MAE 302: Methods and Materials for Teaching Secondary School Math

Derek Pope
Email: derek.pope@stonybrook.edu
Spring 2021, Tu OR Th 4:45 – 7:35, online synchronously via Zoom
Office hours: Tu/Th 3:30-4:45, and by appointment, via Zoom
Final: Monday, May 17, 5:30-8

**Please note: This is a tentative syllabus and is subject to change based on evolving University constraints for "Coming Back Safe and Strong," as well as on final department decisions and constraints regarding teaching staff and on best practice for online course instruction.*

This is a course in the theory and practice of teaching mathematics at the secondary level. We will learn about the philosophy and goals of mathematics education, with an emphasis on implementation: curriculum development; teaching techniques and styles, learning theories and styles; and lesson planning and assessment. Students will plan an entire unit, the work sample, including lesson plans and assessments.

Course Expectations and Grades:
Course grades will be tentatively determined by the following. The goal for each assignment is to help you learn and apply course material. You will also leave this class with lessons, unit plans, and other resources that you can use in your own future classroom. Grading rubrics will be provided to help you clearly understand expectations and properly assess your own work before submitting it. More specific details on due dates, expectations, and grading rubrics will be given during the semester.

What?	How?	Why?
Active member of a community of learning (20%)	-Be present, on time, to each class; missing more than one class will result in a significant grade reduction. -Actively engage in all class discussions, including your peers' presentations. -Complete all assigned readings and other homework assignments before class. -After each of your peers' lessons, complete the homework assignment they have created and give them constructive, critical feedback to help them improve their practice.	-Everyone benefits from each other's ideas, questions, and feedback during class discussion. -Homework assignments are carefully chosen to give essential practice and reflection, and readings are chosen so that your practice is grounded in solid research. -Through your peers' HW assignments, each of us will have a chance to create and assess authentic work.
Lesson Planning and Teaching (20%)	-Once during the semester, you will plan and present a 20-minute long, constructivist, conceptually focused lessons to your peers. Topics will be randomly assigned. -You will also create, administer, grade, and reflect upon the results of a homework assignment as assessment.	-The presenter will gain confidence in teaching a lesson, as well as practice planning a conceptually focused lesson and assessing student understanding. -Through the presentations and follow-up discussions, the class will review important math concepts and learn various pedagogical and classroom management strategies.
Classroom Management (10%)	-Complete a "journal" documenting the specific strategies and ideas you learned about effective classroom management practices.	-One of the most challenging aspects of teaching is managing the classroom effectively. This will give you a chance to compile many strategies for preempting, and dealing with, problematic behaviors.

Unit planning portfolios (50%)	-Throughout the semester, you will complete a variety of assignments that will contribute to two "portfolios": one middle school unit plan, and one high school unit plan. These assignments will include writing formal tests, creating alternative assessments, and sequencing units of instruction coherently, among others. -Through these unit plans, you will demonstrate: familiarity with various pedagogical strategies; understanding of how to sequence and scaffold a unit of instruction; ability to differentiate instruction and foster equitable environments; and ability to create meaningful assessments of student understanding.	-This will be a chance to put together various elements of your understanding of mathematics, pedagogical techniques, and assessment techniques into two coherent units of study. -By focusing on one high school unit and one middle school unit, you will gain familiarity with the wide range of concepts you are being certified to teach.

Also be sure that you are familiar with the PEP (Professional Education Program) requirements, as outlined here: https://www.stonybrook.edu/commcms/dtale/_files/pep_guide.pdf

Synchronous Online Course Expectations: Due to the COVID-19 pandemic, this course will be taught synchronously online via Zoom. We will make the most of this situation and utilize a variety of technological tools that you will be able to use in your future teaching career. To help facilitate a positive learning experience for all, please adhere to the following practices:

- Video: please keep your video ON during the duration of the class. Be mindful of your attire and background and consider using a neutral virtual background. (As future teachers consider this: if you are teaching a class virtually and students' videos are off, what do you think they might be doing? And how would you feel if their video is on but they are on their beds, or there is distracting activity in the background?)
- Audio: please keep your microphone OFF except when you are participating in a discussion.
- Chat: please only use the chat for correspondence with the instructor or to contribute to a class discussion.
- Unless otherwise stated, each session will be recorded. Please ask permission before recording the session or taking a screenshot.
- You are expected to participate in class discussion and activities in a thoughtful and professional manner, just as if we were face-to-face in a classroom.
- Please check your audio and video before class begins.
- If you have any questions or concerns about these requirements, please email me.

Required Resources:

- Sigler, J. and Hiebert, J. (1999) *The Teaching Gap*
- Boaler, Jo. (2015) *Mathematical Mindsets*
- Access to NYS Common Core Curriculum (https://www.engageny.org/common-core-curriculum),
- Access to the NYS Next Generation Mathematics Standards (http://www.nysed.gov/curriculum-instruction/new-york-state-next-generation-mathematics-learning-standards)
- Desmos and Geogebra apps (a graphing calculator would also be helpful)

Contact: Please feel free to contact me anytime you have a question or concern, or want to provide feedback to me. The easiest way to contact me is through email or through a message on our Google Classroom. Contacts made Monday-Friday before 3pm will be answered within 24 hours.

Learning Standards:

- Candidates demonstrate a deep understanding of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning.
- Students plan and present lessons that demonstrate understanding of the New York State Common Core Standards for Mathematics, including the Standards for Mathematical Practice.
- Teacher candidates summarize, analyze, and critique current research in mathematics education.
- Candidate makes explicit connections to research or theory in justifying instructional plans.

- Students recognize the INTASC critical dispositions and New York State Code of Ethics, they demonstrate critical dispositions and ethics in their interactions with students and colleagues.
- Teacher candidates work with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
- Teacher candidates engage in ongoing professional learning and use evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, and other professionals in the learning community), and adapt practice to meet the needs of each learner.
- Teacher candidates seek appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth and to advance the profession.
- Teacher candidates understand how children learn and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
- Teacher candidates use understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
- Teacher candidates understand the central concepts, tools of inquiry, and structures of the discipline and create learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
- The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
- The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
- The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills and pedagogy as well as knowledge of learners and the community context.
- The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections and to build skills to apply knowledge in meaningful ways.

Learning Outcomes for "Speak Effectively before an Audience:"

1. Research a topic, develop an oral argument and organize supporting details.
2. Deliver a proficient and substantial oral presentation for the intended audience using appropriate media.
3. Evaluate oral presentations of others according to specific criteria.

Student Accessibility Support Center Statement: If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, 128 ECC Building, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: https://ehs.stonybrook.edu/programs/fire-safety/emergency-evacuation/evacuation-guide-people-physical-disabilities and search Fire Safety and Evacuation and Disabilities.

Academic Integrity: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at: https://www.stonybrook.edu/commcms/academic_integrity/

Critical Incident Management: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to

learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Teacher Education Program Mandatory Professional License Disclosure:
https://www.stonybrook.edu/commcms/dtale/guide/looking_for_job.php#mandatorydisclosure