

EDUT 6122: Curriculum & Instruction Math and Science

Course Description

EDUT 6122: Instruction for Secondary Math and Science Teachers :

This course will provide core instructional components for secondary math and science credential candidates. It includes an overview of issues of curriculum and instruction for secondary classrooms. Structure of knowledge in content areas will be used as a basis for understanding curricular planning as the student-teacher considers what and how to teach, and for what reasons. Also includes instructional/classroom management strategies, planning, technology, assessment for secondary classrooms, and mandated state and local frameworks for secondary subjects.

- ★ The study and development of inclusive, equitable instructional practices;
- ★ Discussions of assigned readings, the issues they raise, and your navigation of the ambiguities and multiple demands of curriculum design and instruction;
- ★ Considerations of data brought from field placements; and
- ★ On-going attention to your emerging identity as a teacher in the process of “becoming”

This semester, C&I will function as a place to establish strong foundations for lesson and unit design, diagnostics and assessment planning that meet the needs of specific learners, and respond to the needs of unique learners (e.g., students who are English Language Learners, students with dis/abilities, etc.), and unique learning environments (Online/distance learning).

Course Goals

- ★ Inquire into children, teachers, and curriculum;
- ★ Plan inclusive, equitable, rigorous, standards-based, and data-informed (broadly defined) subject-specific instruction for children;
- ★ Articulate her/his/their (racialized, gendered, classed, etc.) positionalities, assumptions, beliefs, and values in relationship to what she/he/they teach, as well as why and how; and
- ★ Develop theoretically sound practice with regard to curriculum and teaching (i.e, curriculum choices, curricular planning, selection of instructional and classroom management strategies, and assessment).

Learning Outcome

Students will have the opportunity to...

- ★ Apply a sociohistorical and sociocultural analysis of inequity in U.S. schools and society
- ★ Use effective methods for cultivating a caring, supportive, nurturing, and rigorous classroom community
- ★ Apply socially just teaching and learning methods (curricular and pedagogical) that disrupt dominant ideologies and inequalities through her/his/their dispositions, behaviors, and actions
- ★ Use critical reflection and reflexivity to consider your ideological development through schooling and socialization
- ★ Develop and incorporate sustainable mindfulness and self/community care practices in our lives (personal and professional)

This course is premised upon the following six principles:

1. Working in education is a moral act based on an ethic of care.
2. Working in education is a collegial act.
3. Working in education is reflective and inquiry-based.
4. Working in education is a political act.
5. Learning is a constructivist and developmental process.
6. Working in education is acquisition of subject matter and professional knowledge.

Teacher Performance Expectations (TPE) Competencies

This course is designed to help teachers seeking the Single Subject Credential to develop the skills, knowledge, and attitudes necessary to assist schools and districts in implementing effective programs for all students. The successful candidate will be able to merge theory and practice in order to realize comprehensive and extensive education programs for all students. The following TPEs are explored throughout the class and credential program:

TPE 1. Engaging and Supporting Students in Learning

TPE 2. Creating and Maintaining Effective Environments for Student Learning

TPE 3. Understanding and Organizing Subject Matter for Student Learning

TPE 4. Planning Instruction and Designing Learning Experiences for Students

TPE 5. Assessing Student Learning

TPE 6. Developing as a Professional Educator

Class Culture:

It is important for us to make every attempt to facilitate a humanizing, empowering, productive, and safe community. Here are a few things we want to make clear to help support that.

1. **We start on time and end on time.** We know we are all busy and have so many other responsibilities other than school, so we want to respect that. If we have to start later or might go over our end time, I will ask you all first.
2. **Keep your mind, hands, and heart where your feet are.** Each class will be packed, so prepare yourself to be engaged throughout. Laptops/Tablets/Phones should be used to support your

productivity and work within this class during this class. Please keep them silent during class. You will be asked to discontinue the use of your laptop if it is obvious you are not using it for classroom purposes.

