San José State University
Department of Mathematics & Statistics
MTED 394 Secondary School Mathematics (Section 2, Spring 2021)

Course and Contact Information

Instructor: Dr. Cheryl Roddick

Office Location: Online

Telephone: (H) 408-579-7475

Email: cheryl.roddick@sjsu.edu

Office Hours: Tuesday: 1:15 – 2:45; after class as needed.
Thursday: 1:15 – 2:45
Also by appointment.

Class Days/Time: Tuesday 4:30 – 7:10 pm

Classroom: Online

Prerequisites: Passing score on all 3 CSET math exams or be within 3 courses of completing the subject matter preparation program, or instructor consent.

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on Canvas at http://sjsu.instructure.com. You are responsible for regularly checking with the messaging system through MySJSU at http://my.sjsu.edu (or other communication system as indicated by the instructor) to learn of any updates.

Course Description

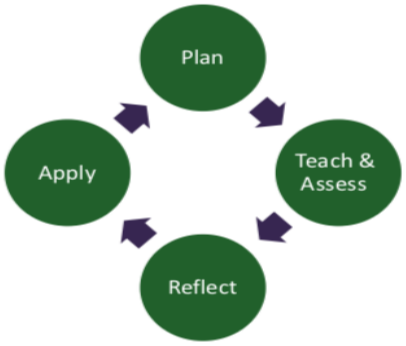
The place and function of mathematics in secondary education, improvement and evaluation of instruction. Teaching the subject matter of secondary mathematics.

Course Goals

Students in this course will learn what it means to engage in skillful teaching in departmentalized mathematics classroom settings by developing strong core teaching practices and learning effective instructional strategies that are all appropriate to secondary school mathematics. They will plan math lessons, develop effective ways of teaching and assessing math lessons, reflect on how they are planning their lessons and how those lessons support student learning and attend to the needs of all students, and apply what they learn from the hypothetically-structured instructional cycle to strengthen their teaching practices to support increased student learning, deep understanding and mathematical proficiency, and active engagement in their own learning. All students are expected to implement and refine knowledge and learnings from this course in the early/beginning phase of their student-teaching (MTED 184X/EDSC 184X) and further

refine them in the advanced phase (MTED 184YZ/EDSC 184YZ). If applicable, students in this course who are also enrolled in EDSC 184X should be able to successfully submit a complete CalTPA Cycle 1 narrative by the end of the semester.

Underlying Theory of Learning to Teach Secondary Mathematics: Skillful teaching of secondary mathematics develops through repeated application of the instructional cycle of plan, teach & assess, reflect, and act, coupled with the following three fundamental questions that are meant to improve one's own teaching practice: (1) What am I trying to accomplish? (2) How will I know that a change is an improvement? (3) What change can I make that will result in improvement? These improvement questions are meant to deepen the instructional cycle of planning, teaching and assessing, reflecting, and applying.



Course Requirements

Your grade will be determined in the following manner:

Assignments	10%
Lesson Plans	30%
Midterm	20%
Final Exam (Unit Plan)	30%
Class Participation/Presentations	10%

Grading Scale

A:	93-100 ;	A+:	97-100	A-:	90-92
B:	83-86;	B+:	87-89;	B-:	80-82
C:	73-77;	C+:	77-79;	C-:	70-72
D:	63-67;	D+:	67-69;	D-:	60-62
F:	0 -59				

Classroom Protocols

1. **Attendance and Participation.** Please attend all classes and actively participate in classroom activities.
2. **Timeliness.** Be on time. If you work, please let your employer know that you need to come to class on time. Three late arrivals constitute an absence.
3. **Missed Classes.** Any time you are unable to come to class, due to illness, accident, or other unavoidable incident, it is *your responsibility* to contact me regarding the missed class to you are able. Each missed class should be made up by submitting a book or article analysis and reflection (at least 2000 words) on the day of your return to class. Absolutely

no extension is allowed on any make-up essay; it is worth 10 points and will be factored in your final grade. It is your responsibility to secure the book or article that you will analyze.

4. **Late Policy.** Late assignments will receive half credit, up to one week. After that, they will receive no credit.
5. **Professional Disposition.** Demonstrate appropriate professional disposition at all times.

Learning Outcomes

Upon successful completion of this course, students will be able to provide rigorous, coherent, and focused instruction, teaching, learning, and assessment in mathematics for all students that lead to deep understanding of mathematics.

