

ON-DEMAND COURSE

UDL IN MATHEMATICS INSTRUCTION K-5

45 Continuing Education Hours/3 graduate credits



Overview

Have you ever heard a scholar say, “*I’m bad at math,*” or have you ever felt that way yourself? How would you like to be the person who changes that narrative and makes math accessible to all scholars you work with?

This self-paced course is designed to support elementary math educators in designing universally designed instruction in their classrooms. This course will provide strategies, resources, and practical tools aligned with the principles of Universal Design for Learning (UDL) to foster confident and capable young mathematicians.

Throughout these modules, you'll reflect on your own teaching practices, uncover barriers that may be holding scholars back, and explore strategies to help all learners **thrive in mathematics!**



Course Objectives & Learning Outcomes

By the end of this course, participants will be able to:

- Identify barriers to learning in mathematics and explore strategies to create accessible and engaging math experiences for all scholars.
- Develop UDL-aligned lessons integrating multiple means of representation, engagement, and expression.
- Develop multiple means of expression for scholars to demonstrate their understanding.
- Reflect on current teaching practices and identify opportunities for incorporating culturally relevant strategies into daily instruction.

COURSE INSTRUCTOR



Dr. Angela Burke

Education Consultant

Dr. Burke has over twenty years of experience as an educator, working in various school structures, including charter, inter-district magnet, pilot, public, and charter management organizations. Her classroom experience spans from K-6th Grade. She has served in various leadership roles in and out of the classroom. Her most recent experiences have been as Assistant Superintendent/Chief Academic Officer and Director of Curriculum, Instruction, Assessment, and Technology. She is level 1 & 2 certified in UDL and holds certifications in both DEI and Digital Leadership from Cornell University.

REQUIRED TEXT

Universal Design for Learning in Mathematics Instruction K-5 by Katie Novak, EdD and Ashley Marlow.

Group pricing is available, email Orders@PSSC.com

All other readings, videos, and tools will be provided in the course platform.

COURSE OUTLINE

Review the course outline below. Within each lesson, you will complete the following activities:

- Begin by watching, reading and/or listening to the video lessons.
- Dive deeper into the content. Review readings, videos, and resources - the key is to self-differentiate. Choose what works best for you and helps you better understand the content and engage with the lesson.
- Try it out: Put your learning into action.
- Reflect on your learning.
- Check for understanding: complete a, low-stakes quiz to reinforce key concepts from this lesson.

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Module One Moving Beyond Mimicry

Lessons

- Lesson 1: Breaking the One-Size-Fits-All Model
- Lesson 2: Opening Doors to Mathematical Thinking
- Lesson 3: A UDL Math Classroom

Objectives

- Identify characteristics of traditional math instruction and examine how it can limit scholars' access and engagement.
- Analyze how UDL's principles of engagement, representation, and action/execution can transform math classrooms into inclusive learning spaces.
- Reflect on personal teaching practices and begin envisioning shifts away from traditional models toward universally designed instruction.

Essential Question

- How can shifting away from traditional, one-size-fits-all math instruction toward a UDL approach create more equitable and empowering experiences for all scholars?

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Module Two Designing for Discovery

Lessons

- Lesson 1: More Than the Curriculum
- Lesson 2: Flexible Pathways with Blended Learning
- Lesson 3: Fueling Deeper Thinking in Math

Objectives

- Develop strategies to connect math instruction to real-world, culturally relevant experiences that elevate interest and access.
- Apply frameworks like Webb's DOK and blended learning to design math tasks that encourage deeper thinking and foster nurturing classroom environments.

Essential Question

- How can we move beyond scripted instruction to create math classrooms where scholars develop original ideas, deep understanding, and a true sense of belonging?

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Module Three Growing Positive Mathematical Mindsets

Lessons

- Lesson 1: Beliefs: Breaking the Math Myth
- Lesson 2: Skill Sets: Improving Teacher Self-Efficacy

Objectives

- Reflect on personal beliefs and experiences with mathematics and examine how they influence current instructional practices.
- Understand the interconnected roles of belief systems, system drivers, and skill sets in creating humanizing, inclusive math classrooms.
- Apply strategies such as presuming competence to foster positive mathematical mindsets and equitable learning environments.

