



EDUC 494-1 Section 1
STEM Teaching and Learning, Theory and Practice
CRN #20591
Tuesdays
4:00 – 5:20 pm
University hall 440
Spring 2015

Conceptual Framework Theme: Engaging diverse communities through leading and learning for social justice.

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Hours:	Thursdays 11:00 AM-12:00 PM, or by appt.

School of Education Mission & Vision Statement
(Adopted by SOE Governance Community, January 2013)

Vision

To serve the educational needs of local, regional, and global communities, the School of Education advances innovative practice and leadership by generating, embracing, and promoting equitable and creative solutions.

Mission

The mission of the School of Education community is to collaboratively transform education. We:

- Create community through partnerships
 - Promote and foster social justice and educational equity
 - Advance innovative, student-centered practices
 - Inspire reflective teaching and learning
 - Conduct purposeful research
 - Serve the School, College, University, and Community
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Basic Tenets of our Conceptual Framework

- Student centered education
 - Research and theory specific to the program field inform practice
 - Connections and links between coursework and application
 - Strong engagement between faculty and candidates
 - Co-teaching clinical practice
 - Culturally responsive pedagogy and socially just outcomes
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COURSE DESCRIPTION

The course is designed for students serving as Learning Assistants (LAs), Teaching Assistants (TAs), and Supplemental Instructors (SIs) in undergraduate STEM courses. The course will help integrate educational theory, pedagogy, and practice. It will touch on theoretical issues such as conceptual development, conceptual change, collaborative learning, technology in education, and students' conceptions of various topics in mathematics and science. It will also focus on practical issues encountered in facilitating learning, managing the classroom, formative and summative assessment, curricula development, and differentiating instruction in a collaborative environment. This is a seminar-style course where students are responsible for weekly readings, in-class discussions, and project presentations all based on the LA, TA, or SI field placement.

Prerequisites

Accepted as a CSUSM LA, TA, or SI for Spring 2015.

Required Texts

Weekly course readings will be available online through Cougar Courses (CC).

Student Learning Outcomes

As a result of this course, students will be able to:

- Identify univocal vs. dialogic discourse in a STEM classroom
- Apply appropriate questioning strategies in their work as an LA, TA, Tutor, or SI
- Describe the role of formative assessment and the importance of eliciting student thinking in the STEM classroom
- Utilize student preconceptions to design learning/teaching scenarios
- Manage group investigations related to a topic/concept in their fields of expertise
- Evaluate student activity to recognize examples of "doing science" vs. "doing school"
- Identify the intellectual activity of STEM teaching, including the ongoing opportunities to do math or do science as a teacher

GENERAL CONSIDERATIONS

All University Writing Requirement

All CSU students must demonstrate competency in writing skills as a requirement for graduation. At California State University San Marcos, students complete the graduation writing assessment through the All-University Writing Requirement. This requirement mandates that every course at the University must have a writing component of at least 2,500 words (approximately 10 pages). The assignments for this course meet this requirement.

CSUSM Academic Honesty Policy

"Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. All written work and oral presentation assignments must be original work. All ideas/materials that are borrowed from other sources must have appropriate references to the original sources. Any quoted material should give credit to the source and be punctuated with quotation marks.

Students are responsible for honest completion of their work including examinations. There will be no tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole."

Incidents of Academic Dishonesty will be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University.

Plagiarism: As an educator, it is expected that each student will do his/her own work, and contribute equally to group projects and processes. Plagiarism or cheating is unacceptable under any circumstances. If you are in doubt about whether your work is paraphrased or plagiarized see the Plagiarism Prevention for Students website <http://library.csusm.edu/plagiarism/index.html>. If there are questions about academic honesty, please consult the University catalog.

Students with Disabilities Requiring Reasonable Accommodations

Students with disabilities who require reasonable accommodations must be approved for services by providing appropriate and recent documentation to the Office of Disable Student Services (DSS). This office is located in Craven Hall 4300, and can be contacted by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with their instructor during office hours or, in order to ensure confidentiality, in a more private setting.

