

Course Outline of Record

1. Course Code: ECE-038
2. a. Long Course Title: Science, Technology, Engineering & Math in ECE
 b. Short Course Title: STEM CONCEPTS
3. a. Catalog Course Description:
 This course explores the development of curriculum ideas for teaching about scientific, mathematical, engineering, and technology (STEM) concepts to young children.
 b. Class Schedule Course Description:
 Students will explore science, technology, engineering, and mathematical (STEM) concepts and their application in the early childhood classroom.
 c. Semester Cycle (if applicable): NA
 d. Name of Approved Program(s):
 - EARLY CHILDHOOD EDUCATION AS Degree for Employment Preparation
 - EARLY CHILDHOOD EDUCATION MASTER TEACHER Certificate of Achievement
 - ECE SITE SUPERVISOR Certificate of Achievement
4. Total Units: 3.00 Total Semester Hrs: 54.00
 Lecture Units: 3 Semester Lecture Hrs: 54.00
 Lab Units: 0 Semester Lab Hrs: 0
 Class Size Maximum: 30 Allow Audit: No
 Repeatability No Repeats Allowed
 Justification 0
5. Prerequisite or Corequisite Courses or Advisories:
Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm1-A)
 Prerequisite: ECE 010
6. Textbooks, Required Reading or Software: (List in APA or MLA format.)
 - a. Moomaw, S. (2013). Teaching STEM in the Early Years: Activities for Integrating Science, Technology, Engineering, and Mathematics (1st/e). Redleaf Press. ISBN: 9781605541211
 College Level: Yes
 Flesch-Kincaid reading level: 12
 - b. California Preschool Curriculum Framework
California Preschool Foundations, Volume 1, 2, and 3
Preschool Program Guidelines
Available from California Department of Education Press as Free Downloads
<http://www.cde.ca.gov/sp/cd/re/cddpublications.asp>
7. Entrance Skills: *Before entering the course students must be able:*
 - a. Explain the major milestones to the study of human development
 - ECE 010 - Examine and discuss major theories of child development.
 - ECE 010 - Examine ways in which developmental domains are continuous, sequential and interrelated.
 - b. Identify, describe, and apply major concepts and principles of human development from conception to nineteen years of age.
 - ECE 010 - Examine and discuss major theories of child development.
 - ECE 010 - Examine ways in which developmental domains are continuous, sequential and interrelated.
 - ECE 010 - Demonstrate knowledge of the physical, social/emotional, cognitive and language development of children, both typical and atypical, in major developmental stages.
 - ECE 010 - Investigate and explain sources of developmental change and reasons for disturbances in the developmental

process.

- ECE 010 - Demonstrate knowledge of current research findings as they apply to child development.
- ECE 010 - Examine and evaluate the importance of the early years and the effects of interaction between the individual and her/his environment.

c. Identify and discuss major issues in the study of human development.

- ECE 010 - Demonstrate knowledge of current research findings as they apply to child development.
- ECE 010 - Examine and explain how bias can influence the research process.
- ECE 010 - Examine and evaluate the importance of the early years and the effects of interaction between the individual and her/his environment.
- ECE 010 - Examine and evaluate the role of family in facilitating children's development.
- ECE 010 - Examine and evaluate the role of teachers and other professionals in facilitating children's development.
- ECE 010 - Examine and evaluate the role of play and its relationship to development at various stages.
- ECE 010 - Identify and describe risk factors that impact families and child at each major developmental stage.
- ECE 010 - Investigate and explain the process of bilingual development in children at various stages.
- ECE 010 - Describe and explain biological and environmental factors influencing the development of identity and self-esteem in children of all ages.

d. Describe how the theories are used in planning appropriate environments for children with diverse developmental patterns.

- ECE 010 - Examine and discuss major theories of child development.
- ECE 010 - Demonstrate knowledge of the physical, social/emotional, cognitive and language development of children, both typical and atypical, in major developmental stages.
- ECE 010 - Investigate and explain sources of developmental change and reasons for disturbances in the developmental process.
- ECE 010 - Demonstrate objective techniques and skills when observing, interviewing, describing and evaluating behavior in children of all ages cultures and backgrounds and their caregivers.
- ECE 010 - Examine and evaluate the importance of the early years and the effects of interaction between the individual and her/his environment.
- ECE 010 - Identify and describe risk factors that impact families and child at each major developmental stage.
- ECE 010 - Describe and explain biological and environmental factors influencing the development of identity and self-esteem in children of all ages.

e. Analyze the concepts and principles of human development to personal and professional situations.

- ECE 010 - Demonstrate objective techniques and skills when observing, interviewing, describing and evaluating behavior in children of all ages cultures and backgrounds and their caregivers.
- ECE 010 - Examine and evaluate the importance of the early years and the effects of interaction between the individual and her/his environment.
- ECE 010 - Examine and evaluate the role of family in facilitating children's development.
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- ECE 010 - Examine and evaluate the role of play and its relationship to development at various stages.
- ECE 010 - Identify and describe risk factors that impact families and child at each major developmental stage.
- ECE 010 - Investigate and explain the process of bilingual development in children at various stages.
- ECE 010 - Describe and explain biological and environmental factors influencing the development of identity and self-esteem in children of all ages.