Essential Question

- How can nurturing the right beliefs, systems, and skills- in both scholars and ourselves- transform math classrooms into spaces where everyone can grow as confident mathematicians?

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Module Four Cultivating Early Numeracy

Lessons

- Lesson 1: What Early Numeracy Really Means
- Lesson 2: Best Practices for Building Early Numeracy

Objectives

- Identify and explain key early numeracy skills and their role in developing a strong mathematical foundation.
- Design interdisciplinary, inclusive math experiences that promote sense-making and conceptual understanding using multiple means of representation and action.
- Reflect on the inclusivity and variability of materials, tools, and collaboration structures used in your classroom to foster greater engagement and success.

Essential Question

- How can intentionally cultivating early numeracy skills, using inclusive, sense-making practices, build a strong foundation for lifelong mathematical success?

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Module Five Unlocking Access to Additive Reasoning

Lessons

- Lesson 1: From Facts to Understanding
- Lesson 2: Making Additive Thinking Stick

Objectives

- Explain the key components of additive reasoning and why they are foundational for long-term mathematical success.
- Design and deliver instruction that fosters sense-making through manipulatives, visual aids, real-world connections, and flexible blended learning structures.
- Reflect on your current practices and identify concrete strategies to increase scholar voice, choice, critical thinking, and real-world application in your math classroom.

Essential Question

- What makes additive reasoning a critical foundation for mathematical success, and how can we teach it in ways that foster understanding, agency, and relevance?

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Module Six Multiply Meaningfully

Lessons

- Lesson 1: Fast isn't Always Fluent
- Lesson 2: Foundations of Multiplication and Division
- Lesson 3: Structuring Conceptual Fluency

Objectives

- Explain the limitations of timed tests and the importance of sense-making in developing multiplication and division fluency.
- Deepen understanding of the conceptual foundations of multiplication and division using terms like unitizing, composition, and decomposition.
- Design and assess learning experiences that prioritize mathematical understanding, reduce anxiety, and make space for equitable participation.

Essential Question

- How can we foster meaningful multiplication and division understanding while removing the pressure and inequity that come with traditional fluency practices?

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Module Seven Making Fractions Make Sense

Lessons

- Lesson 1: Why Fractions Matter
- Lesson 2: Bringing Fractions to Life
- Lesson 3: Fractions without Fear

Objectives

- Reflect on and unlearn common misconceptions about fractions that stem from rote or procedural teaching methods.
- Use key fraction concepts like equipartitioning, equivalence, and iteration to build conceptual understanding in your instruction.
- Design lessons that embed fractions in meaningful, real-life contexts to support deeper understanding and a more positive math identity.

Essential Question

- How can we move beyond tricks and procedures to help scholars, and ourselves, understand, visualize, and connect with fractions in meaningful ways?

FINAL PROJECT

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GOAL

Demonstrate how you have internalized and applied UDL principles to create an inclusive, engaging, and equitable elementary math learning experience that removes barriers and empowers all learners.

FINAL PROJECT

Participants will design a UDL-aligned Instructional Unit or Learning Experience that reflects the course's core themes and practices. This can take one of several forms (participants choose their format), and will consist of four required sections:

Part 1: Introduction

Begin with a narrative portrait of your practice before you began this course. What was your math instruction like before UDL? What barriers did you observe? Why did you take this course?

Part 2: Annotated Bibliography

The second section is an annotated bibliography that captures the research and course resources that shifted your thinking. It doesn't need to be formalized - share 3-5 resources that made the biggest impact on your thinking and why. What did you learn from each resource? How does it connect to your evolving instructional beliefs? How will you use this insight moving forward?

Part 3: Practical Understandings and Implementations

The third section is your concrete demonstration of learning. Create a tangible, practical product applying UDL principles. Your product may be a UDL-aligned unit or multi-lesson sequence in math, a blended learning station plan with embedded culturally relevant math tasks, a revised curriculum segment (e.g., fraction fluency or early numeracy), a PD workshop or professional learning experience for peers, a choice board, math playlist, or interdisciplinary project integrating early numeracy and additive reasoning or a multimedia scholar resource (e.g., an accessible math guide or visual vocabulary kit). Clearly identify UDL principles applied: engagement, representation, expression. Demonstrate cultural relevance and equity in math and show how learners have options and voice.