3. **Communicate your needs with me.** As educators, you must discipline yourself to advocate for your needs in effective, productive, and humanizing ways. Communicate any challenges, conflicts, concerns, questions, or any other general needs directly with us. You can talk to me in person or email. *If you determine that formal, disability related accommodations are necessary, it is important that you register with the Office of Services for Students with Disabilities so that accommodations can be arranged for this course and future courses at Mills.*
4. **Get comfortable with being uncomfortable.** Teaching is not a neutral discipline, so if you are not comfortable with conflict in general you will have to practice, especially within our safe space. Use the literature and our critical dialog to help push your thoughts and the thinking of others, because our students cannot afford for us to be complacent in our process of becoming.
5. **Step Up Step Back.** Be aware of the air time you take up. Challenge yourself to speak more if your tendency is to not speak up much. Encourage others to speak if you tend to be one to speak often.

Semester at a glance...

Theme	Central Questions(s)
Creating a vision for successful science Pt. 1- STEM Literacy → define the goal → understanding science and how it works →reshaping future scientists: problem solving, critical thinking in science	How do we as educators unpack the basics of science literacy? Why is any of this important for a young learner, and how do we nurture/guide the urgency?
Creating a vision for successful science Pt. 2→ High Quality Science Teaching →examining beliefs and practices → what is high quality instruction → framework for instructional materials → action plans	What are some misconceptions about learners and science, and how might that show up in my practice?
Pedagogical Content Knowledge →the role of standards, → context for meaningful learning, → methods, strategies, and best practices for high quality instruction → tools for thinking and meaning → Assessments to guide instruction → Safe, supportive, and challenging environments for learning	How can you create lessons that have students fully engaged and that peaks their interest? How can you use your curriculum to make the switch from being viewed as an “outsider” to one that is trusted in the community? How do you break the mold of responsive teaching cliches?

Knowing your learners → using IEP's and 504's → student cum files and other personal	How do I ensure all learners are fully engaged in each lesson? How can I re-engage families and communities?
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assessments → working with your teams → family/community involvement	
Final Assessment Unit Design	What does a backwards-designed science unit look like? How can you take the principals of NGSS' backward design, and apply it to your planning?
Course Reflection	What were your biggest gains from this unit? What else do you feel you need in order to be successful at science pedagogy and equitable practices?

Assignments & Evaluation ← Link to submit work

Your performance in this course is based on the following criteria:

Assignment	Description (TPE)	Due Date	Point Value
Journal Entries	You will be asked each week to complete a journal entry answering discussion questions based on the lecture/activity for the week to come. Journal entries should be submitted no later than Monday 11:59pm before the next class for full credit. Journal entries may also come from assigned readings, or as a reflection on a major assignment.	Weekly	10pts
SMARTE Goals	This semester you will be picking 1-3 goals that you would like to personally work on in terms of improving your STEM craft.	12/13	5pts
Essential Questions & Scientific Phenomena	Practicing how to hook students in for a unit, lesson, and school year, you will be asked to create a few essential questions specific to your grade level, science-specific subject, etc. as well as bring in a scientific phenomena to support	11/1	10pts
NGSS & Planning	Practicing how to incorporate essential questions, scientific phenomena, and NGSS to create strong learning targets for lessons	11/29	10pts
In class assignments	During class, we will be doing a variety of hands-on activities to help build your skills as a classroom teacher. While not worth a lot of points, participation during these activities is expected.	Weekly	10pts

Final	Design an outline of your first unit of the second semester for your field placement. This should include the essential question, sub-questions, and learning objectives. Also, add what skills you think they may need to know coming into the unit. If you want the challenge, you can add potential assessments, and key vocabulary. More information will be provided in class.	12/17	35 pts
Attendance	<i>See below.</i>		10
Participation	<i>See below.</i>		10

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Attendance & Timeliness

Your presence and participation in class activities is important not only for your own learning, but also for that of your colleagues. You are expected to be on time to class and after break, to demonstrate professional behavior, and to contribute to discussions and activities. The program—and therefore, course instructor—value(s) collaborative group processes as well as individual activity. Attendance is mandatory; absence in excess of **one session** may result in a lower grade or the need to retake the course . Specifically, after three absences, you risk failing the course.

