

Course Syllabus:
EDU 154/254: Mathematics and Science: Elementary Curriculum
Mount Saint Mary's University

Spring 2021 Wednesdays 5:30 – 8:30 pm (Fully online)

Instructors: Dr. Annalisa Chang-Miller

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Office hours: by appointment (email requests)

Education Department Philosophy:

MSMU Education Department courses are meant to be laboratories of learning. Our hope is that the activities and materials included will serve your learning goals as you explore the various course topics. Our intent is that students from all diverse backgrounds and perspectives be well-served, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to each course be viewed as a resource, strength and benefit. Throughout the semester, please feel free to let your course instructor know ways to improve the effectiveness of the course for you personally, or for other students or student groups, if you have any suggestions.

Investment in Inclusivity:

- This class aims to be an anti-discriminatory environment that is inclusive of differences of race, ethnicity and national origins, gender and gender identity, sexuality, class and religion. The success of this expectation relies on the support and understanding of everyone in the class. We seek to establish a community where we engage in critical dialogue and active listening. While all are expected to make their best effort to be respectful, we understand that someone may say something that results in unintentional offense and hurt feelings. We invite everyone to adopt a stance of assumed positive intent that seeks greater knowledge and understanding.
- All people have the right to be addressed and referred to in accordance with their personal identity. You may choose to indicate the name that you prefer to be called and, if you choose, to identify pronouns with which you would like to be addressed.
- It is the policy of MSMU to permit students to observe holidays set aside by their chosen religious faith. If you plan to be absent from class on your religious holiday, please make arrangements with the course instructor in advance.

Student Support Statements:

- MSMU has a Minors on Campus policy statement published in the Student Handbook that allows for faculty discretion. If you are a parent and are concerned that childcare needs could disrupt your ability to attend class, please reach out so we can create a plan in advance for potential emergencies.

- If personal challenges related to health issues might affect the ability to perform in this class, please know that there are resources to assist you with appropriate accommodations.
- Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Dean of Student Life on their respective campus for support. Chalon Campus: Laura Crow, Dean of Student Life 310-954-4133 and lcrow@msmu.edu. Doheny Campus/WEC & Online/Sunset Gower/Graduate: Jessica Cuevas, Dean of Student Life 213-477-2570 and jcuevas@msmu.edu. Also, please feel free to notify your course instructor or program director if you are comfortable doing so.

Course Description:

This course examines mathematics and science concepts and theories and their application in teaching. A major focus is on constructivist learning and inquiry and related instructional methods and assessment procedures. Concrete manipulative materials critical to the learning of mathematics and science are used throughout the course. Emphasis is placed on both individual and group participation as well as differentiated instruction for a range of students from struggling to gifted.

Note: Observation and participation in exemplary mathematics and science learning environments plus travel time is required. Candidates must have access to transportation to the fieldwork site. (*During school closure due to Covid-19, alternate fieldwork/observation may take place online – be sure to get permission from the instructor for alternate fieldwork before you get started.)

Course Objectives and Student Learning Outcomes:

Demonstrate the ability to understand and teach the progression of the state-adopted content standards in mathematics to all students while engaging all students in the Standards for Mathematical Practice. (*TPE Part 2, Teaching Mathematics in a Multiple Subject Assignment*)

Demonstrate the ability to understand and teach the state-adopted academic content standards in science to all students, balancing instruction among the disciplinary core ideas, crosscutting concepts and the scientific and engineering practices as indicated in the Next Generation Science Standards. (*TPE Part 2, Teaching Science in a Multiple Subject Assignment*)

Demonstrate the ability to support all students in learning through the use of real-life contexts and active learning experiences. (*TPE 1.3*)

Demonstrate the ability to promote students' critical and creative thinking and analysis through activities that provide opportunities for inquiry, problem solving, responding to and framing meaningful questions, and reflection. (*TPE 1.5*) (*TPE 4.7*)

Develop instructional plans that are consistent with subject-specific pedagogy. (*TPE 3.3*)

Develop instructional plans and learning environments that include specific strategies for adapting the subject matter for all students, including English learners, Standard English learners, students with disabilities and other learning needs (TPE 1.6) (TPE 3.5) (TPE 4.4)

Apply developmentally appropriate teaching strategies and knowledge of human learning in the design, planning and delivery of instruction.

Demonstrate the ability to use multiple measures to assess student learning using a variety of types of assessments and their appropriate uses to inform instruction and evaluate student performance. (TPE 5.1)

Demonstrate the ability to involve all students in self-assessment that provides opportunities for revision. (TPE 5.3)

Demonstrate the ability to model the use of digital tools for students to access information, support learning and thinking, and present new content. (TPE 4.8)

Develop the foundation for ongoing personal professional development in math and science subject matter and instruction. (TPE 3.1, TPE 6.1, TPE 6.3)

Required Texts and Course Materials (available at the Doheny Bookstore):

- Burns, M. (2015). *About Teaching Mathematics: A K-8 Resource (4th Edition)* (fourth edition). Math Solutions. ISBN-13: 978-1-935099-32-1
- NSTA Learning Center <https://learningcenter.nsta.org>
 - Create your NSTA LC account:
 - Go to the Learning Center to create a new account:
 - Pay for the NSTA LC access/NSTA student membership bundle
- National Research Council. *A Framework for K-12 Science Education*. <https://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts>
- Additional articles & chapters from specific books (available on Canvas) will be required as assigned.

