

**Troy University  
College of Education  
Fall 2012**

**Dr. Deborah B. Lee**

**COURSE NUMBER** ELE 6603

**COURSE TITLE** Elementary Science Education

**COURSE CREDIT** 3 semester hours

**PREREQUISITES** NONE

**COURSE DATES:** 8/25; 9/8; 9/15; 9/22; 10/6

**INSTRUCTOR:** Dr. Deborah B. Lee  
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**COURSE DESCRIPTION:**

This course will examine relevant research and a variety of instructional strategies appropriate in the field of natural science. Emphasis is placed on appropriate instruction and materials including technology for teaching science in grades K-6.

**COURSE OBJECTIVES:**

The general objectives of this course are to:

- Foster a learner-centered approach to learning and instruction
- Discuss orally and in writing the current methodology in teaching science.
- Prepare and demonstrate materials for reinforcing scientific concepts, processes and attitudes.
- Evaluate the use of technology in the science program.
- Demonstrate professionalism in communication skills and in professional involvement in the classroom.
- Develop a Teacher Work Sample in the area of science education.

**TEXTS:**

Abruscato, J. (2010). *Teaching children science: a discovery approach-7<sup>th</sup> ed.* Boston:

Pearson Education, Inc.

**Required Materials:**

LiveText is a required software program used to assess student program outcomes and standards-based assignments for accreditation that can be purchased at the bookstore or online at [www.livetext.com](http://www.livetext.com).

Students only need to purchase the standard version and they only purchase it one time for their first degree program.

Students only have to purchase this once as it is active for five years from the time of initial purchase/registration. If students need to have the program active after the five year period has ended they can contact LiveText to pay for an extension. This could occur if a student comes back to the university for a second degree program that requires the use of LiveText.

LiveText is required for all Troy University students enrolled in education courses.

### **OTHER MATERIALS:**

There may be times when students will need to bring materials to class to assist them in demonstrating scientific concepts to the class.

### **CONTENT:**

- I. Psychology and Science Teaching
- II. Scientific processes
- III. Scientific literacy and attitudes
- IV. Methods for Teaching science
- V. Evaluation in science teaching
- VI. Interdisciplinary and integrated approaches
- VII. Technology and science teaching

### **COURSE REQUIREMENTS:**

General Course Requirements:

1. Attend class meetings.
2. Participation in classroom activities and completion of class assignments.
3. Read assigned material by assigned dates.
4. Complete all exams.

Specific course assignments will be determined by the individual instructor to meet course objectives.

**In order for a candidate to successfully pass a course which contains critical assignments, the candidate must earn a minimum score of three (3) on each element of the critical assignment rubric. Candidates who earn less than a score of three (3) on any one of the rubric elements and where there is adequate time remaining in the**

**semester/term, the course instructor may provide a remediation plan to the candidate for improving the candidates' learning and score on the element(s).**

Score	Descriptor	Explanation
4	Exceptional	The candidate demonstrates exceptional understanding and/or skill expected of a candidate at the Ed. S. level of certification. Knowledge conveyed and/or performance demonstrated regarding this standard places the candidate at a level far beyond peers.
3	Proficient	The candidate demonstrates proficient understanding and/or skill expected of a candidate at the Ed. S. level of certification. Knowledge conveyed and/or performance demonstrated regarding this standard is consistent with that of effective Ed. S. candidates.
2	Basic	The candidate demonstrates basic understanding and/or skill expected of a candidate at the Ed. S. level of certification. Knowledge conveyed and/or performance demonstrated regarding this standard is consistent with Ed. S. candidates' understanding and/or performance in this area.
1	Unacceptable	The candidate does not demonstrate minimal understanding and/or skill expected of a candidate at the Ed. S. certification level. Knowledge conveyed and/or performance demonstrated regarding this standard is unsatisfactory.

**Critical Assignment 1: Lesson Plan** Plan 20/% Due 9/10

The student will create an inquiry-based lesson plan in the content area. Elements to be included are target grade/subject, Course of Study objectives addressed in the lesson, materials required for the lesson, lesson procedures, closure, and assessment.

This should be created in a Word document and attached in the section below this one titled ATTACH ASSIGNMENT HERE.

Once the assignment is complete click the pink Submit Assignment button located at the top of this assignment template to submit it to the instructor.

