

University of California – Riverside
School of Education

Fall 2021

Looking into Classrooms: Science/Math Emphasis - EDUC 004

3 Units

Tracy Lawrence

Mondays 5:00-6:50 pm

Winston Chung Hall

Room 139

Office Hours: Monday 12:00-1:00 pm via Zoom

Or by appointment

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EDUC 4 – Looking into Classrooms: Science/Math Emphasis

COURSE OVERVIEW

CATALOG COURSE DESCRIPTION

3 Units, Lecture, 2 hours; field, 3 hours. Involves observation in classrooms in local schools identified as having exemplary programs in mathematics and science. Students record and interpret their observations and compare them to published studies of classrooms. Designed for lower-division students who plan to teach mathematics or science in the public schools. Credit is awarded for only one of EDUC 002 or EDUC 004.

Course Pre-requisites: EDUC 003; admission to the California Teach program; consent of instructor.

COURSE OVERVIEW

This course consists of 2 hours of lecture at the university and 3 hours of observation and participation in secondary public-school classrooms per week. Students will observe and participate in classroom instructional practices while developing critical observation and reflection skills. Students will be placed in local secondary mathematics or science classrooms. They will compare and contrast real classroom practice with published educational theory and consider the implications for students' learning. Emphasis will be on secondary students' acquisition of conceptual and procedural knowledge. Students will develop an understanding of the changes occurring in science and math education, the historical context of these changes, the implications for professional educators, and the career opportunities available to them in science and math education.

COURSE OBJECTIVES

1. Through observation of teaching videos and interaction with science and mathematics teachers, students will gain insight into the practical considerations of daily instruction in public secondary schools
2. A major focus will be to consider the interactions between teachers and students and how those interactions impact conceptual and/or procedural learning.
3. Through reflective consideration of their critical observations and technical readings, students form deeper understandings of the strategies which help develop conceptual understanding in science, technology, engineering and mathematics.
4. By developing a working relationship with classroom teachers, students will develop a more complete understanding of teaching science/math courses in a public secondary classroom from a teacher's perspective
5. Students will observe, detail, and critique a math or science lesson focusing on three criteria from the course.

UCR-GSOE POLICIES

ACCOMMODATIONS POLICY

If you have a disability or believe you may have a disability, you can arrange for accommodations by contacting Student Disability Resource Center (SDRC) at 951-827-3861 (voice) or sdrc@ucr.edu (email). Students needing academic accommodations are required to register with SDRC and provide required disability-related documentation. If you have approved accommodation(s), you are advised to notify your instructor privately. The SDRC website <http://sdrc.ucr.edu> provides information about academic and non-academic supports and has additional contact information.

COVID-19 COMPLIANCE/NON-COMPLIANCE POLICY

Non-compliance with COVID-19 health and safety standards during instructional activities will be considered disruptive under the UCR standards of Conduct.

ATTENDANCE POLICY

GSOE takes seriously the need for students to attend and actively participate in classes; class absences and lack of participation undermine the learning process. Students who miss more than 20% of the course meeting are strongly urged to withdraw from the course. Instructors may also fail such students, except in the case of documented serious illness or immediate family emergency. Missing portions of classes, through persistent late arrival or early departure, can count toward the “more than 20% of class time.”

ACADEMIC HONESTY POLICY

Students are expected to conduct themselves and their work in a manner consistent with UCR’s policy on academic integrity. Academic misconduct includes, but is not limited to, cheating, fabrication and plagiarism (e.g., using another’s work or ideas without giving credit-intentionally or unintentionally). Submitting your own work more than once (e.g. for this class and another class, without both instructors’ knowledge and permission) is also a form of academic dishonesty and will result in an F. If you are at all unsure of what constitutes plagiarism or other forms of academic dishonesty, consult the UCR website for more information: <http://conduct.ucr.edu>. Please familiarize yourself with UCR’s policies and procedures regarding academic integrity, published in full in the General Catalog at <http://catalog.ucr.edu>.

