

California State University, Fresno

SYLLABUS FOR CI 176 MATHEMATICS INSTRUCTION AND APPLIED ASSESSMENT	
Semester: Spring 2020	Multiple Subject Credential Program, Department of Curriculum and Instruction California State University, Fresno
Instructor Name: Jeanie Behrend	Office Location: ED 231
Units: 3	E-Mail: jeanb@csufresno.edu
Class Time: Tuesdays, 4:00-6:50 pm	Telephone: 559-278-0235
Location: ED 400	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.

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 study an average of 6 hours outside of class each week.

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

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, 3.1)
- Use knowledge of students' backgrounds, interests, and needs to plan mathematics instruction that provides access to all students. (TPE 1.1, 1.4, 3.2, 3.5, 4.1, 4.4, 5.7, 5.8)
- 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, 1.6, 2.2, 2.5, 2.6, 3.5, 4.4)
- 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 1.3, 1.5, 3.2, 3.5, 3.6, 4.6, 4.8)
- 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, 3.3, 3.4, 3.5, 3.6, 4.7)

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, 5.1, 5.3, 5.4)
- Interpret evidence gathered using assessment strategies and use it to pace mathematics instruction and address students' misconceptions. (TPE 1.8, 5.2, 5.8)
- Manage records related to students' academic progress in mathematics and communicate student progress to students, families, and administrators (TPE 1.2, 4.1, 5.4, 5.5)
- Examine different assessment methods and identify the purpose for which each method is most effective. (TPE 5.1)

PROFESSIONAL EDUCATOR

The teacher candidate will:

- Consider personal biases and how they affect teaching and learning mathematics. (TPE 2.5, 6.2; 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, 6.3; Reflection)
- Analyze, discuss, and evaluate professional resources, including research studies related to mathematics education as tools to improve mathematics instruction. (TPE 6.3, Critical Thinking; Life-long Learning)

Major Assignments and Examinations:

Math Attitude Survey (20 points)

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. *More details very soon.*

Student Interview (50 points)

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. *More details soon.*

Journal Articles #1 and #2 (15 points x 2 = 30 points)

Twice during the semester teacher candidates will participate in an in-class group assignment that will be scored. Teacher candidates will be assigned an article to read prior to class and must come prepared to discuss the article with their assigned group. During class, the groups will discuss the article, prepare a poster addressing specific prompts, and share information about the article with their classmates. *More details soon.*

Mathematics Instruction (30 points)

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. *More information soon.*

Mathematics Lesson Plan (50 points)

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. *More information later.*

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 will be included. *More information later.*

Final Exam (30 points)

The final exam will focus on lesson planning and other course content. *More information later.*

Assignment and Examination Schedule:

Date	Assignment	Possible Points
All semester	Attendance, Participation, Final Reflection	60
February 11	Math Attitude Survey	20
February 18	Journal Article #1 – mostly in class	15
March 10	Midterm Exam – in class	30
March 17	Student Interview	50
March 31	Math Instruction	30
April 14	Journal Article #2 – mostly in class	15
April 28	Mathematics Lesson Plan	50
Finals Week, May 12	Final Exam – in class	30

Course Policies:

Grading. Assignments: The major assignments completed outside of class (Math Attitude Survey, Student Interview, Math Instruction, and Mathematics Lesson Plan) will be graded using rubrics. Each of these assignments may be redone for a better score. *Exams and group assignment completed in class may NOT be redone for a better score.*

Attendance and Participation: As indicated above, 60 points will be given for attendance and participation. This is not a lecture and reading course; active participation in the hands-on activities, discussions, and reading assignments is required. Teacher candidates will earn 1 point per hour of attendance (14 session x 3 points = 42 possible points), plus 1 point for participation each session (14 possible points), plus a final reflection for the course (4 points). Participation points will be based on the following criteria: (a) being prepared for class, completing assigned readings and tasks; (b) class contributions to knowledge of mathematics, instruction, assessment, and connections between course content and the classroom; (c) willingness to ask questions; (d) efforts to include all class members; (e) awareness of differing opinions; (f) sensitivity to people's beliefs and feelings; (g) positive attitude; (h) professionalism (e.g. being on time, notifying instructor of absences, professional responses to feedback).

