EDUC 263E: Quantitative Reasoning and Mathematics I
Stanford University Summer 2014
Mondays 3:30-6:05
Wednesdays 3:15-6:05
CERAS 204

Instructors:

Melissa Kemmerle  Jen Munson
email: kemmerle@stanford.edu  email: jmunson@stanford.edu
Office: CERAS 227  Office: CERAS 213
Office Hours: by appointment  Office Hours: by appointment
Phone: 505-715-1965  Phone: 301-787-2489

Course Objectives:

The EDU263E (Quantitative Reasoning and Mathematics I) course is Part 1 of the three-course sequence EDU263E, F, and G. This sequence is designed to provide teacher candidates with a coherent set of experiences for mathematics teaching and learning in elementary schools. Through assigned readings, classroom discussions, content rich mathematics activities, and assignments that require data collection in your field placement, you will be supported as you make sense of how to approach the incredibly important profession of teaching. Teaching is a complex profession that requires teachers to combine different forms of knowledge and practice to create meaningful learning experiences for their students. In this sequence, we will build connections among the different types of knowledge necessary for mathematics teaching (e.g., knowledge of content, standards, student learning, learning theories, assessment) in practice. Teaching will be considered a collaborative, reflective, and constantly developing process that is driven by research. We will develop an understanding of effective teaching practices in connection to theory on student learning of mathematics.

For EDU263E this summer, our course experience will focus on student learning of number sense in elementary schools. Through thinking about ourselves as teachers, examining classroom culture and structure, conducting clinical interviews on number concepts, and teaching a mini math talk lesson, we will set the stage for our development as elementary mathematics teachers.

Please note: We will adhere to the syllabus as much as possible. However, we are sensitive to the needs of the class, therefore, the syllabus is subject to change.
Course Assignments:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mathstory Assignment</strong></td>
<td>Sunday, July 6th</td>
</tr>
<tr>
<td>Reflect on your past and present experiences as a math learner and how these experiences impact your identity and beliefs as a teacher.</td>
<td></td>
</tr>
<tr>
<td><strong>Student Interview Analysis</strong></td>
<td>Tuesday, July 15th</td>
</tr>
<tr>
<td>Interview several of your students to learn about their attitudes/mindset about math as well as how they approach specific math problems. Analyze your findings for trends.</td>
<td></td>
</tr>
<tr>
<td><strong>Math-Talk Lesson and Reflection</strong></td>
<td>Sunday, July 27th</td>
</tr>
<tr>
<td>Plan and teach a small group lesson focused on engaging students in rich math talk. Video-tape your lesson. Reflect on 1) how talk supports student understanding and 2) the challenges you faced while leading the lesson.</td>
<td></td>
</tr>
<tr>
<td><strong>Participation</strong></td>
<td>Every week</td>
</tr>
<tr>
<td>Our whole class learning is enhanced when everyone reads carefully and fully participates in class activities and discussions.</td>
<td></td>
</tr>
</tbody>
</table>

Course Grades:

Course grades will be based on attendance, participation in classroom activities (discussion about the readings, math content activities, etc.), punctuality, and the quality and completion of the assignments for the course. We will make our expectations clear and will support you in meeting or exceeding them.

Course Readings:


<table>
<thead>
<tr>
<th>Date</th>
<th>Topics and In-Class Activities</th>
<th>Readings</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>Pedagogy Focus: The relationship between pedagogy, beliefs about math, and math identity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>Math Focus: Fluency vs. memorization of math facts; Games that promote mathematical learning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Equity Focus: Students’ past experience with math impacts the way they approach and learn math today.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Math focus: Making sense of mathematics through problem solving.  
Equity Focus: Deep understanding supported by discourse, exploration, and multiple solution pathways serves all learners; Technology issues. | VW Chapter 1: Teaching Mathematics in the 21st Century  
VW Chapter 2: Exploring What it Means to Know and Do Mathematics |
|---|---|---|---|
| Class 3 | July 7 | Pedagogy Focus: Using number talks to develop flexibility.  
Math Focus: Early number concepts and number sense; Exploring addition, subtraction, multiplication, and division through number talks.  
Equity Focus: Supporting multiple models and solution pathways gives learners access to tasks and learning; Creating a classroom culture that supports collaboration and shared understanding. | VW Chapter 8: Developing Early Number Concepts and Number Sense  
VW Chapter 9: Developing Meanings for the Operations  
Mathstory Assignment: due Sunday, July 6th |
| Class 4 | July 9 | Pedagogy Focus: Supporting a progression of strategies from concrete to pictorial to abstract; Patience and empathy for our students.  
Math Focus: Place value; Our base-10 system.  
Equity Focus: Students develop understanding through an evolution of strategies that are individual and connected. Maintaining the connections from one strategy to the next allows students to build understanding. | VW Chapter 11: Developing Whole-Number Place Value Concepts |
| Class 5 | July 14 | Pedagogy Focus: Evaluating the cognitive demand of the problems we give our students; Planning problem-based lessons and facilitating discourse; How much to tell and not tell?  
Math Focus: Learning through cognitively demanding math problems.  
Equity focus: A value on struggle and mistakes creates an even playing field for learners. | VW Chapter 3: Teaching Through Problem Solving  
VW Chapter 4: Planning in the Problem-Based Classroom |
| Class 6 | July 16 | **Pedagogy Focus**: Planning problem-based lessons and facilitating discourse.  
**Math Focus**: Addition and Subtraction.  
**Equity Focus**: Listening to and reflecting on student thinking puts students at the center of teaching. | **VW Chapter 12**: Developing Strategies for Addition and Subtraction | **Student Interview Analysis**: due Tuesday, July 15th |
|---|---|---|---|---|
| Class 7 | July 21 | **Pedagogy Focus**: Modeling with mathematics.  
**Math Focus**: Multiplication and Division; Algebraic thinking.  
**Equity Focus**: Emphasizing sense-making instead of memorized procedures and algorithms provides access to more students; Instilling mathematical confidence in students. | **VW Chapter 13**: Developing Strategies for Multiplication and Division Computation  
**VW Chapter 14**: Algebraic Thinking: Generalizations, Patterns, and Functions |---|
| Class 8 | July 23 | **Pedagogy Focus**: Formative assessment as the engine for instruction,  
**Math Focus**: Assessment Problems (formative to standardized tests)  
**Equity Focus**: Using assessment to drive instruction enables differentiated, responsive instruction. | **VW Chapter 5**: Building Assessment into Instruction |---|
| Class 9 | July 28 | **Pedagogy & Equity Focus**: Pedagogical strategies for promoting differentiation, choice, voice, access, rigor, and responsiveness  
**Math Focus**: More addition, subtraction, multiplication, division.  
**Equity Focus**: Considering the needs of specific populations: ELLs, students with disabilities, gifted students, and issues of gender; Homework. | **VW Chapter 6**: Teaching Mathematics Equitably to All Children | **Math-Talk Lesson and Reflection**: due Sunday, July 27th |