Web Based & Additional Resources

- Common Core State Standards- CA Math <https://www.cde.ca.gov/be/st/ss/documents/ccsmathstandardaug2013.pdf>
- Common Core State Standards <http://www.corestandards.org/read-the-standards/>
- California Science Framework <https://www.cde.ca.gov/ci/sc/cf/>
- Next Generation Science Standards (NGSS) <https://www.nextgenscience.org>
- National Research Council. *A Framework for K-12 Science Education* <https://www.nap.edu/download/13165>

- Teaching Channel Videos, Teaching Strategies, and Lesson Plans
<https://www.teachingchannel.org>
- Illustrative Mathematics <https://www.illustrativemathematics.org>
- National Council of Teachers of Mathematics: *Principles to Actions: Ensuring Mathematical Success for All*.

Course Assignments:

Course Assignment(s)	% of Final Course Grade	TPE Addressed
<p>Self-Assessment in Subject Matter Competency Take a practice test in math subject matter competency to determine areas of strength and areas in need of improvement; and develop a plan with professional learning goals and make progress to improve in these areas. (Due 1/27)</p>	5%	TPE 3.1, TPE 6.1, TPE 6.3
<p>Conceptual Mathematics Multimedia Asynchronous Presentation. Utilize technology and multimedia (audio, visual, digital, video, etc.) to present the major concepts of a specific math domain within a grade level span (K-2 or 3-5). (Due 2/10)</p>	5%	TPE 3.1, TPE 3.5, TPE 3.6 TPE 4.8 TPE Part 2: Teaching Mathematics in a Multiple Subject Assignment
<p>Common Core Standards Based Math Lesson OT #2: Create a grade level appropriate standards-based problem-solving Mathematics lesson that engages students in academic discourse. The lesson will incorporate both Mathematical Content and Practice Standards in addition to a language objective. Modifications/accommodations for an assigned virtual student with an IEP and an English Learner must be included. (Due 3/3)</p>	25%	TPE Part 2, Teaching Mathematics in a Multiple Subject Assignment TPE 1.3, TPE 1.5, TPE 3.1, TPE 3.2, TPE 3.3, TPE 4.3 TPE 5.1, TPE 5.2, TPE 5.8
<p>Focused Fieldwork Observation Reflection I. Science Classroom/Museum visits (Due 3/24) II. Math Classroom Observations (TBA)</p> <p>You will have an opportunity to visit a science museum and an LAUSD math classroom to observe effective subject matter instructions. Before and after each visit, you will also be able to consult, discuss, and collaborate with other educators and subject matter community experts regarding accessing resources for planning and</p>	10%	TPE 1.3, TPE 1.5 TPE 3.3 TPE 4.4, TPE 4.6

instruction, and using multiple means of delivering effective subject matter instructions to elementary students.		
NGSS Storyline Take a science content assessment on the NSTA website and choose an area to increase content knowledge through NSTA resources. Develop a storyline, demonstrate your content knowledge including phenomena, driving question, gapless explanation and conceptual flow for the area you chose. (Due 4/7)	10%	TPE Part 2: Teaching Science in a Multiple Subject Assignment TPE 1.3, TPE 1.5 TPE 3.1
NGSS Standards Based Science Lesson OT #1: Use 5E model for lesson planning in science to create a grade level appropriate science lesson series that is derived from the Next Generation Science Standards. Modifications/accommodations for an assigned virtual student with an IEP and an English Learner must be included. (Due 5/5)	25%	TPE Part 2: Teaching Science in a Multiple Subject Assignment TPE 1.3, TPE 1.5, TPE 1.6 TPE 3.1, TPE 3.2, TPE 3.3, TPE 3.5 TPE 4.3 TPE 5.1, TPE 5.8
Assessment and Tutoring in Math OT #3: Provides the opportunity to collect and examine student language and work samples as well as a student self-evaluation in order to evaluate for understanding and misconceptions. This will lead to decisions about how to further instruct the focus student(s), which will be addressed through work on a weekly basis tutoring a student in mathematics. Journal includes evidence of implementation of student self-assessment and communication of learning goals with family. Experiences will be reflected in digital journal entries. (Due throughout semester)	10%	TPE 5.1, TPE 5.3 TPE 3.2. 5.2. 5.5
Asynchronous Assignments & Discussions: Assignments during asynchronous meetings focusing on specific topics; Various discussions reflecting on topics and concepts discussed in class. (Due Asynchronous Meetings: 1/27, 2/17, 4/7, 4/28)	10%	TPE 1.3, TPE 1.5, TPE 1.6 TPE 4.7 TPE 5.1, TPE 5.3 TPE Part 2, Teaching Mathematics in a Multiple Subject Assignment TPE Part 2: Teaching Science in a Multiple Subject Assignment
TOTAL	100%	