COURSE REQUIREMENTS

Key Assignments

This course is a seminar, and its success will depend on the active participation of all members in helping to shape the content and its relevance. Our primary activity will be in-depth discussions of course topics and readings. Requirements include the following:

1. *Class Discussion/Participation (20%)* – Class members are expected to attend every class session and contribute to class discussions. The purpose of these discussions is to help us as individuals, and as a group, develop meaningful interpretations of the ideas conveyed by the readings, and to make connections to the class members' teaching experiences. There will be weekly questions about the assigned article(s).
2. *Weekly Reading Reflections (15%)* – Each class member is expected to answer a collection of questions based on the weekly article reading. Post responses to CC.
3. *Weekly Teaching Reflections (15%)* – Each LA is expected to spend approximately 5-7 hours per week working with STEM undergraduates in collaborative, learner-centered environments. Using this experience as a guide, fill out weekly teaching reflection questions. Post responses to CC. These reflections may be shared with the CSM lead faculty; however, LA names – not departments/courses – will be removed. ****NOTE**** After several weeks, if you have only interacted with a handful of students (and/or mainly on an individual basis), contact your LA course instructor (me).
4. *Question Analysis / Peer Observation (20%)* – (A.) Each LA will be required to conduct an analysis of his/her questioning practices. Results of this analysis will be written up and used in class discussions and submitted to the course instructor. (B.) In addition, each LA will complete and submit a written summary of a field observation of another LA. During the LA Seminar, you will also have a consultation session with the LA you observed. (Likewise, you will also be observed and participate in a consultation session.)
5. *Poster Assignment (15%)* – Working individually or in pairs, students will develop and present a poster that describes how their views of teaching and learning have changed over the course of the semester. The poster will be shared with faculty and fellow students.
6. *Weekly Meetings with Lead Faculty in Mathematics and Science to Plan Instruction (15%)* – Each week, LAs are responsible for meeting with the CSM lead faculty to plan and reflect on instruction and to discuss student achievement. Students cannot pass the LA Seminar course if they fail to meet with the Lead Instructor each week. ****NOTE**** If you find that your Lead Instructor is not meeting with you, notify your LA course instructor immediately so that this can be corrected.

Grading

The following activities contribute to the course grade:

Activity	Points Possible	% Total Grade
Attendance & Class Participation	60	20%
Weekly Reading Reflections (3pts each X 15)	45	15%
Weekly Teaching Reflections (3pts each X 15)	45	15%
Question Analysis Assignment	30	10%
Observation Assignment	30	10%
Poster Assignment	45	15%
Weekly Meetings with Faculty	45	15%
Total	300	100%

Course grades will be based on the following grading scale:

A	100.00%	–	93.00%
A-	92.99%	–	90.00%
B+	89.99%	–	87.00%
B	86.99%	–	83.00%
B-	82.99%	–	80.00%
C+	79.99%	–	77.00%
C	76.99%	–	73.00%
C-	72.99%	–	70.00%
D+	69.99%	–	67.00%
D	66.99%	–	63.00%
D-	62.99%	–	60.00%
F	less than 60%		

Unless *prior arrangements* have been made with the instructor, work submitted past the due date will be reduced by one letter grade for each week it is late. Work received over two weeks late will receive no credit. One point will be deducted for all reflections submitted after the start of the class period. Two points will be deducted for all reflections submitted more than two weeks late.

School of Education Attendance Policy

Due to the dynamic and interactive nature of courses in the School of Education, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the instructor. Individual instructors may adopt more stringent attendance requirements. Should the student have extenuating circumstances, s/he should contact the instructor as soon as possible. (*Adopted by the COE Governance Community, December, 1997*).

