

**California State University, San Marcos**  
**COLLEGE OF EDUCATION**

**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 COE Governance Community*

*October, 1997)*

**EDMS 543 – Elementary Math Education**  
**Fall 2003**

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**REQUIRED TEXTS** (Available in the bookstore)

California Department of Education (2000). Mathematics Content Standards for California Public Schools, Kindergarten Through Grade Twelve. Sacramento, CA: author. Can be found online at:  
<http://www.cde.ca.gov/board/pdf/math.pdf>

Choate, Joyce. Successful Inclusive Teaching(3<sup>rd</sup> edition). Allyn and Bacon, Needham Heights, MA, 2000.

National Council of Teachers of Mathematics (2000). Principles and standards for school mathematics. Reston, VA: author. Can be found at: <http://standards.nctm.org/document/index.htm>

Van de Walle, John A. Elementary and middle school mathematics: Teaching developmentally (5<sup>th</sup> ed.), Addison Wesley Longman, New York, 2004.

**OPTIONAL TEXTS** (Can be ordered online)

Burns, Marilyn. About Teaching Mathematics (2<sup>nd</sup> edition), Math Solutions Publications, Sausalito, CA, 2000.

Kaplan, Andrew. Math on Call. Great Source Education Group, Inc. Wilmington, MA, 1998.

Richardson, Kathy. Math Time, The Learning Environment. Educational Enrichment, Inc. Norman, OK 1997.

## **COURSE DESCRIPTION**

Learning to teach mathematics well is difficult. This course will not complete your education in learning how to teach mathematics; it is but one stage in your continuing development as a mathematics teacher. The goal of this course is to help you gain an understanding of the answers to the focus questions and to become familiar with the resources available to you as a teacher.

The focus of this course will be on:

- developing an understanding of the current practices in mathematics
- learning to teach content specific concepts using effective and appropriate strategies
- practicing how to teach for mathematical understanding.

Enfolded into this course will be curriculum development, developing an understanding of children's mathematical 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. Topics that will be addressed include mathematics curriculum, instructional theory and techniques, materials, and assessment approaches.

The instructional content of this course and the assignments are organized to reflect the following dimensions identified as critical to understanding effective mathematics instruction:

- The Role of the Teacher
- The Nature of the Learning Tasks
- The Culture of the Classroom
- Mathematical Tools and Technology
- Equity and Accessibility for All Students

## **Focus Questions**

These focus questions will serve as a guide throughout the 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.

- How do children develop mathematical understanding competence, and confidence?
- How does the culture of the classroom affect mathematical communication and learning?
- How does the teacher help all children become successful in learning mathematics?
- How will you continue to develop your mathematical understanding, confidence, and competence?
- How does the teacher analyze the curriculum in relation to State mathematics standards?

## **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)
- TPE 2-Monitoring Student Learning During Instruction
- TPE 3-Interpretation and Use of Assessments
- TPE 4-Making Content Accessible
- TPE 6a-Developmentally Appropriate Practices in Grades K-3
- TPE 6b-Developmentally Appropriate Practices in Grades 4-8
- TPE 8-Learning About Students

### Secondary Emphasis:

- TPE 5-Student Engagement
- TPE 6d-Developmentally Appropriate Practices for Special Education
- TPE 7-Teaching English Learners
- TPE 9-Instructional Planning
- TPE 10-Instructional Time
- TPE 11-Social Environment
- TPE 13-Professional Growth

## **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.

## **Cross-cultural, Language, and Academic Development (CLAD) 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 EnglishD. 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 \*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 DevelopmentIII. Language and Content Area AssessmentC.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

## REQUIREMENTS

All assignments have a rubric (evaluated on a scale of 4-1) that will accompany them.

**Participation** (10%) – Attend class regularly, arrive on time, stay for the whole class, bring assigned books to class, complete assignments, including responses to reading selections and display an understanding of material read through class discussions. You are also expected to speak up and out in class, to question not only when you do not understand, but also when you disagree.

**Reading and Reflections** (15%) - The assigned readings provide an important foundation for your increasing understanding of how to effectively teach mathematics. To aid you in remembering the readings, and assist you with meaningful class participation, you are asked to respond to each reading assignment by coming to class with an entry in your reading response journal (Blue Book) summarizing key points from the assigned reading for that day. Response journals will be checked randomly and may be collected at the professor's discretion. Response journals may also be referenced by you to answer open-ended questions/quizzes about assigned readings. Please structure each page with:

- (1) reading identification (VdW:8, for example),
- (2) key points from the reading (you may include graphics),
- (3) one question that the reading assignment prompts you to ask at this time.

Every other week students will write a "meaningful" 1-2 page reflection on the articles assigned to be read for those weeks, the information covered in class and your on site observations. These reflections should clearly articulate your thoughts on the reading and class and discuss how you might specifically apply what you learned as a teacher in the classroom.

**Student Interviews** (25%) - You and one of your classmates will conduct a series of four 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** (30%)– Working in small groups, your team will first compile resources on a predetermined mathematical topic (15%) 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** (20%)– Students will review the mathematics curriculum currently being used in their 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).

