

## COURSE SYLLABUS

### MAT 927 Teaching Mathematics to English Language Learners

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**Number of Units:** 3 semester units

#### Course Description:

This course will introduce teachers to specific strategies to engage English language learners in mathematics learning and understanding. Teachers will explore current research-based strategies proven to support English language learners in both mathematics and language development. Teachers will analyze mathematics teaching examples involving the development of academic language, the use of concrete materials, and the importance of visual learning. Course readings and assignments will support teachers as they design and deliver mathematics instruction that incorporates these strategies.

Throughout the course, teachers will have multiple opportunities to connect current research to their own classroom practice. All of the readings and activities included in this course support the principles and standards communicated by the National Council of Teachers of Mathematics.

#### Course Materials:

Coggins, D., Kravin, D., Coates, G.D., & Carroll, M.D., *English Language Learners in the Mathematics Classroom*. Corwin Press, 2007

“Teaching Mathematics to English Language Learners.” Position Statement, NCTM, 2008.

Irujo, S. (Mar/Apr 2007). Teaching math to English Language Learners: Can research help? *ELL Outlook*.  
[http://www.coursecrafters.com/ELL-Outlook/2007/mar\\_apr/ELLOutlookITIArticle1.htm](http://www.coursecrafters.com/ELL-Outlook/2007/mar_apr/ELLOutlookITIArticle1.htm)

Irujo, S. (May/June 2007). So just what is the academic language of mathematics. *ELL Outlook*.  
[http://www.coursecrafters.com/ELL-Outlook/2007/may\\_jun/ELLOutlookITIArticle1.htm](http://www.coursecrafters.com/ELL-Outlook/2007/may_jun/ELLOutlookITIArticle1.htm)

Irujo, S. (Nov/Dec 2007). Putting it all together: Integrating academic math language into math teaching. *ELL Outlook*.  
[http://www.coursecrafters.com/ELL-Outlook/2007/nov\\_dec/ELLOutlookITIArticle2.htm](http://www.coursecrafters.com/ELL-Outlook/2007/nov_dec/ELLOutlookITIArticle2.htm)

The following journal articles are used with permission and available in pdf format in the course management system.

Murrey, D. L. "Differentiating Instruction in Mathematics for the English Language Learner." *Mathematics Teaching in the Middle School*, 14(3).

Wiest, L. R. "Problem Solving Support for English Language Learners." *Teaching Children Mathematics*, April 2008.

### **Course Requirements:**

To complete this course satisfactorily, students will complete the assignments outlined in the Schedule of Topics and Assignments section of the syllabus.

In summary, students will

- 1) Reflect on personal experiences with English language learners.
- 2) Identify what research says about supporting the math development of English language learners.
- 3) Explore the NCTM process standards; select a topic/standard from current mathematics curriculum and create a student-centered contextualized investigation.
- 4) Reflect on implementing specific strategies that support academic language acquisition.
- 5) Articulate key insights relating to seven essential strategies for mathematics instruction for English language learners.
- 6) Complete an English language learner strategy planning map for a current mathematics curriculum lesson.
- 7) Teach and reflect on a lesson that incorporates essential English language learner strategies.
- 8) Engage in thoughtful conversation about English language learner strategies with a colleague.

### **National Standards:**

This course is based upon the following standards:

Mathematical process standards proposed by NCTM:

Problem Solving:	Students identify and solve problems that arise from a variety of experiences and encompass connected mathematical ideas. They analyze problems and apply a wide range of strategies in flexible ways.
Reasoning and Proof:	Students make conjectures (informed guesses), express these conjectures in multiple ways (through language and other forms of representation), and analyze and evaluate their reasonableness.
Communication:	Students organize their thinking by expressing their ideas clearly, and by considering and analyzing the

	ideas of others.
Connections:	Students recognize the connections among mathematical ideas and across experiences. They acknowledge, appreciate, and apply mathematical ideas outside the mathematics curriculum.
Representation:	Representation is both a process (to represent) and a product (or artifact). Representations include such forms as symbols, pictures, charts, models, and graphic displays. Representations are not ends in themselves, but tools for understanding and communication.

