

ESCI 4420: Science for Early Childhood Education

Fall 2007

Instructor: Julie Kittleson, PhD
Office: 212G Aderhold
Phone: 542-4650
Email: jkittl@uga.edu
Office hours: by appointment

Day & Time: Wed. 8:00-12:15
Location: 213 Aderhold

Graduate assistants:

Brittan Hallar bhallar@uga.edu
Rachel Wilson rewilson@uga.edu

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

Reference materials Georgia Performance Standards
(available online) <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:

- 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 a highly complex practice. 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. Developing and reflecting on your science content understanding, as well as your understanding of the nature of scientific knowledge;
2. Becoming familiar with factors that influence learning (e.g., students' conceptions of science, how these conceptions influence science learning, how teaching practices support science learning, etc.);
3. Developing competencies that allow you to make informed decisions about curriculum and instruction in your classroom;
4. Understanding how to employ various forms of assessment to evaluate student learning and how to adjust instruction in relation to information gained from assessment;
5. Developing an understanding of diversity and equity and an understanding of how you can organize your teaching practices to meet the needs of all students in your class;

6. Developing an understanding of your goals as a teacher of science and reflecting on how the 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. In order for you to serve your students well, it is important that you continue to refine your ideas about science teaching and learning.

Assignments

Reading response papers (10%)

The readings for this course are integral for developing and reflecting on your ideas about science teaching. You are responsible for submitting a response paper for each reading assignment. I will provide questions to which you should respond. Additionally, please include 2 questions for discussion.

Content presentation (10%)

For this assignment, you and a partner will investigate an assigned content area. You will locate resources for the topic and present central ideas related to the topic. You will develop a handout containing information about content and resources.

Text resources in elementary science (10%)

Children's literature can be a useful resource when teaching science, particularly if you select texts that can be used to support conceptual understandings. For this assignment, you will identify and evaluate text resources (e.g., trade books) you could use to when teaching science. You will share your findings with your peers via a presentation and written handout.

Microteaching (10%)

For this assignment, you and a partner will develop and teach a science lesson in class. You and your partner will be required to submit a lesson plan for this assignment.

Field experience assignments

1. Students' ideas about science (20%)

Select one of the following:

- a. Interview three students about their ideas about a particular science topic. Try to select students who represent the range of the overall population in the class;
- b. Propose a project to fulfill this assignment, although please consult me prior to beginning your project. If you choose to propose a project please explain how it addresses students' understandings of science.

2. Teaching science in the elementary classroom (20%)

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*. I may ask you to revise your lesson, so please 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.

3. Teacher and/or curriculum perspectives (10%)

Select one of the following:

- a. Interview your cooperating teacher about his/her perspectives on science teaching and curriculum materials
- b. Examine science curriculum materials used in your field experience classroom

Science teaching resource file (10%)

Throughout the semester you should be collecting materials/ideas you can use in your classroom (e.g., resources, lesson plans).

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 one class session 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. If an assignment is late, there will be a reduction of one grade level per day overdue. I expect you to type and proofread your assignments. (Response papers do not have to be typed.)

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 22 | <ul style="list-style-type: none"> Introduction to course Why teach science to elementary students? | Settlage & Southerland <ul style="list-style-type: none"> Foreward Preface Ch. 1—Forming commitments to science teaching | |
| Aug 29 | <ul style="list-style-type: none"> Goals for science teaching Engaging in inquiry-oriented science | Settlage & Southerland <ul style="list-style-type: none"> Ch. 10—Integrating science with other subjects <i>SFAA</i> ch. 4 & 5 | Reading response (RR) 1 |
| Sept 5 | <ul style="list-style-type: none"> Big ideas in science <i>Content presentations</i> <ul style="list-style-type: none"> Integrating text resources into science instruction <i>Text resources assignment</i> | Settlage & Southerland <ul style="list-style-type: none"> Ch. 2—Observe, infer, and classify: Basic science process skills Ch. 3—Measure, predict, and communicate: Basic science process skills Ch. 4—Approaches to science instruction | RR 2 Handout from content presentation |
| Sept 12 | <ul style="list-style-type: none"> Text resources presentations Engaging in inquiry-oriented science | Settlage & Southerland <ul style="list-style-type: none"> Ch. 5—The learning cycle as a model for science teaching Ch. 11—Assessing students' science learning <i>NSES vignettes</i> | RR 3 Handout from text resources assignment |
| Sept 19 | <ul style="list-style-type: none"> Assessment <i>Prepare for field assignment #1</i> <ul style="list-style-type: none"> Engaging in inquiry-oriented science | Settlage & Southerland <ul style="list-style-type: none"> Ch. 6—Questioning strategies and leading discussions Ch. 7—From activity to inquiry | RR 4 |
| Sept 26 | <ul style="list-style-type: none"> Microteaching | Settlage & Southerland <ul style="list-style-type: none"> Ch. 9—From lessons to units: Science curriculum Ch. 12—Managing a classroom for science learning | RR 5 Microteaching lesson plan RR 6 (send via email by 10/3) |
| FIELD EXPERIENCE (Oct.1—Oct. 25) | | | |
| Field assignment #1 due by Oct. 25 | | | |
| Oct 31 | Field experience presentations | | |
| Nov 7 | Environmental science | | |
| Nov 14 | Resources for science teaching | | Field assignment #2 |
| Nov 21 | NO CLASS—THANKSGIVING BREAK | | |
| Nov 28 | Microteaching | | |
| Dec 5 | Last day of class | | Field assignment #3 Science teaching resource file |

Sept. 11—Meet your teacher day; Friday field days—Sept. 14, 21, 28