

**Fall 2006, ESCI 4420**  
**SCIENCE FOR EARLY CHILDHOOD EDUCATION**

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**Course Description**

Welcome to the course, Science for Early Childhood Education! 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 elementary school age children.

**Course Materials**

The instructors will make available core readings from the journal literature and selected textbooks. You will be expected to read and critique relevant course articles.

**Course Description**

Again, welcome to ESCI 4420: Science for Early Childhood Education. We are very excited to work with you as we learn about teaching elementary school science. We have designed this course in ways to will allow you to practice and question different aspects of science teaching and learning.

Several questions will guide this exploration, including:

- ***How do students come to understand ideas and processes in science?***
- ***What classroom conditions facilitate students' science learning?***
- ***What do teachers need to know and do to create such conditions?***

Through this course, we hope to facilitate your learning by providing opportunities for you to:

- 1) Teach and learn science through hands-on activities with your peers and elementary students,
- 2) Observe, discuss, and reflect on your experiences in watching others and yourselves teach science in a safe environment, and
- 3) Develop a repertoire of science teaching 'tricks of the trade,' list of resources to draw from in the future, and appropriate expectations for yourself as a science teacher.

**Additional Course Goals**

The course will focus on possible solutions to questions like:

1. What is the nature of science and scientific knowledge?

2. How can science be taught as part of an interdisciplinary/thematic/whole language unit using children's literature?
3. What can be done to encourage females and minorities in science?
4. How can a teacher or student assess learning with understanding?
5. How can science be integrated across the curriculum?
6. 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 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](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 three projects, daily participation, and a cumulative exam 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.

Assignment:

Daily Journal: 20 Points

Paired teaching: 20 points

Case Responses: 20 points

Cumulative exam: 20 points

Daily participation: 20 points (-2 if not there, 0 present w/o contributing, 1 contributed)

**Daily Journal: 20 Points**

You will be keeping a daily science journal (please use a single-subject spiral notebook (lined or unlined) separate from the rest of you class materials. We will start by recording observations on the night sky and add additional observations during the course (wild vertebrates, simple machines, and weather). You should date each entry as provide

needed written records of your observations (specific expectations will be provided as assigned). Drawings and questions are always encouraged.

**Paired teaching:** 20 points

You will work in assigned pairs and collaborate to plan and teach a 30-minute period in science starting November 27<sup>th</sup>. Specific concepts (based on the GPS's) and expectations will be provided later in the class.

**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.

| <b>Component</b>   | <b>Points</b> |
|--|---------------|
| Catchy title for the case reaction   | 1             |
| In-depth insight and reflection  | 4             |
| Analysis from multiple perspectives  | 4             |
| 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             |
| <b>Total points possible (for each case reaction) (15)</b>   | <b>15</b>     |

You will have 4 case reactions to write, each will be 5% of you final grade (totaling 20%, or 20 points out of 100)

**Daily participation:** 20 points (-2 if not there, 0 present w/o contributing, 1 contributed). Dr. Calkin and Ms. Freeman will determine whether each students contributed (1pt/class) or did not contribute (0pt/class) following each class. Since there are 18 class meetings, each student will begin with 2/2 points. While each absence is worth 2 points, the instructors reserve the right to lower a student's letter grade for multiple absences.

**Cumulative Exam** (20 points)

The exam will be cumulative in nature, with questions posed throughout the course. Each day we will develop several exam questions based on the content of previous class activities, discussion, or readings.

## ESCI 4420 Schedule

| <b>Date</b>             | <b>Topic</b>  | <b>Assignments</b>                           |
|-------------------------|---|--|
| Wednesday, August 16    | Course Overview<br>Collecting Data<br>Process Skills  | Survey (in class)<br>Start night sky journal |
| Monday, August 21       | Inquiry Science<br>Constructivism and Science Teaching<br>Georgia Standards                   | Case 2.1 Inquiry: To do or not to do?        |
| Wednesday, August 23    | Integrated and Interdisciplinary Curricula and Instruction                                    |  |
| Monday, August 28       | Life Science - characteristics of Life,   | Wild Vertebrates into journals               |
| Wednesday, August 30    | Life Science (continued) - Taxonomy   | Leaf/Insect Mini-collections                 |
| Wednesday, September 6  | Life Science (continued) – ecology and life cycles  |  |
| Monday, September 11    | Life Science (continued) – natural selection, genetics, cells                                 |  |
| Wednesday, September 13 | Socio-cultural dimensions of Science Teaching and Learning/Gender Issues in Science Education | Case 5.3: I do not understand                |
| Monday, September 18    | Physics – physical characteristics, types of energy   |  |
| Wednesday, September 20 | Physics (continued) – motion and forces   |  |
| Monday, September 25    | Physics (continued) – magnetism/electricity   | Simple Machines in journals                  |
| Wednesday, September 27 | Physics (continued) – sound/light   |  |
| Monday, October 2       | Project Wild Workshop (part 1)  |  |
| Wednesday, October 4    | Project Wild Workshop (part 2)  |  |
| Monday, October 9       | Chemistry   | Salt activity                                |
| Wednesday, October 11   | Earth Science (Continued) – Rocks, minerals, and soils  |  |
| In field October 16     | To November 14  |  |
| Wednesday, November 15  | Earth Science (Continued) - Astronomy   |  |
| Monday, November 20     | Earth Science – Weather   | Weather into journals                        |
| Monday, November 27     | Earth Science - Geology   | Paired Teaching                              |
| Wednesday, November 29  | Controversial Issues in the Science Classroom   | Paired Teaching                              |
| Monday, December 4      |   | Daily Journal Due<br>Paired Teaching         |
| Wednesday, December 6   |   | Paired Teaching                              |
| TBA                     | Final exam  |  |