



STEAM for Secondary Education (9-12th grades) Course Syllabus

Course Description

Within this course teachers will explore how STEAM education in a high school can enhance student's learning, engagement and motivation. We will begin with an overview of STEAM and identify the 21st century skills that are built through STEAM instruction. Teachers will also explore human development and how STEAM can help teens build agency and healthy identities through hands-on project based learning within the classroom and makerspace. Lastly teachers will learn about the need for effective STEAM Professional Development that prepares teachers to effectively implement STEAM within their classrooms and schools.

This course enhances classroom teaching effectiveness and supports improved student outcomes by introducing new knowledge in designing and implementing high school STEAM education that fosters 21st-century skills, supports adolescent development, and promotes project-based learning through makerspaces and design thinking.

Course Objectives

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

1. Learn the foundational elements of STEAM in order to better understand the how, what, and why of STEAM for grades 9-12.
2. Learn the connections between the stages of human development and learning in order to identify age appropriate STEAM lesson objectives and activities for high school students.
3. Explore how STEAM can create college and career ready students by teaching and learning 21st century skills.
4. Learn about Project Based Learning (PBL) and Design Thinking in order to identify their application in a STEAM setting.
5. Explore the need for, benefits of, and ways to incorporate makerspaces into an existing space within a school building.
6. Learn how to advocate for and the common barriers of a STEAM program in order to understand how to begin or enhance a STEAM program within your school.

Modules

- Module 1: The Foundational Elements of STEAM, Quiz 1
- Module 2: Human Development and High School STEAM, Quiz 2
- Module 3: STEAM in 9-12th grade, Quiz 3
- Module 4: Design and Studio Thinking, Quiz 4
- Module 5: STEAM Project based Learning in High School Makerspaces, Quiz 5



- Module 6: How to Integrate or Build a STEAM program in High School, Quiz 6

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.