California State University, Fresno

SYLLABUS FOR CI 176	
MATHEMATICS INSTRUCTION AND APPLIED ASSESSMENT	
Semester: Fall 2020	Multiple Subject Credential Program, Department of Curriculum and Instruction California State University, Fresno
Instructor Name:	Office Location:
Units: 3	E-Mail:
Class Time:	Telephone:
Location:	Office Hours: by appointment

CI 176 Catalog Course Description:

This course is designed to prepare teacher candidates to plan instruction based on the assessment of students' mathematical understanding and to teach mathematics using multiple strategies and methods in culturally and linguistically diverse elementary classrooms.

Multiple Subject Program Requirements:

This course is a required course in Phase 2 of the Multiple Subject Program. Taken concurrently, Field Study B is designed to provide the necessary classroom access essential for completing the assignments in this course. Teacher candidates not enrolled in Field Study B will need to make special arrangements with the instructor.

For the 3 hours of weekly class time, you will be attending a synchronous class meeting and completing assigned asynchronous activities. It is usually expected that students will spend approximately 2 hours of study time outside of class for every one hour in class. Since this is a 3-unit class, you should expect to spend an average of 6 hours outside of class each week reviewing course material, completing reading homework, and working on major assignments.

Prerequisites for the course: Successful completion of Phase 1 of the Multiple Subject Credential Program.

Required COURSE Materials

Carpenter, T. P., Fennema, E., Franke, M. L., Levi, L, Empson, S. B. (2015). *Children's mathematics: Cognitively guided instruction* (2nd edition). Portsmouth, NH: Heinemann.

California Common Core Content Standards for Mathematics. (2013).
http://www.cde.ca.gov/ci/cc/

Recommended course materials:
Teaching Channel. (optional, $10.00 per month). www.teachingchannel.org
National Council of Teachers of Mathematics (NCTM) student membership (optional)

Course goals: This course is designed to examine both teacher candidates' and students' conceptions of mathematics, explore instructional strategies and assessments to develop a problem-based view of mathematics, and encourage critical thinking.

Learning Outcomes:

The learning outcomes are aligned with the 2016 Teaching Performance Expectations (TPE), and the KSOEHD Dispositions: Reflection, Critical Thinking, Professional Ethics, Valuing Diversity, Collaboration, Life-Long Learning.

CURRICULUM, PLANNING, & INSTRUCTIONAL STRATEGIES
The teacher candidate will:

- Demonstrate an understanding of the current national and state mathematics content standards and applicable English Language Development Standards and their responsibility for student academic learning outcomes related to the standards. (TPE 1.6 P, 3.1 IPA)

- Apply knowledge of students' backgrounds, interests, and needs to plan mathematics instruction that provides access to all students. (TPE 1.1 P, 1.4 P, 3.2 IPA, 3.5 P, 4.1 P, 4.4 P)

- Identify characteristics of a secure environment that encourage intellectual risks, and foster students' positive attitudes, curiosity, flexibility, communication, and persistence in mathematics. (TPE 1.5 IPA, 1.6 P, 2.2 P, 2.5 P, 2.6 P, 4.4 P)

- Use and adapt instructional materials for mathematics, including software and other technology resources, which develop students' adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition. (TPE 1.5 IP, 3.5 P, 3.6 IP, 4.6 P)

- Demonstrate the ability to organize instruction to make mathematics concepts concrete and meaningful by (a) engaging students in exploration of real-world problems and multiple representations, (b) encouraging discussions of multiple approaches to math problems, (c) requiring students to construct logical arguments based on evidence, and (d) providing clear explanations and appropriate academic language. (TPE 1.3 IPA, 3.3 IPA, 3.5 P, 4.7 IP)

ASSESSMENT
The teacher candidate will:

- Identify, evaluate, adapt, and apply methods to assess children's understanding in mathematics, including assessment strategies such as observation, questioning, student work, scoring guides, written tests, student journals, self-assessment, and portfolios. (TPE 4.3 P, 5.1 IP, 5.4 I)

- Interpret evidence gathered using assessment strategies and use it to pace mathematics instruction and address students' misconceptions. (TPE 1.8 IP, 5.2 P)

- Examine different assessment methods and identify the purpose for which each method is most effective. (TPE 5.1 I)

PROFESSIONAL EDUCATOR

The teacher candidate will:

- Consider personal biases and how they affect teaching and learning mathematics. (TPE 2.5 IP, 6.2 IP; Valuing Diversity)

- Examine his or her own pedagogical practices related to mathematics instruction and reflect on the importance of planning and implementing mathematics instruction to improve student learning. (TPE 6.1 IPA, 6.3 IP; Reflection)

- Analyze, discuss, and evaluate professional resources, including research studies related to mathematics education as tools to improve mathematics instruction. (TPE 6.3 IP, Critical Thinking; Life-long Learning)

Common Assignments and Examinations:

Asynchronous Class Assignments (100-120 points)

There will be course assignments to document completing the asynchronous class activities. You will have the option of completing most of the asynchronous activities individually, partner, or with a group. Specific directions will be provided on Canvas for each asynchronous activity. These activities will be worth 5 to 10 points each and graded based on completing the assigned tasks.

