



Integrating STEM/STEAM into your Curriculum Professional Development Course Syllabus

Course Description

Participants will learn to develop, create, implement, and assess a STEM/STEAM (Science, Technology, Engineering, Arts, and Mathematics) program, lessons and units. A variety of frameworks will be reviewed and discussed to allow for easy replication of /STEAM units and activities. A variety of STEM/STEAM careers will be explored and highlighted in resources. Educators will leave the course with a roadmap to better implement STEM/STEAM into their classroom, promote STEM/STEAM questioning, and develop STEM/STEAM PBL (Project Based Learning) units.

System Requirements

This is specific for technology or online course.

- Computer with word processing software
- Internet access connection
- Software capable of reading PDF files
- Software capable of viewing PowerPoint presentations

Text Books/Supplemental Reading

No textbook is required for this course. Critical reading of assigned articles and supplementary materials is embedded throughout the course. Assigned and recommended readings are listed in each milestone.

Global Goals of the Course

To deepen and/or apply the content and skills of the teacher's existing professional knowledge base by meeting the following global goals of the course:

1. To design and develop 21st century skills across curriculums (NBPTS 1, 2 5; ISTE (International Standards for Technology in Education standards) 5;10; InTasc 1-6, 8, 10)
2. To appraise resources for STEAM integration into classroom lessons (NBPTS 1-5; ISTE 5;10; InTasc 6-8, 10)
3. To employ the STEAM content areas across all curriculums and examine reasons for utilizing STEAM lessons in the classroom (NBPTS 1-5; ISTE 5;10; InTasc 6-8, 10)
4. To identify clear learning strategies to develop inquiry based questions involving STEAM lessons that improve student learning (NBPTS 5; ISTE 5;10; InTasc 1-6)

5. To demonstrate proficient knowledge of STEAM lessons, activities, and Inquiry based learning to create learning experiences and assessments for students (NBPTS 1-5; ISTE 1-4; 5, 6; InTasc 1-10)

Instructional Objectives

By the conclusion of the course, each participant should be able to do the following:

1. Examine the history of STEM and STEAM Education
 - 1.1 Understand the difference between STEM and STEAM education
 - 1.2 Explore the benefits of STEM/STEAM education
 - 1.3 Explore basic STEM/STEAM lessons in the classroom
 - 1.4 Identify personal classroom use of possible STEM/STEAM lessons
2. Understand the process to integrate STEM/STEAM into your classroom:
 - 2.1 Explore models of integrating STEM/STEAM into the classroom
 - 2.2 Explore STEM/STEAM integrated schools
 - 2.3 Examine and explore each foundational element of STEM/STEAM
 - 2.4 Review real-world applications of STEM/STEAM and their importance to students
3. Explore methods and concepts to Implement STEM/STEAM projects into your classroom
 - 3.1 Explore project based learning mediums
 - 3.2 Explore pre-made STEM/STEAM lessons
 - 3.3 Explore and create a STEM/STEAM project based learning activity and use multi-discipline questioning techniques
4. Examine and utilize online resources for STEM/STEAM lessons and integration
 - 4.1 Learn about websites and organizations that can help with STEM/STEAM lessons
 - 4.2 Appraise technology and apps that can help with STEM/STEAM integration
 - 4.3 Use backward design to help plan steam lessons and units
5. Devise a classroom unit based on STEM/STEAM principles
 - 5.1 Explore and evaluate STEM/STEAM units
 - 5.2 Reflect and refine your own personal STEM/STEAM goals
 - 5.3 Identify STEM/STEAM career fields

Compliance with Interstate Teacher Assessment and Support Consortium (InTASC) Standards

The Interstate Teacher Assessment and Support Consortium's work is guided by one basic premise: An effective teacher must be able to integrate content knowledge with the specific strengths and needs of students to assure that all students learn and perform at high levels. All teachers should meet the following standards: (1) learner development, (2) learning differences, (3) learning environments, (4) content knowledge, (5) application of content, (6) assessment, (7) planning for instruction, (8)

instructional strategies, (9) professional learning and ethical practices, and (10) leadership and collaboration.

Teaching Methodology and Delivery Model

Teaching methodologies used in this course are specifically designed to maximize learning in a self-paced, online distance-learning model.

