

ESCI 4420: Science for Early Childhood Education

Fall 2008

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The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary.

Required text Settlage, J. & Southerland, S. (2007). *Teaching science to every child: Using culture as a starting point*. New York: Routledge.

Additional readings to be distributed in class or via WebCT

Reference materials (available online) Georgia Performance Standards
<http://www.georgiastandards.org/science.aspx>

American Association for the Advancement of Science. (1990). *Science for All Americans: Project 2061*. New York: Oxford University Press.
<http://www.project2061.org/publications/sfaa/online/sfaatoc.htm>

American Association for the Advancement of Science. (1993). *Benchmarks for Science Literacy*. New York: Oxford University Press.
<http://www.project2061.org/publications/bsl/online/bolintro.htm>

National Research Council. (1996). *National Science Education Standards*. Washington, DC: National Academy Press.
<http://fermat.nap.edu/openbook/0309053269/html/index.html>

National Research Council. (2000). *Inquiry and the National Science Education Standards*. Washington, DC: National Academy Press.
<http://fermat.nap.edu/openbook/0309064767/html/index.html>

Miscellaneous Environmental science (approx. \$15)—*contingent on scheduling*

Course description

This course is intended to introduce prospective elementary teachers to the practice of teaching science. Building upon current research on science teaching and learning, we will explore:

- Approaches to science instruction for elementary students
- Elementary science curriculum and state/national science education standards;
- Learning environments that support students' understandings of science content as well as the nature of scientific knowledge;
- Forms of assessment that reveal students' understandings of science;
- Science instruction that supports the goals/needs of diverse groups of students.

Objectives

My primary goal is to guide you to become a reflective practitioner. Being reflective means being thoughtful and critical about the science learning experiences you enact in your classroom. To be an effective science teacher, you need to consider the backgrounds and experiences your students bring to your classroom. You also need to be thoughtful about the experiences you provide for your students, and you must consider how these experiences support their understandings of science. Being a reflective practitioner involves continuously evaluating your understanding of science content, your goals for student learning, the manner in which you engage students in science content and processes, the ways in which students participate in science learning experiences, and the ways in which students show evidence of meeting your learning goals.

Please keep in mind that teaching science (or any topic) is highly complex. The complexity is due to the interplay between your understanding of science, the understandings of science your students hold, and your ability to orchestrate science learning experiences in your classroom. It is your responsibility to learn how to negotiate your classroom environment and determine which instructional strategies meet your needs and goals, as well as the needs and goals of your students. Therefore, the intent of this course is to help you develop competencies that enable you to make informed curricular and instructional decisions.

The goals for this course include:

1. Reflecting on and developing your understanding of science content, as well as your understanding of the nature of scientific knowledge;
2. Becoming familiar with factors that influence learning (e.g., students' prior conceptions of science, how teaching practices support science learning, etc.);
3. Developing competencies that allow you to make informed decisions about curriculum and instruction;
4. Understanding how to use various forms of assessment to evaluate student learning and how to adjust instruction based on these assessments;
5. Developing an understanding of diversity and equity and ways to meet the needs of all students in your class;

6. Developing an understanding of your goals as a teacher and reflecting on how decisions you make about curriculum and instruction support or hinder these goals;
7. Developing habits of mind that allow for professional development. This course is one step toward becoming a science teacher, but in order to serve your students well you need to continue learning about science teaching and learning.

Assignments

Reading response papers (18%)

The readings for this course are integral for developing and reflecting on your ideas about science teaching. You are responsible for submitting a reading response paper for readings. I will provide questions you should use to frame your paper. Response papers should be at least 1 page in length. Additionally, at the end of the paper please include 2 questions for discussion. Response papers should be submitted via WebCT prior to the beginning of class. *Papers not posted prior to class will be considered late.*

Microteaching (15%)

Prior to field experience you will teach a science lesson in class. You will be required to submit a lesson plan for this assignment.

Field experience assignments

1. **Students' ideas about science (25%)**

You will interview at least three students about their ideas about a particular science topic.

2. **Teaching science in the elementary classroom (25%)**

Select one of the following:

- a. Design and teach at least one science lesson
- b. Design and conduct at least one science center investigation

You will be required to develop a lesson plan for this assignment, and *you must submit the lesson for approval prior to teaching it*. You may be asked to revise your lesson, so allow sufficient time to make revisions. After teaching your lesson, you will interview at least one student to assess his/her understanding of the ideas you presented.

Post-field experience reflection (10%)

Following field experience, you will be asked to reflect on your experience and what you learned about teaching science to elementary students.

Science teaching resource file (7%)

Throughout the semester you should be collecting materials/ideas you can use in your classroom (e.g., resources, lesson plans). At the end of the semester, you will submit your resource file.