8. Course Content and Scope:

Lecture:

Lecture:

1. Integrating STEM concepts throughout the indoor and outdoor environment.
2. Sequence of basic mathematical concepts and their importance.
3. Review of Theories of Cognitive Development.
4. Integrating technology and engineering activities in classroom centers.
5. Create activity plans for science, math, technology and engineering.
6. Create and demonstrate homemade math and science activities.

7. Construction of teacher-made activities.
8. Evaluate the use of technology in the ECE classroom by children and by adults according to NAEYC criteria.
9. Read and summarize research related to cognitive neuroscience and child development.

Lab: (if the "Lab Hours" is greater than zero this is required)

9. Course Student Learning Outcomes:

1.

Integrate STEM concepts into curriculum by developing lessons and play materials and models to help children explore basic STEM concepts.

2.

Identify developmentally appropriate STEM curriculum experiences for an early childhood classroom.

3.

Organize and present learning activities that expand cognitive processes for young children according to best and promising practices that incorporate the latest research in child development and neuroscience.

10. Course Objectives: *Upon completion of this course, students will be able to:*

- a. Describe and explain the basic principles of STEM in relation to a child's perspective and development.
- b. Design and implement STEM curricula that will show enthusiasm and appreciation for the subject.
- c. Explain how children learn STEM concepts.
- d. Identify appropriate STEM curricula experiences and materials.
- e. Read and apply the most recent research about child development and cognition.

11. Methods of Instruction: (*Integration: Elements should validate parallel course outline elements*)

- a. Discussion
- b. Distance Education
- c. Lecture
- d. Observation

Other Methods:

- c. Student presentation d. Group projects

12. Assignments: (*List samples of specific activities/assignments students are expected to complete both in and outside of class.*)

In Class Hours: 54.00

Outside Class Hours: 108.00

a. In-class Assignments

1. Develop material tests for math and science experiences.
2. Presentations/student demonstration.
3. Group activity/participation/observation.

b. Out-of-class Assignments

1. Read textbook.
2. Compile an activity file which includes lesson plans and activities specific with curriculum materials.
3. Construct teacher-made math materials that are developmentally appropriate.
4. Compose a parent letter explaining Early Childhood Philosophy of math and science education.
5. Research, read and summarize three peer-reviewed journal articles related to cognitive neuroscience.

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*

- Written homework
- Critiques
- Portfolios
- Field/physical activity observations
- Presentations/student demonstration observations
- Group activity participation/observation
- Product/project development evaluation

14. Methods of Evaluating: Additional Assessment Information:

- a. Tests b. Lesson plans c. Oral and written reports d. Demonstrations

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*

PO - Career and Technical Education

Apply critical thinking skills to execute daily duties in their area of employment.

IO - Critical Thinking and Communication

Summarize, analyze, and interpret oral and written texts, with the ability to identify assumptions and differentiate fact from opinion.

Utilizing various communication modalities, display creative expression, original thinking, and symbolic discourse.

16. Comparable Transfer Course

| University System | Campus | Course Number | Course Title | Catalog Year |
|-------------------|--------|---------------|--------------|--------------|
|-------------------|--------|---------------|--------------|--------------|

17. Special Materials and/or Equipment Required of Students:

18. Materials Fees: Required Material?

| Material or Item | Cost Per Unit | Total Cost |
|------------------|---------------|------------|
|------------------|---------------|------------|

19. Provide Reasons for the Substantial Modifications or New Course:

2-year periodic review

20. a. Cross-Listed Course (*Enter Course Code*): *N/A*
 b. Replacement Course (*Enter original Course Code*): *N/A*

21. Grading Method (*choose one*): Letter Grade Only

22. MIS Course Data Elements

- a. Course Control Number [CB00]: CCC000294226
- b. T.O.P. Code [CB03]: 130500.00 - Child Development/Early C
- c. Credit Status [CB04]: D - Credit - Degree Applicable
- d. Course Transfer Status [CB05]: B = Transfer CSU
- e. Basic Skills Status [CB08]: 2N = Not basic skills course
- f. Vocational Status [CB09]: Clearly Occupational
- g. Course Classification [CB11]: Y - Credit Course
- h. Special Class Status [CB13]: N - Not Special
- i. Course CAN Code [CB14]: *N/A*
- j. Course Prior to College Level [CB21]: Y = Not Applicable
- k. Course Noncredit Category [CB22]: Y - Not Applicable
- l. Funding Agency Category [CB23]: Y = Not Applicable

m. Program Status [CB24]: 1 = Program Applicable

Name of Approved Program (if program-applicable): EARLY CHILDHOOD EDUCATION,EARLY CHILDHOOD EDUCATION MASTER TEACHER,ECE SITE SUPERVISOR

Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)

23. Enrollment - Estimate Enrollment

First Year: 30

Third Year: 30

24. Resources - Faculty - Discipline and Other Qualifications:

a. Sufficient Faculty Resources: Yes

b. If No, list number of FTE needed to offer this course: N/A

25. Additional Equipment and/or Supplies Needed and Source of Funding.

N/A

26. Additional Construction or Modification of Existing Classroom Space Needed. (Explain:)

N/A

27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES

Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the Course: Yes

28. Originator Donna Marie Greene

Origination Date 09/19/17