NBPTS five core propositions:

Proposition 1: Teachers are Committed to Students and Learning	Dedication to making knowledge accessible to all students; belief that all students can learn; recognition of the individual differences that distinguish students from one another
Proposition 2: Teachers Know the Subjects They Teach and How to Teach Those Subjects to Students.	Mastery over the subject(s) they teach; familiarity with the skills gaps and preconceptions students may bring to the subject; use of diverse instructional strategies to teach for understanding.
Proposition 3: Teachers are Responsible for Managing and Monitoring Student Learning.	Effective instructional delivery; use of range of instructional techniques; organization of instruction to meet instructional goals; assessment of the progress of individual students as well as the class as a whole; use of multiple methods for measuring student growth and understanding; clear explanations of student performance to parents.
Proposition 4: Teachers Think Systematically about Their Practice and Learn from Experience.	Willingness to try new things; familiarity with learning theories and instructional strategies; critical examination of teaching practice on a regular basis to deepen knowledge, expand repertoire of skills, and incorporate new findings into practice.
Proposition 5: Teachers are Members of Learning Communities.	Collaboration with others to improve student learning; involvement with other professionals regarding instructional policy, curriculum development and staff development.

Students will be required to reference their respective state mathematics content standards and ELL standards for specific assignments. These standards can be found online at: <http://www.educationworld.com/standards/>

## **Learning Objectives/Outcomes:**

By the end of this course, students will be able to:

1. Demonstrate through written reflection an understanding of current research on essential strategies that support English language learners in mathematics instruction (NCTM Process Standards: Communication; NBPTS Prop. 1, 2)
2. Summarize and implement strategies that support academic language acquisition in mathematics (NCTM Process Standards: Communication, Representation; NBPTS Prop. 4)
3. Design, teach, and reflect on math lessons which incorporate essential strategies for English language learners (NCTM Algebra Standards; NBPTS Prop. 2)
4. Examine their mathematics curriculum and modify lessons to engage students in contextualized problem solving (NCTM Process Standards: Connections, Problem Solving, Reasoning & Proof; NBPTS Prop. 3, 4)
5. Collaborate with peers and colleagues at their school/district sites to share insights, strategies, and deepen their professional practice (NBPTS Prop. 5)

## **Schedule of Topics and Assignments:**

Assignment rubrics found in the course management system provide detailed expectations for the quality of work submitted.

### **1) Getting Started**

Personal experiences with English language learners in the math classroom

### **2) Looking at Research**

What does research say about how teachers can effectively support the mathematics development of English language learners?

### **3) Culture and the English Language Learner**

Cultural considerations and orientation

### **4) Supporting Academic Language Acquisition**

Principles and strategies which support language learning and vocabulary development

### **5) A Focus on Problem Solving**

Student investigation and support strategies

### **6) Essential Instructional Strategies for English Language Learners**

Research, examples, scenarios

### **7) Designing Mathematics Instruction**

Planning and implementing effective instruction

### **8) Teaching and Reflecting**

Apply to your own classroom

## 9) Reflecting on Your Learning

Develop a checklist, create presentation, reflective conversation with colleague

### Evidence of Learning:

- 1) Student demonstrated critical thinking and thoughtful engagement with the course objectives through reflective written assignments. (Assignments 1, 2, 4, 5, 7, 8)
- 2) Student applied new learning to teaching practice through thoughtful lesson design and reflection. (Assignments 3, 6, 7)
- 3) Student identified key strategies and made appropriate connections to state/local standards and mathematics teaching in general. (Assignments 5, 6)
- 4) Student demonstrated effective implementation of English language learner strategies in mathematics lesson planning and teaching. (Assignments 6 & 7)
- 5) Student demonstrated appropriate and effective collaboration with school site community. (Assignment 8)

### Instructor/Student Contact

Since it is my hope that this course is a meaningful, interactive experience for students, there will be frequent course updates, notes from the instructor, and responses to assignment submissions.

### Grading Policies and Rubrics

Evaluation:

Written Responses	30
Contextualized Investigation	10
Chapter Insights & Summaries	30
Lesson Map & Teaching Reflection	20
Strategy Checklist	5
Peer Reflection	5

100%-90% = A

89%-80% = B

79% or below = no credit

Students who take the course for credit/no credit must earn a 80% or above to earn credit. Students who enroll in the course for a letter grade must achieve a grade of "A" or "B." Coursework that earns below a "B" mark will not receive credit; this applies to both the credit/no credit and the letter grade option.

**Assignment Rubrics will provide detailed expectations regarding each type of assignment.**

### References:

Additional resources will be included in the course management system.

**Policy on Plagiarism:**

“All people participating in the educational process at Fresno Pacific University are expected to pursue honesty and integrity in all aspects of their academic work. Academic dishonesty, including plagiarism, will be handled according to the procedures set forth in the Fresno Pacific University Catalogue.”

“Graduate level course work reflects Fresno Pacific University’s Desired Student Outcomes as it applies to professional development to demonstrate the following:

- Oral and written communication in individual and group settings
- Content knowledge, and application of such knowledge in the student’s area of interest to affect change
- Reflection for personal and professional growth
- Critical thinking
- Cultural and global perspectives to understand complex systems
- Computational/methodological skills to understand and expand disciplines, including an understanding of technological systems”