TENTATIVE* SCHEDULE

Date	Topic	Reading/Assignment (To be completed BEFORE class)
Week 1 1/20/15	Introduction to Being an LA <i>Discuss LA contracts</i>	LA Entrance Survey
Week 2 1/27/15	Classroom Discourse: Dialogic versus Univocal	Knuth, E., & Peressini, D. (2001). Unpacking the nature of discourse in mathematics classrooms. <i>Mathematics Teaching in the Middle School</i> . 6(5). 320-325. Week 1 Teaching & Reading Reflections
Week 3 2/3/15	Questions and Questioning Strategies <i>Discuss question analysis assignment</i>	Trowbridge, L. W., Bybee, R. W., & Powell, J. C. (2000). Questioning and discussion. In <i>Teaching secondary school science: Strategies for developing scientific literacy</i> (1st ed). Upper Saddle River, NJ: Merrill. Week Teaching & Reading Reflections LA Contract – signed by professor
Week 4 2/10/15	Learning Theory I: Mental Models	Redish, E. (1994). Implications of cognitive studies for teaching physics. <i>American Journal of Physics</i> . 62(9). Week 3 Teaching & Reading Reflections
Week 5 2/17/15	Formative Assessment <i>Guest Speaker: Professor Ed Price</i>	Nicol, D.J. & MacFarlane-Dick, D., (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. <i>Studies in Higher Education</i> . Week 4 Teaching & Reading Reflections
Week 6 2/24/15	Mindsets <i>Discuss protocol for LA observation</i>	Dweck, C. (2008). Mindsets and Math/Science Achievement. <i>Carnegie Corporation of New York-Institute for Advanced Study Commission on Mathematics and Science Education</i> . 31(2), 198-218. Week 5 Teaching & Reading Reflections
Week 7 3/3/15	Student Ideas in Content Areas	See miscellaneous articles posted on CC relevant to topic areas. Week 6 Teaching & Reading Reflections Question Analysis write-up due
Week 8 3/10/15	Cooperative Learning & Motivation	Frey, N., Fisher, D., Everlove, S. (2009). Defining Productive Group Work. In <i>Productive Group Work</i> . Alexandria, VA: ASCD. Frey, N., Fisher, D., Everlove, S. (2009). Promoting Face-to-Face interactions. In <i>Productive Group Work</i> . Alexandria, VA: ASCD. Week 7 Teaching & Reading Reflections
Week 9 3/17/15	Metacognition & Argumentation <i>Debrief observations</i>	Schoenfeld, A. (1987). What's all the fuss about metacognition? In A. Schoenfeld (Ed.) <i>Cognitive Science and Mathematics Education</i> (pp. 189-215). Hillsdale, NJ: Lawrence Erlbaum Associates. Week 8 Teaching & Reading Reflections
Week 10 3/24/15	LA Celebration & Recruitment Event	Week 9 Teaching & Reading Reflections LA Observation write-up due
SPRING BREAK		
Week 11 4/7/15	Nature of Science/Nature of Mathematics <i>Discuss poster assignment</i>	McComas, W. (1997) 15 Myths of Science. <i>Skeptic</i> 5(2) 88-96. Week 10 Teaching & Reading Reflections

Date	Topic	Reading/Assignment (To be completed BEFORE class)
Week 12 4/14/15	Learning Theory II: Cognitive & Socio- Cultural Frameworks	Thagard, P. (2005). Representation and Computation. In <i>Mind: Introduction to Cognitive Science</i> . Cambridge, MA: The MIT Press. Lemke, J.L. (2001). Articulating Communities: Sociocultural Perspectives on Science Education. <i>Journal of Research in Science Teaching</i> . 38(3). 296-316. Week 12 Teaching & Reading Reflections
Week 13 4/21/15	Qualities of Effective Teachers	Stronge, J. H. (2002). <i>Qualities of effective teachers</i> . Washington, DC: ASCD. Week 13 Teaching & Reading Reflections
Week 14 4/28/15	Technology's Influence and Opportunities in Education	Berrett D. (2012) How 'Flipping' the Classroom Can Improve the Traditional Lecture. <i>Chronicle of Higher Education</i> Articles/videos from CC list Week 14 Teaching & Reading Reflections
Week 15 5/5/15	Poster Presentations	Week 15 Teaching & Reading Reflections LA Exit Survey Poster presentation due

**This schedule is an approximation. Given the nature of the seminar, we will likely alter the scheduled topics (and possibly dates) in order to accommodate student interest and learning opportunities. In particular, reading assignments are likely to adjust as the class unfolds. Please check the course website regularly for updates to this schedule.*