

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

FALL 2009, ESCI 4420

SCIENCE FOR EARLY CHILDHOOD EDUCATION

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Schedule: Mondays, 9:30-12:15

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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 or refine your 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 books are required:

Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill: Algonquin Press. (new and updated 2008 version)

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

Miscellaneous materials and supplies

Project Wild (\$15.00)

Scrapbook/Journal for your Photoessay

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:

- ◇Respect others (i.e., cell phones off; newspapers and assignments for other classes packed away)
- ◇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 regarding learning
- ◇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 this course. If you do not attend class you are unable to participate in many activities that will be undertaken during class time. In this regard, you are responsible for attending all class sessions. 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. In the event of an emergency please try to notify me.

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 judgments regarding the conditions of projects you submit. Detailed directions will be provided for each assignment along with performance criteria. In addition, your participation in classroom activities will be considered in the final grade for the course.

Assignments

| | |
|--|----------|
| Case Reactions | 15 pts. |
| Last Child in the Woods Discussion and Photo Essay | 30 pts. |
| Culturally Relevant Lesson | 25 pts. |
| Class participation/Science in the News | 10 pts. |
| Field Experience Assignments | 20 pts. |
| Total | 100 pts. |

I am looking forward to a very productive course in which we will all learn a great deal about elementary science teaching and learning!

Grading Scale

| | |
|------------|------------|
| 96-100 = A | 72-75 = C |
| 92-95 = A- | 68-71 = C= |
| 88-91 = B+ | 64-67 = D+ |
| 84-87 = B | 60-63 = D |
| 80-83 = B- | |

Assignment #1: Case Reactions (15 points)

During this course you will read a number of “cases” that address issue 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 and be prepared to discuss them in class. You will develop a written response for **one** 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. The case you will write a response to is:

El Secreto de las Ninias

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 can 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 a selected case. 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 in relation to your personal experience as a teacher or student. 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. Educational theories that can be applied 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

CASE REACTION GRADING RUBRIC

| Component | Points |
|--|---------------|
| Catchy title for the case reaction | 1 |
| In-depth insight and reflection | 3 |
| Should include at least five 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. | 10 |
| Typed and Submitted on Time | 1 |
| Total points possible (15) | |

Assignment #2: Last Child in the Wood: Discussion and Photo Essay Guidelines (30points)

This book is organized into seven sections, with each section containing several chapters. As you read this book you should think about the issues and questions it raises for you, particularly as they relate to science teaching and learning. There are two parts to this assignment:

a) Photo Essay:

You will keep a Photo Essay corresponding to the seven sections of the book. Your Photo Essay should contain seven sections. In each section you should write an in-depth reflection about one or more of the issues/questions in the section. Each reflection should be supported with photos, your own personal drawings, or other visual images. Your Photo Essay should include an introduction section, conclusion section and the seven reflections sections.

b) Section Presentation:

You will collaborate with peers to lead an interactive presentation of one section in the book. Your presentation should highlight key points in a creative way, and should engage peers in deep and critical

reflection of the issues. You will have 15-20 minutes for your presentation. Your presentation should not exceed 20 minutes.

Assignment #3: Culturally Relevant Lesson (25 pts.)

You will select an activity from class and modify the activity to make it more relevant to the students and community in which you teach or plan to teach. You will develop a new version of the activity with modifications.

| | |
|---|------------------|
| Selected activity – Did background research for modifications | 6 |
| Made appropriate modifications to the activity, culturally relevant | 7 |
| Constructed new activity – neat and attractive | 7 |
| One Page explanation of modifications | 5 |
| TOTAL POINTS | 25 points |

Assignment #4: Class participation and Science in the News (10 points)

You should actively participate in all class activities to the best of your ability. You will collaborate with a classmate to provide a brief (5 minute) report of a current news event featuring some aspect of science. As you share with the class you should:

- a) Summarize the key ideas of the news report
- b) Describe what surprised you about the news report
- c) Discuss the significance of the ideas to our lives and to science teaching and learning

You should prepare an index card addressing these three points.

Assignment #5: Field Experiences (20 pts.)

