

Mathematics 67-490 (3 credits)
Senior Seminar for Math Teaching
Spring 2020

Instructor: Dr. Amy Parrott

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Office Hours: I am available: Monday, Wednesday, and Friday 1:40-2:30. Most days I will also be available after class for about 15 minutes. I am happy to meet with you during other times if these do not work with your schedule. Please see me after class or send me an e-mail to schedule a time.

Catalog Course Description: Seminar emphasizing problem solving and mathematical modeling in Elem/Middle School, and Secondary programs. Survey and study of research literature on the teaching and learning of mathematics, and connections among the other courses in the mathematics minor and major programs. Experience with units from demonstration projects in school curriculum materials. Prerequisite: A major in elementary education and completion of 16 units (crs.) toward a minor in mathematics, or a major in mathematics and completion of 30 credits toward the major.

Department Learning Outcomes: Upon successful completion of the course, students are expected to have the ability to:

- Describe the nature and cultural practices of mathematics.
- Develop an awareness and understanding of current theories of learning (e.g. constructivism) and recognize their implications for teaching and learning.
- Read and make sense of relevant research literature on the learning and teaching
- Make sense of the mathematical thinking and misconceptions of school children (e.g., as presented through video cases).
- Identify the key mathematical ideas and practices in a middle-grades math lesson.
- Use mathematical conventions and precise language to communicate mathematical ideas.
- Develop and implement lessons that engage students in mathematical thinking and the development of understanding.
- Reflect on and learn from their own and others' teaching practices and experiences.

The content of the course is guided by the mathematics content and practices as described by the Common Core State Standards for Mathematics, and by the National Council of Teachers of Mathematics. This course focuses on the nature of mathematical behavior; learning theory; the mathematical thinking and misconceptions of elementary and middle grades children; and on creating and implementing student-centered mathematics lessons.

Format: All of the activities in this course are designed for you to gain a deeper understanding of mathematics and teaching mathematics. During the first half of the semester, we will discuss a prepared reading daily. You are expected to read the assignment carefully prior to coming to class and to participate fully in the discussion. Based on our reading and discussions, you will better understand the nature of mathematics; you will explore the constructivist theory of learning; and you will gain a background in the research literature on the learning and teaching of mathematics. The second half of the semester will be spent discussing additional readings and designing and implementing the ideas from our readings. We will explore school mathematics curriculum materials to draw connections among mathematical topics and to discuss the learning and teaching of mathematics, and you will have the opportunity to plan and present mathematics lessons based on those materials to our class. You will be responsible for leading two lessons. You will also prepare and lead a number talk.

Materials: You will need a notebook specifically for this class where you will be recording your responses to questions about the readings as well as ideas for teaching. You will also need the following books:

- Boaler, J. *Mathematical Mindsets* Jossey-Bass, San Francisco, CA. (2016)
- Boaler, J, and Humphreys, C. *Connecting Mathematical Ideas: Middle School Video Cases to Support Teaching and Learning* Heinemann, Portsmouth, NH. (2005)

Grading: Grades will be determined based upon how well you demonstrate your understanding in six key “Big Ideas”. Your final grade will be determined by your overall performance, which is the weighted average of your performance on each Big Idea as follows:

30% Reflections on learning
15% Reflections on own growth
10% Analysis of others
10% Mathematical understanding
10% Lesson planning
10% Teaching
15% Contribute to our Mathematical Community

The chart below lists each specific Big Idea and specific expectations for each idea.

490 Big Ideas	Expectations
Reflections on learning	Journals show that you have thought critically and thoroughly about each assigned reading Evaluations of curriculum units demonstrate ability to apply readings appropriately
Reflections on own growth	Reflections on your lessons and number talk demonstrate that you fully analyzed your teaching as well as articulate what you learned about yourself and the mathematical thinking of others
Analysis of others	Using our readings as a guide, provide constructive critiques of others' teaching
Mathematical understanding	Demonstrate command of mathematical content through writings as well as teaching presentations Instructional plans and reflections demonstrate an understanding of mathematical practices and content evidenced by a correct interpretation of the CCSS
Lesson planning	Lesson plans appropriately address required areas and demonstrate an understanding of best instructional practices Adapt mathematical exercises to promote problem solving and identify ways to help students understand mathematics
Teaching	Number talk and lesson presentations encourage student engagement, focus on mathematics, and consistently provide a high press for understanding
Contribute to our Mathematical Community	Fully participate in and constructively contribute to discussions and activities including listening to, respecting, and considering others' contributions; sharing own thoughts, ideas, & reasoning; asking & answering questions; and being on-task & working well with group members Complete assignments in a timely manner

You will have many opportunities to demonstrate your mastery of these Big Ideas. You will keep a journal where you will respond to prepared questions. You will observe and evaluate lessons. You will prepare, present, and reflect upon a number talk. And, you will prepare, present, and reflect upon two lessons from mathematics curriculum. Additionally, there will be other assignments for you to demonstrate your learning.

Grades will be no stricter than the following:

A: 93 - 100 %	A-: 90 - 92 %	B+: 88 - 89 %
B: 83 - 87 %	B-: 80 - 82 %	C+: 78 - 79 %
C: 70 - 77 %	D+: 68 - 69 %	D: 63 - 67 %
D-: 60 - 62 %	F: 0- 60 %	

Resources: There are many resources available to help you succeed in this course as well as thrive at UWO. If you are struggling with this course, please talk with me during office hours or make an appointment to meet outside of the scheduled times. Additionally, the following places are here to help you:

- Dean of Students Office: If you are encountering a problem and you are not sure where to turn, contact the Dean of Students Office. Whether it is an issue in a class or a problem with your landlord, they can help with support and advocacy. The office is located in Dempsey 125 <https://uwosh.edu/deanofstudents/>
- Food Assistance: If you are in need of food assistance, your Oshkosh Student Association (OSA) runs the campus food pantry, The Cabinet. It is open to all UWO students who express a need for food assistance. It is located in the lower level of the Reeve Memorial Union. Operational hours and additional information can be found on the OSA's Services <http://uwosh.edu/osa/services>
- Other Resources: Please check out <http://www.uwosh.edu/resources/> for additional resources available to you.

Academic Policies:

You are expected to behave with integrity and honor. The official UWO policy regarding academic misconduct can be found at: <https://www.uwosh.edu/deanofstudents/university-policies-procedures/academic-misconduct>

Students are advised to see the following URL for disclosures about essential consumer protection items required by the Students Right to Know Act of 1990: <https://uwosh.edu/financialaid/consumer-information/>.

The University of Wisconsin Oshkosh supports the right of all enrolled students to a full and equal educational opportunity. It is the University's policy to provide reasonable accommodations to students who have documented disabilities that may affect their ability to participate in course activities or to meet course requirements.

Students are expected to inform Instructors of the need for accommodations as soon as possible by presenting an Accommodation Plan from either the Accessibility Center, Project Success, or both. Reasonable accommodations for students with disabilities is a shared Instructor and student responsibility. The Accessibility Center is part of the Dean of Students Office and is located in 125 Dempsey Hall. For more information, email accessibilitycenter@uwosh.edu, call 920-424-3100, or visit <https://www.uwosh.edu/deanofstudents/Accessibility-Center>