

## **Mathematics 67- 490, 3 credits**

### **Senior Seminar for Elementary and Middle School Programs**

**Prerequisites:** You must have completed each of 110 (Number Systems), 211 (Geometry and Measurement) and 217 (Data Exploration) with a C or better, *and* you must have completed at least two of the four electives in the middle school mathematics minor.

**Course Objectives:** The first half of this course is centered on understanding and exploring four big questions:

- What is mathematical behavior?
- How do humans learn mathematics?
- What is the culture of school mathematics?
- What does the research tell us about teaching and learning?

Based on our reading and discussion of work on these questions, you will understand the nature of mathematics; you will explore the constructivist theory of learning; you will gain a background in the research literature on the learning and teaching of elementary and middle grades mathematics and the NCTM National Standards for school mathematics for Grades 5-8.

In the second half of the course, we will explore elementary and middle school mathematics curriculum materials, and you will have the opportunity to plan and present mathematics lessons based on those materials to the class. The mathematical content of this course will include topics from Number Systems, Geometry, and Data Exploration and Analysis. We will use the curriculum materials to draw connections among those topics and to discuss the learning and teaching of mathematics.

**Instructor:** Dr. Jennifer Szydlik

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**Office Hours:** Monday and Wednesday: 11:30 – 12:30; Tuesday: 1:50 – 2:50; Thursday: 12:40 – 1:40; and most days after class. Please don't let yourself fall behind. I am happy to meet with you. Let me know if you would like an appointment.

#### **Texts and Materials:**

- 1) *Principles and Standards for School Mathematics*. (2000). NCTM, Reston, VA. (This text is available free online for a three-month period at <http://standards.nctm.org/>.) You may also purchase a hard copy at the site if you prefer to do so.
- 2) *Course Materials for Mathematics 490: The Senior Seminar for Elementary and Middle School Programs* by Szydlik, Beam, & Kuennen (available at the bookstore).
- 3) *Connecting Mathematical Ideas: Middle School Video Cases to Support Teaching and Learning* by Jo Boaler and Cathy Humphreys (2005). Heinemann, Portsmouth, NH. You can purchase this at [www.heinemann.com](http://www.heinemann.com).

**Instructional Methodology:** In this seminar course, we will often discuss a prepared reading. You are expected to read the assignment carefully prior to coming to class and to participate fully in the discussion. In addition, you will prepare and lead lessons on much of the course material. Each team of students will be responsible for leading two 45-minute lessons from the curriculum materials. You will prepare content-rich, hands-on lessons for the rest of the class or for

elementary school children through the Lighted Schoolhouse Program.

**Evaluation:** You will write a 6-8-page paper on a topic of your choice -- and based on the readings we will complete during the first 5 weeks of the course. This paper will be a scholarly synthesis and extension of the work done in class. This paper is worth 25% of your course grade.

You will prepare and present two lessons to the class. Each lesson (along with your self-evaluation of the lesson) will be worth 25% of your course grade. The following questions will be used in my (and your) evaluation:

- 1) Was the mathematical content of the presented lesson clear, important, appropriate and accurate?
- 2) To what extent did the lesson succeed in conveying that content to the class?
- 3) To what extent did the leaders make use of what we have learned about children's learning, thinking, and misconceptions in the content domain?
- 4) Were the lesson leaders prepared for the questions and ideas that arose from the lesson?
- 5) Was the lesson itself well prepared and executed?

Your careful reading of assigned chapters and papers, and your daily preparation for and contribution to the class discussions is very important. It is your obligation to demonstrate to me that you have both completed and *thought about* the readings and assignments (otherwise I will assume you have not). You will do this in two ways: First, you will contribute knowledgeably to the class conversation. Second, you will keep a journal that I will collect regularly throughout the term. In that journal, you will write ideas, questions, comments, problem solutions, and other things relevant to the class content. This journal is worth 25% of your course grade and will be evaluated several times throughout the term.

Summary:	25%	Research Paper in mathematics education
	25%	Lesson Presentation #1
	25%	Lesson Presentation #2
	<u>25%</u>	<u>Journal and Participation</u>
	100%	

Grades will be kept on D2L. If you ever find an error, let me know. The grading scale will be as follows (after rounding to the nearest percent):

A	93 - 100% of the course points
A-	90 - 92%
B+	87 - 89%
B	83 - 86%
B-	80 - 82%
C+	77 - 79%
C	73 - 76%
C-	70 - 72%
D	60 - 69%
F	0 - 59%