

# Math 499E

*Senior Seminar (3 credits)*  
Fall 2011

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## **Course Rationale:**

In this course mathematics teaching candidates will show their ability to solving and pose problems aligned with the Washington State Mathematics Endorsement and NCTM teaching standards. Candidates will discuss how the mathematics curriculum is organized around big ideas and essential questions. Finally, candidates will learn how to develop and implement assessment tasks to identify their student's mathematical performance and plan further instruction. The rubrics for these pedagogy activities are aligned with the Washington State TPA for secondary mathematics (assessment used during student teaching).

Most mathematics-teaching candidates understand why they need to be able to do and explain the even more mathematics than they will be required to teach, but many teachers do not understand why they should teach mathematics from a problem solving approach. Hiebert and others describe one of the essential principles for mathematics instruction as building understanding in mathematics: Make the subject problematic. Instruction ought to allow students to wonder why things are, to inquire, to search for solutions, and to resolve incongruities. In a problem-based approach, students are expected to solve problems or make sense of situations for which no-well defined routines or procedures exist. Although no one claims the existence of one correct way to teach, using good problems to plan instruction with the focus on student thinking and reasoning is one strategy that holds promise. Gail Burrill as summarizes problem-based instruction in its simplest; Good teachers foster an environment in which the students do the work!

## **Course Description: What are the goals and outcomes of this course?**

### Course Goals

1. Assess the student's mathematical knowledge in mathematical content areas.
2. Give the student experience in making connections between mathematical idea and applications.
3. Create learning activities were problems are posed to engage students in meaningful mathematics.
4. Create assessment methods that give clear insight into the students understanding of mathematical concepts.
5. Use student work to evaluate students understanding and give feedback for further learning.
6. Use assessment information to plan next step instruction so that students will meet state or local standards/targets.
- 7.

### Learner Outcomes--Student will be able to:

- Solve problems in each of the content areas in the mathematics-teaching program.
  - Numbers, Number Theory, and Number Systems
  - Analysis using functions
  - Algebra and Functions
  - Geometry and Spatial Visualization
  - Discrete Mathematics
  - Probability and Statistics
  - Calculus
- Solve problems that arise in mathematics and in other contexts.
- Explain connection between mathematical ideas and real world applications. (WA TPA M1)
- Monitor and reflect on process of mathematical problem solving, communication, reasoning, and making connections.

- Create lessons where problems are posed that engage students in a specific mathematical concept or process. (WA TPA M1)
- Create assessment methods that clearly reveal their students understanding of lessons outcomes. (WA TPA M6)
- Evaluate students understanding and give feedback to guide instruction and correct misconceptions. (WA TPA M8)
- Plan next step instruction so that students will meet state or local standards/targets. (WA TPA M7)
- Reflect on the philosophical and pedagogical practices of teaching mathematics.

Candidates will be assigned tutoring/teaching positions after the first week. Candidates can expect to observe at first, tutor student with a specific protocol, and finally teach at least one lesson. Because we will be spending between 20 to 16 hours out of class working with students between 8 and 10 class meeting will be cancelled. These exact days will be worked out in advance during the second week of class.

**Course Text and equipment:** Blackboard Course Math 499E and a TI 83+ graphing calculator is required to solve and teach the problems. Livetext account uses the Teaching Secondary Mathematics Portfolio.

**Assessment:** Students will show their ability to meet the performance outcomes by completing the following assessments:

Assessments	Points
6 exams (2 small @ 20 points and 4 large@40 points)	200
Lead discussion on a math content target	20
Tutoring Professionalism	40
Tutoring documentation, reflections, and assessments (Blog)	100
Tutoring segment commentary - WA TPA Rubrics (Livetext)	100
Lesson planning documentation, reflection, and assessment (Blog)	50
Lesson planning commentary - WA TPA Rubric (Livetext)	50

Grading--Grades will be determined by the following percents:

93-100% = A, 90-93% = A-, 87-90% = B+, 83-87% = B, 80-83% = B-, 77-80% = C+, 73-77% = C, 70-73% = C-, 67-70% = D+, 63-67% = D, 60-63% = D-, 0-60% = F.

**Schedule/Rules:** The instructor has a class schedule for the quarter but it is subject to change depending on the needs of the students. If a student misses class, it is their responsibility to find out what was covered announced or assigned. In case of emergencies, it is their responsibility to contact the instructor as soon as possible. If a course deadline was missed, assessment alternatives are left up to the discretion of the instructor.

**How to succeed:** Take the responsibility for your own achievement of these performance objectives. Use the activities, assignments, assessments and people such as the instructor to insure that you understand the mathematical teaching concepts and can demonstrated this understanding in the form of the performance objectives.

"Students with disabilities who wish to set up academic adjustments in this class should give me a copy of their "Confirmation of Eligibility for Academic Adjustments" from the Disability Support Services Office as soon as possible so we can meet to discuss how the approved adjustments will be implemented in this class. Students with disabilities without this form should contact the Disability Support Services Office, Bouillon 205 or dssrecept@cwu.edu or 963-2171 immediately."