

This syllabus will be negotiated on the first day of class and throughout the semester.

FALL 2006, ESCI 4420
SCIENCE FOR EARLY CHILDHOOD EDUCATION

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Class Location: 220 Aderhold Hall

Schedule: Monday and Wednesday
 10:10 - 12:05

Course Description

Welcome to the course, Science Education for Early Childhood! This course is intended to provide you with opportunities to construct a vision of what elementary science teaching and learning can be like and to help you learn how to plan appropriate activities which fit within this vision. During the semester you will be involved in independent and group activities that will enable you to become a competent and confident teacher of science to elementary school age children.

Course Materials

The instructor will make available core readings from the journal literature and selected textbooks. You will be expected to read and critique relevant course articles. The following book is required:

Tippins, D.J., Koballa, T. R. & Payne, B.D. (2002). *Learning from cases: Unraveling the complexities of elementary science teaching*. Boston, MA: Allyn & Bacon.

Project Wild Training Materials \$15

Science Fair Board for Exploratory Center & Miscellaneous Supplies

Course Goals

The course will focus on possible solutions to questions like:

1. What is the nature of science and scientific knowledge?
2. What do teachers do when they teach science?
3. How can a teacher provide learning environments which will promote active learning, student responsibility and autonomy?
4. How can science be taught as part of an interdisciplinary/thematic/whole language unit using children's literature?
5. What can be done to encourage females and minorities in science?
6. How can a teacher or student assess learning with understanding?
7. What "tools" can assist a teacher in becoming a "reflective" practitioner and students in becoming "reflective" learners?
8. What resources are available for early childhood science educators?
9. How can science be integrated across the curriculum?

10. How can science be taught using outdoor learning environments?
11. What is meant by “culturally relevant” science teaching and learning?

Course Objectives

The objectives of this course are to develop:

- Positive attitudes towards science, science teaching and learning.
- Confidence and competence in designing teaching-learning activities needed to teach in an activity-centered or project-centered classroom.
- Awareness and knowledge of sources of current literature and contemporary issues in science education.
- Awareness of the multicultural dimensions of the classroom and what it means to teach “science for all” at the early childhood level.
- Tools to critically evaluate and reflect upon your own science teaching beliefs and practices.
- Understanding of ways to integrate science with other content areas.
- Familiarity with ways to use the outdoor learning environment as a context for science teaching.
- Understanding of constructivism as a referent for thinking about science teaching and learning.
- Awareness and knowledge of curricular options and curricular materials appropriate for science teaching at the early childhood level.
- Understanding of science inquiry as a way to motivate students and enhance their creativity.
- Understanding of how science teachers can use theory to improve their teaching effectiveness.
- Understanding of science processes skills.
- Understanding of the characteristics of teaching science as inquiry.
- Questioning skills to elicit students’ ideas about science concepts.

Expectations

I expect you to:

- Be an active participant in class discussions and activities
- Attend **all** course sessions
- Be **prompt** in attendance
- Read and reflect **critically** on assigned readings
- Locate and read additional materials related to elementary science teaching
- Demonstrate reflection through discussion and writing
- Share resources, readings and insights
- Collaborate with colleagues reading learning
- Complete **all** assigned tasks to best of your ability
- Communicate expectations, frustrations and ideas
- Put as much into this course as you expect to get out of it!

Attendance

Class participation is a very important aspect of the course. If you do not attend class, you are unable to participate in the many activities that will be undertaken during class time. In this regard, you are responsible for attending **all** class sessions. Please arrive at class in a prompt and timely manner. Equally important is your advance preparation for each class. Before class please evaluate readings and/or assignments from the perspective of your own teaching and learning experiences. Your careful preparation and enthusiastic participation will contribute to the course. If it is necessary for you to miss a class due to an emergency, please make every effort to notify me in advance.

Academic Honesty

Instructors are committed to the principles of academic honesty and subscribe to the UGA Academic Honesty Policy guidelines for the definition and processes of academic integrity. All students are subject to these academic guidelines; Instructors have and will initiate academic dishonesty proceedings if in their courses they find reasonable cause to do so.

