



Mathematics for Everyone: UDL for Elementary Mathematics

Self-Directed Course
30 Continuing Education Hours
Final Project Optional: 3 Graduate Credits + 15 Cont. Ed. Hours

Meet the Course Designer

Karen G. Gartland, M.Ed.



I have spent my entire career working in the field of mathematics education, as well as integrating the purposeful use of technology into mathematics experiences. I believe that students should have opportunities to learn mathematics skills and concepts through varied opportunities, including manipulatives, visual models, number sense experiences, problem-solving, and critical thinking. I have been fortunate enough to have worked with students in grades K-12 and in teaching college-aged students, both undergraduate and graduate. I am currently employed as the K-8 Mathematics Supervisor in the Groton-Dunstable Regional School District in Massachusetts. It has also been an honor to have experienced co-authoring five mathematics education books, the most recent of which is the *Well Played* series, involving learning mathematics concepts through games. I look forward to our journey together throughout this course to engage in the relationship between UDL and mathematics education!

Course Description

The Common Core Standards for elementary mathematics are well-aligned with the principles of Universal Design for Learning. In particular, the Standards for Mathematical Practice rely heavily on UDL to teach mathematics effectively.

The focus of this course is to learn how to engage in best practices from these standards and UDL strategies to increase course participants' ability to effectively engage their students in learning elementary mathematics. Participants will engage in selected topics focused on providing their students with conceptual understanding, mathematical fluency, and the development of a growth mindset. In-depth discussions and assignments will include the use of visual models, manipulatives, technology platforms, and student collaboration to prepare for a UDL-based elementary mathematics classroom environment.

Course Objectives

As a result of participating in and completing the requirements of this course, participants will:

- Take a deep dive into mathematics instructional frameworks and the intersection of the UDL frameworks
- Learn from the research to effectively implement instructional strategies for teaching mathematics with a UDL-focused approach
- Focus on the best practices for implementing the use manipulatives, technology platforms, and instructional routines as tools for learning mathematics with a UDL approach

Course Text

There are no required texts for this course. There will be required readings and recommended resources provided in each module.

Final Project

At the end of the course, learners have the opportunity to take everything they learned in the course and put it together to create a final project. We will encourage you to **create** an amazing product to share with your **network**! Take a **risk** and share your learning in a new way - lots of options and choices available! This product will be evaluated using the single-point, holistic rubric below. Revisions will be allowed. Learn more about [universally designed rubrics here](#).

Not There Yet!	Met Expectations	Exceeded Expectations
	Product is an original creation that models an understanding of UDL, is clearly organized, and answers the essential question of the module by expressing content that is appropriate for the task, purpose, and audience.	
<p style="text-align: center;">1 Point Meeting the standard, or going above and beyond, will earn you the full point value for the assignment.</p>		



The final project is required for students taking the course for graduate credits but all are welcome to participate. It is a great opportunity to self-reflect and to implement the



course learnings. Share your final project with colleagues, classmates, or on the discussion board! You just won't receive feedback or a grade from the course instructor unless you signed up for graduate credits.

Graduate Credits

You have the option to receive 3 continuing education graduate credits with the course. Register for the course + graduate credits or add on the graduate credit section at any time. Upon successful completion of the course and graduate final project, you will receive 3 accredited graduate credits from your choice of one of our university partners (Gordon College or Teachers College of San Joaquin).

Course Schedule

MODULE	Topics
	<p>Module 1: The “Engagement” of UDL and Mathematics</p> <p>Objectives</p> <ul style="list-style-type: none">● Focus on understanding the core principles of UDL and its relationship to mathematics instruction● Self-assess your current understanding of how to implement UDL approaches in an elementary mathematics class <p>Essential Question</p> <ul style="list-style-type: none">● What is UDL and what is your current understanding of how it can be implemented as an approach to teaching mathematics to elementary students? <p>Activities & Assignments</p> <ul style="list-style-type: none">● Choose 2-3 resources to deepen your knowledge● Optional: Discussion and self-reflection of current understanding of UDL● Assessment
	<p>Module 2: A Peek into a UDL-Focused Mathematics Classroom Environment</p> <p>Objectives</p> <ul style="list-style-type: none">● Engage in an exemplar of an elementary mathematics lesson with embedded UDL principles● Recognize the validity of the implementation of UDL design toward student learning outcomes <p>Essential Question</p>

