Continuing Education
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MAT-962: Building Thinking Classrooms

Independent Study Online Course Syllabus

Instructor: Candi Reimer **Phone:** (559) 355-3871 **Email:** candi.reimer@fresno.edu	**Number of Graduate Semester Units:** 3 units **Target Audience:** K – College Educators **Course Access:** https://connect.fresno.edu

Course Description

Transform your classroom with 14 evidence-based teaching techniques to optimize student thinking. This course explores the principles and practices outlined in Peter Liljedahl's *Building Thinking Classrooms in Mathematics*—a teaching framework developed over fifteen years of research in more than 400 classrooms. Math teachers are inundated with ideas about what works in the classroom. Liljedahl put teaching strategies to the test, identifying the moves that genuinely foster student learning. His approach challenges traditional norms and centers the classroom around student thinking, showing that deep understanding stems from intentional instructional design.

You will discover the key practices that unlock student thinking, including:
- what types of tasks to use and when, where, and how to give them
- how to arrange classroom furniture and form collaborative groups
- how to use vertical non-permanent workspace
- how to answer student questions
- what homework and notetaking look like
- how to increase lesson flow with hints and extensions
- how to consolidate a lesson through guided gallery walks
- how to design meaningful rubrics, formative assessment, and grading

If you've ever felt frustrated by passive "learning," disengaged students, or repetitive routines, this course offers teacher-tested strategies to re-energize your instruction and create a space where mathematical thinking truly thrives.

The course may be taken with or without students.

Note: Required book must be acquired separately.

Required Texts and Course Materials

Book: Liljedahl, Peter. (2020). *Building Thinking Classrooms in Mathematics, Grades K-12: 14 Teaching Practices for Enhancing Learning.* Corwin. ISBN-13: 978-1544374833.
https://www.amazon.com/Building-Thinking-Classrooms-Mathematics-Grades/dp/1544374836

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.

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.

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

National Board for Professional Teaching Standards (NBPTS)
(http://www.nbpts.org/standards-five-core-propositions/)

First published in 1989 and updated in 2016, *What Teachers Should Know and Be Able to Do* articulates the National Board's Five Core Propositions for teaching. The Five Core Propositions - comparable to medicine's Hippocratic Oath — set forth the profession's vision for accomplished teaching. Together, the propositions form the basis of all National Board Standards and the foundation for National Board Certification. Course assignments have been designed so students can demonstrate excellence against these professional teaching standards whenever possible.

- Proposition 1: Teachers are committed to students and their learning
- Proposition 2: Teachers know the subject 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

Common Core Standards for Mathematical Practice
(https://www.thecorestandards.org/Math/Practice/)

The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy.

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****
C-SLO 1	**Develop a thinking classroom environment** Implement instructional strategies that foster student engagement, autonomy, and deep mathematical thinking, including the use of vertical non-permanent surfaces (VNPS), random grouping, and strategic classroom arrangement.	NBPTS 1, 2, 3, 4, 5	CE 1, 2, 3, 4, 5, 6
C-SLO 2	**Facilitate rich mathematical discourse** Shift from the role of information-giver to facilitator by designing and leading discussions that encourage curiosity, productive struggle, and collaborative problem-solving.	NBPTS 1, 2, 3, 4, 5	CE 1, 2, 3, 4, 5, 6
C-SLO 3	**Design and implement thinking tasks** Create, modify, and evaluate rich, open-ended mathematical tasks that promote critical thinking, exploration, and student-centered learning	NBPTS 1, 2, 3, 4, 5	CE 1, 2, 3, 4, 5, 6
C-SLO 4	**Enhance student autonomy and apply alternative approaches to assessment** Apply alternative approaches to homework, notetaking, and assessment that empower	NBPTS 1, 2, 3, 4, 5	CE 1, 2, 3, 4, 5, 6

	students to take ownership of their learning while developing perseverance and a growth mindset.		
C-SLO 5	**Refine questioning and feedback techniques** Utilize questioning strategies that withhold immediate answers, encourage deeper reasoning, and guide students toward independent problem-solving without over-scaffolding.	NBPTS 1, 2, 3, 4, 5	CE 1, 2, 3, 4, 5, 6
C-SLO 6	**Create a sustainable action plan** Develop a personalized plan for integrating thinking classroom principles into daily instruction, addressing potential challenges, and fostering long-term student buy-in.	NBPTS 1, 2, 3, 4, 5	CE 1, 2, 3, 4, 5, 6
C-SLO 7	**Collaborate with teaching peers and online colleagues** Engage in forum discussions to exchange ideas and best practices for building thinking classrooms. Provide and receive peer feedback and incorporate insights into classroom applications.	NBPTS 1, 2, 4, 5	CE 1, 2, 3, 4, 5, 6