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. I expect assignments to be completed on time. If you cannot turn in one of the major assignments (Math Attitude Survey, Student Interview, Mathematics Instruction, and Mathematics Lesson Plan) when it is due, let me know in writing when you plan to turn it in. Late assignments [if I have not received a written request of your intent] will be docked 10% of the possible points. Other assignments must be turned in on the due date to receive credit.

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. If they become a distraction, I will ask you to put them away.

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*.”

*** 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]

Session	Topic	Assignments DUE
1 01/21/20	Beliefs about mathematics and learning	
2 01/28/20	Addition and subtraction word problem types Common Core State Standards: Math	CCSSM readings, teaching channel video Review Syllabus (posted on Canvas)
3 02/04/20	Children’s strategies for addition and subtraction Word problem types and strategies for multiplication and division CCSSM content standards	Children’s Mathematics: Chapters 1 and 2 (+/- problem types), pp 1-16 CCSSM Content Standards review
4 02/11/20	Intro to Site Visitation Project (Teaching Performance Assessment) Early number and operation sense Lesson design: Engagement	Children’s Mathematics: Chapter 3 (+/- strategies), pp 17-48 <i>DUE: Math Attitude Survey assignment</i>
5 02/18/20	Base ten understanding Operations with multidigit numbers Lesson design: Problem Launch	Children’s Mathematics: Chapters 4 (x/÷ problem types and strategies) and 5 (Beginning to Use CGI), pp 49-83 <i>Journal articles #1</i>

Session	Topic	Assignments DUE
6 02/25/20	Anticipating and assessing children's solutions: Student Interview practice Lesson design: English Language Development	Children's Mathematics: Chapters 6 (base ten) and 9 (eliciting thinking), pp 84-95, 134-152
7 03/03/20	Operations with multidigit numbers Lesson design: Eliciting students' thinking	Children's Mathematics: Chapters 7 (multidigit problems) [part] pp 96-110, 116-127 <i>DUE: Notes from 1st Student Interview</i>
8 03/10/20	Teaching through problem solving Midterm: word problem types and strategies	Children's Mathematics: Chapters 7 (multidigit problems) – [part] pp 111-116 Children's Mathematics: Chapter 8 (Classroom practice), pp 129-133 <i>Midterm exam</i>
9 03/17/20	Task selection and sequencing Algebraic thinking	<i>DUE: Student Interview assignment</i>
10 03/24/20	Evaluating, using, and adapting textbooks Mathematical discourse	Children's Mathematics: Chapter 10 (Engaging students with each other), pp 153-172
03/31/20	Cesar Chavez Holiday: NO CLASS	<i>DUE: Mathematics Instruction - online</i>
04/07/20	Spring Break (Apr 6-10): NO CLASS	
11 04/14/20	Fractions and decimals Designing Instruction	<i>Journal articles #2</i> Children's Mathematics: Chapter 11 (math principles) pp 173-183
12 04/21/20	Assessment Organizing data and analyzing learning	Children's Mathematics: Chapter 12 (conceptual basis) & 13 (conclusion), pp 184-199, (optional, Appendix A, pp 200-209)
13 04/28/13	Assessment Rational numbers, proportional reasoning	<i>DUE: Mathematics Lesson Plan</i>
14 05/05/20	Geometry and measurement Putting it all together	Article: 13 Rules that Expire
Finals week 05/12/20	Final Exam	

Recommended Professional Journals

Teaching Children Mathematics (preK-6 focus, mathematics)

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

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 [Class Schedule](#) (Legal Notices on Cheating and Plagiarism) or the [University Catalog](#) (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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