

# HDEV 0805 - MATH AND SCIENCE IN EARLY CHILDHOOD EDUCATION

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## Catalog Description

Hours: 54 lecture

Description: Designed to support educators in the development of math and science skills in children ages 0-8. Exploration of fundamental math and science concepts and principles, as well as guidance in selecting and implementing appropriate math and science activities in an integrated curriculum. (pass/no pass grading) (noncredit)

## Course Student Learning Outcomes

- CSLO #1: Develop early childhood science/math curriculum that is developmentally appropriate.
- CSLO #2: Analyze how math and science enhances children's development in terms of skills learned in these areas.
- CSLO #3: Identify, choose, and design appropriate materials for science and math centers/activities.

## Effective Term

Fall 2018

## Course Type

Noncredit

## Contact Hours

54

## Outside of Class Hours

108

## Total Student Learning Hours

162

## Course Objectives

1. Develop and implement science/math curriculum that is developmentally appropriate.
2. Develop and implement science/math curriculum that is aligned with state standards.
3. Assess children's developmental needs through the use of formal and informal tools.
4. Explain basic science and math principles involved in the education of children including: observing, classifying, comparing, sorting, number sense, measuring, and inferring.
5. Create curricula that take into account the child's natural curiosity about math and science.
6. Incorporate children's interests in planning math/science experiences.
7. Create active, hands-on experiences related to math and science.
8. Plan and create units of instruction in science and math that are integrated across all curriculum areas.
9. Describe the teacher's role in providing a "science-math rich" environment in a preschool setting.

10. Devise techniques for involving the family in the child's science/math learning.

## General Education Information

- Approved College Associate Degree GE Applicability
- CSU GE Applicability (Recommended-requires CSU approval)
- Cal-GETC Applicability (Recommended - Requires External Approval)
- IGETC Applicability (Recommended-requires CSU/UC approval)

## Articulation Information

### Methods of Evaluation

- Classroom Discussions
  - Example: Students will discuss their own early/current experiences with math and science, and how their beliefs and opinions might affect their teaching of these subjects.
- Essay Examinations
  - Example: Students will write an essay on the importance of algebra as a gatekeeper subject in early childhood. Instructor will develop a rubric to assess each essay.
- Projects
  - Example: Students will present science/math activities/lessons that incorporate developmentally appropriate practice, diversity, and state standards. Rubric Grading.

## Repeatable

Yes

## Methods of Instruction

- Lecture/Discussion
- Distance Learning

Lecture:

1. Instructor will lecture on the scientific method as it relates to early childhood. Students will then get into groups and take the basic concepts of science and develop activities for each based on this method.
2. Students will read text/handouts related to specific math principles (observing, classifying, comparing, sorting, etc.) and bring a specific example of how to include each in classroom math/science activities to discuss in class. Students will then present their ideas to the class.

Distance Learning

1. Instructor will post a discussion board prompt regarding a STEAM Ted Talk and require interaction.

## Typical Out of Class Assignments

### Reading Assignments

1. Construct and present to the class both a science and a math activity that incorporate state standards, is developmentally appropriate, and designed to actively engage students.
2. As a follow-up to reading about and discussing components of a science/math-rich environment, groups of students will create a chart and/or transparency presentation that depicts the teacher's role in designing such an environment.
3. Create a one-week lesson plan, incorporating developmentally appropriate practice and a diversity-sensitive curriculum in which science and math activities

are integrated across all curriculum areas (Language/Literacy, Art, Circle Time, etc).

## Writing, Problem Solving or Performance

1. Write about 3 ways to involve families in their child's science/math learning. 2. Develop written lesson and assessment plans for basic math/science concepts" observing, classifying, comparing, sorting, number sense, measuring, and inferring.

## Other (Term projects, research papers, portfolios, etc.)

### Required Materials

- Integrating Math and Science in Early Childhood Classrooms Through Big Ideas
  - Author: Chaille, C., and McCormick, S.
  - Publisher: Pearson
  - Publication Date: 2016
  - Text Edition: 1st
  - Classic Textbook?:
  - OER Link:
  - OER:
- Early Childhood Mathematics
  - Author: Sperry-Smith, S.
  - Publisher: Pearson
  - Publication Date: 2013
  - Text Edition: 1st
  - Classic Textbook?:
  - OER Link:
  - OER:

**Other materials and-or supplies required of students that contribute to the cost of the course.**