During your field experience you will select and carry out several activities from the list provided. You will prepare field experience reports for two of these activities, which should be signed by your supervising teacher. Your field experience reports will be evaluated according to the criteria listed below.

| OBJECTIVE | POINTS |
|---|---------------|
| Participation in an activity with primary focus of science (selected from list) | 1 |
| Typed, written report that includes the following information organized in three sections: | |
| a. description of the nature of the science teaching/learning activity, including purpose and goals | 3 |
| b. In-depth reflective summary of what you learned about elementary science teaching/learning through this activity | 3 |
| c. describes implications of what was learned for future teaching | 3 |
| d. signature of supervising teacher | required |
| TOTAL SCORE (10 points possible) | |

Last Child in the Woods Grading Rubric

Part I Photo Journal (30 points)

| CRITERIA | POINTS AVAILABLE | POINTS EARNED | TEACHER COMMENTS |
|--|------------------|---------------|------------------|
| Thoughtfully organized into seven sections | 4 | | |
| Evidence of reflection and critical connection to ideas/issues in the seven sections of Louv's book | 4 | | |
| Supported with photos, drawings or other graphic illustration of your reflections | 4 | | |
| Includes a journal introduction that explains your perception of the significance of this book to the course or a description of your own interest in or experience with nature-deficit disorder | 4 | | |
| Includes a conclusion to explain and summarize what you have learned in reading Louv's book | 4 | | |

Part II Discussion/Presentation

| Criteria | Points available | Points Earned | Teacher Comments |
|--|-------------------------|----------------------|-------------------------|
| Collaborate with peers to facilitate interactive discussion/presentation | 3 | | |
| Key points of the section are highlighted in a creative way | 4 | | |
| Activity engages peers | 3 | | |

Last Child in the Woods

Discussion Sheet

| Date | Section | Group Members |
|-----------------------------------|--|---------------|
| Monday, August 31 st . | Part I The New Relationship Between Children and Nature | |
| Monday, Sept. 14 th . | Part II Why the Young (and the Rest of Us) Need Nature | |
| Monday, Sept. 28 th . | Part III The Best of Intentions: Why Johnnie and Jeannie Don't Play Outside Anymore | |
| Monday, Oct. 19 th . | Part IV The Nature-Child Reunion | |
| Monday, Oct. 26 th . | Part V The Jungle Blackboard | |
| Monday, Nov. 9 th . | Part VI Wonder Land: Opening the Fourth Frontier | |
| Monday, Nov. 16 th . | Part VII To be Amazed | |

Field Experiences for Science
ESCI 4420
Fall Semester, 2009
Deborah J. Tippins, Ph.D.

Welcome back to a new semester! You will have many opportunities to see and do elementary science teaching this fall in the context of your methods class and your school-based practica. A list of science activities and experiences for your school-based practica are described below. Your participation in two of the activities is required, and will be developed as a course assignment. The other activities and experiences are recommended-try to take an active role in any science activities that may arise.

Suggested experiences:

- Design and teach an “outdoor” science lesson
- Design and teach an inquiry lesson that encourages students to be problem-solvers (i.e., such as the float/sink or water filtration activities we will do in class)
- Conduct interviews with three diverse students to develop an understanding of how they make sense of a selected science concept.
- Design and teach a science lesson in which you use cooperative learning strategies (i.e., assigned roles) to organize the lesson and facilitate learning;
- Plan and implement a science lesson or series of lessons that start with the learners’ questions (i.e., What would you like to learn about rocks? How can we go about learning that?);
- Look closely at the types of questions students are asking about a science concept, record these questions, and conduct an analysis of them.
- Develop and use a non-paper and pencil task for assessing student learning of a science concept;
- Teach a science lesson that incorporates computer technology
- Teach a science lesson which involves the use of living organisms-check with your teacher to make sure that the organisms you plan to use fall within the parameters of school, district, state and federal guidelines);
- Teach a science lesson which directly relates the science content to a socio-scientific issue (i.e., global climate change);
- Participate in school-based science events (i.e., Family Science Night, Science Fairs, etc.)
- Observe and critique two peers as they teach science lessons;
- Design an interactive science bulletin board or learning center.
- Design a science songbook that addresses the science GPS at your grade level
- Design and implement a science activity as part of a class field trip

Other?

To be negotiated with course instructor

Field Experience

Activity Report Form: Respond in depth to these four questions. Be sure to obtain the signature of your teacher.

