Center for Professional Development
1717 S. Chestnut Ave.
Fresno, CA 93702-4709
(800) 372-5505
http://ce.fresno.edu

Independent Study Online Course Syllabus

Course Number: MAT 932
Course Title: Using Rich Math Tasks in the Classroom

X Online ☐ Distance Learning

Instructor: Paul Reimer **Phone number:** 559-916-1314 **Email:** paulreimer@me.com **Web:** reimermath.com	**Units: 3** **Grade Level: K-12**

Course Description

This online course will introduce teachers to specific strategies for engaging students in meaningful problem solving using rich mathematical tasks. The eight Common Core Standards for Mathematical Practice require students to think critically as they apply their skills and knowledge to mathematical situations. Rich mathematical tasks present students with the opportunity to conjecture and reason, explore and model, and collaborate and communicate about mathematical thinking. Teachers will explore the rationale for developing a math-task culture as well as develop strategies for selecting, planning, and implementing tasks in the classroom. Teachers will reflect on tasks presented in their own classrooms; they will also network with the wider teaching community as they share and evaluate research, resources, lessons, and strategies.

Throughout the course, teachers will have multiple opportunities to connect current research to their own classroom practice. All the readings and activities included in this course support the implementation of Common Core Mathematics Standards and Practices.

Course Dates

Self-paced; students may enroll at any time and take up to one year to complete assignments.

You have up to one year from the date of registration, and no less than three weeks (one week per credit), to complete the course.

Technology Requirements

Please remember that the instructor is not able to offer technical support. In the event that you need technical support, please contact your Internet Service Provider.

Moodle:

This course will be delivered totally online. Moodle is a learning management system that provides students access to online resources, documents, graded assignments, quizzes, discussion forums, etc. with an easy to learn and use interface. To learn more about Moodle go to: (http://docs.moodle.org/en/Student_tutorials). There are some student tutorials on the Center for Online Learning website at Fresno Pacific University – http://col.fresno.edu/student.

Moodle Site Login and passwords – (or other online course access information)

Students will need to have internet access to log onto http://ce-connect.fresno.edu. The username and password numbers for Moodle access will be sent to you by the university using the email address you submitted at the time of registration. The instructor will then contact you with a welcome letter and login instructions. If you need help with the username and password recovery please contact the Center for Professional Development at (800)372-5505, or (559)453-2000 during regular office hours - Mon-Fri 8:00 am to:00 5pm.

Getting Help with Moodle:

If you need help with Moodle, please contact the Center for Online Learning (COL), + by telephone 1-559-453-3460. Help by phone is available Mon-Thurs 8:00 am to 8:00pm and on Fridays from 8:00 am to 5:00 pm, or by filling out a "Request Services" form at http://col.fresno.edu/contact/request-services. Please identify that you are with the Continuing Education/Independent Studies department.

Required Texts and Course Materials

Several research-based journal articles are used with permission and available in pdf format in the course management system. Additional materials will include a variety online videos and web-based resources.

Student Learning Objectives (SLOs)

Student Learning Outcomes in this course Student will be able to:	**Standards Addressed**	**CE program SLOs**
1. Demonstrate through written reflection an understanding of current research which supports the integration of rich mathematical tasks	NBPTS Prop. 1, 2	CE 1, CE 4, CE 6
2. Summarize and implement tools and strategies for engaging students in meaningful task exploration	NBPTS Prop. 4	CE 2, CE 4, CE 6
3. Design, teach, and reflect on math lessons which incorporate rich mathematical tasks	NBPTS Prop. 2, 3	CE 2, CE 3, CE 6
4. Collaborate with peers and colleagues both in person and online to share insights, strategies, and deepen their professional practice	NBPTS Prop. 5	CE 1, CE 3, CE 4, CE 5, CE 6

Evidence of Learning

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

Standards Addressed in This Course

Common Core Standards for Mathematics
http://www.corestandards.org/the-standards/mathematics
Counting & Cardinality
Operations & Algebraic Thinking
Number & Operations in Base Ten
Number & Operations—Fractions
Measurement & Data
Geometry
Ratios & Proportional Relationships
The Number System
Expressions & Equations
Functions
Statistics & Probability

Common Core Standards for Mathematical Practice
http://www.corestandards.org/Math/Practice/
Standard 1: Make sense of problems and persevere in solving them
Standard 2: Reason abstractly and quantitatively
Standard 3: Construct viable arguments and critique the reasoning of others
Standard 4: Model with mathematics
Standard 5: Use appropriate tools strategically
Standard 6: Attend to precision
Standard 7: Look for and make use of structure
Standard 8: Look for and express regularity in repeated reasoning

National Board for Professional Teaching Standards
http://www.nbpts.org/five-core-propositions
Proposition 1: Teachers are committed to students and their learning.
Proposition 2: Teachers know the subjects they teach and how to teach those subjects to students.
Proposition 3: Teachers are responsible for managing and monitoring student learning.
Proposition 4: Teachers think systematically about their practice and learn from experience.
Proposition 5: Teachers are members of learning communities.