Math Attitude Survey (20 points) TPE 1.3, 3.2

Teacher candidates will use one of the provided survey instruments to collect mathematics attitude data from the whole class or a small group of students in their field placement. The data will be organized on a data collection form. Teacher candidates will analyze the data and reflect on what they learned about students' math attitudes and how this information can be used to enhance instruction.

Student Interview (50 points) TPE 1.5, 3.1, 3.2, 6.1

Teacher candidates will conduct two interviews with a student to assess mathematics knowledge. The student, preferably grades K-6, does not need to be in the field placement. The first interview protocol will be provided. Teacher candidates will create problems for the second interview, based on what was learned about the student's math knowledge and additional information they would like to find out. The product will contain (1) a table listing the interview problems and a brief description of the student's responses; (2) an analysis of the student's mathematics knowledge, citing specific evidence from the interview; (3) a 3- to 4-minute video clip from the interview or a description of two problems from the interview, for the purpose of highlighting questioning techniques; (4) a reflection on the interview process.

Mathematics Instruction (30 points) TPE 3.1. 3.3, 6.1

Teacher candidates will work individually or in groups to research a mathematics topic appropriate for their grade level. The selected topic may be used as preparation for the Site Visitation Project (SVP), which is the Teaching Performance Assessment (TPA) in EHD 178.

Mathematics Lesson Plan (50 points) TPE 1.3, 1.5, 3.1, 3.2, 3.3, 6.1
Teacher candidates will demonstrate the ability to plan a problem-solving mathematics lesson, anticipate students' strategies in the lesson, and reflect on elements of the lesson. This lesson plan may be connected to the Mathematics Instruction assignment topic. Teaching the lesson is recommended, but not required.

Final Exam (30 points) TPE 3.1, 3.3, 6.1
The final exam will focus on lesson planning, analyzing student work or assessment data, and analyzing instruction.

OPTIONAL ADDITIONAL ASSIGNMENTS
Journal Articles #1 and #2 (20 points x 2 = 40 points)
Twice during the semester teacher candidates will participate in a group assignment that will be scored. Teacher candidates will be assigned an article to read prior to class and meet with their assigned group. The group will discuss the article and prepare a presentation addressing specific prompts. The presentations will be shared for other groups to see and comment on.

Midterm Exam (30 points)
The midterm exam will focus on understanding word problem types and children's strategies for solving problems from *Children's Mathematics: Cognitively Guided Instruction*. Both group and individual components may be included.

Assignment and Examination Schedule (recommended):

Date	Assignment	Possible Points
All semester	Attendance, participation, homework/reading	60
Week 4	Math Attitude Survey	20
Week 9	Student Interview	50
Week 12	Math Instruction	30
Week 15	Mathematics Lesson Plan	50
Finals Week	Final Exam – in class	30

Optional assignments (recommended):

Date	Assignment	Possible Points
Week 5	Journal Article #1 – mostly in class (optional)	20
Week 8	Midterm Exam – in class (optional)	30
Week 11	Journal Article #2 – mostly in class (optional)	20

Course Policies:
Grading. <u>Assignments:</u> The major assignments completed outside of class (Math Attitude Survey, Student Interview, Math Instruction, and Mathematics Lesson Plan) will be graded using rubrics.

Attendance, participation, homework/reading: Instructors will determine how they want to assign attendance, participation, homework/reading points. It may be done through documentation of attendance and participation, exit tickets, or reflections.

The overall grade is determined by the number of points earned out of the total points:
A = 90% and above; B = 80% to 89%; C = 70% to 79%; D = 60% to 69%; F = below 60%

Late Assignments. Assignments are to be completed on time. Instructors will determine the policy for dealing with late assignments.

Cell Phones. Out of respect for everyone's learning experience, **cell phones are not to be used for calls or texting** during class except in an emergency.

Confidentiality. The privacy and identity of children and their families should be protected in all written materials. Therefore, when writing about a child, the recommended language is "for the purpose of this study, I will refer to the observed student as *Child A.*"

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* Subject to Change: *This syllabus and schedule are subject to change in the event of extenuating circumstances. If you are absent from class, it is your responsibility to check on announcements made while you were absent.*

Tentative Course Schedule*   [Check Canvas for changes]

Week	Topic	Reading Assignments (complete after class meeting)	Major Assignments DUE DATES
1	Beliefs about mathematics and learning	Common Core State Standards reading	
2	Addition and subtraction word problem types Common Core State Standards: Overview	Common Core State Standards reading *Children's Mathematics*: Introduction, Chapters 1 and 2 (+/- problem types), pp. 1-16	
3	Children's strategies for addition and subtraction Word problem types and strategies for multiplication and division Common Core State Standards: Math	*Children's Mathematics*: Chapter 3 (+/-strategies), pp. 17-48	
4	Early number and operation sense Lesson design: Engagement Intro to Site Visitation Project (Teaching Performance Assessment)	*Children's Mathematics*: Chapters 4 (x/÷ problem types and strategies) and 5 (Beginning to Use CGI), pp. 49-83	*Math Attitude Survey*
5	Base ten understanding Operations with multidigit numbers	*Children's Mathematics*: Chapters 6 (base ten) and 9 (eliciting thinking), pp .84-95, 134-152	