All students are encouraged to read and understand A Culture of Honesty (the UGA Academic Honesty Policy) found at http://www.uga.edu/ovpi/academic_honesty/culture_honesty.htm. Printed copies of A Culture of Honesty may also be obtained from the office of the University of Georgia Vice President for Academic Affairs or from the Independent and Distance Learning office in summary form. Students may talk with their instructors about academic honesty. E-mail and/or telephone contact information is available in this course guide and in the Independent and Distance Learning Student Handbook.

Evaluation/Grading

There are three graded projects to be considered as you evaluate your learning in this course. The quality of work submitted will reflect your personal standards of quality.... keep this in mind as you make judgements regarding the conditions of projects you submit. Detailed directions will be provided for each assignment along with performance criteria.

Assignment:

Case reactions:	40 points
Exploratory Center And School Presentation:	45 points
Field Experience Report:	15 points
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Total points possible:	100 points

I am looking forward to a very productive course in which we will all learn a great deal about elementary science teaching and learning!

Case Reactions (40 points)

During this course you will read a number of “cases” that address issues in science teaching and learning. Many of these cases were written by classroom teachers and/or science teacher educators. You should read **all** assigned cases. You will develop a written response for **two** of these cases. Your response should demonstrate insight and in-depth reflection. Your response should be two pages single spaced and typed. You should be prepared to contribute to class discussion of all cases.

Case Reactions

Classroom cases are problem-centered stories of teaching practice that are used to examine and clarify the complexities and connections in teaching practice. They are a particular type of narrative that be used to explicate and clarify the professional knowledge of teachers. In this course you will be reading selected cases written by teachers or teacher educators based on dilemmas they experienced teaching science at the elementary level. You will develop a written response reaction to selected cases. Your response/reaction should be two pages single-space in length. There is no “correct” response or reaction to these cases. Rather, this is an opportunity for you to clarify your own beliefs and biases and consider the case on relation to your personal experience as a teacher. You may want to comment on any of the following in your response:

- a. Your interpretation of the dilemmas/challenges presented in the case;
- b. Theories about science teaching and learning
- c. The solutions you recommend or your evaluation of solutions found in the case
- d. An explanation of why you think the solutions are viable or your justification of other solutions
- e. Your own experiences as a student, teacher or parent
- f. Common sense
- g. Any morals or lessons you think you can draw from your reading and interpretation of the case
- h. Experiences of friends, colleagues or relatives
- i. References to any components of the case itself.

Field Experience Activities (15 points)

You will conduct several science activities from the field list provided. For one of the activities, you will write up what you learned from the experience following the rubric provided. Your paper should be two pages, single-space and organized according to the four questions on the rubric.

Exploratory Center and Presentation (45 points)

You will develop a comprehensive science exploratory center based on one of the themes in the K-5 Georgia Performance Standards for Science.. You will have an opportunity to set up and use your exploratory center with students at a rural elementary school. A detailed description of the exploratory assignment and its different components is attached.

ESCI 4420 Schedule

Date	Topic	Assignments
Wednesday, August 16	Course Overview collecting Data	
Monday, August 21	Basic and Integrated Process Skills	
Wednesday, August 23	Basic and Integrated Process Skills	
Monday, August 28	Constructivist Earth Science	Read “What shape is a Star?:
Wednesday, August 30	Constructivist Earth Science	
Monday, September 4	LABOR DAY HOLIDAY	
Wednesday, September 6	Constructivist Oceanography	Read and <u>Write Reaction</u> : The Day the Lobster Died
Monday, September 11	Constructivist oceanography	
Wednesday, September 13	Inquiry Science Discrepant Events Productive Questions	Read and <u>Write Reaction</u> : El Secreto de las Ninas
Monday, September 18	Constructivist Life Science	
Wednesday, September 20	Constructivist Life Science	Read: Insects and Scientific problem solving go together
Monday, September 25	Constructivist Physical Science	Read: Who’s Teaching Whom?
Wednesday, September 27	Constructivist Physical Science	
Monday, October 2	EXPLORATORY CENTER PRESENTATIONS	Exploratory Centers
Wednesday, October 4	EXPLORATORY CENTER PRESENTATIONS	
Monday, October 9	PROJECT WILD	
Wednesday October 11	PROJECT WILD	