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Participation

There are many manifestations of participation. You will be evaluated holistically across three categories as relevant to each class session:

- ★ Whole-class participation (engaging in discussion, listening actively, interacting courteously and collegially with others in the classroom space)
- ★ Small-group participation (engaging in or leading discussion, fulfilling your role/responsibility as a group member, interacting courteously and collegially with others in the classroom space)
- ★ Individual preparation and participation (completing readings prior to attending class meetings, arriving on time for class and remaining in class for the entire class period, actively listening and participating in discussions and in-class activities)

Satisfactory completion of assignments on time

Assignments contribute to a meaningful dialogue between student and instructor, and among students. All assignments are expected to be clearly and coherently written with attention given to the organization and structure of the paper as a whole, as well as to the editing of basic mechanics of language usage such as spelling, punctuation, and grammar. **APA style (i.e., double-spacing, 12-point font and 1 inch margins) is required.** Also, please use the APA guidelines for unbiased language (and be

careful to use gender inclusive language). You can access tips for improving your writing practice, in general, on the St. Cloud State University and LEO: Literacy Education Online website.

Thorough reading and engagement with course all materials

This class will be a combination of readings followed up with discussions, as well as hands-on activities. I believe one of the best ways to engage in teaching pedagogy is to do the work you will assign your students! There will be options for additional reading and videos, but won't always be required for the class.

Satisfactory progress and final grades

Final grades may be lowered based on tardiness, missed class sessions, late assignments, lack of participation, or interference with the creation of a positive learning environment for others. Graduate students should be fully responsible for their own education. This means you must be proactive in

¹ Absences due to field placement related events are excused. e.g.) Back to School Night; Student/Teacher/Parent conferences; Learning Expeditions; etc.

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communicating about issues such as work overload, illness (physical or emotional), family emergencies, or assignments not being completed on time. Please do not silently worry if you think your grade may be lowered by one of these behaviors. Come to discuss your concerns during office hours. Also, please note that exceptional contributions to the intellectual and social life of the class may result in a higher final grade.

Similarly, if your work demonstrates improvement over the course of the semester, this may be taken into account while calculating the final grade.

Per the Graduate Catalog , letter grades are recorded as A, A-, B+, B, B-, C+, C, C-, D+, D, D-, or F. Although all grades will be calculated in the GPA, only courses with a "C" grade or better will fulfill degree requirements. Credits are not earned for grades of "C-" or lower.

<i>Grading Scale</i>			
95-100	A	59-64	C
89-94	A-	53-58	C-
83-88	B+	47-52	D+
77-82	B	41-46	D
71-76	B-	35-40	D-
65-70	C+	<35	F

Policies regarding academic honesty: Plagiarism is a serious breach of academic honesty. All students are responsible for understanding the Academic Integrity Code and the various related processes detailed in the Student Handbook .

Policies regarding gender pronouns and preferred names: Please communicate to me (via email and/or in person) if you have specific desires regarding the use of gender pronouns, and/or preferred alternative names (i.e., those that are different from what is listed on the social course roster).