	Lesson design: Problem Launch		
6	Anticipating and assessing children's solutions: Student Interview practice Lesson design: English Language Development Operations with multidigit numbers	*Children's Mathematics*: Chapter 7 (multidigit problems), pp. 96-110 and 116-127	***Journal Article #1***
7	Operations with multidigit numbers Lesson design: Eliciting students' thinking through questioning	*Children's Mathematics*: Chapter 7 (multidigit problems) – pp 111-116 and Chapter 8 (Classroom practice), pp 129-133 TCM Article (Baek, multiplication strategies)	
8	Teaching through problem solving		***Midterm Exam***
9	Task selection and sequencing Algebraic thinking		***Student Interview***
10	Task selection and sequencing Mathematical discourse		***Journal Article #2***
11	Evaluating, using, and adapting textbooks Mathematical discourse	*Children's Mathematics*: Chapter 10 (Engaging students with each other), pp. 153-172	
12	Assessment: Analyzing student work using rubrics Fractions	*Children's Mathematics:* Chapter 11 (math principles) pp. 173-183	***Mathematics Instruction***
13	Assessment: Analyzing student work Decimals & proportional reasoning		
14	Assessment: Methods and purposes Organizing class data to inform instruction	*Children's Mathematics:* Chapter 12 (conceptual basis) and 13 (conclusion), pp 184-199.	***Mathematics Lesson Plan and Reflection***
15	Review/Prepare for Final Exam Putting it all together		
Finals week	Final Exam		

Recommended Professional Journals

Teaching Children Mathematics (preK-6 focus, mathematics)

Mathematics Teaching in the Middle School (middle school focus, mathematics)

Mathematics Teacher: Learning and Teaching PK-12
Educational Leadership (general education focus)

Phi Delta Kappan (general education focus)

Journal for Research in Mathematics Education (mathematics education, research focus)

Elementary School Journal (elementary education, research focus)

American Educational Research Journal (general education, research focus)

University Policies

Students with Disabilities: Upon identifying themselves to the instructor and the university, students with disabilities will receive reasonable accommodation for learning and evaluation. For more information, contact Services to Students with Disabilities in the Henry Madden Library, room 1202 (278-2811).

Honor Code: "Members of the CSU Fresno academic community adhere to principles of academic integrity and mutual respect while engaged in university work and related activities." You should:
a) understand or seek clarification about expectations for academic integrity in this course (including no cheating, plagiarism and inappropriate collaboration),
b) neither give nor receive unauthorized aid on examinations or other course work that is used by the instructor as the basis of grading,
c) take responsibility to monitor academic dishonesty in any form and to report it to the instructor or other appropriate official for action.

Cheating and Plagiarism: "Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one's grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term 'cheating' not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one's own work." Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the university. For more information on the University's policy regarding cheating and plagiarism, refer to the <u>Class Schedule</u> (Legal Notices on Cheating and Plagiarism) or the <u>University Catalog </u>(Policies and Regulations).

Make Up Policy for Planned and Unplanned Absences: In the case of an unplanned student absence, papers, tests, and/or homework assignments due during the time the student is absent may be made up only if the student contacts the instructor as soon as practicable after the absence occurs and works out a plan. In the case of authorized absences due to university-sponsored activities, students should expect to submit their work to the instructor on or before the due date, or as arranged with the instructor. This includes papers, tests, and/or homework assignments. See grading policy in syllabus for additional information.

When a student is absent for an extended time period, a viable make-up plan may not be feasible. In these circumstances, other options such as dropping the class for a serious and compelling reason or withdrawal from the university may be appropriate.

Computers: "At California State University, Fresno, computers and communications links to remote resources are recognized as being integral to the education and research experience. Every student is required to have his/her own computer or have other personal access to a workstation (including internet access and a printer) with all the recommended software. In the curriculum and class assignments, students are presumed to have 24-hour access to a computer workstation and the necessary communication links to the University's information resources."

Disruptive Classroom Behavior: "The classroom is a special environment in which students and faculty come together to promote learning and growth. It is essential to this learning environment that respect for the rights of others seeking to learn, respect for the professionalism of the instructor, and the general goals of academic freedom are maintained. ... Differences of viewpoint or concerns should be expressed in terms which are supportive of the learning process, creating an environment in which students and faculty may learn to reason with clarity and compassion, to share of themselves without losing their identities, and to develop an understanding of the community in which they live . . . Student conduct which disrupts the learning process shall not be tolerated and may lead to disciplinary action and/or removal from class."

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