You should prepare a two-page single-spaced report of your activity. The report should be organized into three sections as follows:

- A. Describe in detail the nature of the science teaching/learning activity you participated in during your field experience. Include the purpose/goal of the activity.
- B. Write a reflective summary of what you learned about elementary science teaching and learning through this activity.
- C. Briefly describe the implications of what you learned for your future teaching.
- D. Signature of Supervising Teacher (please have your teacher sign the front page of your report).

SCIENCE IN THE NEWS

| | |
|--------------------------------------|-------------------------|
| Monday, August 24 th . | <hr/> <hr/> <hr/> <hr/> |
| Monday, August 31 st . | <hr/> <hr/> <hr/> <hr/> |
| Monday, September 14 th . | <hr/> <hr/> <hr/> <hr/> |
| Monday, September 28 th . | <hr/> <hr/> <hr/> <hr/> |
| Monday, October 19 th . | <hr/> <hr/> <hr/> <hr/> |
| Monday, November 2 nd . | <hr/> <hr/> <hr/> <hr/> |
| Monday, November 16 th . | <hr/> <hr/> <hr/> <hr/> |
| Monday, November 30 th . | <hr/> <hr/> <hr/> <hr/> |

Monday, December 7th.

ESCI 6420 SCHEDULE
Fall Semester 2009
9:30-12:15, Mondays
Room 220

| Date | Topic | Assignment |
|--------------------------------------|--|---|
| Monday, August 17 th . | Course Overview Collecting and Analyzing Data Introduction to Science as Inquiry Overview of Georgia Performance Standards Nature of Science | |
| Monday, August 24 th . | <u>Constructivist Earth Science</u> Rocks & Minerals Weathering and Erosion Sand & Soil Earth Processes | 1) Science in the News Case Discussion: "The Egyptian Exhibit" |
| Monday, August 31 st . | <u>Constructivist Earth Science</u> (continued) Landforms Oceanography Marine Environments Camouflage Predator Prey | 2) Science in the News Last Child in the Woods (Group 1) Case Discussion: "The Day the Lobster Died" |
| Monday, September 7 th . | LABOR DAY HOLIDAY | |
| Monday, September 14 th . | <u>Constructivist Earth Science</u> (continued) Celestial Sphere and Moon Phases Day and Night Cycle Sun & Seasons | 3) Science in the News Last Child in the Woods (Group 2) Case Discussion: "What Shape is a Star?" |

| | | |
|---|--|--|
| Monday, September 21st. | <u>Constructivist Life Science</u> Animals: Birds Insects | Case Reaction Due: "El Secreto de las Ninas" |
| Monday, September 28th. | <u>Constructivist Life Science</u> (continued) Animals" Mammals Reptiles Food Chains and Food Webs | 4) Science in the News Last Child in the Woods (Group 3) |
| Monday, October 5th. | <u>Constructivist Life Science</u> (continued) Ecology Outdoor Science | Case Discussion: What Happened to Bunny?" |
| Monday, October 12th. | PROJECT WILD TRAINING | Field Report #1 Due |
| Monday, October 26th. | Constructivist Life Science (continued) Health/Nutrition Human Body Heredity | 5) Science in the News Last Child in the Woods (Group 4) |
| Monday, November 2nd. | <u>Constructivist Physical</u> Science Sound Electricity | 6) Science in the New Culturally Relevant Lesson Due |
| Monday, November 9th. | <u>Constructivist Physical</u> Science (continued) Light and Shadows Teaching for Diversity in the Science Classroom | Last Child in the Woods (Group 6) |
| Monday, November 16th. | <u>Constructivist Chemistry</u> Atoms & Molecules Properties of Matter | 7) Science in the News Field Report #2 Due Last Child in the Woods (Group 7) |
| Monday, November 23rd. | THANKSGIVING HOLIDAY | |
| Monday, November 30th. | <u>Constructivist Chemistry</u> (continued) Physical and Chemical Changes | 8) Science in the News Last Child in the Woods Photo Essay due |
| Monday, December 7th. | <u>Constructivist Chemistry</u> (continued) Phases Changes Sharing What we've Learned! | |
| FINAL EXAMS | | |