WRITING POLICY

The School of Education believes that all students should exit its program with strong writing skills. As such, the quality of written composition as well as content will be factored into grades on students’ papers for all education classes.

COURSE POLICIES

ELECTRONIC COMMUNICATION POLICY

When sending me an email, please include on the subject line: your last name, followed by the course number, and followed by the purpose of the email (Example: Evans – ED4 – Question about Final Exam). Keep in mind that I will respond within 24 hours during the week and within 48 hours on the weekend.

DIVERSITY

It is the policy of UCR to support and value diversity; therefore, we require:

- Respect the dignity and essential worth of ALL individuals
- Promote a culture of respect throughout the university community in person and online
- Respect the privacy, property, and freedom of others
- Reject bigotry, racism, discrimination, violence, hazing, or intimidation of any kind
- Promote diversity of opinions, ideas, and background
- Respect the form of how people have asked to be addressed (names/pronouns)

BEHAVIOR/CONDUCT

General Expectations

- Please read all assignment instructions on CANVAS and announcements as I post them.
- Use considerate language when sharing thoughts and opinions. The goal is to create an online environment that encourages academic discussion and personal growth.
- No external electronic recordings, or downloading videos are allowed without prior approval from the instructor.

LATE PAPERS/ASSIGNMENTS

Late assignments will be accepted up to 48 hours beyond due date and time, but total points will be decreased by 10% unless accompanied by proper documentation that could excuse the late assignment submission. If accompanied by a legitimate excuse and the documentation, the assignment will not be decreased by 10% during the time period the excuse covers. Examples of acceptable excuses are but not limited to- proper documentation would be required:

- Illness with a doctor's note
- Having to care for an ill loved one
- Having a death in the family
- Being involved in a car accident

There are no make-ups for this class' activities or discussion activities.

Communication is key to your success. If something happens, please let me know and we can work through your options for success in the course.

UCR ACADEMIC RESOURCE CENTER (for undergraduate students)

The Academic Resource Center (ARC) is the central resource for academic support at UCR. All students are strongly encouraged to visit the ARC, which is staffed by professional and student employees who are well trained to provide academic support and dedicated to fostering academic excellence. Resources provided by the ARC include Tutoring, Supplemental Instruction, Study Skills Workshops, as well as several peer mentoring programs. Participating in these services is most useful to students when used pro-actively for academic enrichment. Visit arc.ucr.edu or call 951-827- 3721 for more information about hours, location and the schedule of services.

COURSE RESOURCES

This course does not include a textbook. Instead you will be assigned various articles related to the teaching profession. You will also be assigned videos through ATLAS. All course materials will be uploaded onto CANVAS and video assignments through ATLAS.

GRADING SCALE

Assignments are due on the dates noted in the syllabus. Barring extraordinary circumstances, late assignments will not be accepted. Each assignment will contribute to the overall grade in the class according to the weight assigned by category.

A+	97 -100%	C+	77-79%
A	93-96%	C	73-76%
A-	90-92%	C-	70-72%
B+	87-89%	D+	67-69%
B	83-86%	D	63-66%
B-	80-82%	D-	60-62%
F: 59% or below OR failure to complete fieldwork hours or submit verification OR failure to participate in classes as outlined in the syllabus.			

COURSE GRADING REQUIREMENTS

1. Fieldwork: Log (25% and required to receive credit): All fieldwork hours and journal assignments must be completed in order to receive credit for the course. 30 hours of observation must be completed at the rate of 2 hours per week in a public, secondary school, regular education classroom and 1 hour per week via assigned ATLAS classroom videos. Your recorded field hours will be verified against records maintained by your mentor teacher. **A student must complete the required field experience observations in order to receive a grade above C-. Furthermore, a grade of C- does not convert into an "S" grade should you elect to S/NC the course. University guidelines require students to earn a C or better in order to obtain "S" grades.**

2. Weekly Journal Entries (25%): The overarching theme of the course is *Exploring the Science/Math Classroom of the 21st Century*. While we find ourselves in a time of unprecedented change in education, every educational situation is embedded in a school and community culture with its own unique history and traditions. Journal entries are a way for you to develop your understanding of the current state of education, according to your observations, while comparing and contrasting this with your developing philosophy and your understanding of educational research as related to Science/Math education. Like any learner, your understanding will evolve over time. A record of your thoughts and observations will help you recognize and guide your own development as a professional educator.

