ESCI 4420: Science for Early Childhood Education

Spring 2009

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

Day & Time: M & W 1:25-3:20
Location: 215 Aderhold

Teaching assistant:
Gerri Cole

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.

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

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 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 (15%)
The readings for this course are integral for developing ideas about science teaching. You are responsible for submitting a reading response paper for select readings. I will provide questions to frame your paper. Additionally, please include 1 question for discussion.

***Science & Children* article presentation (10%)**

The National Science Teachers Association (NSTA) publishes the journal *Science & Children*. The journal is available in the UGA library (Science Library, 3rd floor, Q181.S32). You and a partner will be responsible for selecting and reporting on an article from the journal.

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%)**
   Interview three students about their ideas about a particular science topic. Report your findings about students' understandings of science.
2. **Teaching science in the elementary classroom (25%)**
   Design and teach at least one science lesson or design and conduct at least one science center investigation. Your lesson must include a form of assessment.

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.

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*. Please turn off your cell phone prior to coming to class (i.e., no phone calls and no text messaging). *Text messaging during class will affect your professionalism grade.*

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.

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).

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

DATE	TOPIC	READING (date assigned)	ASSIGNMENTS DUE
Jan 12	Introduction to course	Foreward & Preface	
Jan 14	Images of science	*Science for All Americans* ch. 4 & 5	RR 1 (foreword & preface)
Jan 19	*No Class—Martin Luther King Jr. Day*		
Jan 21	Big ideas in science	Ch. 1—Forming commitments to science teaching	
Jan 22	***Meet Your Teacher Day***		
Jan 23	***Field Experience***		
Jan 26	Georgia Performance Standards	Ch. 4—Approaches to science instruction	RR 2 (ch 1)
Jan 28	Georgia Performance Standards	Ch. 8—The nature of science	RR 3 (ch 4)
Jan 30	***Field Experience***		
Feb 2	Nature of science	Ch. 2—Observe, infer, and classify: Basic science process skills	RR 4 (ch 8)
Feb 4	Processes of science	Ch. 3—Measure, predict, and communicate: Basic science process skills	
Feb 6	***Field Experience***		
Feb 9	Learning cycle	Ch. 5—The learning cycle as a model for science teaching	
Feb 11	Supporting inquiry in elementary classrooms	Ch. 7—From activity to inquiry	RR 5 (ch 5)
Feb 16	Supporting inquiry in elementary classrooms	Ch. 11—Assessing students' science learning	RR 6 (ch 7)
Feb 18	Assessing students' understandings	Ch. 6—Questioning strategies and leading discussions	RR 7 (ch 11)
Feb 23	Microteaching	Ch. 9—From lessons to units: Science curriculum	RR 8 (ch 6)
Feb 25	Microteaching	Ch. 10—Integrating science with other subjects	
Mar 2	Microteaching	Ch. 12—Managing a classroom for science learning	
Mar 4	Final preparations for field experience		
Spring Break March 9-13			
FIELD EXPERIENCE (March 16-April 3)			
Apr 6	Field experience debriefing		
Apr 8	Field experience debriefing		Field Assignment #1
FIELD EXPERIENCE (April 13-April 17)			
Apr 20	Post-field experience reflection		
Apr 22	Post-field experience reflection		Field Assignment #2
Apr 27	Resources for science teaching		
Apr 29	Resources for science teaching		Reflection
Apr 30	Last day of class		