Continuing Education
1717 S. Chestnut Ave.
Fresno, CA 93702-4709
(800) 372-5505
https://ce.fresno.edu

MAT-912: Great Mathematicians Before 1700

Independent Study Online Course Syllabus

Instructor: Candi Reimer, M.A. **Phone:** (559) 355-3871 **Email:** candice.reimer@fresno.edu	**Number of Graduate Semester Units:** 3 **Target Audience:** 3-12 grade teachers **Course Access:** https://connect.fresno.edu

Course Description

Students are consistently surprised and excited to discover that mathematics comes from real human beings like themselves. Much of the fear and apprehension towards mathematics is alleviated when students realize how it originated--usually from a real-life problem that needed solving.

As students hear stories about mathematicians and engage in problems similar to the ones these mathematicians worked with, they begin to see that all of mathematics is inter-connected. They discover that mathematics is, in fact, inter-connected with almost everything in our daily lives. Implementing historical elements into the teaching of mathematics will

- excite students about mathematics.
- increase motivation and interest.
- help students gain an appreciation of the contributions of all cultures.
- provide an effective lead-in to a new area of study.
- provide many opportunities to utilize manipulatives and hands-on learning.
- highlight the mathematical accomplishments of underrepresented groups.
- show that people overcame prejudice, obstacles, and pain to create mathematics.
- provide a natural way to integrate reading, writing, and other curricular areas.
- provide a bridge from the past to the future.
- help students see how mathematics has developed over the centuries.

In this course, teachers will read stories about mathematicians who lived before 1700. They will complete, design, and teach activities related to the mathematics those mathematicians developed. Course assignments ask participants to identify specific state or national standards addressed through the lessons presented. This course was developed to support the objectives of the Common Core State Standards and the NCTM (National Council of Teachers of Mathematics) Math Standards. The course may be taken with or without students.

Note: Required books must be acquired separately.

Required Texts and Course Materials

Textbooks:

- Reimer, Luetta, & Wilbert Reimer. *Mathematicians Are People, Too (Vol 1).* Dale Seymour Publications, 1994. ISBN-13: 9780866515092 https://www.amazon.com/Mathematicians-are-People-Too-Paperback/dp/B00LLOC9LM
- Reimer, Luetta, & Wilbert Reimer. *Mathematicians Are People, Too (Vol 2).* Dale Seymour Publications, 1995. ISBN-13: 978-0866518239 https://www.amazon.com/Mathematicians-Are-People-Too-Stories/dp/0866518231

Note: Students are responsible for purchasing their own textbook, analyzing the content, and applying what they learned to the course assignments. You are welcome to purchase used, e-book, or new versions to save money. You can order the book directly from the publisher or from one of several discount aggregators (for example): https://amazon.com

Online Resources: Relevant online resources that support the course content and encourage further investigation will be available throughout the course assignments. Active hyperlinks are utilized throughout the course and will link to the appropriate information when clicked. These include videos, podcasts, worksheets, online activities, journal articles and other resources.

Canvas: This course will be delivered totally online. Canvas is a web-based learning management system (LMS) that provides students access to online resources, documents, videos, assignments, quizzes, forums, etc. Canvas is easy to learn and has a user-friendly interface.

Course Dates

Self-paced; students may enroll at any time and take up to one year, from the date of registration, to complete assignments. Students may complete assignments in no less than three weeks for a 3-unit course (one week per unit).

National Standards Addressed in This Course

Common Core Standards for Mathematics - http://www.corestandards.org/the-standards/mathematics

- Counting & Cardinality
- Operations & Algebraic Thinking
- Number & Operations
- 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

Common Core Standards for English Language Arts - http://www.corestandards.org/ELA-Literacy/

- Anchor Standards
- Reading: Literature
- Reading: Informational Text
- Reading: Foundational Skills
- Writing
- Speaking & Listening
- Language
- Range, Quality, & Complexity
- Literacy in Science & Technical Subjects

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.

Continuing Education Student Learning Outcomes (CE-SLO)

CE-SLO 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-SLO 2	Demonstrate comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.
CE-SLO 3	Reflect on their personal and professional growth and provide evidence of how such reflection is utilized to manage personal and professional improvement.
CE-SLO 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-SLO 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-SLO 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.