Course Learning Outcomes (Aligned to the CCTC TPEs and CalTPA Requirements)

TPE Alignment: Subject-Specific Pedagogical Skills: Students in this course:

1. Demonstrate knowledge of and ability to teach content aligned with the California State Standards and the English Language Development Standards.
2. Demonstrate the ability to teach the state-adopted academic standards for students to meet or exceed the end of the year expectations for their grade or course in order to be college and career ready by the end of grade 12.
3. Enable students to understand basic mathematical computations, concepts, and symbols, to use them to solve common problems, and to apply them to novel problems.
4. Help students understand different mathematical topics and make connections among them.
5. Help students solve real world problems using mathematical reasoning and concrete, verbal, symbolic, and graphic representations. They require student collaboration and written and oral communication that demonstrates students' ability to construct logical arguments based on substantive claims, sound reasoning, and relevant evidence.
6. Provide students the opportunity to use and evaluate strengths and limitations of media and technology as integral tools in the classroom.
7. Provide a secure environment for taking intellectual risks, model and encourage students to use multiple ways of approaching mathematical problems, and encourage discussion of different solution strategies.
8. Demonstrate positive attitudes toward mathematics, and encourage student curiosity, flexibility, and persistence in solving mathematical problems.
9. Use developmentally appropriate and diverse strategies to engage students in grades 7-12 to understand mathematics as a logical system that includes definitions, axioms, and theorems, and to understand and use mathematical notation and advanced symbols.
10. Assign and assess work through progress-monitoring and summative assessments that include illustrations of student thinking such as open-ended questions, investigations, and projects.
11. Engage students in the Standards for Mathematical Practice.

Required Texts

California Department of Education. (2015). *Mathematics Framework for California Public Schools: Kindergarten Through Grade Twelve.* Sacramento, CA: Author. Available online: http://www.cde.ca.gov/ci/ma/cf/draft2mathfwchapters.asp.

Required Readings and Materials

All files and relevant documents have been uploaded to Canvas.

Student Expectations for our Online Course Environment

As a student in MTED 394, you are expected to have the following technological equipment and knowledge before classes start.

- **Technology**
  - You will need a laptop or other keyboard-based computer that connects to the internet (wifi or ethernet).
  - Your laptop must have an attached webcam and working microphone.
  - You will need a way to take pictures that you can upload.
  - It will be helpful to have some way to draw pictures/solve problems on a computer, either with a stylus or with your finger. Most smartphones should work for this purpose; a touch screen laptop will also work.

  Martin Luther King Library and the IRC also both have a limited number of laptops and other equipment available to borrow; please call or Google them to see what they have available.

- **Internet**
  - You will need access to a reliable internet connection.

- **Software/apps/websites**
  - You need to be able to use Zoom. To get started: https://support.zoom.us/hc/en-us/categories/200101697-Getting-Started
  - You need to be able to use Canvas. To get started: https://www.sjsu.edu/ecampus/docs/Canvas-Student-Quick-Guide.pdf
  - You will need some way of scanning and uploading multiple-page documents (e.g., your homework and exams) as a single PDF file. For most students with smartphones, some kind of camera scanner will work well; I recommend Adobe Scan because it's free and relatively uncomplicated: https://acrobat.adobe.com/us/en/mobile/scanner-app.html

- **Physical**

- Synchronous lectures will be given at **the REGULAR CLASS TIME**, Pacific time. The midterm exam will be given live during our regular class time.
- During the exam, you will need a place where you can connect to Zoom and turn your camera on to show your surroundings (no virtual backgrounds).
- You will be asked to have your camera on during every class, to participate in group discussions with your classmates.
- You should have a table or other large flat surface in your work area, both for writing exams and also to serve as a background for when you scan documents.

CalTPA Alignment: All course requirements will attend to mathematics concepts and principles through the following:

- engaging students in the Standards for Mathematical Practice;
- providing a secure environment for taking intellectual risks, modeling and encouraging students to use multiple ways of approaching mathematical problems, and encouraging discussion of different solution strategies, and;
- enabling students to understand basic mathematical computations, concepts, and symbols; to use them to solve common problems; and to apply them to novel problems.