October 16- November 11th	FIELD EXPERIENCE	
Monday, November 13	Constructivist Ecology De-briefing from Field Experience	Field Experience Report Due
Wednesday, November 15	Sociocultural Issues in Science Teaching and Learning	Read: The Egyptian Exhibit
Monday, November 20	Weather/Astronomy	
Nov. 22nd-24th	THANKSGIVING HOLIDAYS	
Monday, November 27	International Issues in Science Education	

Case Reaction Grading Rubric

The purpose of this assignment is for you to read and reflect on selected cases written by science teachers or teacher educators based on dilemmas they experienced teaching science at the elementary level. You will develop a two-page, single spaced reaction to selected cases. Reaction papers should be typed/word processed and will be graded using the rubric found below.

Component	Points
Catchy title for the case reaction	2
In-depth insight and reflection	5
Analysis from multiple perspectives	5
Should include at least seven of the following elements: a. Your interpretation of the dilemmas/challenges presented in the case; b. theories about science teaching and learning. c. the solutions you recommend or your evaluation of the solutions found in the case; d. an explanation of why you think your solutions are viable or your justification of other solutions; e. your experiences as a student, teacher or parent; f. common sense g. any morals or lessons you think you can draw from your reading and interpretation of the case; h. experiences of friends, colleagues, or relations; i. references to any components of the case itself.	7
Typed and Submitted on Time	1
Total points possible (20)	

FIELD EXPERIENCE GRADING RUBRIC

During your field experience you will select and carry out several activities from the list provided. You will prepare a field experience report for one of these activities, which should be signed by your supervising teacher. Your field experience report will be evaluated according to the criteria listed below.

OBJECTIVE	POINTS
Participation in an activity with primary focus of science (selected from list)	2
Typed, written report that includes the following information:	
a. description of the nature of the science teaching/learning activity, including purpose and goals	4
b. in-depth reflective summary of what you learned about elementary science teaching/learning through this activity	4
c. describes implications of what was learned for future teaching	4
d. signature of supervising teacher	1
TOTAL SCORE (15 points possible)	

Science Exploratory Center

You will develop a comprehensive exploratory center based on one of the topics and related concepts in the K-5 Georgia Performance Standards for science. Your exploratory center should be organized around a central question such as: How do animals protect themselves? What are rocks? How do simple machines work? Why does it rain? What makes a volcano erupt? You will have an opportunity to set up and use your exploratory center with students at a rural elementary school. Your exploratory center should consist of the following components:

- a science fair board backdrop for your exploratory center
 - interactive in nature
 - includes key question
- two hands-on activities/experiments
 - should focus on key concepts related to your question
 - should be inquiry oriented or guided inquiry
 - should include all materials and data sheets needed for the activities
- a thematic game based on science concepts relevant to your topic
 - should allow for self-checking of answers
- a writing connection that highlights the topic of your exploratory center
 - this could be a set of poems, a book you write for children, a set of songs you create, or any other form of writing

- a children's literature connection that highlights the topic of your exploratory center
-this could include a quality fiction or non-fiction book related to the topic should be developmentally appropriate
- a three page typed plan for your exploratory center
-should include designated elements

Exploratory Center Written Plan

You should develop a three-page (1 ½ space) plan for your exploratory center which includes the following elements.

- Key question
- Georgia Performance Standard (s)
- Identify major science concepts addressed by your exploratory center
- Detailed discussion of science background related to the concept(s)
- Description of the two hands-on science activities that are at the heart of your exploratory center, including:
 - purpose of each activity
 - procedures for each activity
 - materials needed
 - productive questions to ask of students
- Brief discussion of the game that you create to fit with your exploratory center
- Brief description of your children's literature connection
- Special notes:
(such as safety precautions or other important tips)
- A reflective summary (one page)