COURSE INFORMATION

COURSE TITLE
ECE125: Science/Math & the Young Child

COURSE DESCRIPTION
Examines theories of cognitive development as a framework for conceptualizing the way young children acquire scientific and mathematical skills, concepts, and abilities. Enables students to research and develop appropriate individual and group scientific/mathematical activities for young children.

CREDIT HOURS
3

SUGGESTED PREREQUISITE KNOWLEDGE
Prerequisites and co-requisites will be determined by each individual institution. Ability to read/comprehend/write at college level is suggested.

CCCOnline Course Policies
The CCCOnline Course Policies page contains information about the student's role in the classroom, grading policies, and rights and responsibilities.
**COURSE MATERIALS**

All course reading material is available online and linked within the course site. You do not need to purchase any additional materials.

**MINIMUM COMPUTER REQUIREMENTS**

To complete this course, you will need **regular** access to a computer from which you can get to the internet and use email. In order to ensure that your course functions properly, you must run the System Check. This is a CRITICAL STEP, and taking the time to do it now will eliminate a tremendous amount of frustration for you later. To run the System Check, click Tools in the course NavBar and then click System Check.

**REQUIRED eTEXT**

Required readings are listed in each Module in the Activities page. Links to each required reading or resource are found within the Read/View section of each module. Directions for what sections or pages to read are found in the description below each reading.

**LIBRARY ACCESS**

You will need your student ID Number (Your S#) to login to the CCCOnline Library in order to gain access to some of the readings and videos in this course.
**COURSE COMPETENCIES AND OUTCOMES**

**STUDENT COMPETENCIES**

The competencies you will demonstrate in this course are as follows:

A. Examine the impact of caregiver attitudes/practices and program goals on math and science learning of young children.
B. Develop skills in observing and analyzing children’s activities, ideas, and interests as sources for developmentally appropriate science and math planning.
C. Deepen understanding of the stages of child development as it relates to the acquisition of scientific and mathematical concepts by young children, through observation, research, and practice.
D. Explore the role of the environment in providing developmentally appropriate and integrated math and science curriculum for young children.
E. Formulate new roles and behaviors for yourself as a care provider of young children.
F. Prepare developmentally appropriate activities for math and science instruction for young children.

**NAEYC STANDARDS**

This course is aligned with the National Association for the Education of Young Children (NAEYC) Professional Preparation Standards.

The module outcomes that will permit you to demonstrate course competencies are:

**MODULE 1 - STEM**

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Evaluate personal biases and beliefs about Math and Science instruction for young children.</td>
<td>A, E</td>
</tr>
<tr>
<td>2. Develop a plan of action for yourself as a significant facilitator of STEM learning for young children.</td>
<td>A, D, E, F</td>
</tr>
<tr>
<td>3. Investigate and discuss developmentally appropriate activities for science, technology, engineering, and math for young children</td>
<td>A, E, F</td>
</tr>
<tr>
<td>4. Create a presentation to inform and encourage parents to include a positive STEM environment in their families.</td>
<td>A, D, E</td>
</tr>
</tbody>
</table>
MODULE 2 - DEVELOPMENT OF MATH CONCEPTS AND SKILLS

Outcomes
1. Discuss the ways in which young children acquire mathematical concepts.
2. Utilize skills in observing and analyzing children’s activities, ideas, environment and interests as sources for developmentally appropriate math planning.
3. Describe the role of environment in providing developmentally appropriate math curriculum for young children.
4. Construct the math component of an early childhood curriculum and environment.

Competencies
B, C, D
B, C, D
A, D
A, D, E, F

MODULE 3 - DEVELOPMENT OF SCIENCE CONCEPTS AND SKILLS

Outcomes
1. Discuss the ways in which young children acquire scientific concepts.
2. Utilize skills in observing and analyzing children’s activities, ideas, environment and interests as sources for developmentally appropriate science planning.
3. Describe the role of environment in providing developmentally appropriate science curriculum for young children.
4. Construct the science component of an early childhood curriculum and environment.

