



Elementary Integrated STEM Education: Optimizing Educational Experiences

Course Syllabus

Course Description

This course is an overview of STEM education for elementary teachers. It reviews each component of S.T.E.M. and will increase understanding of what is meant by Integrated STEM Education. Through 8 Modules teachers engage in learning experiences that will increase understanding of organizing concepts for thinking about and using Integrated STEM teaching and learning in the classroom. Participants will learn about the interdependent nature of STEM and other subjects such as English Language Arts and Social Studies and explore ways to integrate other subjects into Integrated STEM learning. They will learn about the high-value strategies that are integral to using and planning Integrated STEM experiences for students. Teachers will have the opportunity to engage with and evaluate examples of integrated STEM lessons/units developed by other teachers and will be guided through the development of their own Integrated STEM lesson/unit. Participants will have formative, self-assessment opportunities that revolve around learning, questions, and developing an understanding of Integrated STEM and how to get started with richer and more effective student learning experiences.

This course enhances classroom teaching effectiveness and supports improved student outcomes by introducing new knowledge in integrated STEM education, emphasizing cross-disciplinary connections and practical strategies to design equitable, engaging learning experiences that promote critical thinking and real-world application.

Course Objectives

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

1. Describe each component of STEM Education and explain what Integrated STEM Education means by listing and defining them in writing.
2. Describe principles of how students learn and explain how planned student talk supports learning by providing one classroom-based example.
3. Identify organizing concepts and practices in Integrated STEM learning by categorizing them into at least three major themes.
4. Describe ways Integrated STEM supports diversity and equity by citing two specific instructional strategies.
5. Identify high-value strategies in Integrated STEM learning by selecting and justifying three strategies for classroom use.
6. Describe the interdependent nature of STEM and other subjects by mapping at least two cross-disciplinary connections.



7. Explore planning models for Integrated STEM by analyzing the strengths and limitations of one chosen model.
8. Apply Integrated STEM elements by revising or creating one lesson plan to align with Integrated STEM principles.

Modules

- Module 1: S.T.E.M. or STEM?-What We Mean by Integrated STEM, Quiz 1
- Module 2: How Students Learn and the Importance of Productive Talk in that Process, Quiz 2
- Module 3: Practices and Concepts for Integrated STEM Teaching and Learning, Quiz 3
- Module 4: Diversity and Equity, Quiz 4
- Module 5: Identify high-value strategies that are important components of an Integrated STEM learning experience, Quiz 5
- Module 6: Including Other Subjects in Integrated STEM Units, Quiz 6
- Module 7: Exploring Different Planning Models for Integrated STEM, Quiz 7
- Module 8: Examining and Evaluating Integrated STEM Units/Lessons Examples, 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. There is an interactive forum in the course to help you connect with peers and instructors, share ideas, and collaborate on best practices throughout your learning journey.