Reading:

- ★ *Culturally Responsive Teaching & the Brain: Promoting authentic engagement and rigor among culturally and linguistically diverse students.* ~Zaretta Hammond (2015)
- ★ *Awakening Your Stem School: Assuring a job-ready workforce.*~ Dr. Aaron L. Smith with Bud Ramey (2015)

Course Schedule

	<i>Activities/Topics, Readings, Relevant TPEs</i>	<i>Field Work</i>	<i>Tasks/ Assignments Due</i>
	<i>Readings & Topics</i>	<i>Do the following this week</i>	<i>Bring this to class</i>
2 9/13	Zoom <ul style="list-style-type: none"> ● Syllabus overview ● Summer overview <ul style="list-style-type: none"> - Scientific literacy - Your experiences in math and science Journal Entry ● Creating the goals/vision of your classroom <ul style="list-style-type: none"> - Brainstorming Tool - Smart-e goal(s) 	In class Journal Entry #1: Answering questions: ● Describe your experience with teaching up until this point ● Compare/Contrast your experience with that of your students ● Thinking about your own experiences and what your students experience, what additional thoughts come up for you?	Current school schedule

3 9/20	<u>Frontloading skills</u>	<p>Journal entry #2</p> <p>Reflect on the activities from today's slides</p> <ul style="list-style-type: none"> - What came up when creating your lists? - What came to mind when thinking about teaching these skills? 	SMART-E Goals
4 10/4	Backwards planning year-design <u>(understanding by design)</u>	<p>Journal entry #3</p> <ul style="list-style-type: none"> - Have you thought about what your entire year will look like? Explain. - What concerns come to mind when you think about backwards planning for an entire semester/school year? 	<ul style="list-style-type: none"> • Finished slides activities <ul style="list-style-type: none"> • Any lesson planning tools your school may have given • SMART-E goals

5 10/11	Essential questions	Journal entry #4 - What kind of questions did you have growing up in STEM? - Thinking about your content area, what are some questions students have asked you so far or, what kind of questions do you think	
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		they would enjoy learning about?	
6 10/18	Essential questions review	Journal entry #5 • What questions, if any, do you still have about essential questions? • Would you allow students to create their own essential questions for a unit? Explain.	<p>Work on Essential questions slides/work</p> <p>Take a look at this lesson plan template to use during next weeks' class. This will also a partial look at what you will use for your class final</p>

6 11/1	<p><u>Essential Question Practice</u> ➤ Journal entry #6</p> <ul style="list-style-type: none"> • If you could plan your own unit, what would it be on? Explain. • What are the differences/similarities in planning a unit plan vs a lesson plan? • What kind of tweaks have you been making, if any, to the curriculum you've been using? 	<ul style="list-style-type: none"> • Finish activities from today's slides. • Think of a unit you would like to teach, or will be teaching in the next month or so, and do the following: <ol style="list-style-type: none"> 1. Write the name of the unit with a brief description 2. Come up with a few possible essential questions for the unit 3. Pick a unit phenomenon (optional for math)
11/8	<p>NGSS Standards</p> <ul style="list-style-type: none"> - Reviewing standards website - Using standards to plan <p>Journal entry #7</p> <ul style="list-style-type: none"> • What do you know about NGSS? • Based on 	

		<p>what you know, what do you like/dislike about them?</p> <ul style="list-style-type: none"> • What confuses you about NGSS? • How do you feel about high school science classes going from traditional classes (bio» chem» physics, etc. to becoming integrated (mixing all high school science classes together, grouping by related topics)? 	
<p>7 11/15</p>	<p>Learning Objectives/Targets</p> <p>Understanding By Design Review</p> <ul style="list-style-type: none"> • Why we use them • Connection to lesson plan 	<p>Journal entry #8</p> <p>1). How confident are you in terms of creating a learning objective of your own, and then delivering a lesson plan? What are some strengths you already have, and some areas of growth you feel you have?</p> <p>2).What makes a lesson engaging to you? Explain.</p>	<p>Read <u>this link</u> about daily LT in Science</p> <p>(And this for <u>math</u> if you would like some additional reading/information).</p>

