

## Independent Study Online Course Syllabus

**Course Number: MATH 929**  
**Course Title: Fostering Math Discussions**

☒ 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 introduce teachers to specific strategies for engaging students in mathematical communication and discourse in the classroom. Teachers will reflect on math dialogue experiences and explore current research-based strategies proven to promote mathematical discourse. Teachers will analyze mathematics teaching examples involving the use of math talk. They will develop talk lesson plans relevant to state standards and self-evaluate lessons taught. 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 and pedagogy to their own classroom practice and experiences with mathematics communication and discourse. All of 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](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

Smith, M. S., & Stein, M. K. (2011). 5 practices for orchestrating productive mathematics discussions. Reston, VA: National Council of Teachers of Mathematics.

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)

### Evidence of Learning

Student Learning Outcomes in this course Student will be able to:	Standards Addressed	CE program SLOs
1. Demonstrate through written reflection an understanding of the value of incorporating mathematical discourse and communication into mathematics instruction	NBPTS Prop. 2	CE 1, CE 4, CE 6
2. Identify tools, strategies, and principles of productive math talk that support mathematics communication	NBPTS Prop. 2	CE 2, CE 4, CE 6
3. Design, teach, and reflect on lessons which model effective questioning and engage students in math talk	NBPTS Prop. 2, 3	CE 2, CE 3, CE 6
4. Evaluate student responses to lessons and activities designed to promote mathematical discourse	NBPTS Prop. 3	CE 2, CE 3, CE 6
5. 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

1. Student demonstrated critical thinking and thoughtful engagement with the course objectives through reflective written assignments. (Assignments 1, 2, 3, 4, 5, 6, 8)
2. Student demonstrated thorough understanding of tools, strategies, and principles of productive math talk that support mathematics communication. (Assignments 3, 4, 5, 6)
3. Student demonstrated awareness of effective questioning techniques that promote mathematical discourse. (Assignment 3, 4, 5, 6)
4. Student applied new learning to teaching practice through thoughtful lesson design and reflection. (Assignments 7, 8)
5. Student demonstrated appropriate and effective collaboration with online or school site community. (Assignments 1-8)

---

Course Number and Title: MAT 929 Fostering Math Discussions

Instructor: Paul Reimer

Date of Revision 2/16/16

To register for courses go to <http://ce.fresno.edu/cpd> and log in

## 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.
---	--

---

Course Number and Title: MAT 929 Fostering Math Discussions

Instructor: Paul Reimer

Date of Revision 2/16/16

To register for courses go to <http://ce.fresno.edu/cpd> and log in

Topic 2 – Getting Started	Topic 2 – Reflect thoughtfully on personal experiences with and attitudes toward math dialogue. Participate in forum discussion.
Topic 3– Looking at Research	Topic 3 – Use research-based data to develop a rationale for promoting mathematical discourse in the classroom. Write a persuasive letter.
Topic 4 – What’s Your Level of Math Discourse?	Topic 4 – Read an article. Determine your level of math discourse and share your findings in a forum.
Topic 5 – Introducing the Five Practices	Topic 5 – Explore and analyze use of the five practices for orchestrating production math discussions
Topic 6 – Setting Goals and Selecting Tasks	Topic 6 – Identify and evaluate rich mathematical tasks . Discuss learning goals with online colleagues.
Topic 7 – The 5 Practices in Action	Topic 7 – Reflect on math discussion strategies observed during a web-based video.
Topic 8 – Questioning and Accountability	Topic 8 – Describe specific effective questions for supporting student-centered mathematics instruction
Topic 9 – Talk Moves to Support Discussion	Topic 9 – Watch a video that models talk moves in action. Discuss personal applications in forum discussion.
Topic 10 – Lesson Planning and Implementation	Topic 10 – Create lesson plans relevant to grade level. Record a transcript of a math discussion that took place during a lesson.
Topic 11 – Reflection	Topic 11 – Read a blog, reflect on course highlights and goals with online colleagues.

## 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,

---

Course Number and Title: MAT 929 Fostering Math Discussions

Instructor: Paul Reimer

Date of Revision 2/16/16

To register for courses go to <http://ce.fresno.edu/cpd> and log in

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

<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.

**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.