout the course. Use this chapter as an ongoing reference.	8 – Technology and School Mathematics