		3). Takeaways from the reading about	
		learning targets	
10 11/22	No Class		
11/29	Finish Learning Targets slides/work	Journal entry #9 Take a moment to reflect on your experience as an educator thus far. Think about your classes at Mills since you joined the program, your classroom experiences, experiences with your school placement, etc.	If you haven't already, read this link about daily LT in science, and this one for math
8 12/6	Work Time for Final & final class Journal entry #10 SMARTE Goals reflection		

9 12/13	<p>Final Class Journal entry #11</p> <p>Reflection on your year.</p> <p>As the last entry, take some time to reflect on your experience as a teacher ending 2020, as well as how the semester went for you at Mills. Think about what worked, what did not work, what you're looking forward to next year, what you still have concerns about, etc. There is no minimum for this entry, but please be</p>	
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	thoughtful and reflective when giving your response.	
13 12/17	<u>FINAL DUE by 11:59pm</u>	

Social Justice and Equity in Education

Recommended Resources for Teachers – Evolving List

Recommended Resources and Professional Organizations - Across Content Areas: • Readings

- ★ Rethinking Schools (they have a magazine you can subscribe to, and excellent books):
<http://www.rethinkingschools.org/index.shtml>

- ★ Cultofpedagogy blog: <http://www.cultofpedagogy.com/category/rants-and-pep-talks/>
- ★ Teaching for change reading list: <https://www.teachingforchange.org/2016-summer-reading>
- ★ Voices in Urban Education: <http://www.annenberginstitute.org/publications>

In the News

- ★ UCLA's Just News weekly list serv of ed justice-related news: <https://centerx.gseis.ucla.edu/just-news/>

Organizations

- ★ Teachers 4 Social Justice: <https://t4sj.org>
- ★ People's Education Movement - Bay Area: <https://peoplesedbayarea.wordpress.com>
- ★ California chapter of National Association for Multicultural Education: <http://californianame.nationbuilder.com>

Materials

- ★ Social justice-oriented classroom posters: <http://www.progressivecatalog.com/catalog/sociusposter.html>
- ★ Planning to Change the World - Social justice planner for teachers: www.justiceplanbook.com

Restorative Justice

Mental Health

- ★ Mental health website tool for teachers: <https://www.classroommentalhealth.org>

Standards

- ★ Common Core: <http://www.corestandards.org/read-the-standards/>
- ★ <http://www.socialstudies.org/system/files/c3/C3-Framework-for-Social-Studies.pdf>
- ★ <http://www.cde.ca.gov/be/st/ss/>
- ★ <https://www.cde.ca.gov/be/st/ss/vapacontentstds.asp>

California Commission on Teacher Credentialing

- ★ <http://www.ctc.ca.gov/>

Recommended Resources and Professional Organizations - Social Science:

- ★ National Council for the Social Studies: <http://www.socialstudies.org>
- ★ What Kind of Citizen?: <https://www.tpress.com/what-kind-of-citizen-educating-our-children-for-the-common-good-9780>
- ★ Teaching Tolerance: <http://www.tolerance.org>
- ★ Facing History: <https://www.facinghistory.org>
- ★ Reading Like a Historian: <https://sheg.stanford.edu/rh>
- ★ Zinn Education Project: <https://zinnedproject.org>

Recommended Resources and Professional Organizations - Science:

- ★ Teaching Tolerance: <https://www.tolerance.org/magazine/summer-2013/just-science>
- ★ <http://www.asbmb.org/asbmbsmbtoday/201403/Outreach/>
- ★ <http://www.kzoo.edu/praxis/category/science/>
- ★ Teaching Science for Social Justice book:
<https://www.amazon.com/Teaching-Science-Social-Justice-Paperback/dp/0807743836>

- ★ People's Curriculum for the Earth: <https://www.rethinkingschools.org/books/title/a-people-s-curriculum-for-the-earth>

Recommended Resources and Professional Organizations - English:

- ★ National Writing Project: <https://www.nwp.org/>
- ★ Connected Learning: <https://clalliance.org/why-connected-learning/>
- ★ <http://www.ncte.org>