## **GRADING RUBRIC**

### **"A" Students**

1. *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.*
2. Complete all assignments thoroughly and thoughtfully, receiving 3.5-4.0 average on all assignments.
3. Make insightful connections between all assignments and their developing overall understanding of mathematical concepts; they continually question and examine assumptions in a genuine spirit of inquiry.
4. Students show high-level achievement of course goals.

### **"B" Students**

1. *Simply comply with the course requirements and expectations.*
2. Complete all assignments, usually thoroughly and thoughtfully, receiving 2.7 -3.4 average on all assignments.
3. 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 assumptions or seeking a higher level of understanding of the implications.
4. Students show reasonable achievement of course goals.

### **"C" Students**

1. *Demonstrate an inconsistent level of compliance to course requirements and expectations.*
2. Complete all assignments with limited thoroughness and thoughtfulness, receiving 1.7-2.6 average on all assignments.
3. Make limited connections between assignments and their developing overall understanding of mathematical concepts; may not be open to examining assumptions or implications and may actually dismiss the importance of the mathematics and varied methods of teaching it.
4. Attempt, but show limited progress in achieving course goals.

### **"D/F" Students**

Fail to meet the minimum requirements of a C. The specific grade will be determined based on a rate of assignment completion, attendance, etc.

## **NOTES**

Students must meet the attendance requirements for the grade described. Attendance is a prerequisite for earning a particular grade.

Students falling in between grade levels will earn a "+" or "-", depending on where they meet the criteria most fully.

You must maintain a B average (3.0 GPA) in your teacher education courses to receive a teaching credential from the State of California.

## Course Plan for Fall, 2003 (tentative) Tuesday/Thursday

| <b>Date</b> | <b>Topic</b>                                      | <b>Readings &amp; Assignments</b><br>(Readings are due the day they appear on the calendar) |
|-------------|---------------------------------------------------|---------------------------------------------------------------------------------------------|
| Sep. 2      | Introduction to Mathematics Education             | Van de Walle ch. 2                                                                          |
| Sep. 4      | Problem Solving                                   | Van de Walle ch. 4<br>Choate ch. 11                                                         |
| Sep. 9      | Developing Mathematical Understanding             | Van de Walle ch. 3                                                                          |
| Sep. 11     | Standards                                         | CA Content Standards/NCTM Assignment                                                        |
| Sep. 16     | Lesson Study & Working Groups                     | Assigned Readings                                                                           |
| Sep. 18     | Instructional Practices                           | Van de Walle ch. 22, 23                                                                     |
| Sep. 23     | Assessment & Conducting Student Interviews        | Van de Walle ch. 5<br>Assigned Article(s)                                                   |
| Sep. 25     | Technology                                        | Van de Walle ch. 24                                                                         |
| Sep. 30     | Addition and Subtraction                          | Van de Walle ch. 7, 8, 10<br>Choate ch. 10<br>Student Interview #1 Due Today                |
| Oct. 2      | Multiplication and Division                       | (Reading integrated with Session 9)<br>Mult/Div Interview Due (option 2)                    |
| Oct. 7      | Number Concepts                                   | Van de Walle ch. 9, 11, 21<br>Number Concepts Interview Due (option 2)                      |
| Oct. 9      | Fractions, Decimals, Percents, Ratio & Proportion | Van de Walle ch. 12, 13, 14, 15<br>Fractions Interview Due (option 3)                       |
| Oct. 14     | Algebraic Thinking                                | Van de Walle ch. 19, 20<br>Algebra Interview Due (option 3)                                 |
| Oct. 16     | Measurement & Geometry                            | Van de Walle ch. 16, 17<br>Measurement/Geom Interview Due (option 4)                        |
| Oct. 21     | Data Analysis & Probability                       | Van de Walle ch. 18<br>Data Analysis/Prob Interview Due (option 4)                          |
| Oct. 23     | Wrap-up                                           | Bring Questions to Ask<br>Curriculum Assignment Due Today                                   |

