



AI Empowered STEM Instruction

Course Syllabus

Course Description

Welcome to AI Empowered STEM Instruction, designed to empower educators with the knowledge and tools to integrate artificial intelligence into STEM teaching practices. This 8-module course offers a comprehensive approach to AI-supported learning, guiding educators through frameworks, strategies, and hands-on applications that bring STEM topics to life in the classroom.

Each module focuses on a key STEM framework or approach, from inquiry-based and project-based learning to the engineering design process and data-driven experimental methods. Participants will explore how AI can drive deeper learning and offer practical ways to apply these frameworks in authentic classroom settings. Each module culminates with an activity, allowing educators to synthesize and apply new skills. The course wraps up with a capstone project, where educators will demonstrate their understanding by creating a cohesive AI-enhanced STEM project that reflects the knowledge gained across all modules.

Join us as we embark on this journey to create more dynamic, engaging, and future-focused STEM classrooms through the power of AI.

This course enhances classroom teaching effectiveness and supports improved student outcomes by introducing new knowledge in how to use AI to enhance STEM instruction through modeling, simulation, and design-based inquiry aligned with NGSS and hands-on, curiosity-driven learning.

Course Objectives

At the end of this course you should be able to:

1. Design a STEM experience integrating AI within the 5E framework to enhance student learning.
2. Facilitate phenomena-based inquiry using AI to deepen learner questioning.
3. Apply AI strategies to guide learners through engineering design challenges.
4. Leverage AI tools to strengthen learners' data analysis and quantitative reasoning.
5. Guide nature-inspired innovation through AI-supported biomimicry exploration.
6. Create AI-enhanced maker spaces for collaborative problem-solving.
7. Map personalized STEM career pathways using AI exploration tools.
8. Synthesize AI-enhanced STEM frameworks to evaluate and refine instructional practices.

Modules

- Module 1: Reimagining the 5E Framework with AI, Quiz 1
- Module 2: Bringing STEM Phenomena to Life with AI, Quiz 2
- Module 3: Engineering the Future: AI-Enhanced Design Solutions, Quiz 3



- Module 4: Decoding Data: AI-Driven Insights in STEM, Quiz 4
- Module 5: Inspired by Nature: Biomimicry Meets AI, Quiz 5
- Module 6: Design, Make, Learn: AI in the Maker Movement, Quiz 6
- Module 7: Navigating the Future: STEM Careers and AI Exploration, Quiz 7
- Module 8: Bringing It All Together: STEM Frameworks in Practice, Quiz 8

Grading

Each quiz must be passed at an 80% or higher (three attempts allowed).

Format

This is a self-paced, asynchronous (no required live meetings) course. Throughout the PD course, you will find it helpful to take notes along the way to assist with the quizzes. Within each module, you will find reflection assessments that are not graded but will help in your journey through the course.