3. Class Participation (20% and required to receive credit): Each class will include lecture, writing, discussion and activity components. Your full participation will ensure you gain the skills and knowledge necessary to complete the assignments. Missing two or more classes during a quarter or habitually showing up late or leaving early may lead to receiving a failing grade for the course. Remember: **There are no make-ups for class activities.**

4. Final Exam (30%): The final exam for the course will be a Lesson Critique presented during the last meeting. The written and presentation format will be described in class.

Submitting Assignments: Each assignment is due on the date given in the syllabus and should be submitted to my email.

COURSE SCHEDULE/ TIMELINE

Meeting #1 (September 27, 2021)

TOPIC: What can be expected this quarter?

CLASS:

- Introductions, logistics and administration details, expectations. Class discussion and introduction to Common Core and Next Generation Science Standards

READ FOR NEXT TIME:

- Common Core and NGSS See CANVAS for links

WATCH FOR NEXT TIME:

- NA

DUE NEXT TIME:

- *Journal #1* See CANVAS for prompts
-

Meeting #2 (October 4, 2021)

TOPIC: Why do we need standards to teach content?

CLASS: Lecture and discussion of: Content Standards in the classroom; Common Core and NGSS; Standards Activity; Video and discussion Case # 608

READ FOR NEXT TIME:

- Seidel, S. B., & Tanner, K. D. (2013). "What if Students Revolt?": Considering Student Resistance: Origins, Options, and Opportunities for Investigation. *CBE-Life Science Education*, 12(4), 586-594
- Dweck, C. S. (2014). Mindsets and math/science achievement.

WATCH FOR NEXT TIME:

- NA

DUE NEXT TIME:

- *Video Observation #1* Math/ Science Practices #608 See CANVAS for prompts
 - *Journal #2* See CANVAS for prompts
-

Meeting #3 (October 11, 2021)

TOPIC: Is classroom management just about discipline?

CLASS:

- Lecture and discussion of: the need for classroom management, procedures, student behavioral expectations; Discuss Seidel article; Growth mindset as a management tool; Classroom management Activity (groups)

READ FOR NEXT TIME:

- Oyinloye, O., & Popoola, A. A. (2013). Activating junior secondary school students' prior knowledge for the development of vocabulary, concepts and mathematics through instructional strategies. *International Journal of Education and Literacy Studies*, 1(2), 1-7.

WATCH FOR NEXT TIME:

- Differentiation Instructional Strategies Case #994

DUE NEXT TIME:

- **Journal #3** See CANVAS for prompts
 - **Video Observation #2** Case #994 See CANVAS for prompts
-

Meeting #4 (October 18, 2021)

TOPIC: How do we know what they already know and why does it matter?

CLASS:

- Lecture and discussion on significance of a student's prior knowledge (accessing and assessing); discussion on Cases #302 and #993.

READ FOR NEXT TIME:

- Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners*. Ascd. Chapter 1 - Understanding Differentiation in Order to Lead: Aiming for Fidelity to a Model (pp. 12-24).
- Parsons, S. A., Dodman, S. L., & Burrowbridge, S. C. (2013). Broadening the view of differentiated instruction. *Phi Delta Kappan*, 95(1), 38-42.

WATCH FOR NEXT TIME:

- NA

DUE NEXT TIME:

- **Journal #4** See CANVAS for prompts
- **Video Observation #3** Accessing Prior Knowledge Cases #302 and #993 See CANVAS for prompt

Meeting #5 (October 25, 2021)

TOPIC: What types of strategies can be utilized to provide differentiated instruction and assessment?

