

MAE 311
Introduction to Methods of Teaching Secondary School Math

Derek Pope

derek.pope@stonybrook.edu

Fall 2018, Tu/Th 4 - 5:20

Office: S240C

Office hours: Tu 3:20-4, Th 5:20-6:10, and by appointment

This is a course in the theory and practice of teaching mathematics at the secondary level. Students will discover the benefits of student-centered mathematics teaching, grounded in a constructivist philosophy of learning, and acquire tools for successfully implementing effective teaching strategies. We will analyze the NYS Next Generation Math Standards and learn how to create tasks and lessons that facilitate student mastery of these standards. Students will actively observe and reflect upon the lessons of practicing teachers and will create and teach mathematics lessons to their peers.

Course Expectations and Grades

Course grades will be tentatively determined by the following. More specific details on due dates, expectations, and grading rubrics will be given during the semester.

- Observations: 25%
 - Observe *at least* 36 hours (48 regular class periods) of classroom teaching in secondary schools
 - Half of the hours in middle schools, half in high schools
 - At least half of the hours in high needs schools (schools with a 50% or higher free/reduced lunch rate, or 50% or higher “economically disadvantaged”)
 - Do not observe in any schools you personally attended as a secondary student
 - Be ready to begin observations on the fourth week of the course, the week of September 17th. This means contacting districts and getting any necessary requirements fulfilled (ex., fingerprinting) as soon as possible.
 - Reflections on observations will be coordinated with class discussion. To facilitate this, you should plan to observe at least *6 classes per week* during the 8 weeks of: 9/17, 9/24, 10/1, 10/15, 10/22, 10/29, 11/5, and 11/26.
 - Maintain an electronic journal, using instructor-provided template, to record your observation reflections each week. Specific prompts will be posted and must be included in that week’s reflection. Be ready to discuss your observations in class each week.
 - Remember you are a guest at each school, so be sure to dress and act professionally. Inappropriate or unethical behavior is grounds for course failure and dismissal from the teacher education program.

- Active class participation and homework: 25%
 - Be present, on time, to each class. In order to receive credit for this course, you must not miss more than two scheduled classes.
 - Be actively engaged in all class discussions and activities, including your peers’ presentations. All assigned readings must be carefully completed before class, so that you are ready to thoughtfully discuss them.
 - In addition to your observation journal, you will submit written answers to specific prompts throughout the semester. Unless otherwise stated, homework will be due the class after which it is assigned, and should be submitted through Microsoft Teams.

- Midterm Presentation: 20%
 - Plan and present a lesson to your peers. Your plan and presentation must incorporate teaching strategies that we have learned in class and reflect a constructivist philosophy of learning.
 - Submit a written reflection that includes an analysis of student learning, with specific evidence from the lesson.

- Will tentatively take place in class during the weeks of 10/16 and 10/23.
- More specific requirements and rubrics will be given in class.
- Final Presentation: 20%
 - Plan and present a lesson to your peers. This lesson should demonstrate that you have reflected upon your midterm presentation and have implemented specific changes based on instructor's and peers' feedback.
 - More specific requirements and rubrics will be given in class.
- Final Essay: 10%
 - Write an essay that effectively communicates your understanding of various course topics.
 - Due on or before December 18th.
 - More specific requirements and rubrics will be given in class.

Required Resources

- Sigler, J. and Hiebert, J. (1999) *The Teaching Gap*
- Boaler, J. (2016) *Mathematical Mindsets*
- New York State Next Generation Mathematics Learning Standards
<http://www.nysed.gov/common/nysed/files/nys-next-generation-mathematics-p-12-standards.pdf>
- Desmos and Geogebra apps (a graphing calculator would also be helpful)

Learning Standards

- Candidates demonstrate a deep understanding of how students learn mathematics and of the pedagogical knowledge specific to mathematics teaching and learning.
- Teacher candidates 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.
- Teacher candidates recognize the INTASC critical dispositions and ethical standards of the New York State Code of Ethics, they demonstrate critical dispositions and ethics in their interactions with students and colleagues.
- 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 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 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 understand the central concepts, tools of inquiry, and structures of the discipline and creates 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.
- The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his or her practice, particularly the effects of his or 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.
- The teacher candidate seeks 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.

Disability Support Services (DSS) Statement:

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC (Educational Communications Center) Building, room 128, (631) 632-6748. They will determine with you what accommodations, if any, 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 Disability Support Services. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>

Academic Integrity Statement:

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 are 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 http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management Statement:

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs 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.