Required Field Experience:

An important way to apply the theories and principles studied in class to real-life students and a classroom is through focused participation/observation activities. This course requires you to complete a **total of 50 hours of early fieldwork**. This includes one full day of planned

observation under the direction of a LAUSD Math Coach, a designated science classroom/museum observation, and 10 hours of math tutoring. Additionally, you must log in extra 35 hours of fieldwork from an approved field site. In order to meet the guidelines for public school classroom experience, all students (including in-service teachers) must complete these hours. **(Due to Covid-19, Alternate online field experiences will be substituted as needed. Be sure to get permission for fieldwork before getting started.)**

Course Format:

This course meets **ONLINE**. All course documents, including assignment guidelines and rubrics, will be available on Canvas, and all assignments will be submitted through Canvas.

Classroom Policies:

- **Submitting work:** Assignments must be completed on time according to detailed guidelines. **Very significant points are deducted for late work!** PLEASE NOTE: *if you are going to be absent, you may submit your work before the start time for the class (on the due date) through CANVAS to be considered for full credit.* All assignments will be submitted through Canvas.
- **Formatting:** All assignments should be thoughtfully prepared, written in standard academic English, free of grammatical and spelling errors, and typed. Use 12-point Times or Arial font, double-spacing, and one-inch margins. (Note: Educators must be excellent language and literacy models. Written work with multiple grammatical/spelling errors per page will receive point deductions.)
- **Grading:** The major assignments will be graded using an assessment-specific rubric. All assignments will be recorded using a traditional point system, which allows the student to earn partial points for an assignment. Remember that you must maintain a 3.0 GPA in order to proceed in the MSMC Multiple Subject Credential Program.
- **Make-up Work:** Most in class assignments will not be available for make-up thus it is critical that you attend all classes on time. Please contact your classmates for any missed class information and lecture.
- **Tardiness:** Some of the most important announcements are made during the first 15 minutes of class; therefore, it is critical that you arrive to class on time. Please let us know as soon as possible if you are experiencing personal difficulties with getting to class on time. On those occasions when you are late, please check with a classmate to see what information or announcements you may have missed.
- **Classroom Participation:** Learning is done through social interaction and discussion. It is important to be present at each class session and to participate in class discussions. There will be multiple modes of expression and each is a valuable part of the class. Any work completed in class must be submitted by the end of the class period.

- **Peer Support:** Please exchange phone numbers and/or email addresses with your classmates/colleagues for mutual help and support. Find a friend who will read and edit your assignments with you before preparing and submitted a final draft. All assignments should be thoughtfully prepared, written in standard academic English, free of grammatical and spelling errors, and typed. Use 12-point Times or Arial font, double-spacing, and one-inch margins. (Note: Educators must be excellent language and literacy models. Written work with multiple grammatical/spelling errors per page will receive point deductions.) If you're absent, check in with a classmate and meet to discuss what you've missed.
- **E-Learning System (Canvas):** Please check your Canvas frequently. All emails, assignments, rubrics, announcements, supplemental readings will be available on Canvas. Assignments must be completed on time according to detailed guidelines. **Very significant points are deducted for late work!** PLEASE NOTE: *if you are going to be absent, you may submit your work before the start time for the class (on the due date) through Canvas to be considered for full credit. All assignments will be submitted through Canvas.*

Assessment – EDU 154/254 aims to model the importance of using multiple measures of assessment to gauge the progress of learners. Each assignment will be assessed using specified rubric.

Opportunity Tasks – Following the competency routes laid down by the California Commission on Teacher Credentialing for the Multiple Subject credential, you will have opportunities throughout the methodology coursework to practice tasks related to the California Teacher Performance Expectations (TPE's) and to meet the “opportunity task” level of a skilled beginning teacher. These (TPE's) will provide the knowledge base for the final Teacher Performance Assessments that you must complete successfully before you can apply for your credential. Each methodology course contains in-class practice and a few culminating “opportunity tasks”. EDU 154/254 includes three opportunity tasks. Your course grade will be based on your performance of the following projects and activities.

Student Credit Hour Policy – A credit hour is an amount of work represented in intended outcomes and verified by evidence of student achievement that reasonably approximates not less than:

- (1) One hour of classroom or direct faculty instruction and a minimum of two hours of out-of-class student work each week for approximately fifteen weeks for one semester, or the equivalent amount of work over a different amount of time; or
- (2) At least an equivalent amount of work as required in paragraph (1) for other academic activities, including laboratory work, internships, practice, studio work, and other academic work leading to the award of credit hours.

