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

SPRING 2008, ESCI 4420
SCIENCE FOR EARLY CHILDHOOD EDUCATION

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Schedule: Monday and Wednesday 1:25-3:20pm
Field Dates: 10/1-10/25
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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 both PreK and 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. Readings from the following book will be on file at the OIT (second floor of Aderhold):

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

Georgia Performance Standards for grades K-5 and Science Tasks for each grade. Available at the OIT Course Reserves File Cabinet or http://www.georgiastandards.org/science.aspx (you can print them out yourself)

Project Wild Training Materials $15 (maybe, maybe not)
Sea Monkeys (10$)
Notebooks to organize course materials & miscellaneous materials (approx. $20)
Suggested: 3 ring binder and art sketchbook.

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 five 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:	20%
Science Autobiography and Show-and-Tell	20%
Science-in-the-Field Lesson (Field Experience)	20%
Cumulative Final Exam (opening ?'s in Journal)	20%
Science Journal and small assignments	20%
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 (20%)

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 1.5 pages single spaced (or 3 pages double 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.

Science Autobiography and Show-and-Tell(20%)

In this first assignment you are asked to reflect deeply on the question "Where is science in my life?" You should consider your life history and identify meaningful experiences/encounters you have had with science. You will develop a creative way to display your science autobiography along with a one-page description of it.

Show-and-Tell is just what it sounds…bring something in that relates to science, Dr. Calkin will model it the first few classes.

Science in the Field Lesson (Field Experience Activity) (20%)

You will develop a science lesson and share it with two partners. The science lesson may be one you actually taught in the field or one you created on an assigned topic. If you can teach one or more science lessons in the field, that's great. If not, no problem…you will just have to develop on from scratch on an assigned topic.

Cumulative Final Exam (Opening questions in science journals) (20%)

The exam will be cumulative in nature, with questions posed throughout the course. Each day you will answer 2-3 exam questions based on the content of previous class activities, discussions or reading. You will record these questions and answer them in the back of the science journal (see below). They will be posted on the overhead or whiteboard before each class session. Your answers will be graded based on creativity and 'completeness.' I will look over your work midway through course to provide feedback on your progress.

Science journal and small homework assignments (20%)

You will need to keep a science journal (a sketchbook works best for me). In it, you will be recording many observations and data from experiments. Topics will include moon observations, mealworm beetles, and garden work. You also will have small homework assignments (in and out of your science journal). The science journal will be graded based on creativity and 'completeness.' I will look over all journals midway through course to provide feedback on your progress.

Science Autobiography
Grading Rubric

In this assignment you are asked to reflect deeply on the question "Where is science in my life?" You should consider your life history and identify meaningful experiences/encounters you have had with science. You will develop a creative way to display your science autobiography along with a one-page description of it.

(**Examples**: Develop a book; make a mobile; make a photo-essay; create a diorama; make a mural, write a Reader's Theater; develop an epic poem; write a collection of songs)

Science Autobiography	**Points**	
Shows evidence of deep reflection	5	
Includes minimum of 5 examples	5	
Creative organization/display	5	
One-page explanation of autobiography	5	
Total Points Possible (20)		

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	1
Analysis from multiple perspectives	1
Should include at least six 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.	6
Typed and Submitted on Time	1
Total points possible (10)	10

Science-in-the-Field Lesson…ESCI 4420 Field Requirement for Calkin's Section

If you taught any science lessons in the field, you can pick your best lesson and adjust it to fit the requirements below. If you didn't teach any science in the field, you will be assigned a topic and required to create the lesson from scratch (but you will not be penalized if you did not get the chance to teach any science). The lessons will be due the day of your presentations.

Teaching Rubric

Lesson plan* requirements

1.	GPS's (include how the 'Habits of Mind' are taught/addressed)	0 .5 1
2.	brief summary of the science content/concept(s) taught (100 -175 words)	0 .5 1
3.	materials needed (try to use easy things to get)	0 .5 1
4.	directions/sequence of activities	0 1 2
5.	assessments (how will you know if the students learned what you wanted them to learn)	0 .5 1
6.	**starter ideas for integration with language arts and/or math	0 .5 1
7.	resources (at least one website and at least one text/magazine/journal/ newspaper article)	0 .5 1
8.	images (black and white okay) (could be digital photos, images from web, Diagrams, drawn pictures) can be incorporated into the lesson plan above or Attached at end	0 .5 1
9.	Copies for classmates	0 1

#grade /10

*The format of the lesson plan is not important, just that you include each of the 9 things somehow. If you want to use an internet or other lesson plan and simply add on by hand or attach a typed page any needed requirements, that's fine too. In other words, please don't spend any extra time on formatting this lesson to make it look good.

** good starter ideas means enough is included so your peers could read it in a year or two and have enough information to build a lesson around it. Resources and key directions, materials needed are all things that might be included, you can work together or each group member work separately but you'll all get the same grade for these 6 points.

20 minute presentation by individuals will include

One activity done by all peers in the class

Must be hands-on	1 2 3 4 5
Science concept(s) clearly stated/discussed before, during and/or after the activity done	1 2 3 4 5

Optional: other activities related to the science concept can be demonstrated and very briefly discussed

#grade: /10

if you work with others, everyone in the group will get the same 'presentation' grade but different 'lesson plan' grades.

If you work with others, it should be on related concepts/subjects and you will be allotted more time for your presentation.

ESCI 4420: Spring, 2008

Date	Topic	Assignments
Mon, Jan. 7th	Course Overview Introductions	
Wed, Jan. 9th	Georgia Performance Standards Basic Process Skills Data Collection	
Mon, Jan. 14th	Inquiry in teaching science Science in My Life	Science Autobiography Due
Wed, Jan. 16th	Life Science: Characteristics of Life and Gardening	*Case Reaction Due Inquiry: To do or not to do. (Case 2.1)
Wed, Jan. 23rd	Life Science: Taxonomy	
Mon, Jan. 28th	Ecology and the Environment	
Wed, Jan. 30th	Diversity in the Science Classroom	*Case Reaction due: El Secreto de las Ninas (Case 8.1)
Mon, Feb. 4th	Physical Science: Matter, Simple Machines and Forces	
Wed, Feb. 6th	Physical Science: Sound and Light	
Mon, Feb. 11th	Art and Science Integration	
Wed, Feb. 13th	TBA – We may be volunteering with GSTA (GA Sci. Teachers Assoc)	
Wed, Feb. 20th	Physical Science: Magnets, and Electricity	
Feb. 25st-March 28th		**In the Field**

Mon, March 31st	Science in the Field	
Wed, April 2nd	Earth Science: Rocks & Minerals	
Mon, April 7th	Earth Science: Geology	
Wed, April 9th	Earth Science: Weather	
Mon, April 14th	Earth Science: Astronomy	Case Read (no Case Reaction Due): Talking Together about the Moon (Case 7.1)
Wed, April 16th	Students Teach	Science-in-the-Field lesson
Mon, April 21st	Students Teach	Science-in-the-Field lesson Journals/Final Questions Due
Wed, April 23rd	Students Teach	Science-in-the-Field lesson
Mon, April 28th	Students Teach	Science-in-the-Field lesson