## Course Plan for Fall, 2003 (tentative) Tuesday evenings

| <b>Date</b> | <b>Topic</b>                                      | <b>Readings &amp; Assignments</b><br>(Readings are due the day they appear on the calendar) |
|-------------|---------------------------------------------------|---------------------------------------------------------------------------------------------|
| Sep. 2      | Introduction to Mathematics Education             | Van de Walle ch. 2                                                                          |
| Sep. 9      | Problem Solving                                   | Van de Walle ch. 4<br>Choate ch. 11                                                         |
| Sep. 16     | Developing Mathematical Understanding             | Van de Walle ch. 3                                                                          |
| Sep. 23     | Standards                                         | CA Content Standards/NCTM Assignment                                                        |
| Sep. 30     | Lesson Study & Working Groups                     | Assigned Readings                                                                           |
| Oct. 7      | Instructional Practices                           | Van de Walle ch. 22, 23                                                                     |
| Oct. 17     | Assessment & Conducting Student Interviews        | Van de Walle ch. 5<br>Assigned Article(s)                                                   |
| Oct. 21     | Technology                                        | Van de Walle ch. 24                                                                         |
| Oct. 28     | Addition and Subtraction                          | Van de Walle ch. 7, 8, 10<br>Choate ch. 10<br>Student Interview #1 Due Today                |
| Nov. 4      | Multiplication and Division                       | (Reading integrated with Session 9)<br>Mult/Div Interview Due (option 2)                    |
| Nov. 11     | Number Concepts                                   | Van de Walle ch. 9, 11, 21<br>Number Concepts Interview Due (option 2)                      |
| Nov. 18     | Fractions, Decimals, Percents, Ratio & Proportion | Van de Walle ch. 12, 13, 14, 15<br>Fractions Interview Due (option 3)                       |
| Nov. 25     | Algebraic Thinking                                | Van de Walle ch. 19, 20<br>Algebra Interview Due (option 3)                                 |
| Dec. 2      | Measurement & Geometry                            | Van de Walle ch. 16, 17<br>Measurement/Geom Interview Due (option 4)                        |
| Dec. 9      | Data Analysis & Probability                       | Van de Walle ch. 18<br>Data Analysis/Prob Interview Due (option 4)                          |
| Dec. 16     | Wrap-up                                           | Bring Questions to Ask<br>Curriculum Assignment Due Today                                   |



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**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.

*(Approved: 12/19/97)*

**Students with Disabilities Requiring Reasonable Accommodations**

Students with disabilities requiring reasonable accommodations must be approved for services through the Disabled Student Services Office (DSS). This office is located in Craven Hall 5205, and can be reached by phone at (760) 750-4905 or TTY (760) 750-4909. Eligible students should contact their instructor during his office hours or in a more private setting in order to ensure confidentiality.

**Statement on Plagiarism**

Any evidence of cheating or plagiarism (defined as presenting the words or ideas of others as your own) will result in a failing grade for that assignment and a letter regarding the incident to be placed in your file in the Dean of Student's Office. Please read "Academic Honesty" in Academic Regulations and CSUSM Policies (found in your catalog or student handbook) and see me if you have any more questions about what constitutes plagiarism or cheating. Note that on written assignments exact quotes must be placed in quotation marks. All quoted and paraphrased work must be cited in the text.

## PROFESSIONALISM/DISPOSITIONS RUBRIC

|                             | Excellent 4                                                                                                                                                                                                                                                                                                  | Acceptable 3                                                                                                                                                                                                                   | Unacceptable 2                                                                                                                                                                                             | Score |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| Attitude                    | Consistently displays a positive attitude. May offer constructive criticism and include alternatives that show initiative.                                                                                                                                                                                   | Displays a positive attitude. May offer constructive criticism and include alternatives that show initiative.                                                                                                                  | Seldom has a positive attitude. Often is critical. Does not offer alternative solutions to criticism.                                                                                                      |       |
| Participation               | Attends every class, always on time and well prepared, and never leaves early. Gives closest attention to class activities and speakers.                                                                                                                                                                     | Attends every class, on time and prepared, and never leaves early. Gives most attention to class activities and speakers.                                                                                                      | Is not always ready when class time begins. Doesn't give full attention in class; sometimes talks when others are speaking.                                                                                |       |
| Professionalism             | Consistently behaves, talks and works in a professional manner, regardless of task/topic.                                                                                                                                                                                                                    | Most of the time, behaves, talks and works in a professional manner, regardless of task or topic.                                                                                                                              | Seldom behaves, talks, and works in a professional manner, regardless of task or topic.                                                                                                                    |       |
| Collaboration               | Consistently listens to, shares with, and supports the efforts of others. Tries to keep people working well together.                                                                                                                                                                                        | Most of the time listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.                                                                                                         | Rarely listens to, shares with, and supports the efforts of others. Is not always a good team player.                                                                                                      |       |
| Contributions               | Consistently provides useful ideas; always stays focused on the task. Exhibits a lot of effort and valuable contributions.                                                                                                                                                                                   | Most of the time provides useful ideas; stays focused most of the time. A satisfactory group member who does what is required.                                                                                                 | Rarely provides useful ideas; not always focused. Reluctant to participate. Lets other take charge and participate.                                                                                        |       |
| Disposition toward teaching | Consistently demonstrates concern in learning to teach all children. Always demonstrates strong commitment toward developing (a) an understanding of children, (b) teaching strategies, and (c) knowledge of the CA Standards for the Teaching Profession (CSTP) and Teacher Performance Expectations (TPE). | Most of the time demonstrates concern in learning to teach all children. Often demonstrates commitment toward developing (a) an understanding of children, (b) teaching strategies, and (c) knowledge of the CSTP's and TPE's. | Rarely shows concern in learning to teach all children. Rarely demonstrates commitment toward developing (a) an understanding of children, (b) teaching strategies, and (c) knowledge of CSTP's and TPE's. |       |
| Leadership                  | Shows strength through leadership in different class activities; other students respect you as a leader.                                                                                                                                                                                                     | Effectively participates and contributes, but rarely shows leadership qualities.                                                                                                                                               | Does not show leadership in any area of class.                                                                                                                                                             |       |