CLASS:

- Lecture and discussion on the meaning of differentiation and strategies employed; Video Case #994; connections to articles read; activity with strategies .

READ FOR NEXT TIME:

- Tanner, K. D. (2013). Structure matters: twenty-one teaching strategies to promote student engagement and cultivate classroom equity. *CBE—Life Sciences Education*, 12(3), 322-331.
- Almarode, J. (2014). Student Engagement. *Engaged Instruction: Thriving Classrooms in the Age of the Common Core*, 35-56.
 - Skim pp 35-40 then read carefully after pp41-56

WATCH FOR NEXT TIME:

- Video Case # 803

DUE NEXT TIME:

- **Video Observation #4 for case #803** See CANVAS for prompts
 - **Journal #5** See CANVAS for prompts
-

Meeting #6 (November 1, 2021)

TOPIC: Is student engagement really a key to their success?

CLASS:

- Video #1846 What does engagement look like? Class discussion of readings; Group Activity on engagement

READ FOR NEXT TIME:

- Lee, O., & Stephens, A. (2020). English Learners in STEM Subjects: Contemporary Views on STEM Subjects and Language with English Learners. *Educational Researcher*,
- Miller, E., Lauffer, H. B., & Messina, P. (2014). NGSS for English language learners. *Science and Children*, 51(5), 55.

WATCH FOR NEXT TIME:

- NA

DUE NEXT TIME:

- **Video Observation #5 for case #1846** See CANVAS for prompts
 - **Journal #6** See CANVAS for prompts
-

Meeting #7 (November 8, 2021)

TOPIC: How can we assist English Language Learners to become proficient in English while also developing proficiency in STEM content?

CLASS:

- Lecture and discussion of building academic vocabulary; Cases #377 and #192; Activity on strategies

READ FOR NEXT TIME:

- Dixson, D. D., & Worrell, F. C. (2016). Formative and summative assessment in the classroom. *Theory into practice*, 55(2), 153-159.
- Gao, X., Li, P., Shen, J., & Sun, H. (2020). Reviewing assessment of student learning in interdisciplinary STEM education. *International Journal of STEM Education*, 7(1), 1-14.

WATCH FOR NEXT TIME:

- NA

DUE NEXT TIME:

- **Video Observation #6 for case #377 and #192** See CANVAS for prompts
 - **Journal #7** See CANVAS for prompts
-

Meeting #8 (November 15, 2021)

TOPIC: How can we assess learning?

CLASS:

- Lecture on Formative vs Summative assessments; Discussion of readings.

READ FOR NEXT TIME:

- Frederick, R., Cave, A., & Perencevich, K. C. (2010). Teacher candidates' transformative thinking on issues of social justice. *Teaching and Teacher Education*, 26(2), 315-322.
- Levitan, J. (2015). *The Difference Between Educational Equality, Equity, and Justice... and Why It Matters*. American Journal of Education Forum. <http://www.ajeforum.com/the-difference-between-educational-equality-equity-and-justice-and-why-it-matters-by-joseph-levitan/>

WATCH FOR NEXT TIME:

- NA

DUE NEXT TIME:

- **Journal #8** See CANVAS for prompts
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Meeting #9 (November 22, 2021)

TOPIC: What is equity in education and what can we do to move toward it?

CLASS:

- Discussion of barriers to equity; Activity on how to achieve more equity.

READ FOR NEXT TIME:

- NA

WATCH FOR NEXT TIME:

- NA.

DUE NEXT TIME:

- *Journal #9* See CANVAS for prompts
 - Lesson Critique
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Meeting #10 (November 29, 2021)

TOPIC: Final Exam

CLASS: Lesson Critique Presentations (TBA)

READ FOR NEXT TIME:

- NA

WATCH FOR NEXT TIME:

- NA

DUE NEXT TIME:

- NA

**In teaching, things may change over the course of the quarter especially due to COVID-19. Therefore, this Syllabus and the Class Schedule is subject to change at the discretion of the instructor.*