- Online methodologies include presentations, skill practice, assessment completion, and the synthesis of new knowledge and skills.
- Course content and assignments are organized into modules that participants may complete at their own pace during a 4-week span of time.
- Online assignments are facilitated using a variety of research-based instructional approaches appropriate for adult learners in an online setting, which allow teachers to acquire, practice, apply, and evaluate course content and skills.
- The course is taught in a supportive learning environment with teacher-participant interaction and feedback.
- Class participants actively construct their own learning and make it personally relevant by acquiring and applying course knowledge/skill to their own teaching situation.

Final Projects

In keeping with best instructional and assessment practices, the course requires participants to demonstrate synthesis and application of course knowledge in a final Course Reflection Document to the instructional objectives of this course.

Final projects are due and will be submitted within the 4-weeks of allotted class time. Unless stated otherwise, all papers are expected to be properly formatted electronically. Proof of seat hours will be presented to the participants after completing the state required course evaluation located on the student portal.

Assessment of the work will not be limited to the quantity of work submitted but will carefully consider the quality and intellectual value of the work.

Formative Assessments

- Complete all readings and online video viewing within a 4-week time frame
- Complete Forum questions posted in each milestone
- Complete Course Reflection Document at a level of "Proficient"

Grading

Points are assigned based on a rubric that can be further defined as follows:

Proficient: The assessment is well-organized and complete; is effectively and clearly presented; demonstrates clear understandings; applies what has been learned to the author's own classroom situation; clearly shows connections; is detailed; and is

thoughtful and supported with ideas. A thoroughly completed assessment demonstrates that the participant shows awareness of the tasks, gives explanations, and shows how the assessment applies to a teaching/learning situation. The assessment meets the specific criteria delineated in "Proficient" on the course rubric.

Unsatisfactory: The assessment is missing evidence or information; is sloppy and poorly organized; demonstrates only surface understandings; shows no evidence of application to the author's own teaching situation; is poorly written; and does not meet minimum standards for academic performance in a graduate-level course. The assessment meets the specific criteria delineated in "Unsatisfactory" on the course rubric.

The assessments for this course are weighted as follows:
Participation and Reflection Document: 100%

To receive full credit for completion, all work must be completed at a level of "Proficient", which is equivalent to 80% or higher out of 100% possible.

Academic Honesty and Integrity

All participants are expected to maintain academic honesty and integrity by doing their own work to the best of their ability. Academic dishonesty (cheating, fabrication, plagiarism, etc.) will result in the participant being removed from the course; no partial credit will be granted.

Americans with Disabilities Act Compliance

In compliance with Section 504 of the Rehabilitation Act and The Americans with Disabilities Act, participants who have any condition, either permanent or temporary, which might affect their ability to perform in this class, are encouraged to inform The Connecting Link prior to the start of the course. Reasonable academic accommodations, aids, and adjustments may be made as needed to provide for equitable participation.

Attendance, Late Work, and Make-Up Policy

Participants will have 4 weeks from the time of their first date of login to complete the course requirements. Failure to complete all work in this time frame will result in an incomplete. Please contact The Connecting Link directly at (888) 550-5465 if seeking an extension for any reason.



Course Reflection Assessment Rubric

	<i>Proficient</i>	<i>Unsatisfactory</i>
Milestone 1 Quality of Response	Provided complete responses that directly referenced milestone content	Unable to locate specific details to show connection to milestone content
Organization	Displayed logical and organized flow using appropriate writing conventions and standards	Information presented is not organized; no logical progression of ideas; or numerous writing
Adherence to due dates	Postings were submitted within the allotted time frame of the course	Postings were submitted outside the allotted time frame of the course (an extension was required)
Milestone 2 Quality of Response	Provided complete responses that directly referenced milestone content	Unable to locate specific details to show connection to milestone content
Organization	Displayed logical and organized flow using appropriate writing conventions and standards	Information presented is not organized; no logical progression of ideas; or numerous writing
Adherence to due dates	Postings were submitted within the allotted time frame of the course	Postings were submitted outside the allotted time frame of the course (an extension was required)
Milestone 3 Quality of Response	Provided complete responses that directly referenced milestone content	Unable to locate specific details to show connection to milestone content
Organization	Displayed logical and organized flow using appropriate writing conventions and standards	Information presented is not organized; no logical progression of ideas; or numerous writing
Adherence to due dates	Postings were submitted within the allotted time frame of the course	Postings were submitted outside the allotted time frame of the course (an extension was required)