

AEDE 435
Math and Science Experiences in Early Childhood Education
Fall 2008

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Meeting Time: T-Th. 8:00-9:15

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Office hours: as posted

I. Descriptive Information

A. Number and Title of Course

AEDE 435 Math and Science Experiences in Early Childhood Education

B. Catalog Description:

(3 hours) (Prereq: grades of C or better in AMTH 221 and 222; admission to Professional Program or permission of education advisor; coreq: AEDE 435P)
This methods course includes the basic content of the inquiry areas of math and science as they are to be presented to preschool and primary children. Appropriate experiences, learning activities, materials and equipment to aid the development of math and science concepts in young children are presented. Multicultural influences and needs of exceptional children are addressed.

C. USCA School of Education Conceptual Framework

The objectives of this course are designed to facilitate the candidate's development as a Dynamic Educator. This course will focus specifically on the development of the Dynamic Educator with respect to *planning, instructing, communicating, growing professionally, and managing.*

II. Course Goals and Objectives

A. General Goals

By the end of the semester, it is intended that each candidate will acquire an understanding of teaching mathematics and science, as well as develop skills structuring the classroom environment and preparing curriculum experiences which will facilitate a child's intellectual development and inquiry skills in preschool and primary settings.

B. Instructional Objectives

Each candidate will...

1. acquire knowledge, skills, and resources necessary for developing, implementing and evaluating appropriate learning experiences for young children in the curriculum areas of mathematics and science, including authentic assessment.

2. identify, develop and critique a wide variety of materials and activities appropriate for teaching math and science.

3. examine effective instructional strategies/methods for teaching science and mathematics lessons to children in pre- and primary school settings.
4. plan and implement developmentally appropriate curriculum and instructional practices based on knowledge of individual children, the community, and curriculum goals and content.
5. evaluate and demonstrate use of technology in mathematics and science, including assistive technology for children with special needs.

III. Course Readings

A. Required texts

1. Smith, S.S. (2006). *Early Childhood Mathematics*. Boston, MA: Pearson Education, Inc.
2. Articles from *Spotlight on Young Children Math & Spotlight on Young Children Science*.
3. Other readings as assigned
4. Internet Resources:
<http://ed.sc.gov/agency/Standards-and-Learning/Academic-Standards/old/cso/standards/science/index.html>
<http://ed.sc.gov/agency/Standards-and-Learning/Academic-Standards/old/cso/standards/math/index.html>

IV. Instructional Procedures

The following methods will be used, but not be limited to, for instruction: lectures, discussions, small group activities, student presentations, guest speakers, videos, hands-on activities, projects, and demonstrations.

V. Course Requirements

A. Administrative Requirements

1. Professionalism is a valued characteristic of teachers. You will be expected to attend classes and be on time. You are expected to behave in a professional manner to demonstrate your interest in preparations for teaching young children. Absences should not exceed more than three classes. Absences above that limit or excessive tardiness will result in the loss of at least one letter grade of your final grade. Participation and professionalism are elements of the evaluation criteria and assessment in each aspect of the course.

2. Assignments are due on dates specified at the beginning of class. Assignments turned in after the beginning of class will not be awarded the full point value.
3. Students will sign the USCA Honor Pledge on all graded academic work certifying that no unauthorized assistance has been received or given in the completion of the work.
4. If you have a physical, psychological, and/or learning disability which might affect your performance in this class, please contact the Office of Disability Services, 126A B&E, (803) 641-3609, as soon as possible. The Disability Services Office will determine appropriate accommodations based on medical documentation.
5. Your instructor values good writing in this course. Please remember that the written work that you produce in this class can be included in your rising junior writing portfolio. For further information on the portfolio requirement, consult your USCA Undergraduate and Graduate Bulletin or visit Dr. Lynne Rhodes, Director of Writing Assessment, or Karl Fornes, Director of Writing Room.

B. Required Activities

- Professionalism (5 pts.) Education Majors Disposition Evaluation will be completed regarding professionalism. Candidates are expected to be in class on time.
- Participation (5 pts.) Candidates will contribute to class through their participation in class and group discussions and projects. (For example, bringing in 100 items, preparing a fingerplay for class, article review, small group lesson presentation, early childhood classroom presentations/observations etc.)
- Prepare a math lesson plan to be taught in practicum class. (10 pts.)
- Prepare a science lesson plan to be taught in practicum class. (10 pts.)

*** All plans must be approved by your cooperating teacher prior to due date!**

**** Each lesson plan should include the following:**

- Objective(s)—2 points
- SC state standards—1 point
- Materials—1 point
- Procedures—2 points
- Special accommodations—1 point
- Assessment(s)—2 points
- Correct Spelling and Grammar—1 point

--Mathematics Module (10 pts.) Children do not all learn a concept in the same way. This assignment will help candidates see that there are a variety of ways to approach a particular objective. Each candidate will pick out one objective correlated with a SC State Standard for mathematics. Candidates will create two different lessons plans to help students meet the chosen objective using different learning styles/multiple intelligences of the students when teaching a lesson. For these two lessons, candidates should indicate the **learning style and multiple intelligence** addressed. Materials and assessments needed for each plan should be included.

One math objective correlated to a SC Math Standard—1 pt.

Plans address 2 **different** learning styles/multiple intelligences—8 pts.

Spelling/Grammar/Structure—1 pt.

--Play Center Design (5 pts.) Candidates will design a play center for a kindergarten classroom. The design should include the layout of the center, materials to be included (pictures when possible), and SC standards that would be addressed/experienced in the center. This will be an in-class assignment.

Design—1 pts.