	<ul style="list-style-type: none"> ● Why should elementary mathematics be taught using UDL design principles? <p>Activities & Assignments</p> <ul style="list-style-type: none"> ● Choose 2-3 resources to deepen your knowledge ● Optional Self-reflection/discussion - Respond to examples of mathematics instruction to determine connections to UDL approaches ● Assessment
	<p>Module 3: Providing Multiple Means for Engagement in Mathematics Teaching and Learning</p> <p>Objectives</p> <ul style="list-style-type: none"> ● Understand how the why of learning mathematics relates to student interest and engagement ● Engage in opportunities focusing on growing students' positive mindsets toward learning mathematics through effort and perseverance <p>Essential Question</p> <ul style="list-style-type: none"> ● How can a focus on the WHY of learning mathematics create learners who are motivated to engage in high-quality tasks? <p>Activities & Assignments</p> <ul style="list-style-type: none"> ● Choose 2-3 resources to deepen your knowledge ● Optional Discussion and self-reflection about mathematical tasks which are engaging and motivating for student learners ● Assessment
	<p>Module 4: Providing Multiple Means for Representation in Mathematics Teaching and Learning</p> <p>Objective</p> <ul style="list-style-type: none"> ● Focus on representation of mathematics content through a variety of models and strategies <p>Essential Question</p> <ul style="list-style-type: none"> ● How do varied representations increase student comprehension of mathematics content? <p>Activities & Assignments</p> <ul style="list-style-type: none"> ● Choose 2-3 resources to deepen your knowledge ● Optional Discussion and self-reflection: Dive into the Deep End of Mathematical Visual Models ● Assessment

5

Module 5: Providing Multiple Means for Action and Expression in Mathematics Teaching and Learning

Objectives

- Learn about student goal setting as an approach to developing executive function strategies
- Engage in examples of multiple tools for learning content standards

Essential Question

- How can filling students' mathematical tool boxes give them greater ownership over their own learning?

Activities & Assignments

- Choose 2-3 resources to deepen your knowledge
- Optional Discussion and self-reflection: Building a student tool box
- Assessment

6

Module 6: Meeting the Challenges to UDL-Focused Mathematics Instruction

Objectives

- Facing and overcoming barriers to UDL-based instruction in a mathematics class
- How learner variability impact students' approaches to learning mathematics and how does UDL mitigate challenges

Essential Question

- Why is an understanding of potential barriers important as we engage in implementing UDL in our mathematics class?

Activities & Assignments

- Choose 2-3 resources to deepen your knowledge
- Optional self-assessment of individual beliefs about potential barriers and how to overcome them
- Assessment

7


Module 7: "Getting Married": Mathematics Instruction with a Fully-Embedded UDL Approach

Objectives

- Engage in specific practices which demonstrate a fully embedded UDL approach
- Gain a comfort level with taking ownership of implementing UDL into your own mathematics class
- Learn how to develop professional relationships which foster collaboration toward the end goal of teaching through UDL

Essential Question

- What do you need to "see" UDL as successful in your mathematics class?

	<p>Activities & Assignments</p> <ul style="list-style-type: none"> ● Choose 2-3 resources to deepen your knowledge ● Optional: Discussion and self-reflection ● Assessment
	<p>Module 8: Final Reflection</p> <p>Objectives</p> <ul style="list-style-type: none"> ● Reflect back on what we have learned ● Consider how your educational experiences throughout the course have altered your approach to teaching elementary mathematics ● Look ahead to determine next steps on how you will implement UDL in your mathematics class <p>Essential Question</p> <ul style="list-style-type: none"> ● How do we create a framework by which we can feel successful in beginning to use UDL in mathematics instruction? <p>Activities & Assignments</p> <ul style="list-style-type: none"> ● Putting it together: A Beginning Step Toward Implementation ● Choose 2-3 resources to deepen your knowledge ● Optional Discussion and self-reflection: Reflecting on your course successes ● Assessment