California Teaching Performance Expectations (TPEs)	Cycle 1	Cycle 2	TPE
TPE 1: Engaging and Supporting All Students in Learning			
1. Apply knowledge of students, including their prior experiences, interests, and social-emotional learning needs, as well as their funds of knowledge and cultural, language, and socioeconomic backgrounds, to engage them in learning.	X	X	I/P/A
2. Maintain ongoing communication with students and families, including the use of technology to communicate with and support students and families, and to communicate achievement expectations and student progress.			A
3. 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.			I/P/A
4. Use a variety of developmentally and ability-appropriate instructional strategies, resources, and assistive technology, including principles of Universal Design of Learning (UDL) and Multi-Tiered System of Supports (MTSS) to support access to the curriculum for a wide range of learners within the general education classroom and environment.	X	X	I/P/A
5. 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.	X	X	I/P/A
6. 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.	X		I/P/A
7. Provide students with opportunities to access the curriculum by incorporating the visual and performing arts, as appropriate to the content and context of learning.			I/P/A
8. Monitor student learning and adjust instruction while teaching so that students continue to be actively engaged in learning.		X	I/P/A

California Teaching Performance Expectations (TPEs)	Cycle 1	Cycle 2	TPE
TPE 2: Creating and Maintaining Effective Environments for Student Learning			
1. Promote students' social-emotional growth, development, and individual responsibility using positive interventions and supports, restorative justice, and conflict resolution practices to foster a caring community where each student is treated fairly and respectfully by adults and peers.	X	X	I/P/A
2. Create learning environments (i.e., traditional, blended, and online) that promote productive student learning, encourage positive interactions among students, reflect diversity and multiple perspectives, and are culturally responsive.	X	X	I/P/A
3. Establish, maintain, and monitor inclusive learning environments that are physically, mentally, intellectually, and emotionally healthy and safe to enable all students to learn, and recognize and appropriately address instances of intolerance and harassment among students, such as bullying, racism, and sexism.	X	X	I/P/A
4. Know how to access resources to support students, including those who have experienced trauma, homelessness, foster care, incarceration, and/or are medically fragile.	X		I/P/A
5. Maintain high expectations for learning with appropriate support for the full range of students in the classroom.	X		I/P/A
6. Establish and maintain clear expectations for positive classroom behavior and for student-to-student and student-to-teacher interactions by communicating classroom routines, procedures, and norms to students and families.		X	I/P/A

TPE 3: Understanding and Organizing Subject Matter for Student Learning			TPE
1. Demonstrate knowledge of subject matter, including the adopted California State Standards and curriculum frameworks.	X	X	P/A
2. 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.	X	X	P/A
3. 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.	X	X	P/A
4. Individually and through consultation and collaboration with other educators and members of the larger school community, plan for effective subject matter instruction and use multiple means of representing, expressing, and engaging students to demonstrate their knowledge.			A
5. 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.	X		P/A
6. Use and adapt resources, standards-aligned instructional materials, and a range of technology, including assistive technology, to facilitate students' equitable access to the curriculum.	X	X	I/P/A
7. Model and develop digital literacy by using technology to engage students and support their learning, and promote digital citizenship, including respecting copyright law, understanding fair use guidelines and the use of Creative Commons license, and maintaining Internet security.	X		I/P/A
8. Demonstrate knowledge of effective teaching strategies aligned with the internationally recognized educational technology standards.	X		I/P/A

California Teaching Performance Expectations (TPEs)	Cycle 1	Cycle 2	TPE
TPE 4: Planning Instruction and Designing Learning Experiences for All Students			
1. Locate and apply information about students' current academic status, content- and standards-related learning needs and goals, assessment data, language proficiency status, and cultural background for both short-term and long-term instructional planning purposes.	X	X	I/P/A
2. 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.	X		I/P/A
3. 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.		X	I/P/A
4. 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.	X	X	I/P/A
5. Promote student success by providing opportunities for students to understand and advocate for strategies that meet their individual learning needs and assist students with specific learning needs to successfully participate in transition plans (e.g., IEP, IFSP, ITP, and 504 plans.)	X		I/PA
6. 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.			I/P/A
7. 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.	X	X	I/P/A
8. 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.	X		I/P/A