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

Topics, Assignments, and Activities

Module Title	Module Assignments and Activities	Points Possible
Home Page	• Welcome Video • Course Syllabus • Policies and Procedures	
Module 1 – Introductions	• Introductions • Reflect on personal teaching practices and set a goal for the course • Read the Foreword of the course textbook (Liljedahl) • 1.1 Introduction • 1.2 Class introductions	10 pts 10 pts
Module 2 – About Thinking Classrooms	• The research behind *Building Thinking Classrooms* • Why do students struggle with thinking and engagement in traditional classrooms? • What does a thinking classroom look like? • Shifting from information-giver to facilitator • Classroom scenarios: Identifying thinking vs. non-thinking behaviors • Read introduction (Liljedahl) • 2.1 Thinking Notes • 2.2 “Studenting” in Your Classroom	CR 10 pts

Module Title	Module Assignments and Activities	Points Possible
Module 3 – Toolkit #1	• Task/lesson types and their impact on thinking (non-curricular, scripted curricular, and as-is curricular) • How to script a curricular task • "I do-we do-you do": mimicking, faking, stalling, slacking, trying • Visibly random grouping strategies • Using vertical non-permanent surfaces (VNPS) • Try a problem-solving activity using VNPS • Role-play common student concerns and practice teacher responses. • Read chapters 1-3 (Liljedahl) • 3.1 Thinking Notes • 3.2 Book Club Ch.1-3 • 3.3 Script a Task	CR 10 pts 10 pts
Module 4 – Toolkit #2, Part 1	• Furniture arrangement: defronting the classroom • When and how to answer questions • Types of student questions: proximity, stop-thinking, keep-thinking • When, where, and how to present math tasks • Giving check-your-understanding questions • Compare traditional exercises with thinking tasks. • Modify a textbook problem to make it more engaging. • Watch and analyze teacher questioning techniques. • Practice responding to student questions in ways that encourage thinking. • Read chapters 4-6 (Liljedahl) • 4.1 Thinking Notes • 4.2 Book Club Ch. 4-6	CR 10 pts
Module 5 – Toolkit #2, Part 2	• Homework and student autonomy • Practice vs. check-your-understanding • "Studenting" behaviors on marked and unmarked HW • Being less helpful with deflective teaching moves • Passive and active interactions • Giving check-your-understanding questions • Mobilizing knowledge • Adjust a homework assignment and reflect on outcomes • Read chapters 7-8 (Liljedahl) • 5.1 Thinking Notes • 5.2 Book Club Ch. 7-8 • 5.3 A Spicy CYU	CR 10 pts 10 pts
Module 6 – Toolkit #3	• Building flow, perseverance, and patience with asynchronous hints and extensions • Thin slicing vs. thick slicing sequences • Creating parallel sequences of tasks • How to shift modes of engagement for flow • Consolidating lessons from the bottom up (3 methods) • Focused-guided gallery walks: selecting and sequencing student work	CR 10 pts 10 pts 10 pts

Module Title	Module Assignments and Activities	Points Possible
	• Rethinking note-taking—when and how students should record learning. • Notetaking competencies: creation, annotation, selection • Graphic organizers, worked examples, and notes to forgetful future selves • Read chapters 9-11 (Liljedahl) • 6.1 Thinking Notes • 6.2 Give Me a Hint • 6.3 Thin Slicing Sequences (2) • 6.4 Comparing Structured Notes	
Module 7 – Toolkit #4	• Aligning assessment practices with thinking classroom principles. • Evaluate classroom values • Meaningful rubrics • Formative assessment: helping students retain and organize feedback • Student navigation instruments (where you are and where you're going) • Grading: point-gathering vs. data gathering • Grading instruments and recording strategies • Forms of testing and summative assessment • Explore alternative assessment strategies and share ideas. • Read chapters 12-14 (Liljedahl) • 7.1 Thinking Notes Portfolio • 7.2 Co-Constructed Rubric • 7.3 Navigation Instrument	30 pts 10 pts 10 pts
Module 8 – Putting it All Together	• The Building Thinking Classrooms Framework: 4 toolkits/14 thinking practices • Setting realistic goals for long-term implementation. • The 4 vital thinking practices: from collective synergy to individual understanding • Typical lesson sequences • Student-responsibility practices • The Rebuilding Thinking Classrooms Framework • Create a personalized action plan for applying thinking classroom strategies. • Read chapter 15 (Liljedahl) • 8.1 Thinking Classroom Action Plan • 8.2 What's Next?	30 pts 10 pts
Course Wrap-up – Grading and Evaluation	• Course Evaluation • Course Completion Checklist • Grade Request / Transcript Request	
	TOTAL POINTS	**200 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 discussion 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 discussions promote reflection and analysis while allowing students to appreciate and evaluate positions that others express. 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 discussion question whenever possible. The faculty role in the discussion forum 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	**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.