Grading Scale

94-100 = A
90-93 = A-
87-89 = B+
84-86 = B
80-83 = B-
77-79 = C+
74-76 = C
70-73 = C-
65-69 = D
<65 = F

Assessment of Student Learning Outcomes:

Student learning is at the core of the MSMU mission. MSMU faculty have developed a plan to assess the student learning outcomes that represent the knowledge, skills, and attitudes expected of MSMU's graduate students. In this class one or more student learning outcomes will be assessed. Some of our class assignments may be used to evaluate overall student learning and to improve teaching and learning in this class, this department, and throughout the University.

MSMU University and Education Department Policies:

***Potential COVID-19 Disruption:** Should the course modality change during the semester the instructor will provide a written comprehensive update of how the class will continue and any changes that may result.*

***University PPE Policy:** All students must comply with the University personal protective equipment (PPE) policy while on campus. Non-compliant students will not be allowed to stay in class.*

- **Absences:** Your attendance helps us build a class community. Arriving on time allows everyone to benefit from planned activities and discussions, as the class functions as a lab and instructors strive to model a variety of pedagogical practices. Timeliness also is an indication of professionalism and generates an important and lasting positive impression. Also, please limit absences to no more than one session for a 1 or 2-unit course or two sessions for a 3 or 4-unit course. Students will have an opportunity to do a make-up assignment if there is an additional absence due to an emergency. If more than three absences occur, so much content will have been missed that an administrative withdrawal would be necessary and you would be invited to re-register for the course during a subsequent semester. If any concern arises that will prevent you from arriving to class regularly and/or in a timely way, please come talk with me so we can work together to ensure your successful course completion. For online sessions, submitting the assignments for that session count as your attendance for that session.
- **Academic Integrity:** Students are expected to adhere to their MSMU statements on Academic Integrity in the MSMU catalog and Student Handbook. This includes avoiding plagiarism and constructing your best work on each assignment. Papers and

other work including images, should not be copied from the Internet. Infractions may be addressed by the MSMU administration and possibly include an AI Board review. For clarification on what constitutes plagiarism, students are encouraged to review the Preventing Plagiarism page on TurnItIn.com (see <https://www.turnitin.com/solutions/plagiarism-prevention>).

- **Academic Freedom:** Students' and faculty's freedom of speech is constitutionally protected, so they are free to take reasoned exception to the data or views offered in any course of study and to reserve judgment about matters of opinion—and allow the same freedom for others. See MSMU's Student Handbook for further discussion.
- **Calendar Verification:** Please review the schedule in the tentative course calendar carefully. Education Department course calendars may not align with the generally published MSMU holidays and break schedule due to the nature of a teacher preparation program.
 - **Fall Mid-Semester Break:** Some Graduate-level Education courses meet on the Thursday of mid-semester break. Check your course calendar.
 - **Spring Break:** The MSMU Spring Break is observed for all education courses that meet on campus and the campus will also be closed. Courses involving other sites, such as for supervised teaching, will take their breaks consistent with the districts in which they take place. The result may be that those doing student teaching may not have any week that does not include Mount course meetings or obligations.
 - **Study Days:** The "Study Days" policy does not apply to Education courses (including those cross-listed with UG students). As our courses meet only one day per week throughout each semester, it is not possible to lose an additional day. All students are expected to participate in class meetings (in person or online) on the final Thursday before finals.
 - **Finals Week:** All Education evening courses meet as regularly scheduled during finals week.
- **Candidate Dispositions:** The Education Department has adopted a Dispositions Statement that outlines expectations of all credential and graduate students. (See the Education Department Student Handbook.) An assessment process exists so that candidates will receive formative feedback through a Notice of Concern, if necessary, in order to support candidates to meet expectations.
- **Certificate of Clearance:** In order to demonstrate eligibility to complete all elements of an Education course requiring public school fieldwork, students must submit a copy of a CCTC-issued Certificate of Clearance or valid California teaching credential to the course instructor as instructed and by the date due. According to the California Commission on Teacher Credentialing (CCTC), teacher credential candidates **MUST** have a Certificate of Clearance **PRIOR** to entering a school for fieldwork. This is a non-negotiable state requirement. **(This requirement applies to EDU courses 1/207, 1/208A, 1/250, 1/254, 1/256, 1/266, 1/267, and 1/268.)**

- **Incompletes:** Incompletes are meant to provide support for students who have experienced an emergency in their lives and need special consideration on a case-by-case basis. An application for an Incomplete may be granted only if the student:
 - files the application no later than 1 week prior to finals
 - has completed the majority of assignments
 - on the basis of the work completed, has a passing grade in the class (C or better). This is not necessarily the same as the default grade. In other words, although the student may have a B grade for the completed work, if they fail the missing assignment or do not complete it, their final grade might be a D
 - is prevented from completing the final assignment

- **Quality of Work:** The MSMU Education Department expects all credential and master's candidates to demonstrate their ability to act as literacy models for K-12 students by submitting high quality, written assignments and projects. Candidates with assignments turned in with serious writing errors, including high numbers of typos, will either be asked to resubmit the assignment or have significant point/percentage reductions.

