

PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE
MASTER SYLLABUS

FIELD STUDIES IN SCIENCE EDUCATION
EDU 2030

Class Hours: 1.0

Credit Hours: 2.0

Laboratory Hours: 4.0

Date Revised: Spring
01

Catalog Course Description:

Background in elementary science education goals and pedagogies; training in cart demonstrations; design, preparation, implementation and evaluation of hands-on science activities in the elementary schools; and development of family science activities.

Entry Level Standards:

Must have basic knowledge of chemistry or biology with sincere interest in elementary science education. Must be self-motivated, interested in working with children in the classroom.

Prerequisites:

Successful completion of a college level laboratory science course, or two years of high school science

Textbook(s) and Other Reference Materials Basic to the Course:

None

I. Week/Unit/Topic Basis:

Week	Topic
1	Lecture: Introduction; K-5 science educational goals and pedagogies Lab: AMSE: tour and introduction to cart activities
2	Lecture: Goals and pedagogies, cont.; scheduling class visits and topics Lab: AMSE cart activities – training and practice
3	Lecture: Discussion of cart activities, applying to classroom setting Lab: Additional AMSE cart activities – training and practice
4	Lecture: Classroom boundaries – appropriate and inappropriate behavior Lab: Classroom observation
5	Lecture: Demonstration of activities for first class visit – develop discussion questions Lab: Preparation, first class visit
6	Lecture: Evaluation of first class visit; develop discussion questions for second class visit

- Lab: Demonstration, preparation and second class visit
- 7 Lecture: Evaluation of second class visit; develop discussion questions for third class visit
Lab: Demonstration, preparation and third class visit
- 8 Lecture: Evaluation of third class visit; develop discussion questions for fourth class visit
Lab: Demonstration, preparation and fourth class visit
- 9 Lecture: Evaluation of third class visit; overview of fifth and sixth class visits; students develop discussion questions
Lab: Demonstration and preparation of fifth and sixth class visits
- 10 Lecture: Review discussion questions; select topics for student activities
Lab: Fifth and sixth classroom visits
- 11 Lecture: Evaluation of fifth and sixth class visits; overview of seventh and eighth class visits; students develop discussion questions
Lab: Demonstration and preparation of seventh and eighth class visits
- 12 Lecture: Review discussion questions; small group discussions and input on student activities
Lab: Seventh and eighth classroom visits
- 13 Lecture: Review of classroom activities; discussion of age-appropriate learning strategies
Lab: Design of original classroom activity
- 14 Lecture: Resources available in the community
Lab: Design of original classroom activity; small group review
- 15 Lecture: Involving family in the learning process
Lab: Participation in family science activity
- 16 Lecture: Applying skills in the community
Lab: Demonstration of original classroom activities

II. Course Objectives*:

- A. Work directly with elementary students in a classroom setting. I.5
- B. Know needs of K-5 students with respect to science education. I.5
- C. Determine means by which to meet needs of K-5 students with regard to science education. III.2
- D. Design, prepare and implement hands-on science activities that are age-appropriate and curriculum-based. III.2
- E. Design, prepare and implement hands-on "family science" activities that are age-appropriate and curriculum-based. III.2
- F. Mentor third through fifth grade students in designing, preparing and conducting a science fair projects. III.2
- G. Serve as judges in elementary school science fairs (as appropriate). III.2

H. Assess effectiveness of participatory hands-on activities. VI.1

*Roman numerals after course objectives reference goals of the university parallel program.

III. Instructional Processes*:

Students will:

1. Research and discuss shortcomings of science education in K-5 classrooms and strategies for improving science education. *Information Literacy Outcome, Communication Outcome, Problem Solving and Decision Making Outcome*
2. Design, develop, and implement curriculum-based, age-appropriate hands-on science activities for K-5 classrooms, science fairs, and "family science" activities. *Problem Solving and Decision Making Outcome, Active Learning Strategies*
3. Develop communication skills that will promote active learning in K-5 students and their families in science activities. *Personal Development Outcome*
4. Evaluate the effectiveness of participatory science activities in improving attitudes toward and understanding of fundamental scientific concepts. *Problem Solving and Decision Making Outcome*
5. Volunteer to visit selected elementary schools under guidance of PSTCC faculty to conduct participatory science activities. *Transitional Strategies*
6. Develop positive work ethic professionalism. *Personal Development Outcome, Transitional Strategies*

*Strategies and outcomes listed after instructional processes reference Pellissippi State's goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*:

Upon successful completion of this course, the student should be able to:

1. Research issues in science education. B
2. Design age appropriate science activities. C, D, E, F
3. Develop age appropriate science activities. C, D, E
4. Conduct age appropriate science activities. C, D
5. Assess effectiveness of science activities. H
6. Communicate concepts to K-5 students. C, D, H
7. Demonstrate professionalism. A
8. Recognize attitudes towards science. B
9. Engage students in the learning process. D, E, F
10. Use equipment and prepare science materials. D, E, F

*Letters after performance expectations reference the course objectives listed above.

V. Evaluation:

A. Testing Procedures: 0% of grade

N/A

B. Laboratory Expectations: 50% of grade

Classroom visits (40%): Students will participate in 8 classroom visits. Students will be evaluated on their effective engagement of elementary children in hands-on learning of science concepts as well as their application of concepts discussed in class. If a student cannot attend a classroom visit, no credit will be given; if two visits are missed, the student will not receive credit for the course.

Preparation (10%): Students will prepare materials for classroom activities; package them for transport; and clean up and return materials to storage upon completion of classroom visits.

C. Field Work: 50% of grade

Cart Demonstrations (10%): Students are expected to complete training and participation in two cart demonstrations at the American Museum of Science and Energy in Oak Ridge before the fourth week of class.

Classroom Observation (5%): Students will write a 500 word essay, typed, double spaced, based on their observations of a K-5 science class. This will be due the sixth week of class.

Discussion Questions (20%): Students will write appropriate classroom discussion questions for classroom visits 5-8. These will be submitted and discussed in class during weeks 10 and 12.

Family activity (5%): Students will participate in a family science activity and write a 500 word essay on what they did, what was effective and what could have been better.

Original Science Activity (10%): Students will develop a science activity appropriate for a K-5 classroom. This activity will be presented to the class during the last week of the semester. Students will submit, typed, double spaced, an outline of the activity, identifying the intended audience, appropriate curriculum concepts, leading discussion questions, and a list of suggested connecting concepts.

VI. Policies:

Attendance Policy:

Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic and Student Affairs, may have requirements that are more stringent.