Course Student Learning Outcomes (C-SLO)

Student Learning Outcomes for This Course By the end of this course student will be able to:	**National Standards Addressed***	**CE-SLO Addressed****
1. identify and discuss some of the great mathematicians of the past and teach information about their contributions.	NBPTS Props. 1-5	CE 1, CE 2, CE 4, CE 6
2. develop and experiment with a variety of approaches for implementing history into their mathematics classrooms.	NBPTS Props. 1, 2, 3, & 4	CE 1, CE 2, CE 4, CE 6
3. design activities for classroom use.	NBPTS Props. 1, 2, 3, & 4	CE 1, CE 2, CE 3, CE 4, CE 6
4. articulate the importance of teaching mathematics from a historical perspective and gain creativity and self-assurance as these important concepts and truths are introduced to students.	NBPTS Props. 2, 3, & 4	CE 1, CE 3, CE 4, CE 5, CE 6
5. demonstrate how activities are connected to a standards-based curriculum.	NBPTS Prop. 5	CE 1, CE 3, CE 4, CE 5, CE 6

* Please refer to the section on **National Standards Addressed in This Course**
** Please refer to the section on **Continuing Education Program Student Learning Outcomes**

Topics, Assignments, and Activities

Module Title	**Module Assignments and Activities**	**Points Possible**
Module 1 – Introductions	• Introductions and goals for class • 1.1 Assignment: Submit Orientation • 1.2 Forum: Class Introductions	4, 4
Module 2 – Why Use History to Teach Mathematics?	• Watch a video • Read module articles and essays • 2.1 Assignment: Persuasive Letter	10
Module 3 – Story Time	• Watch a video. • Select and read stories. • Create question sets. • 3.1 Assignment: Q & A • 3.2 Forum: Share Questions	10, 4
Module 4 – Historical Connections	• Complete mathematical activities for selected mathematicians • 4.1 Assignment: Historical Connections Activities	20
Module 5 – Lesson Unit Design	• Design two lesson units relevant for your grade level. • Participate in peer lesson review • 5.1 Assignment: Upload Your Lesson Units (2)	20, 4

Module Title	Module Assignments and Activities	Points Possible
	• 5.2 Forum: Sharing Units	
Module 6 – Lesson Implementation & Reflection	• Facilitate one unit with your class and reflect. • 6.1 Assignment: Lesson Unit Implementation	10
Module 7 – Sharing Your Learning	• Create a presentation of insights and strategies • Plan for ongoing collaboration • 7.1 Final Reflection • 7.2 Forum: Next Steps	10, 4
	TOTAL POINTS	**100 points**

Grading Policies, Rubrics, and Requirements for Assignments

Grading Policies

- Assignments will be graded per criteria presented in the course rubrics.
- A = 90-100% and B = 80-89%, (anything below 80% will not receive credit.)
- The discernment between an A or a B letter grade is at the discretion of the instructor based on the quality of work submitted (see course rubrics).
- Coursework falling below a B grade will be returned with further instructions.
- All assignments must be completed to receive a grade and 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.

Grading Rubrics

Grade	Percent	Description	Rubric
A	90-100%	Excellent	Meets all course / assignment requirements with significant evidence of subject mastery and demonstration of excellent graduate level professional development scholarship.
B	80-89%	Very Good	Adequately meets criteria for all course/assignment requirements - demonstrates subject competency with very good graduate level professional development scholarship.
NC	Below 80%	Unacceptable	Does not meet the minimum criteria for all course/assignment requirements and demonstrated little, if any, evidence of acceptable graduate level professional development scholarship.

Writing Requirements

Superior: Writing is clear, succinct, and reflects graduate level expectations. Clearly addresses all parts of the writing task. Maintains a consistent point of view and organizational structure. Includes relevant facts, details, and explanations.

Standard: Writing is acceptable with very few mistakes in grammar and spelling. Addresses most parts of the writing task. Maintains a mostly consistent point of view and organizational structure. Includes mostly relevant facts, details, and explanations.

Sub-standard: Writing contains noticeable mistakes in grammar and spelling. Does not address all parts of the writing task. Lacks a consistent point of view and organizational structure. May include marginally relevant facts, details, and explanations.

Lesson Plan Requirements

Superior: Instructional goals and objectives clearly stated. Instructional strategies appropriate for learning outcome(s). Method for assessing student learning and evaluating instruction is clearly delineated and authentic. All materials necessary for student and teacher to complete lesson clearly listed.