- **Resource Binder Maintenance**
 All preliminary credential candidates are required to organize and maintain a resource binder each semester that will serve as a post-credential resource file. Instructions are provided in EDU 1/208A, made available via Canvas. Course materials provided in each class as handouts or made available on Canvas should be downloaded and kept in a personal filing system, whether electronic or hardcopy. This material will be reviewed during the last semester in the Supervised Teaching Seminar: EDU 1/210.

- **Student Resources**
Learning Resource Center: The Doheny Learning Resource Center will arrange personal tutoring or assistance for undergraduate students. Call (213) 477-2690.
Professional and Academic Resource Center (PARC)
 - The Professional and Academic Resource Center (PARC) offers assistance to graduate students in person, over the phone, or by videoconferencing. To schedule an appointment, access the PARC page on myMSMU: <https://mountsaintmarysuniversi.sharepoint.com/sites/MYMSMU/academics/PARC>
 - All appointments (in-person, phone, or online) are 45 minutes long. (213) 477-2898, PARC@msmu.edu, located on the second floor of Building 10.

- **Students with Disabilities:** Mount Saint Mary's University, Los Angeles is committed to ensuring the full participation of all students in its programs. If you have a documented disability (chronic, medical, physical, learning, psychological, or temporary), or think you may have a disability and need a reasonable accommodation to participate in class, complete course requirements, or access the University's programs or services; contact Disability Services (DS) as soon as possible. To receive an accommodation, you must register with DS. DS works with students confidentially and does not disclose any disability-related information without student consent. DS

coordinates and promotes disability accommodations and awareness and works in partnership with faculty and all other student service offices. For further information about services for students with disabilities, contact DS at the Chalon Academic Support Center, H207, (310) 954-4142, or at the Doheny Student Resource Center, Building 3, (213) 477-2690. You can also email for more information at disability@msmu.edu.

- **Accommodation Policy:** Students with disabilities should consult the MSMU policies regarding commitment to equal educational opportunities for disabled students in the MSMU catalog.

Please be advised that this class may be audio- or video-recorded as an accommodation under the American with Disabilities Act, but only with prior permission from Disability Services and the instructor. Students may only use such recordings for personal use; no posting or further distribution or use is permitted.

- **Technology Policy:** Candidates are expected to adhere to the MSMU technology policy as stated in the MSMU Student Handbook.

MSMU Office Information:

- Please call or email the Education Department Administrative Assistant to make an advisement appointment: educationdepartment@msmu.edu or (213) 477-2620.

Course Calendar

NOTE: Keep in mind that this is a working syllabus, subject to change, and should not be construed as a contract.

Each session has a specific focus question(s) that will be the basis for reflection that evening. Together these reflections on the focus questions will serve to address the essential question for the course:

Essential Question:

What must I do to ensure that I am an effective teacher of science and mathematics to K-8 students?

EDU 154/254 TENTATIVE COURSE CALENDER Mathematics and Science Elementary Curriculum			
Date	Topic(s)	Reading Due	Assignment(s) Due
1/13 (1)	<p>Welcome/Course Overview</p> <p><i>How do children learn mathematics? What are the barriers to student success in mathematics?</i></p> <p>Growth Mindset Key ideas in the Mathematics Framework:</p> <ul style="list-style-type: none"> • Focus, Coherence, and Rigor • Two sets of Standards • Fluency vs. Conceptual Understanding • Barriers to student success <p>Problem solving; identification and approach</p> <p>Preview of Opportunity Task #3-Tutoring</p>	<p>Burns, M. (Part 1)</p> <p>Boaler, Jo. "Math Person"</p>	
1/20 (2)	<p><i>What is the role of language in the elementary mathematics classroom?</i></p> <ul style="list-style-type: none"> • What are different approaches to teaching mathematics in an elementary setting? • Promoting a growth mindset • What are Constructive Conversation Skills? • Conceptual Mathematics • How does academic discourse support students' learning of language and content in mathematics? <p>Overview of Opportunity Task #3 -Tutoring</p> <ul style="list-style-type: none"> • Using Self-Assessment in Tutoring • Review of the rubric 	<p>Burns, M. (Part 2)</p> <p>"Talk Moves"</p> <p>C. Fosnot Video</p> <p><u>Exemplars</u></p>	

