

---

## Independent Study Online Course Syllabus

**Course Number: MAT 928**  
**Course Title: Technology-Enhanced Math Learning**

☒ Online      ☐ Distance Learning

<b>Instructor:</b> Paul Reimer <b>Phone number:</b> 559-916-1314 <b>Email:</b> paulreimer@me.com <b>Website:</b> reimermath.com	<b>Units: 3</b> <b>Grade Level: K-12</b>
--	---

### Course Description

This online course will help teachers select appropriate technology tools, evaluate their effectiveness with students, and design instruction to utilize these tools in their mathematics teaching. Teachers will explore applications of technology such as graphing software, spreadsheets, calculators, and interactive websites.

Throughout the course, teachers will collaborate with their online colleagues to refine their own practices and apply their knowledge and insight to their own teaching. Teachers will use these experiences to develop a series of technology-enhanced mathematics lessons and activities for immediate use in their classrooms.

All of the readings and activities included in this course support the implementation of the 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](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.

## Evidence of Learning

1. Student demonstrated critical thinking and thoughtful engagement with the course objectives through reflective written assignments. (Assignments 1 – 13)
2. Student applied current research findings on the role of technology to personal teaching practice through lesson design and reflection. (Assignments 7 – 12)
3. Student made thoughtful recommendations for utilizing technology in a best-practices

- mathematics environment. (Assignment 4)
4. Student demonstrated effective implementation of a variety of technology applications in mathematics teaching and learning. (Assignments 4 – 5)
  5. Student interacted thoughtfully with online colleagues and contributed productively to online forum discussions, peer lesson review, and collaborative assignments. (Assignments 1-8)

### Student Learning Objectives (SLOs)

<b>Student Learning Outcomes in this course Student will be able to:</b>	<b>Standards Addressed</b>	<b>CE program SLOs</b>
1. Demonstrate through written reflection an understanding of current research findings on appropriate technology applications in the mathematics classroom	NBPTS Prop. 1, 2, ISTE I – V	CE 1, CE 4, CE 6
2. Identify and evaluate specific applications of technology and determine effective uses of each application in mathematics instruction	NBPTS Prop. 4, ISTE I – V	CE 2, CE 4, CE 6
3. Demonstrate successful integration of standards-based mathematics lessons and investigations which utilize a variety of appropriate technology applications	NBPTS Prop. 2, 3, ISTE I – V	CE 2, CE 3, CE 6
4. Evaluate the outcomes of implementing technology-enhanced math instruction to support student learning of important mathematics content	NBPTS Prop. 3, 4, ISTE I – V	CE 2, CE 3, CE 6
5. Analyze student responses to technology-enhanced math instruction and monitor level of understanding and motivation	NBPTS Prop 3, 4, ISTE I – V)	CE 2, CE 4, CE 6
6. 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

## Standards Addressed in This Course

ISTE Standards·T

<http://www.iste.org/standards/ISTE-standards/standards-for-teachers>

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 – View Prezi presentation. Describe personal experiences with technology in mathematics teaching and learning.
Topic 3– Research About Technology in Mathematics Education	Topic 3 – Watch included video, read articles, present a rationale summary, engage in forum discussion.
Topic 4 – Your Technology Inventory	Topic 4 – Read an article, conduct a technology inventory, discuss tech integration challenges with online colleagues.
Topic 5 – Guidelines for Technology-Based Activity Development	Topic 5 – Explore guidelines and strategies.
Topic 6 – Lesson Development/Reflecting on Student Learning	Topic 6 – Prepare for lesson development using tech lesson template
Topic 7 – Using Spreadsheets	Topic 7 – Explore included spreadsheet resources; evaluate and share spreadsheet lessons.
Topic 8 – Calculators as Learning Tools	Topic 8 – Read articles and NCTM position statement; explore Desmos online graphing calculator lessons; write a persuasive letter.
Topic 9 – Dynamic Environments - Virtual Manipulatives	Topic 9 – Explore web-based and software-based dynamic environments such as GeoGebra and eNLVM. Discuss resources with online colleagues.
Topic 10 – Games and Practice	Topic 10 – Play and evaluate several grade-level appropriate games.

Topic 11 – Interactive Whiteboards	Topic 11 – Read included articles highlighting interactive whiteboard use. Discuss personal experience and implementation insights in forum.
Topic 12 – Sharing & Presenting	Topic 12 – Explore and discuss tech tools for student presentation.
Topic 13 – Reflection	Topic 13 – Design and reflect on technology-integrated lessons

### **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 receive 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

<b>Student Learning Outcomes Oral Communication:</b> Students will <i>exhibit</i> clear, engaging, and confident oral communication – in both individual and group settings – and will critically <i>evaluate</i> content and delivery components.
<b>Written Communication:</b> Students will <i>demonstrate</i> proficient written communication by <i>articulating</i> a clear focus, <i>synthesizing</i> arguments, and utilizing standard formats in order to <i>inform</i> and <i>persuade</i> others.
<b>Content Knowledge:</b> Students will <i>demonstrate</i> comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.
<b>Reflection:</b> Students will <i>reflect</i> on their personal and professional growth and <i>provide evidence</i> of how such reflection is utilized to manage personal and vocational improvement.
<b>Critical Thinking:</b> Students will <i>apply</i> critical thinking competencies by <i>generating</i> probing questions, <i>recognizing</i> underlying assumptions, <i>interpreting</i> and <i>evaluating</i> relevant information, and <i>applying</i> their understandings to new situations.
<b>Moral Reasoning:</b> Students will <i>identify</i> and <i>apply</i> moral reasoning and ethical decision-making skills, and <i>articulate</i> the norms and principles underlying a Christian world-view.
<b>Service:</b> Students will <i>demonstrate</i> service and reconciliation as a way of leadership.
<b>Cultural and Global Perspective:</b> Students will <i>identify</i> personal, cultural, and global perspectives and will employ these perspectives to <i>evaluate</i> complex systems.
<b>Quantitative Reasoning:</b> Students will accurately <i>compute</i> calculations and symbolic operations and <i>explain</i> their use in a field of study.
<b>Information Literacy:</b> Students will <i>identify</i> information needed in order to fully understand a topic or task, <i>explain</i> how that information is organized, <i>identify</i> the best sources of information for a given enquiry, <i>locate</i> and critically <i>evaluate</i> sources, and accurately and effectively <i>share</i> that information.