Course Policies

Attendance and participation/professionalism

Attendance and participation/professionalism will affect your final grade. Regular and punctual attendance is an important part of this course. *If you miss more than two class sessions your final grade will drop by one grade level (e.g., from A- to B+).* Exemptions may be granted in cases of serious illness, death in the family, religious observance, and other events that fall under the guidelines for an excused absence. Please inform me *in advance* if you are going to be absent from class.

As a class, we will explore and develop ideas related to science teaching and learning. Your participation will enhance the quality of your experience and that of your classmates. Participation involves being a thoughtful contributor to class discussions and activities. I expect that you will come to class prepared to participate in our class discussions. *Your final grade will drop by one grade level (e.g., from A- to B+) if participation/professionalism becomes problematic.*

All assignments must be handed in on or before the day they are due. Assignments should be submitted via WebCT unless otherwise noted. If an assignment is late, there will be a reduction of one grade level per day overdue. I expect you to proofread your assignments.

All academic work must meet the standards contained in "A Culture of Honesty." All students are responsible to inform themselves about those standards before performing any academic work (<http://www.uga.edu/~ovpi/honesty/ah.pdf>).

Please turn off your cell phone prior to coming to class (i.e., no phone calls and no text messaging).

Grading

Your final grade will be calculated based on the following:

100-93=A, 92-90=A-

89-87=B+, 86-83=B, 82-80=B-

79-77=C+, 76-73=C, 72-70=C-

69-67=D+, 66-63=D, 62-60=D-

Below 60=F

Keep in mind that you choose the quality of the work you submit. You can earn an A by submitting assignments that exhibit exemplary quality.

If you are unsatisfied with your performance on an assignment, you may revise and resubmit it. You must submit your revised assignment no later than one week after the assignment was returned to you. Your final grade on the assignment will be the average of the grade you received on the original assignment and the grade you received on the revised version.

DATE	TOPIC	READING (date assigned)	ASSIGNMENTS DUE
Aug 18	Introduction to course Why teach science to elementary students?	Settlage & Southerland Foreward Preface	
Aug 20	Images of science in elementary classrooms	<i>Science for All Americans</i> ch. 4 & 5 (available on WebCT)	Reading response (RR) 1
Aug 25	Big ideas in science	Settlage & Southerland Ch. 1—Forming commitments to science teaching (pp. 1-17) Ch. 8—The nature of science	RR 2
Aug 27	Big ideas in science	Settlage & Southerland Ch. 4—Approaches to science instruction	RR 3
Sept 1	Labor Day—no class		
Sept 3	Approaches to science instruction	Settlage & Southerland Ch. 5—The learning cycle as a model for science teaching	RR 4
Sept 8	Inquiry-oriented science	Settlage & Southerland Ch. 2—Observe, infer, and classify: Basic science process skills	RR 5
Sept 10	Inquiry-oriented science	Settlage & Southerland Ch. 3—Measure, predict, and communicate: Basic science process skills	RR 6
Sept 15	Supporting inquiry in elementary classrooms	Settlage & Southerland Ch. 7—From activity to inquiry	RR 7
Sept 16	Meet your teacher day		
Sept 17	Supporting inquiry in elementary classrooms	Settlage & Southerland Ch. 11—Assessing students' science learning	RR 8
Sept 19	Friday in field		
Sept 22	Assessing students' understandings	Settlage & Southerland Ch. 6—Questioning strategies and leading discussions	RR 9
Sept 24	Microteaching	Settlage & Southerland Ch. 9—From lessons to units: Science curriculum	Microteaching lesson plan
Sept 26	Friday in field		
Sept 29	Microteaching	Settlage & Southerland Ch. 10—Integrating science with other subjects	Microteaching lesson plan
Oct 1	Final prep for field experience	Settlage & Southerland Ch. 12—Managing a classroom for science learning	RR 10

Oct 3	<i>Friday in field</i>		
FIELD EXPERIENCE (Oct.6—Oct. 16)			
Oct 20	Debriefing field experience	NSES vignettes (in class)	
Oct 22	Supporting science learning	NSES vignettes (in class)	
FIELD EXPERIENCE (Oct. 27-Nov. 7)			
Nov 10	Post-field experience reflection		<i>reflection</i>
Nov 12	Post-field experience reflection		<i>reflection</i>
Nov 17	Environmental science		
Nov 19	Environmental science		Field assignments
NO CLASS—THANKSGIVING BREAK (Nov. 24-28)			
Dec 1	Developing science curriculum	Reardon	
Dec 3	Developing science curriculum		
Dec 8	Last day of class		Resource file