Competencies
B, C, D
B, C, D
A, D
A, D, E, F

MODULE 4 - DEVELOPMENT OF ENGINEERING CONCEPTS AND SKILLS

Outcomes
1. Discuss the ways in which young children acquire engineering concepts.
2. Utilize skills in observing and analyzing children’s activities, ideas, environment and interests as sources for developmentally appropriate engineering planning.
3. Describe the role of environment in providing developmentally appropriate engineering curriculum for young children.
4. Construct the engineering component of an early childhood curriculum and environment.

Competencies
B, C, D
B, C, D
A, D
A, D, E, F

MODULE 5 - DEVELOPMENT OF TECHNOLOGY CONCEPTS AND SKILLS

Outcomes
1. Discuss the ways in which young children can benefit from using technology as a tool in an early childhood environment.
2. Utilize skills in observing and analyzing children’s activities, ideas, environment and interests as sources for developmentally appropriate technology planning.
3. Describe the role of environment in providing developmentally appropriate technology tools for young children.
4. Plan the appropriate use of technology tools in an early childhood curriculum and environment.

Competencies
B, C, D
B, C, D
A, D
A, D, E, F
GRADING AND EVALUATION

METHODS

Evaluation includes a combination of discussion participation, assignments, and other evaluations. Rubrics are provided for assignments and discussions.

GRADING POLICIES

Mark all Module due dates on your calendar for this class. You may submit assignments AHEAD of schedule. Late assignments will not be accepted without prior approval.

This is not a self-paced course. The expectation of the ECE/EDU program at CCCOnline is that students will meet assignment due dates. Late assignments will not be accepted without prior approval. Therefore, it is expected that you contact your instructor prior to when the deadline has lapsed. There may be exceptions due to special circumstances such as medical emergency, military deployment, or in some legal cases. In these rare situations, it is at the instructor’s discretion to accept late work or make modification to the course schedule.

SUMMARY OF GRADING

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discussions (10 @ 20 points each)</td>
<td>200</td>
<td>20%</td>
</tr>
<tr>
<td>Assignments (11 @ 40 points each)</td>
<td>440</td>
<td>44%</td>
</tr>
<tr>
<td>Final Project (1 @ 360 points each)</td>
<td>360</td>
<td>36%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1000</td>
<td>100%</td>
</tr>
</tbody>
</table>

Grading Scale

A = 90 to 100%  B = 80 to 89%  C = 70 to 79%  D = 60 to 69%  F = 59% and below

DISCUSSIONS

See the Discussion Guidelines and Rubric located on the Course Rubrics page for discussion evaluation policies. Participation in Discussions is a very important part of this class experience and cannot be made up after each week's discussion ends. Discussions are our "classroom" where we discuss the readings and benefit from each class member's contributions and questions. You'll find two Discussion topics within each module. You are expected to respond to your classmates' postings. Remember, you will receive points, which will count toward your final grade for participating in the Discussions, so of course, not participating will have a negative effect on your final course grade.
All discussions will occur within a week’s time. You will be expected to reply to the initial post in at least one solid paragraph by Wednesday of that week, and then to engage in a conversation with your classmates by responding to at least 2 of them. You are required to post on at least 3 separate days during each week. The goal is to have some back and forth exchanges that take the conversation further in exploration of the topic. Be sure to respond to any questions your classmates ask you and to consider questions you may want to ask of them.

**Assignments**

Each module has at least two assignments. Each assignment has its own rubric that will be used for grading purposes. All rubrics are attached to the respective assignment. Please review each rubric before completing the assignment.

**Course Schedule**

The Schedule is subject to change as needed.

This page summarizes all of the graded assignments and reading assignments for the course. If you want, you can print it out and post it somewhere handy.

All assignments are described in detail on the Module assignment pages. If you have questions check there and/or send me an e-mail.

**This course is not self-paced and is not open-exit.** All assignments and discussions are to be completed by no later than 11:59 pm MST/MDT of the due date.

NOTE: Important CCCOnline semester dates (e.g., drop/withdraw/term end) appear on the [CCCOnline calendar](#).

