

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

**FALL 2005, ESCI 4420  
SCIENCE FOR EARLY CHILDHOOD EDUCATION**

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**Office:** 212 Aderhold Hall

**Class Schedule:** 220 Aderhold Hall

**Schedule:** Wednesday 8:00-9:55

Friday 9:00-12:00

### **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.

You will also need to purchase miscellaneous supplies and materials for class projects, including Project Wild training materials (\$15-20).

### **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](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.

### **EEvaluation/Grading**

There are three projects and a cumulative exam 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:	30 points
Culturally relevant lesson:	30 points
Field Experience project:	20 points
Cumulative exam:	20 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** (30 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.

### **Culturally Relevant Lessons**(30 points)

An important part of this course is the opportunity to consider what it means to teach science in a culturally relevant way. You will modify a course activity to develop a “culturally relevant” lesson. You should develop: a) a two page description of the lesson, b) two copies of the modified activity, c) **all** accompanying materials needed to carry out the lesson. As you develop the lesson activities you should ask yourself the question, “culturally relevant for whom and to what?” You will share your culturally relevant lesson with the class in a round-robin format. Your two page

description should include the following:

- Title of the activity
- Purpose
- Intended grade level
- Scientific background information
- Description of key science concepts
  - Procedures/guidelines
- Materials
- Important tips

**Field Experience Activities** (20 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 using the format provided.

**Cumulative Exam** (20 points)

The exam will be cumulative in nature, with questions posed throughout the course. Each day you will answer several exam questions based on the content of previous class activities, discussion, or readings.

## ESCI 4420 Schedule

Date	Topic	Assignments
Wednesday, August 24	Course Overview collecting Data	
Wednesday, August 31	Basic and Integrated Process Skills	
Wednesday, September 7	Basic and Integrated Process Skills	
Friday September 9	Constructivist Earth Science	Read “What shape is a Star?: Case 6.2
Wednesday September 14	Constructivist Earth Science	
Friday, September 16	Sociocultural Dimensions of Science Teaching and Learning	Reaction to “El Secreto de las Ninas” Case 8.1 due
Wednesday September 21	Constructivist Oceanography	
Wednesday September 28	Constructivist oceanography	Reaction to “The Day the Lobster Died” Case 9.1 due
Friday September 30	Inquiry Science Discrepant Events Productive Questions	
Wednesday October 5	Constructivist Life Science	
Friday October 7	Constructivist Life Science	Read “Insects and Scientific problem solving go together” Case 2.2
Wednesday October 12	Constructivist Ecology	
Wednesday October 19	Science in the Outdoor Learning Environment	
Friday October 21	Constructivist Physical Science	Read “Who’s Teaching Whom” Case 3.1
Wednesday October 26	Constructivist Physical Science	
Friday October 28	NO CLASS - FALL BREAK	

Wednesday November 2	Gender Issues in Science Classrooms International Science Education	Culturally Relevant lesson Due
Wednesday November 9	Constructivist Chemistry	
Friday November 11	Controversial Issues in Science Teaching & Learning	Read “The Egyptian Exhibit” Case 9.2
November 14-18 FULL TIME FIELD	FIELD EXPERIENCE	
Wednesday November 23 THANKSGIVING	NO CLASS - THANKSGIVING	
Wednesday November 30	Constructivist Chemistry	Field Experience Project Due
Wednesday December 7 <sup>th</sup> (Last day of class)	Sharing What We’ve Learned	

### 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	1
In-depth insight and reflection	4
Analysis from multiple perspectives	4
Should include at least six of the following elements: <ul style="list-style-type: none"> <li>a. Your interpretation of the dilemmas/challenges presented in the case;</li> <li>b. theories about science teaching and learning.</li> <li>c. the solutions you recommend or your evaluation of the solutions found in the case;</li> <li>d. an explanation of why you think your solutions are viable or your justification of other solutions;</li> <li>e. your experiences as a student, teacher or parent;</li> <li>f. common sense</li> <li>g. any morals or lessons you think you can draw from your reading and interpretation of the case;</li> <li>h. experiences of friends, colleagues, or relations;</li> <li>i. References to any components of the case itself.</li> </ul>	6
<b>Total points possible (15)</b>	

## Culturally Relevant Lesson Grading Rubric

In this assignment you will consider what it means to teach in a culturally relevant manner. As you develop this lesson you should continually ask yourself the question, “culturally relevant for whom and to what?” You will share your culturally relevant lesson with the class in an informal circle presentation.

Guidelines: You will modify one of the activities we do in class to develop a “culturally relevant” lesson. As part of this lesson you should develop a) a two-page description of the modified lesson, b) two copies of the actual modified activity, c) all accompanying materials needed to carry out the lesson (including such things as data sheets, patterns, manipulatives, pictures, etc.). Your culturally relevant lesson will be graded using the rubric found below.

<b>1. PAPER</b>	<b>POINTS</b>
-includes catchy title	1
-includes purpose of the lesson	1
-intended grade level specified	1
-scientific background information	1
-description of key science concepts	1
-procedures/guidelines	1
-materials	1
-important tips	1
2-pages length	1
<b>2. ACCOMPANYING MATERIALS</b>	
-design of actual lesson activity	6
-includes necessary data sheets, patterns, visual aids	
-includes manipulatives/hands-on materials	3
-materials neatly organized	3
	3

<b>3. OVERALL CULTURALLY RELEVANT LESSON</b>	
-represents creativity	3
-represents accuracy and clarity	3
<b>TOTAL POINTS POSSIBLE (30)</b>	

### 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)	3
Typed, written report that includes the following information:	
a. description of the nature of the science teaching/learning activity	3
b. description of the purpose/goal of the activity	3
c. explanation of why you selected to participate in this activity	3
d. in-depth reflective summary of what you learned about elementary science teaching/learning through this activity	5
e. signature of supervising teacher	3
<b>TOTAL SCORE (20 points possible)</b>	