	TPE
	I/P/A

California Teaching Performance Expectations (TPEs)	Cycle 1	Cycle 2	TPE
TPE 5: Assessing Student Learning			
1. 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.	X	X	
2. Collect and analyze assessment data from multiple measures and sources to plan and modify instruction and document students' learning over time.	X	X	
3. 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.		X	
4. Use technology as appropriate to support assessment administration, conduct data analysis, and communicate learning outcomes to students and families.			
5. Use assessment information in a timely manner to assist students and families in understanding student progress in meeting learning goals.		X	
6. Work with specialists to interpret assessment results from formative and summative assessments to distinguish between students whose first language is English, English learners, Standard English learners, and students with language or other disabilities.	X		
7. Interpret English learners' assessment data to identify their level of academic proficiency in English as well as in their primary language, as applicable, and use this information in planning instruction.	X	X	
8. 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.	X	X	
TPE 6: Developing as a Professional Educator			
1. Reflect on their own teaching practice and level of subject matter and pedagogical knowledge to plan and implement instruction that can improve student learning.	X	X	**I/P/A**
2. Recognize their own values and implicit and explicit biases, the ways in which these values and implicit and explicit biases may positively and negatively affect teaching and learning, and work to mitigate any negative impact on the teaching and learning of students. They exhibit positive dispositions of caring, support, acceptance, and fairness toward all students and families, as well as toward their colleagues.			**I/P/A**
3. Establish professional learning goals and make progress to improve their practice by routinely engaging in communication and inquiry with colleagues.			**I/P/A**
4. Demonstrate how and when to involve other adults and to communicate effectively with peers and colleagues, families, and members of the larger school community to support teacher and student learning.			**A**
5. Demonstrate professional responsibility for all aspects of student learning and classroom management, including responsibility for the learning outcomes of all students, along with appropriate concerns and policies regarding the privacy, health, and safety of students and families. Beginning teachers conduct themselves with integrity and model ethical conduct for themselves and others.	X		**I/P/A**
6. Understand and enact professional roles and responsibilities as mandated reporters and comply with all laws concerning professional responsibilities, professional conduct, and moral fitness, including the responsible use of social media and other digital platforms and tools.			**A**
7. Critically analyze how the context, structure, and history of public education in California affects and influences state, district, and school governance as well as state and local education finance.			**I/A**

TPEs and CalTPA Steps Aligned to the Course Requirements

1. *Technology Presentation* (TPE 1.4, 1.7, 3.6-3.8, 4.8 I, P, and A): Each student will be assigned to learn one technological tool for learning math. The student will then introduce it to class.

Focus on one particular technological tool. Teach the tool to the class and address the following questions below, which deal with issues related to teaching practices and instructional strategies.

a. TPE 1.4, 1.7, 3.6: How do you use the technological tool to provide all your students with conceptual and visual access to mathematical content and practices?

b. TPE 3.7-3.8, 4.8: What are the benefits of teaching and learning mathematics with technology? How do you teach math with technology effectively? How should your students learn math with technology effectively?

2. *Unit Plan* (TPE 1.1, 1.3-1.8, 3.1-3.8, 4.1-4.5, 4.7-4.8, 5.1-5.3 A; CalTPA Cycle 2 Step 1): Students will develop a unit plan that attends to the TPEs noted. Please see attached Unit Plan Template.

3. *Lesson Plans* (TPE 1.1, 1.3-1.8, 3.1-3.8, 4.1-4.5, 4.7-4.8, 5.1-5.3 A, CalTPA Cycle 1 and Cycle 2 Steps 1-2): Students will develop four 55-minute lesson plans that attend to the TPEs noted. Below are the themes of the lesson plans. Please see attached Lesson Plan Template.

a. Lesson Plan 1: Choose one topic from your unit and develop a lesson for the whole class that models one (or two) specific instructional strategy.

b. Lesson Plan 2: Choose a third topic from your unit and develop a lesson plan that incorporates the use of art in teaching and learning the lesson.

4. *Lesson Segment* (TPE 1.1, 1.3-1.8, 3.1-3.8, 4.1-4.5, 4.7-4.8, 5.1-5.3 A, CalTPA Cycle 2 Step 1): Students will develop a sequence of 3 lessons that attend to the TPEs noted. Specific requirements:

a. At least one of the lessons should incorporate the use of technology.

b. The lesson segment should address all the requirements stipulated in CalTPA Cycle 2 Lesson Segment Rubric.

5. *Assessment Instrument* (TPE 1.1, 1.3-1.8, 3.1-3.8, 4.1-4.5, 4.7-4.8, 5.1-5.3 A, CalTPA Cycle 1 and Cycle 2 Step 1-4): Develop a 1-hour summative assessment for your unit that follows CAASPP test item structure specifications with clear CRM classification.