Materials included (along with pictures)—2 pts.

SC Standards addressed w/necessary explanations—2 pts.

--Math Games (10 pts.) Each candidate will create three original math games. Directions for how to play and make the game should be included, as well as any necessary materials. Grade levels and SC state standards relevant to each game should be included. *Be sure to make a copy of this to turn in as well as email to the class. Math games will be presented in class.

Developed 3 **original/creative** math games—6 pts.

Directions for how to play and make—3 pts.

Spelling/Grammar/Structure—1 pt.

--Design an integrated thematic unit. (20 pts.) Overview; Final

It will include activities that are age appropriate and include multicultural influences and address needs of exceptional children. This is a joint assignment with AEDE 544 and AEDE 436. The topic for this unit cannot be a holiday. See rubric.

--Inquiry Project (10 pts.) Each candidate will choose a “wonder” topic to explore. Candidate will include a bibliography of resources (websites, books, software titles, etc.) that could be used to explore the topic. Candidate will write a paper describing what they found out about their topic including a section describing how a similar project on the topic could be implemented in an early childhood classroom. Candidates will share their findings to classmates through presentations in class (7-10 minutes).

Described topic—1 pts.

Described findings—2 pts.

Used references to support findings—1 pts.

(Be sure to include references at the end of your paper)

Resources (minimum of 10)—2 pts.

Application of project to e.c. classroom—1 pt.

Spelling/Grammar/Structure—1 pt.
Presentation—2 pts.

--Standards Journal (10 pts.—5 pts. for each subject) Each candidate will document the various activities, lesson plans, ideas, etc. that relate to the SC State Standards in this journal. The journal should include a copy of the SC State Standards for early childhood (you can keep all subject areas in one journal). Candidates should write the name of the activity, lesson plan, idea, etc. beside the correlating standard in their journal. A **minimum of 25 different activities** should be included for math and for science.

--Final Exam (5 pts.)

...Points will be deducted for spelling and grammar errors.

VI. Evaluation and Grading Scale

Students are encouraged to talk with the instructor during the preparation of assignments and about the evaluation of each assignment. A total of 100 points can be earned by the student.

A 100-95 B+ 94-90 B 89-85 C+ 84-80 C 79-75 D 74-70 F 69 and below

VII. Other Requirements

None

VIII. Course Schedule

August 21

Syllabus

Get to Know You Activity

August 26

Calendar Math

100 Days of School

Lesson Planning

Chapter 1 “Foundations, Myths, and Standards”

Chapter 2 “The Language of Math”

Read *Spotlight...Math* p. 2 “Introduction” and p. 4 “Infants and Toddlers Exploring Mathematics”

August 28

Multiple Intelligences/Learning Styles

Discuss Math Module

Chapter 3 “Early Math Concepts:”

Chapter 7 “Developing Number Sense”

Read *Spotlight...Math* p. 7 “Algebra in the early Years? Yes!”

September 2

Chapter 4 “Space and Shape”

Chapter 5 “Pattern, Function, and Early Algebra”

Read *Spotlight...Math* p. 19 “What Children’s Play Tells Us about Teaching Mathematics” and p. 29 “Learning Paths and Teaching Strategies in early Mathematics”

September 4

Chapter 8 “Problem Solving: Addition and Subtraction”

Chapter 9 “Understanding Our Place Value System”

Read *Spotlight...Math* p. 25 “Developing Mathematical Understanding along the Yellow Brick Road” and p. 32 “Choosing Books You Can Count On”

September 9

Using Children’s Literature to Teach Science

Mayer article: “How can we best use literature in teaching”

Read *Spotlight...Math* p. 35 “The Pizza Project:”

Math Plan Due

September 11

Science Concoctions

Read *Spotlight...Science* p. 2 “Introduction”

September 16

Ruth Patrick Tour

Read *Spotlight...Science* p. 33 “Be a Bee and Other Approaches to Introducing Young Children to Entomology” and p. 38 “Raising Butterflies from Your Own Garden”

September 18

Inquiry Projects/Wonder Topics

Exploring Science

Read *Spotlight...Science* p. 4 “Science in the Preschool Classroom:” and p. 16 “Entries from a Staff Developers Journal...”

September 23

Math Games

Read *Spotlight...Math* p. 14 “Developing Math Games Based on Children’s Literature”
Science Plan Due

September 25

Math Games at the Materials Center

September 30

Chapter 6 “Graphing”

October 2

Assessing Science

Read *Spotlight...Science* p. 21 “Using Photographs to Support Children’s Science Inquiry” and p. 27 “Documenting Early Science Learning”

Math Module Due

October 7

Math Game Presentations

Math Games Due

October 9-10 Fall Break No Class

October 14

Play Centers

Play Center Designs Due (In class activity)

Thematic Unit Overview Due

October 16

Chapter 11 “Problem Solving: Multiplication and Division”

October 21

Chapter 10 “Measurement”

Thematic Unit Due

October 23

Chapter 12 “Assessment”

Chapter 13 “Planning for Success: A Good Beginning”

October 28

Work Sample

October 30

Inquiry Project Presentations

Inquiry Projects Due

November 4 Election Day

November 6

Practicum Class—Thematic Unit

November 11

Practicum Class—Thematic Unit

November 13
Practicum Class—Thematic Unit

November 18
Practicum Class—Thematic Unit

November 20
Practicum Class—Thematic Unit

November 25
Practicum Class—Thematic Unit

December 2
Practicum Class—Thematic Unit

December 4
Thematic Unit Review (On campus)
Reflection and Review
Standards Journal Due

December 11
Final Exam