	<ul style="list-style-type: none"> • Choosing Exemplars • Setting Learning Goals based on Self-Assessment of Your Own Math Subject Matter Competency 		
1/27 (3) NO ZOOM (Asynchronous)	<p><i>How do I engage diverse learners problem-solving tasks that address both sets of standards (content and practices)?</i></p> <ul style="list-style-type: none"> • Subject Matter Competency Self-Assessment & Improvement Plan (DUE at the end of class meeting) (Asynchronous Assignment) <p>Take a practice test in math subject matter competency to determine areas of strength and areas in need of improvement; and develop a plan with professional learning goals and make progress to improve in these areas.</p>	Burns, M. (Part 2)	Tutoring should begin no later than this week
2/3 (4)	<p><i>How do I engage diverse learners in language based problem-solving tasks that address both sets of standards (content and practices)? What is cultural competency?</i></p> <ul style="list-style-type: none"> • CA CCSS Mathematics Framework • Singapore Model Drawing • Problem-based tasks • CGI (Cognitively Guided Instruction) • Overview Opportunity Task #2 (Math Lesson) • Conceptual Mathematics Multimedia Presentation (CMMP) <ul style="list-style-type: none"> ○ Conceptual Mathematics Multimedia Presentation (CMMP) – group work <p>Digital Technology for instruction, assessment and communication</p>	<p>Mathematics Framework cde.ca.gov</p> <p>Burns, M. (Part 3)</p>	Tutoring Journal #1 DUE
2/10 (5)	<p><i>In what ways can and can't technology be beneficial for the struggling math student?</i></p> <ul style="list-style-type: none"> • Discussion CMMP – Groups 1 & 2 • Exploring place value/ Base 10,5,2 • CA CCSS Mathematics Framework • Range of Technology: ST Math, DreamBox, Digital Math tools and platforms <ul style="list-style-type: none"> ○ Using technology as a tool to help ALL students 	Digital technology Article	Conceptual Mathematics Multimedia Presentation (CMMP) Tutoring Journal #2 DUE

	<ul style="list-style-type: none"> ○ How to facilitate students’ equitable access to the curriculum ● Differentiation <ul style="list-style-type: none"> ○ Differentiating math lessons for students with special needs (using IEP excerpts) 		
2/17 (6) NO ZOOM (Asynchronous)	<i>How do I differentiate my lessons?</i> <ul style="list-style-type: none"> ● Differentiating Math instruction for Students with Identified Special Needs ● Differentiation of Instruction for the full range of Learners (IRIS modules) (Asynchronous Assignment) 	Tileston, D. <u>What Every Teacher Should Know about Diverse Learners,</u> (Chapter 2)	Tutoring Journal #3 DUE
2/24 (7)	<i>Why are there so many other countries generally stronger than the US on standardized math tests? What can we do to advance?</i> <ul style="list-style-type: none"> ● Discussion CMMP – Groups 3 & 4 ● Operations: Adding, Subtracting, Multiplying and Dividing ● CA CCSS Mathematics Framework 	Ma, L. <u>Teaching Elementary Mathematics</u> (Chapter 2)	Tutoring Journal #4 DUE Common Core Standards Based Math Lesson – Opportunity Task #2 (Full Rough Draft DUE)
3/3 (8)	<i>What do I need to consider to effectively teach math to elementary children?</i> <ul style="list-style-type: none"> ● Discussion CMMP – Groups 5 & 6 ● Review Conceptual Math Presentations ● Present Common Core Standards Based Math 	“Math and Science Connections”	Common Core Standards Based Math Lesson – Opportunity Task #2 (Final DUE)
3/10	NO CLASS – Spring Break		
3/17 (9)	<i>Why teach science?</i> <ul style="list-style-type: none"> ● The Math-Science Connection ● History of Science Education – Where are we now? ● Science Literacy ● EL Strategies in Science ● Project Based Learning 	<u>Framework Part 1</u> (pp. 7-38)	Tutoring Journal #5 DUE
3/24 (10)	<i>What must I consider in order to teach science to elementary children? Part 1, Science and Engineering</i> <ul style="list-style-type: none"> ● The Nature of Science <ul style="list-style-type: none"> ○ Teaching and Learning ○ Engineering Design Process ○ NGSS Standards <p>Overview NGSS Storyline</p>	<u>Framework Chapter 3: Scientific and Engineering Practices</u>	Science Fieldwork Observation Reflection DUE Tutoring Journal #6 DUE