Topics, Assignments and Activities

Topic 1 – Orientation and Introductions	Topic 1 – Introductions and goals for class.
Topic 2– Getting Started	Topic 2 – Reflect on current use and benefits of mathematical tasks. Watch video and participate in forum discussions.
Topic 3 – Looking at Research	Topic 3 – Explore the research and rationale for integrating rich math tasks in the math classroom. Read and watch research provided in this topic and participate in forum discussions.
Topic 4 – Let's Do Some Tasks	Topic 4 – Explore a variety of tasks and the mathematics involved in solving them.
Topic 5 – What Makes a Rich Task?	Topic 5 –Evaluate cognitive demand levels of tasks and their contexts. Read articles provided in this topic and participate in forum discussions.
Topic 6 – Tools for Facilitation	Topic 6 – Develop effective tools for facilitating task implementation. Watch video, explore included resources, and participate in forum discussions.
Topic 7 – In the Classroom	Topic 7 – Explore math tasks in action. Read instructor blog task narrative and participate in online discussion. Reflect on sample task assessment and analysis.
Topic 8 – Resources for Tasks	Topic 8 – Describe and evaluate online tasks. Explore and comment on the suggestions of colleagues.
Topic 9 – Task Planning and Implementation	Topic 9 – Plan and implement effective mathematical tasks. Participate in peer lesson review. Reflect on task implementation and assessment.

Topic 10 – Reflection	Topic 10 – Develop a checklist, create presentation, reflective conversation with colleague.

Plagiarism and Academic Honesty

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. URL http://www.fresno.edu.

Grading Policies and Rubrics for Assignments

Each assignment is graded on a 4 point rubric. Assignment totals will be averaged for a final grade upon completion of the course. Please view the assignment rubrics in the course management system for detailed expectations for quality of work.

Students must earn a minimum of 80% to received credit
A – 90-100%, B= 80-89%, (anything below 80% will not receive credit.)

Grading Policies:

The discernment between an A or a B is at the discretion of the instructor based on the quality of work submitted (see assignment rubrics). Coursework falling short of a quality equaling a B or a Credit Grade will be returned with further instructions.
All assignments must be completed in order to receive a grade. In addition, all assignments are expected to reflect the quality that teacher-training institutions require of professional educators. If completed assignments do not meet this standard, students will be notified with further instructions from the instructor.

Written assignments and papers need to follow APA formatting (1" margins, Times New Roman font - size 12, double spaced; centered title, student first and last name on paper. Instructors may add additional APA writing requirements as needed.)

Final Course Grade and Transcripts

When all work for the course has been completed, students will need to logon to the Center for Professional Development website (http://ce.fresno.edu/cpd) to "Submit Grade Form". Once the instructor fills out the grade form online, students may log back in to request their Grade Report as well as order transcripts online. Please allow at least two weeks for the final grade to be posted. For more information see the Independent Studies Policies and Procedures that were

sent to you when you received your course materials, or in your online course. They are available, also at http://ce.fresno.edu/cpd - under General Information > CPD Policies.

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.

References

Additional resources will be included in the course management system.

CONTINUING EDUCATION PROGRAM STUDENT LEARNING OUTCOMES:

CE 1. Demonstrate proficient written communication by articulating a clear focus, synthesizing arguments, and utilizing standard formats in order to inform and persuade others, and present information applicable to targeted use.
CE 2. Demonstrate comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.
CE 3. Reflect on their personal and professional growth and provide evidence of how such reflection is utilized to manage personal and professional improvement.
CE 4. Apply critical thinking competencies by generating probing questions, recognizing underlying assumptions, interpreting and evaluating relevant information, and applying their understandings to the professional setting.
CE 5. Reflect on values that inspire high standards of professional and ethical behavior as they pursue excellence in applying new learning to their chosen field.
CE 6. Identify information needed in order to fully understand a topic or task, organize that information, identify the best sources of information for a given enquiry, locate and critically evaluate sources, and accurately and effectively share that information.

FRESNO PACIFIC UNIVERSITY STUDENT LEARNING OUTCOMES

Student Learning Outcomes Oral Communication: Students will *exhibit* clear, engaging, and confident oral communication – in both individual and group settings – and will critically *evaluate* content and delivery components.
Written Communication: Students will *demonstrate* proficient written communication by *articulating* a clear focus, *synthesizing* arguments, and utilizing standard formats in order to *inform* and *persuade* others.
Content Knowledge: Students will *demonstrate* comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.

Reflection: Students will *reflect* on their personal and professional growth and *provide evidence* of how such reflection is utilized to manage personal and vocational improvement.
Critical Thinking: Students will *apply* critical thinking competencies by *generating* probing questions, *recognizing* underlying assumptions, *interpreting* and *evaluating* relevant information, and *applying* their understandings to new situations.
Moral Reasoning: Students will *identify* and *apply* moral reasoning and ethical decision-making skills, and *articulate* the norms and principles underlying a Christian world-view.
Service: Students will *demonstrate* service and reconciliation as a way of leadership.
Cultural and Global Perspective: Students will *identify* personal, cultural, and global perspectives and will employ these perspectives to *evaluate* complex systems.
Quantitative Reasoning: Students will accurately *compute* calculations and symbolic operations and *explain* their use in a field of study.
Information Literacy: Students will *identify* information needed in order to fully understand a topic or task, *explain* how that information is organized, *identify* the best sources of information for a given enquiry, *locate* and critically *evaluate* sources, and accurately and effectively *share* that information.