**Module 1: STEM**

<table>
<thead>
<tr>
<th>Reading/Assignments</th>
<th>Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discuss: M1 Discussion 1: Student Introductions</td>
<td></td>
</tr>
<tr>
<td>View: M1 Exploration: STEM - What is Stem? Tab</td>
<td></td>
</tr>
<tr>
<td>Read: STEM Introduction Articles</td>
<td></td>
</tr>
<tr>
<td>Do: M1 Assignment 1: Introducing Parents of Young Children to STEM</td>
<td></td>
</tr>
<tr>
<td>View: M1 Exploration: STEM - Exploring Biases and Why Do Biases Matter? Tabs</td>
<td></td>
</tr>
<tr>
<td>Read: Exploring Biases articles</td>
<td></td>
</tr>
<tr>
<td>Discuss: M1 Discussion 2: Stem Activities</td>
<td></td>
</tr>
<tr>
<td>View: M1 Exploration: STEM - Self Reflection Tab</td>
<td></td>
</tr>
<tr>
<td>Read: Self Reflection/Plan of Action Articles</td>
<td></td>
</tr>
<tr>
<td>Do: M1 Assignment 2: Self Reflection</td>
<td></td>
</tr>
</tbody>
</table>

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## MODULE 2: DEVELOPMENT OF MATH CONCEPTS AND SKILLS

### Reading/Assignments

- View: M2 Exploration: Math Teaching and Learning - Background Tab
- View: M2 Exploration: Math Teaching and Learning - The Math Environment Tab
- Read: Math Environment Articles
- Discuss: M2 Discussion 1: Math Environment
- View: M2 Exploration: Math Teaching and Learning - Math Standards Tab
- Read: Math Standards Articles
- View: M2 Exploration: Math Teaching and Learning - The Math Curriculum Tab
- Read: Math Curriculum Articles
- Do: M2 Assignment 1: Math Activity File
- Discuss: M2 Discussion 2: Math Activity File Sharing
- Do: M2 Assignment 2: Self Reflection: Math

## MODULE 3: DEVELOPMENT OF SCIENCE CONCEPTS

### Reading/Assignments

- Read: Science Standards Articles
- Read: Science Instruction Articles
- Discuss: M3 Discussion 1: Why Science Learning is Important for Young Children - Top 10 List
- Do: M3 Assignment 1: Science Observation
- View: M3 Exploration: Development of Scientific Concepts in Young Children - Science Environments Tab
- Read: Science Environment Articles
- Discuss: M3 Discussion 2: Inquiry Science and Young Children
- Do: M3 Assignment 2: Science Center
- View: M3 Exploration: Development of Scientific Concepts in Young Children - Creating Curriculum Tab
- Do: M3 Assignment 3: Module 3 Self Reflection & Science Activities

## MODULE 4: DEVELOPMENT OF ENGINEERING CONCEPTS AND SKILLS

### Reading/Assignments

- View: M4 Exploration: Engineering Concepts in Early Childhood - What is Engineering? Tab
- Read: What is Engineering? Articles
- Discuss: M4 Discussion 1: What is Engineering?
- Do: M4 Assignment 1: Facilitating an Engineering Activity
- View: M4 Exploration: Engineering Concepts in Early Childhood - What is Engineering in ECE?
- Read: Engineering in ECE Articles (as assigned in Module Exploration)
- Discuss: M4 Discussion 2: Sharing an Engineering Observation in an ECE Setting
- Do: M4 Assignment 2: Engineering Resource File
- Do: M4 Assignment 3: Engineering Plan of Action
MODULE 5: EFFECTIVE USE OF TECHNOLOGY IN EARLY CHILDHOOD ENVIRONMENTS

Reading/Assignment

View: M5 Exploration: Technology in ECE - History of Technology in ECE Tab
Read: History of Technology in ECE Articles
Discuss: M5 Discussion 1: Technology in Early Childhood Settings
View: M5 Exploration: Technology in ECE - Beneficial Technology in ECE Tab
Read: Beneficial Technology in ECE Articles
Do: Module 5 Assignment 1: Reflection/Plan of Action: Technology
Discuss: Module 5 Discussion 2: Playing with Coding in ECE Environments
View: M5 Exploration: Technology in ECE - Wrapping it Up Tab
Read: Wrapping it Up Article
Do: M5 Project Assignment: Final Individual Plan of Action

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