Standard: Instructional goals and objectives are stated but are not easy to understand. Some instructional strategies are appropriate for learning outcome(s). Method for assessing student learning and evaluating instruction is present. Most materials necessary for student and teacher to complete lesson are listed.

Sub-standard: Instructional goals and objectives are not stated. Learners cannot tell what is expected of them. Instructional strategies are missing or strategies used are inappropriate. Method for assessing student learning and evaluating instruction is missing. Materials necessary for student and teacher to complete lesson are missing.

Instructor/Student Contact Information

Throughout the course participants will be communicating with the instructor and their classmates on a regular basis using asynchronous posting forums. Students are provided with instructor contact information in the event they want to make email or phone contact. In addition, students are encouraged to email or phone the instructor at any time. Students will also receive feedback on the required assignments as they are submitted.

Forums

Participation is an important expectation of this course and all online courses. Online forums promote reflection and analysis while allowing students to appreciate and evaluate positions that others express. Forum postings are open to be viewed by all students in the course, so do not post sensitive or personal information about your students. While students may not be engaging with the same students throughout this course, they will be expected to offer comments, questions, and replies to the forum questions whenever possible. The faculty role in the forums is that of an observer and facilitator.

Coursework Hours

Based on the Carnegie Unit standard, a unit of graduate credit measures academic credit based on the number of hours the student is engaged in learning. This includes all time spent on the course: reading the textbook, watching videos, listening to audio lessons, researching topics, writing papers, creating projects, developing lesson plans, posting to discussion boards, etc. Coursework offered for FPU Continuing Education graduate credit adheres to 45 hours per semester unit for the 900-level courses. Therefore, a student will spend approximately 135 hours on a typical 3-unit course.

Services for Students with Disabilities

Students with disabilities are eligible for reasonable accommodations in their academic work in all classes. In order to receive assistance, the student with a disability must provide the Academic Support Center with documentation, which describes the specific disability. The documentation must be from a qualified professional in the area of the disability (i.e. psychologist, physician or educational diagnostician). Once documentation is on file, arrangements for reasonable accommodations can be made. For more information and for downloadable forms, please go to https://www.fresno.edu/departments/disability-access-education.

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 per the procedures set forth in the Fresno Pacific University Catalogue and Handbook - https://handbook.fresno.edu/graduate/academic-policies

Technology Requirements

To successfully complete the course requirements, course participants will need Internet access, can send and receive email, know how to manage simple files in a word processing program, and have a basic understanding of the Internet. Please remember that the instructor is not able to offer technical support. If you need technical support, please contact your Internet Service Provider.

Getting Help with Canvas: If you need help with Canvas, please contact the FPU Help Desk by phone: (559) 453-3410 or email: helpdesk@fresno.edu. Help is available Mon-Fri 8:00 am to 7:00 pm.

Final Course Grade and Transcripts

When all work for the course has been completed, students will need to logon to the Continuing Education website (https://ce.fresno.edu/my-account) and "Request Final Grade". Once the instructor receives the requests and submits the grade online, students may log back in to view their Final Grade Report or order transcripts online. Please allow at least two weeks for the final grade to be posted. For more information, see the Continuing Education Policies and Procedures at https://ce.fresno.edu/ce-policies-and-procedures.

University Policies and Procedures

Students are responsible for becoming familiar with the information presented in the Academic Catalog and for knowing and observing all policies and procedures related to their participation in the university community. A summary of university policies may be found on the university website at https://www.fresno.edu/departments/registrars-office/academic-catalogs.

Fresno Pacific University Student Learning Outcomes (FPU-SLO)

FPU-SLO 1	**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.
FPU-SLO 2	**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.
FPU-SLO 3	**Content Knowledge:** Students will *demonstrate* comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts.
FPU-SLO 4	**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.
FPU-SLO 5	**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.
FPU-SLO 6	**Moral Reasoning:** Students will *identify* and *apply* moral reasoning and ethical decision-making skills, and *articulate* the norms and principles underlying a Christian worldview.
FPU-SLO 7	**Service**: Students will *demonstrate* service and reconciliation as a way of leadership.
FPU-SLO 8	**Cultural and Global Perspective:** Students will *identify* personal, cultural, and global perspectives and will employ these perspectives to *evaluate* complex systems.
FPU-SLO 9	**Quantitative Reasoning**: Students will accurately *compute* calculations and symbolic operations and *explain* their use in a field of study.
FPU-SLO 10	**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.