3/31 (11)	<p><i>What must I consider in order to teach science to elementary children? Part 2, Pedagogy</i></p> <ul style="list-style-type: none"> • Learning and Teaching <ul style="list-style-type: none"> ○ Constructivism & Inquiry Based ○ 5E Lesson Plans ○ Role of Discourse – “Talk Moves” ○ Flipped Lessons <p>Overview Opportunity Task #1</p>	<u>Framework</u> Chapter 4: Cross Concepts	Tutoring Journal #7 DUE
4/7 (12) (NO Zoom) Asynchronous	<p><i>What must I consider in order to teach science to elementary children? Part 3, The Learner</i></p> <p>Misconceptions Controversial Issues (Asynchronous Assignment)</p>	<u>Framework</u> Chapters 5-8 - Selections	NGSS Storyline DUE Tutoring Journal #8 DUE
4/14 (13)	<p><i>What must I consider in order to teach science to elementary children? Part 3, The Learner (con't)</i></p> <p>Connections to Common Core Differentiation</p> <ul style="list-style-type: none"> • English Learners • Special Needs • Gifted <p>Investigation Notebook Examining student work - Error Analysis</p>	<u>Framework</u> Chapter 9 – Selections	Tutoring Journal #9
4/21 (14)	<p><i>How do I know if I am teaching effectively?</i></p> <p>Teaching and Learning Framework Assessment Analyzing Student Work – Protocols</p>	<u>California Standards for Teaching Profession</u>	NGSS Standards Based Science Lesson OT #1 DUE (Full Rough Draft) Tutoring Journal #10 DUE
4/28 (15) (NO Zoom) Asynchronous	<p><i>How do I demonstrate my understanding?</i></p> <p>Prepare for performance task (model lesson) Virtual Science Lesson/Presentation (Asynchronous Assignment)</p>		
5/5 (16)	<p><i>How do I demonstrate my understanding?</i></p> <p>Science Lesson Presentation Final Reflections</p>		NGSS Standards Based Science Lesson OT #1 DUE (Final)

TPEs addressed in this course:

This course addresses the following California Teaching Performance Expectations. (adopted 2016) <https://www.ctc.ca.gov/docs/default-source/educator-prep/standards/adopted-tpes-2016.pdf?sfvrsn=0>

1. *Engaging and Supporting All Students in Learning.*

- Connect subject matter to real-life contexts and provide active learning experiences to engage student interest, support student motivation, and allow students to extend their learning. (TPE 1.3)
- Promote students' critical and creative thinking and analysis through activities that provide opportunities for inquiry, problem solving, responding to and framing meaningful questions, and reflection. (TPE 1.5)
- Provide a supportive learning environment for students' first and/or second language acquisition by using research-based instructional approaches, including focused English Language Development, Specially Designed Academic Instruction in English (SDAIE), scaffolding across content areas, and structured English immersion, and demonstrate an understanding of the difference among students whose only instructional need is to acquire Standard English proficiency, students who may have an identified disability affecting their ability to acquire Standard English proficiency, and students who may have both a need to acquire Standard English proficiency and an identified disability. (TPE 1.6)
- Monitor student learning and adjust instruction while teaching so that students continue to be actively engaged in learning. (TPE 1.8)

2. *Creating and Maintaining Effective Environments for Student Learning.*

- Maintain high expectations for learning with appropriate support for the full range of students in the classroom. (TPE 2.5)

3. *Understanding and Organizing Subject Matter for Student Learning.*

- Demonstrate knowledge of subject matter; including the adopted California State Standards and the curriculum framework. (TPE 3.1)
- Use knowledge about students and learning goals to organize the curriculum to facilitate student understanding of subject matter and make accommodations and/or modifications as needed to promote student access to the curriculum. (TPE 3.2)
- Plan, design, implement, and monitor instruction consistent with current subject-specific pedagogy in the content area(s) of instruction, and design and implement disciplinary and cross-disciplinary learning sequences, including integrating the visual and performing arts as applicable to the discipline. (TPE 3.3)
- Adapt subject matter curriculum, organization, and planning to support the acquisition and use of academic language within learning activities to promote the subject matter knowledge of all students, including the full range of English learners, Standard English learners, students with disabilities, and students with other learning needs in the least restrictive environment. (TPE 3.5)

- Use and adapt resources, standards-aligned instructional materials, and a range of technology, including assistive technology, to facilitate students' equitable access to the curriculum. (TPE 3.6)

4. *Planning Instruction and Designing Learning Experiences for All Students.*

- Understand and apply knowledge of the range and characteristics of typical and atypical child development from birth through adolescence to help inform instructional planning and learning experiences for all students. (TPE 4.2)
- Design and implement instruction and assessment that reflects the interconnectedness of academic content areas and related student skills development in literacy, mathematics, science, and other disciplines across the curriculum, as applicable to the subject area of instruction. (TPE 4.3)
- Plan, design, implement and monitor instruction, making effective use of instructional time to maximize learning opportunities and provide access to the curriculum for all students by removing barriers and providing access through instructional strategies that include:
 - Appropriate use of instructional technology, including assistive technology;
 - Applying principles of UDL and MTSS;
 - Use of developmentally, linguistically, and culturally appropriate learning activities, instructional materials, and resources for all students, including the full range of English learners;
 - Appropriate modifications for students with disabilities in the general education classroom;
 - Opportunities for students to support each other in learning; and
 - Use of community resources and services as applicable. (TPE 4.4)
- Access resources for planning and instruction, including the expertise of community and school colleagues through in-person or virtual collaboration, co-teaching, coaching, and/or networking. (TPE 4.6)
- Plan instruction that promotes a range of communication strategies and activity modes between teacher and student and among students that encourage student participation in learning. (TPE 4.7)
- Use digital tools and learning technologies across learning environments as appropriate to create new content and provide personalized and integrated technology-rich lessons to engage students in learning, promote digital literacy, and offer students multiple means to demonstrate their learning. (TPE 4.8)

