

MAE 520: Advanced Methods of Teaching Secondary School Mathematics

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Edmodo: <https://edmo.do/j/tbyzxi>

Fall 2017, Tu/Th 4 - 5:20

Final exam: Monday, December 18, 2:15-5

Office hours (in S240C): Tentatively Tu 3-4, Th 3-4, Th 5:20-6:20

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 and unit plans 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 (25%)	<ul style="list-style-type: none">-Be present, on time, to each class; missing more than two classes will result in a significant grade reduction.-Be actively engaged in all class discussions, including your peers' presentations.-Complete all assigned readings and other homework assignments before class.-Reflect on what you've learned each week on class reflection sheets, which will be collected periodically.-After each of your peers' lessons, you will 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. By reflecting on what you've learned each week, along with your own participation, you will learn the course material better. You will also have a clearer sense of whether or not you are meeting course expectations.
Lesson Planning and Teaching (30%)	<ul style="list-style-type: none">-Twice during the semester, you will plan and present 10-15 minute long, constructivist, conceptually-focused lessons to your peers.-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 strategies.
Midterm: collaborative unit plan (20%)	You will submit a complete unit plan as part of a group, to include outlines of at least 8 lessons (and 2 detailed lesson plans: first lesson and one middle lesson) demonstrating a variety of pedagogical strategies, a constructivist approach toward teaching and learning, an understanding of how to sequence and scaffold a unit, and attention to differentiating instruction for students with various special needs. Your unit plan will also include a culminating assessment, and explain how you will informally assess students throughout the unit. Finally, you will give a 10-15 minute presentation of your unit plan to your peers.	This will be a chance to put together various elements of your understanding of mathematics, pedagogical techniques, and assessment techniques into a coherent unit of study. You are doing this cooperatively so that your group members can learn from one another, work off of each other's ideas, and strengthen each other's practice.

Final: individual unit plan, summary, and exit interview (25%)	You will submit an individual unit plan as a final assignment, due at the end of semester. Requirements will be given later in the semester. You will defend your instructional choices to me in an exit interview on the day of the final exam.	This culminating assignment will be your opportunity to provide evidence of your understanding of, and ability to apply, the course material learned from Methods 1 and 2.
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Also be sure that you are familiar with the PEP (Professional Education Program) requirements, as outlined here: <http://www.stonybrook.edu/pep/guide/requirement.shtml>

Required Resources

- Sigler, J. and Hiebert, J. (1999) *The Teaching Gap*
- Grades 6-8 and grades 9-12 NYS Common Core Mathematics Curricula (bring hard copies to class)
- A graphing calculator (or computer program/app capable of graphing)

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.

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.