Part 4: Reflection

Analyze how the course resources informed your professional practice, identify the resources/colleagues whose support you will need for successful implementation, and articulate one measurable goal you will pursue over the next six months. How did this course impact your philosophy and practices? What support will you need to sustain your changes? What's one bold next step in your UDL journey? This section is also the place to detail how you used artificial-intelligence tools. Include a brief section identifying each AI tool you used, the task(s) it assisted with, and the ways you reviewed, adapted, or refined the output to ensure accuracy, accessibility, and professional integrity. Remember to verify any AI-generated facts.

FINAL PROJECT (CONT)

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PROJECT ASSET-BASED RUBRIC

Note: You are encouraged to treat generative AI as a creative thought-partner in this course. Feel free to use tools such as ChatGPT, image generators, or copilots to brainstorm ideas, draft language, design visuals, or analyze data. Remain the final decision-maker: verify facts and revise all machine output to make it YOURS and aligns with your professional judgment and personality. In part 4 of this project, you will be asked to share how you used AI as a thought partner as you complete your project.

Rubric: You need a total of 4 points to pass the course. If any required element is missing, you'll be invited to revise and resubmit.

Project Component	Not Yet (0)	Meets Project Requirements (1)
Introduction	A narrative has been submitted and provides a starting point; now deepen the detail, add evidence, and articulate a clear problem statement linked to UDL barriers.	Integrates multiple data sources, such as student work or engagement metrics, to illustrate challenges and explicitly connect them to UDL barriers and the reason for taking the course.
Annotated Bibliography	Resource list is underway; expand to ten course-related sources and enrich each annotation with a concrete insight or next step.	Provides 3-5 course resources, with each annotation explaining a key takeaway and how it will inform upcoming practice.
Practical Understandings and Implementations	Initial artifacts show promising redesign work; complete the full set of ten before/after pairs and add commentary that ties each shift to firm goals and flexible means.	Includes ten complete before/after artifact pairs, one for every workflow shift, with commentary linking design moves to UDL's firm-goal, flexible-means principle.
Final Reflection & AI Use	Reflection is started; expand to address every prompt, specify collaborators, set a measurable goal, and document any AI support.	Analyzes course influence, names needed collaborators, states one measurable six-month goal, and, if AI was used, supplies an AI log that notes the tool, its task, and basic edits.

COURSE SYLLABUS

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ADDITIONAL INFORMATION

- At the end of the course, all learners will be required to complete a final project. Once submitted, your final project will be reviewed by an expert in UDL and math and feedback will be provided. Our instructor will work with you until you meet required expectations.
- Upon series completion, you will receive feedback and approval on your final project. After this, you will receive a completion certificate for 45 continuing education hours or 3 credits from Novak Education via the course platform.
- Please check in with your school or district prior to enrolling to determine if this course will be sufficient for salary points or advancement. Some states require additional proof of completion such as clock hours, contact hours, or credits. We are committed to providing professional learning to help all educators grow, if you have any questions, [reach out](#).
- CTLE and Clock Hours are available, [view our FAQs](#) for details or contact us.
- Before enrolling, please review our [withdrawal policy](#).
- This is a self-directed course, designed for independent learning at your own pace. Please note that there will be no direct interaction with the instructor outside of the final project. If you feel you would benefit from instructor support or group interaction throughout a course, we invite you to explore our [facilitated courses](#), where more personalized guidance is available.

REGISTRATION

Individuals can register directly through the course site. Learners have the option to take the course for 3 graduate-level credits or for 45 continuing education hours. Once registered, you will gain immediate access to the course. You will have six months to complete the course/access the materials.

If you will be paying with a PO, as an individual or as a group and require an estimate or an invoice, email Lon@NovakEducation.com.

Group pricing and all-inclusive memberships are available. Contact Education@NovakEducation.com for details.

TECHNOLOGY

Courses are entirely online. To access them, you'll need a compatible web browser like Chrome or Firefox. For an optimal experience, we recommend using a desktop or laptop computer with a word processing tool or reader (i.e. Microsoft Word, Libre, or Google Docs). While our course platform is mobile-friendly, a larger screen will provide the best viewing and interactive experience. If you need personal assistance or have technical questions, you can [contact us](#).

Novak Education is in compliance with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act (ADA).