5. *Assessing Student Learning.*

- Apply knowledge of the purposes, characteristics, and appropriate uses of different types of assessments (e.g., diagnostic, informal, formal, progress-monitoring, formative, summative, and performance) to design and administer classroom assessments, including use of scoring rubrics. (TPE 5.1)

- Collect and analyze assessment data from multiple measures and sources to plan and modify instruction and document students' learning over time. (TPE 5.2)
- Involve all students in self-assessment and reflection on their learning goals and progress and provide students with opportunities to revise or reframe their work based on assessment feedback. (TPE 5.3)
- Use technology as appropriate to support assessment administration, conduct data analysis, and communicate learning outcomes to students and families (TPE 5.4)
- Use assessment information in a timely manner to assist students and families in understanding student progress in meeting learning goals. (TPE 5.5)
- Use assessment data, including information from students' IEP, IFSP, ITP, and 504 plans, to establish learning goals and to plan, differentiate, make accommodations and/or modify instruction. (TPE 5.8)

6. *Developing as a Professional Educator.*

- Reflect on their own teaching practice and level of subject matter and pedagogical knowledge to plan and implement instruction that can improve student learning. (TPE 6.1)
- Establish professional learning goals and make progress to improve their practice by routinely engaging in communication and inquiry with colleagues. (TPE 6.3)

Subject-Specific Pedagogical Skills for Multiple Subject Teaching Assignments

Teaching Mathematics in a Multiple Subject Assignment

Beginning Multiple Subject teachers demonstrate the ability to understand and teach the progression of the state-adopted academic content standards and applicable English Language Development Standards for students in mathematics. They facilitate students' development of the knowledge, skills, and academic language required to (a) appropriately use processes of problem solving, reasoning and proof, communication, representation, and connections in real-world situations, and (b) appropriately apply the strands of mathematical proficiency, including adaptive reasoning, strategic competence, conceptual understanding, procedural fluency, and productive disposition. Beginning teachers facilitate student understanding of mathematical concepts and support students in making and testing conjectures and recognizing relationships within and among concepts. They provide students the opportunity to use and evaluate strengths and limitations of media and technology as integral tools in the classroom.

Beginning teachers provide a secure environment for taking intellectual risks, and they model and encourage students to use multiple approaches to mathematical problems. They facilitate student collaboration and written and oral communication that demonstrates students' ability to construct logical arguments based on substantive claims, sound reasoning, and relevant evidence. They foster positive attitudes toward mathematics and encourage student curiosity, academic discourse, and persistence in solving mathematical problems. Beginning teachers engage students in the Standards for Mathematical Practice: 1) Make sense of problems and persevere in solving them; 2) Reason abstractly and quantitatively; 3) Construct viable arguments and critique

the reasoning of others; 4) Model with mathematics; 5) Use appropriate tools strategically; 6) Attend to precision; 7) Look for and make use of structure; and 8) Look for and express regularity in repeated reasoning. Beginning teachers assure that students at various English proficiency levels have the academic language needed to meaningfully engage in the content.

Teaching Science in a Multiple Subject Assignment

Beginning Multiple Subject teachers demonstrate the ability to teach the state-adopted academic content standards and applicable English Language Development Standards for students in science. They balance the focus of instruction between disciplinary core ideas, crosscutting concepts, and scientific and engineering practices as indicated in the Next Generation Science Standards. Their explanations, demonstrations, and class activities serve to illustrate science concepts and principles, scientific investigation, and experimentation. Beginning teachers emphasize the nature of science, the integration of engineering design, and the connections between science, society, technology, and the environment. Further, beginning teachers integrate mathematical concepts and practices, including the importance of accuracy, precision, estimation of data, and literacy, into science pedagogy. Beginning teachers teach students to independently read and comprehend instructional materials that include increasingly complex subject-relevant texts, and graphic/media representations presented in

diverse formats. Beginning teachers assure that students at various English proficiency levels have the academic language needed to meaningfully engage in the content. Beginning teachers also teach students to engage in disciplinary discourse practices that foster evidence-based explanations and argumentations to write opinion/persuasive and expository text in the content area. They provide students the opportunity to use and evaluate strengths and limitations of media and technology as integral tools in the classroom. Beginning teachers assure that students at various English proficiency levels have the academic language needed to meaningfully engage in the content.