6. *Statement of Teaching Philosophy* (TPE 1-6 A): Refer to the TPE Table on pp. 3-6. Develop a 6-paragraph STP, where each paragraph addresses one TPE. Limit your STP to 3 pages (so approximately half a page per TPE). To help you begin a process for writing your STP, read all 6 TPEs and then plan a strategy for addressing the elements in each TPE.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/.

MTED 394 Schedule

Day	Topic	Activities and Assignments
Week 1		
2/2	1. Social Emotional Learning Competencies 2. Growth Mindset and Classroom Norms 3. CCSSM Content and Practice Standards 4. California Teaching Performance Assessment (CalTPA) 5. Formative Assessment Cycle	• Growth Mindset https://www.youcubed.org/ • California Common Core Standards in Mathematics-Mathematical Practices: http://www.cde.ca.gov/be/st/ss/documents/ccssmathstandardaug2013.PDF • **Assign HW 1**
Week 2		
2/9	1. Formative and Summative Assessments: Formative Assessment Cycle 2. Formative Assessment Lessons 3. Norman Webb's Cognitive Rigor Matrix and CAASPP (SBAC) 4. CCSS-M Learning Progressions 5. CCSSM Content and Practice Standards	• **HW 1 due** • **Assign HW 2** • **Assign Technology Presentations**
Week 3		
2/16	1. Learning Progressions 2. Developing Unit Plans Part 1 3. Common Core Math Practice: Modeling	• **HW 2 due** • **Assign HW 3/Unit Plan outline**
Week 4		
2/23	1. Developing Unit Plans Part 2 2. Universal Design for Learning 3. Assessment Tasks 4. Rubrics	• **HW 3 due** • **Assign HW 4**
Week 5		
3/2	1. Developing FAC-driven Lesson Plans 2. Bruner's Theory of Representations 3. Teaching Algebra with Manipulatives	• **Unit Plan Outline due** • **Assign HW 5** • **Assign Lesson Plan 1**
Week 6		

3/9	1. Developing FAC-driven Lesson Plans 2. Orchestrating Productive Math Discussions 3. Singapore Bar Model http://www.conceptuamath.com/bar-models/	• **HW 4 due** • **Assign HW 5** • Desmos https://www.desmos.com/
Week 7		
3/16	1. Unit and Lesson Planning: Putting it All Together 2. Geometry and van Hiele Levels 3. Teaching Geometry with Manipulatives 4. Common Core Math Practice 1: Make sense of Problems	• **HW 5 due** • **Lesson Plan 1 due** • **Assign HW 6** • **Assign Technology Presentations** • **Assign Lesson Plan 2**
Week 8		
3/23	**Midterm**	**Midterm**
3/29-4/2	Spring Break	
Week 9		
4/6	1. EL Strategies 2. Academic Language 3. Scaffolding: Language and Mathematical 4. Mathematics Practice 6: Attend to precision Effective Questioning and Gallery Walks	• **HW 6 due** • **Assign HW 7**
Week 10		
4/13	1. Justifying Reasoning: Claim-Evidence-Connection 2. Mathematics Practice 3: Construct viable arguments 3. Technology Presentation #1	• **HW 7 due** • **Assign Unit Plan** • **Lesson Plan 2 Due** • **Assign HW 8**
Week 11		
4/20	Teaching High Leverage Concepts (Fractions, Ratios, and Proportions) Technology Presentation #2	• **HW 8 due** • **Assign HW 9** • **Outline of Idea of Unit Plan Due**

Week 12		
4/27	1. Cooperative Learning (Vygotsky) (group roles p. 35 toolkit) 2. Teaching Modeling 3. Rubrics 4. Technology Presentation #3	• **HW 9 due** • **Assign HW 10** • **Draft of outline of Lesson Plans due**
Week 13		
5/4	1. Reengaging and Reteaching Strategies (read pp. 31-32 in toolkit for homework) 2. Math Talks/Data Talks 3. Analyzing Student Work 4. Technology Presentation #4	• **HW 10 due** • **Assign HW 11** • **Draft of both Assessments due**
Week 14		
5/11	1. Culturally Responsive Teaching 2. Classroom Management 3. Early Assessment Program	• **Draft of Commentary Due**

Final Unit Plan due Wednesday, May 19 11:59 pm