

ESCI 4420 – Science for Early Childhood Education
Fall 2007

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This syllabus is tentative and subject to modifications throughout the semester.

Introduction & Course Description

Welcome to the exciting world of Science Education for Early Childhood! This course has been designed to provide you with opportunities to learn more about science teaching and learning and to construct a vision of yourself as a teacher of elementary science. During the semester, you will be involved in independent and group activities to help you become competent in planning activities that fit within your vision. I am looking forward to a productive semester in which we learn a great deal about elementary science teaching and learning.

Course Materials

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

You will also need to download a copy of the Georgia Performance Standards for science from <http://georgiastandards.org/>.

The instructor will make available additional readings from journals and books. You will be expected to read and critique relevant course articles. You will also need to purchase miscellaneous supplies and materials for class projects (\$15-20).

Course Goals

This course will focus on possible solutions to such questions as:

- What is the nature of science and scientific knowledge?
- What do teachers do when they teach science?
- How can a teacher provide learning environments which will promote active learning, student responsibility, and autonomy?
- How can science be integrated across the curriculum?
- How can science be taught as part of an interdisciplinary/thematic/whole language unit using children's literature?
- What can be done to encourage females and minorities in science?
- What is meant by "culturally relevant" science teaching and learning?
- How can a teacher or student assess learning with understanding?
- What "tools" can assist a teacher in becoming a "reflective" practitioner and students in becoming "reflective" learners?
- What resources are available for early childhood science educators?
- How can science be taught using outdoor learning environments?

Course Objectives

The objectives of this course are to develop:

- Positive attitudes towards science, science teaching, and science 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 an 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 process skills
- Understanding of the characteristics of teaching science as inquiry
- Questioning skills to elicit students’ ideas about science concepts

Expectations

Below are my expectations of you for this course, as well as criteria I will consider when evaluating whether expectations have been met.

- Participation:
 - Demonstrates ability to actively contribute to group and class discussions
 - Actively engages in learning exercises
- Critical thinking:
 - Class work and assignments demonstrate original thinking and ideas go beyond what is described in class or in readings
 - Shows evidence of ability to synthesize information from a variety of sources
- Communication:
 - Communicates respectfully with others
 - Shows respect for others' ideas, especially those that may differ from one's own
 - Timely communication with instructor of any concerns
 - Thoughtful dialogue that indicates learning is occurring
 - Shares resources and ideas
- Motivated to learn:
 - Works diligently to increase knowledge and ability to teach children science
 - Actively seeks information from a variety of resources
 - Demonstrates mentality of being a lifelong learner
- Coursework:
 - Projects indicate that care has been taken in their completion
 - Goes beyond average expectations of assignment
 - Work is free of misspellings and grammatical mistakes
 - Work is turned in on time
 - Shows evidence that reading assignments have been completed
- Attendance and promptness:
 - Attends every class meeting
 - Arrives by the assigned starting time of the course and is prepared to begin
 - Remains for entire class
- Preparation:
 - Prepares for teaching experiences through prior practice
 - Accounts for materials and understands the working of equipment prior to teaching situations

Attendance

Class participation is a vital component of this course. If you are not in class, you are unable to participate in course activities. You are expected to be present for every class meeting in its entirety. It is also important that you arrive on time and that you have prepared in advance for class. I reserve the right to lower a final grade by one or more letter grades if you exceed one unexcused absence or if tardiness/leaving early becomes problematic. Excessive excused absences may also result in the lowering of a final grade. Absences that may be excused include illness, death or illness in the family, jury duty, or a personal crisis. It is the responsibility of the student to contact the instructor with documentation for any absence. It is also the responsibility of the student to contact the instructor regarding content missed in class. When circumstances permit, you should make direct contact with the instructor before class takes place. If I cannot be reached in person, by email, or by phone; you should leave a message with the secretary in the Mathematics and Science Education Department (542-1763).

**Prior to the beginning of class, please turn off your cell phone or its ringer.

Academic Honesty

All academic work must meet the standards contained in "A Culture of Honesty." Each student is responsible for informing himself about these standards before performing any academic work. This policy holds you responsible for maintaining the highest standards of honesty and integrity. Penalties for academic dishonesty are severe and ignorance is not an acceptable defense. Academic dishonesty includes plagiarism, cheating, lying, tampering, stealing, receiving unauthorized or illegitimate assistance from any other person, or using any source of information that is not common knowledge. The policy can be found at: http://www.uga.edu/honesty/ahpd/culture_honesty.htm.

Disability Policy

The University of Georgia is committed to providing equal educational opportunities for students with disabilities in accordance with state and federal laws including the Americans with Disabilities Act. Help for students with disabilities is available from the Disability Resource Center. More information is available at <http://www.drc.uga.edu/>. If you receive assistance from this center due to physical, cognitive, or mental impairments; please submit paper work to me and we will proceed accordingly.

