

DOMINICAN UNIVERSITY of CALIFORNIA

STEM/STEAM in the Early Childhood Classroom

ECE 9245 3 Graduate-Level Credits/Units

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Course Syllabus

Course Overview

Discover how STEM/STEAM can foster learning through curiosity and problem-solving. You will research Inquiry-Based Learning and STEAM/STEAM along with coding and robotics, and discover ways to implement it into your daily/weekly lessons. You will leave this course with a unit created that fits into your curriculum and a plan for daily/weekly implementation of STEM.

Course Objectives:

- Understand STEM/STEAM.
- Explore ways for STEM/STEAM be integrated into your classroom.
- Discover how Inquiry Based Learning and STEM are connected
- Explore different ways elementary teachers utilize tools for learning through STEM/STEAM.
- Develop a plan for implementing STEM/STEAM into your daily lessons and activities.

Course Relation to Early Childhood Generalists Standards:

Standard I: Using Knowledge of Child Development to Understand the Whole Child

Standard II: Partnering with Families and Communities

Standard VI: Managing the Environment for Development and Learning

Standard VII: Planning for Development and Learning

Standard VIII: Implementing Instruction for Development and Learning

How to Submit Coursework

Each completed assignment in this course is submitted to the instructor for review. Follow directions at the end of each assignment on how to prepare and submit your assignments. Name each file submitted with your last name and assignment number (i.e. BrownAssignment3. Make sure you place your full name, course number and assignment number at the top of each document page. You will receive feedback from your instructor within 5 days indicating successful completion of the assignment or the need for revision. Assignment grades will be averaged for the final course grade.

Submit completed work to the corresponding Module dropboxes in Moodle

Course Modules

There are 4 modules that comprise this course. The first module explains the basics of STEM/STEAM and the benefits for learning. Module 2 and 3 take you on a journey that displays how Inquiry-Based Learning and STEM go hand in hand. These modules will guide you to discover ways to transform your current thematic units into Inquiry and STEM units of learning. You will leave this course motivated and ready to teach in a whole new way.

MODULE 1: What is STEM/STEAM	
Objective	The teacher will discover how STEM/STEAM creates lifelong learners as well as establishes a curiosity to know more. They will also analyze their classroom in regard to the amount of STEM/STEAM is integrated into their daily/weekly/monthly units.
Assignment(s) Activities and Needed Materials	<p>Explore/study the basics of STEM/STEAM in the primary classroom. Use the following resources as well as conducting some of your own research.</p> <ul style="list-style-type: none"> ● Read The STEAM Powered Classroom ● Read Engaging Children in STEM ● Explore Ted Talks ● Write a 1-page summary of what you learned about STEM/STEAM. Reflect on your own classroom units, lessons, and activities by answering the following questions: Do you create a space that allows your students to learn in this way? Do you use the language and vocabulary of STEM? What do you do well? What would you like to do more of?
Assessment	The Course Assessment Rubric will be used to assess if the module objective(s) were met. Grades and comments will be issued via the LMS

MODULE 2: Inquiry-Based Learning and STEM/STEAM.	
Objective	The teacher will explore how to implement STEM/STEAM into their everyday learning environments by exploring other experts in the field and considering the similarities with Inquiry-Based Learning.
Assignment(s) Activities and Needed Materials	<ul style="list-style-type: none"> ● Watch the Video STEM in Early Learning with 3 Little Pigs ● Watch the video Insight on Inquiry ● Read the Blog Post: How I Implement Inquiry in My Classroom ● Take time to do a little research! Find blogs of teachers that you like. Look for ideas for implementing inquiry-based Based Learning and STEM/STEAM into your daily/weekly lesson plans or thematic units. <i>Use the Research Log found in Moodle to document your hours to submit.</i> ● Submit a document or slide show (Power Point or Google Slide) including the following: <ul style="list-style-type: none"> ○ What is STEM/STEAM? ○ How are STEM/STEAM and inquiry-based Based Learning

	<p>similar?</p> <p>Describe a strategy that you found other teachers using that are effective in the primary classroom. What makes this strategy so effective? How would you use this strategy in your own classroom?</p>
Assessment	The Course Assessment Rubric will be used to assess if the module objective(s) were met. Grades and comments will be issued via the LMS

MODULE 3: Turning a thematic unit into STEM/STEAM	
Objective	The teacher will be able to identify how STEAM was represented in an inquiry-based unit in a Kindergarten Classroom. Observe how one teacher utilized inquiry-based Based Learning to teach a unit on Physics. You will discover each component of STEAM within this project!
Assignment(s) Activities and Needed Materials	<p>Read the Blog Post How Did We Explore Physics in Kindergarten.</p> <ul style="list-style-type: none"> • After reading this blog post, write a summary describing how this teacher created space for her students to be curious and learn about the given topic. Also, identify each component of STEAM. • Choose a unit of study from your own curriculum. Transform your unit of study to implement STEAM/Inquiry. • Write a reflection about how you feel about teaching in this way. What do you love about it? What concerns do you have? How would your co-workers/administrators think about it?
Assessment	The Course Assessment Rubric will be used to assess if the module objective(s) were met. Grades and comments will be issued via the LMS

MODULE 4: Implementing Coding, Robotics, and other Technology in the classroom.	
Objective	The teacher will discover ways to foster students' curiosity and problem-solving skills through the implementation of digital tools, coding, and robotics. The teacher will keep a log of hours (at least 10 hrs.) they spend researching resources for teaching coding, robotics, and other digital tools for the primary level classrooms.
Assignment(s) Activities and Needed Materials	<ul style="list-style-type: none"> • Research tools that other teachers are using in their classrooms. This page of resources and tools may help: STEM/STEAM Resources and Tools • Create your own list of resources that you are interested in learning more about. Use the document titled: STEM, Coding, and Robotics

	<p><u>Tools and Strategies</u> found in Moodle.</p> <ul style="list-style-type: none"> • Submit a 1-page summary explaining how you plan to implement coding and robotics in your daily/weekly lessons and the tools you will use. • Draft a letter to your building principal, proposing that your school purchase a tool or curriculum for teaching coding or robotics. Submit your letter in the corresponding module dropbox. Whether you give it to your administrator or not is up to you, but I recommend doing so.
Assessment	The Course Assessment Rubric will be used to assess if the module objective(s) were met. Grades and comments will be issued via the LMS

STEM/STEAM in the Primary Classroom
Course Bibliography

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