Evaluation/Grading

Your final grade will be based on the following:

Case Reactions:	20 %
Culturally Relevant Lesson:	20 %
Field Experience Activities:	20 %
Peer Teaching:	20 %
Cumulative Exam and Class Participation:	20 %

Your final grade will be calculated based on scale: 90-100 = A; 80-89 = B; 70-79 = C; 60-69 = D; and less than 60 = F. Keep in mind that you choose the quality of the work you submit. A's will be earned by those products that exhibit exemplary quality, rather than simply completion of the assignment.

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 and be prepared to contribute to class discussions. You will be required to develop written responses for **two** of these cases. Your responses should demonstrate insight and in-depth reflection. Your responses should be two, single-spaced, and typed pages. There is no "correct" response or reaction to the cases. This is an opportunity for you to clarify your own beliefs and biases and to consider the case in

relation to your personal experiences as a teacher. You may want to comment on the following in your response:

- Your interpretation of the dilemma/challenges presented in the case
- Theories about science teaching and learning
- The solutions you recommend or your evaluation of solutions found in the case
- An explanation of why you think the solutions are viable or your justification of other solutions
- Your own experiences as a student, teacher, or parent
- Common sense
- Any morals or lessons you think you can draw from your reading and interpretation of the case
- Experiences of friends, colleagues, or relatives
- References to any components of the case itself

Culturally Relevant Lesson (20%)

An important part of this course is the opportunity to consider what it means to teach science in a culturally relevant way. You will modify a course activity (or activity of your choice) to develop a "culturally relevant" lesson. You should develop: a) a two-page description of the lesson, b) two copies of the modified activity, and c) **ALL** accompanying materials needed to carry out the lesson. As you develop the lesson activities, you should ask yourself the question, "culturally relevant for whom and to what?" You will share your culturally relevant lesson with the class. Your two-page description should contain the following:

- Title
- Purpose
- Intended grade level
- Scientific background information
- Description of key science concepts
- Procedures/Guidelines
- Materials
- Important Tips

Field Experience Activities (20 %)

You will conduct several science activities from the field list that will be provided. For one of the activities, you will write up what you learned from the experience. Your report should include the following:

- Description of the purpose/goal of the activity
- Description of the science teaching/learning activity
- Explanation of why you selected this activity
- In-depth reflective summary of what you learned about elementary science teaching/learning through this activity
- Signature of supervising teacher

Peer Teaching (20%)

You will work in pairs to teach science lessons (no longer than 1 hour) to your classmates. Your lesson should be, GPS-based, student-centered, and multicultural. Additionally, your lesson should include some form of assessment.

Cumulative Exam and Class Participation (20 %)

The exam will be cumulative in nature with questions posed throughout the course which will be answered based on previous class activities, discussions, and readings. Since exam questions are also used as incentives for class attendance and as aides in gauging class participation, make-ups for missed exam questions will not be administered.

ESCI 4420 Schedule

Date	Topic	Assignments
Thurs, Aug 16	Course Overview	
Tues, Aug 21	Basic and Integrated Process Skills	
Thurs, Aug 23	Basic and Integrated Process Skills	
Tues, Aug 28	Life Science	Read Case 2.2: "Insects and Scientific Problem Solving Go Together"
Thurs, Aug 30	Life Science	
Tues, Sept 4	Sociocultural Dimensions of Science Teaching and Learning	Reaction to Case 8.1 ("El Secreto de las Niñas") due
Thurs, Sept 6	Inquiry Science Discrepant Events Productive Questions	
Tues, Sept 11	Earth Science	Read Case 6.2: "What Is the Shape of a Star?"
Thurs, Sept 13	Earth Science Peer Teaching	
Tues, Sept 18	Physical Science	Read Case 3.1: "Who's Teaching Whom?"
Thurs, Sept 20	Physical Science Peer Teaching	
Tues, Sept 25	Peer Teaching	
Thurs, Sept 27	Culturally Relevant Lessons	Culturally Relevant Lesson due
Oct 1 – Oct 25	FULL TIME FIELD EXPERIENCE	
Tues, Oct 30	Gender Issues in Science Classrooms International Science Education	
Thurs, Nov 1	Ecology	Field Experience Project Due
Tues, Nov 6	Environmental Science	
Thurs, Nov 8	Peer Teaching	
Tues, Nov 13	Oceanography	Reaction to Case 9.1 ("The Day the Lobster Died") due
Thurs, Nov 15	Oceanography Peer Teaching	
Tues, Nov 20	Controversial Issues in Science Teaching and Learning	Read Case 9.2 : "The Egyptian Exhibit"
Nov 21 - 23	THANKSGIVING BREAK	
Tues, Nov 27	Chemistry	
Thurs, Nov 29	Chemistry	
Tues, Dec 4	NO CLASS (UGA on Friday Schedule)	
Thurs, Dec 6 (Last Day of Class)	Sharing What We've Learned	

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