ELE 6603 Lesson Plan

	<b>Exceptional (4 pts)</b>	<b>Proficient (3 pts)</b>	<b>Basic (2 pts)</b>	<b>Unacceptable (1 pt)</b>
<p><b>Target Grade/ Subject/Description</b>  <b>Identify the grade and the ability level of the students, and a brief description of the lesson and cross-disciplinary curricular connections. (1, 20%)</b>  <b>AL-TROY-COE-CF.1 AL-TROY-COE-CF.3 AL-TROY-COE-CF.5 AL-TROY-COE-CF.6 AL-TROY-COE-CF.9</b>  <b>NBPTS.GEN.P-3.1</b>  <b>NBPTS.GEN.P-3.5</b>  <b>NBPTS.SC.5-10.1</b></p>	<p>The candidate identifies the selected grade, clearly describes the ability level of the students, and articulates well-reasoned cross-disciplinary curricular connections.</p>	<p>The candidate identifies the selected grade, describes the ability level of students, and articulates cross-disciplinary curricular connections.</p>	<p>The candidate identifies the grade and ability level of students and makes reference to cross-disciplinary curricular connections.</p>	<p>The candidate fails to identify the grade and/or ability level of students and does not make cross-disciplinary curricular connections.</p>
<p><b>Objective(s)/Standards List Content Standards from the appropriate Alabama Course of Study. Identify what students will know or be able to do at the end of the lesson. Knowledge and/or ability statements must be measurable or observable. "The Learner Will (TLW)" (1, 20%)</b>  <b>AL-TROY-COE-CF.1</b>  <b>AL-TROY-COE-CF.3</b>  <b>AL-TROY-COE-CF.5</b>  <b>AL-TROY-COE-CF.6</b>  <b>AL-TROY-COE-CF.9</b>  <b>NBPTS.1 NBPTS.GEN.P-3.3 NBPTS.GEN.P-3.9</b>  <b>NBPTS.SC.5-10.1</b>  <b>NBPTS.SC.5-10.8</b></p>	<p>The candidate identifies the content standards addressed in the lesson and clearly states what the students will know or be able to do at the end of the lesson. Knowledge and/or ability statement are measurable and observable.</p>	<p>The candidate identifies the content standards addressed in the lesson and lists measurable and observable knowledge and ability statements.</p>	<p>The candidate identifies content standards addressed in the lesson and identifies knowledge and ability statements.</p>	<p>The candidate fails to identify content standards or identifies standards inappropriate to the lesson; knowledge and ability statements are not included or are poorly constructed.</p>
<p><b>Materials Attach all materials, including those developed by the teacher, as well as explanations</b></p>	<p>The candidate provides all materials to be used in the</p>	<p>The candidate attaches all materials to</p>	<p>The candidate attaches most of the</p>	<p>The candidate fails to include the materials and/or</p>

ELE 6603 Lesson Plan

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<b>that are needed for lesson (1, 20%)</b> AL-TROY-COE-CF.1 AL-TROY-COE-CF.3 AL-TROY-COE-CF.5 AL-TROY-COE-CF.6 AL-TROY-COE-CF.9 NBPTS.GEN.1-7.5 NBPTS.SC.5-10.3	lesson and includes thorough explanations for their use.	be used in the lesson and includes basic explanations for their use.	materials to be used in the lesson and includes basic explanations for their use.	explanations for their use.
<b>Procedures Describe how the lesson will work. Describe the lesson so that another teacher could understand it and implement it without your presence. (1, 20%)</b> NBPTS.SC.5-10.7	The candidate provides thorough, step-by-step procedures that can be followed and implemented by another teacher without the candidate's presence.	The candidate provides step-by-step procedures that allow another teacher to implement the lesson.	The candidate provides a basic explanation of the procedures to follow.	The candidate fails to provide a plan of procedures.
<b>Assessment Describe the evaluation procedures for determining whether the lesson's goal(s) and objective(s) were met. (1, 20%)</b> AL-TROY-COE-CF.1 AL-TROY-COE-CF.3 AL-TROY-COE-CF.5 AL-TROY-COE-CF.6 AL-TROY-COE-CF.9 NBPTS.2 NBPTS.GEN.1-7.8 NBPTS.GEN.P-3.3 NBPTS.GEN.P-3.9 NBPTS.SC.5-10.1 NBPTS.SC.5-10.8	The candidate provides a clear and appropriate evaluation that includes evidence that the lesson's goals and objectives were met.	The candidate provides an evaluation procedure that includes evidence that the lesson's goals and objectives were met.	The candidate provides an evaluation procedure appropriate to the lesson.	The candidate fails to provide an appropriate evaluation.

**Standards**

AL-TROY-COE-CF.1

Demonstrate an understanding of and show effective performance with diverse learning populations in a variety of school cultures

AL-TROY-COE-CF.3

Demonstrate effectiveness as communicators, facilitators, pedagogues and scholars

AL-TROY-COE-CF.5

Demonstrate competencies in content area knowledge, assessment and emerging technologies

AL-TROY-COE-CF.6

Demonstrate cutting-edge competencies in pedagogical and applied research skills

AL-TROY-COE-CF.9

Refine and evaluate innovative delivery and assessment models

NBPTS.1

Teachers are committed to students and their learning.

NBPTS.2

Teachers know the subjects they teach and how to teach those subjects to students.

NBPTS.GEN.P-3.1

Understanding Young Children. Accomplished early childhood teachers use their knowledge of child development and their relationships with children and families to understand children as individuals and to plan in response to their unique needs and potentials.

NBPTS.GEN.P-3.3

Assessment. Accomplished early childhood teachers recognize the strengths and weaknesses of multiple assessment methodologies and know how to use them effectively. Employing a variety of methods, they systematically observe, monitor, and document children's activities and behavior, analyzing, communicating, and using the information they glean to improve their work with children, parents, and others.

NBPTS.GEN.P-3.5

Knowledge of Integrated Curriculum. On the basis of their knowledge of how young children learn, of academic subjects, and of assessment, accomplished early childhood teachers design and implement developmentally appropriate learning experiences that integrate within and across the disciplines.

NBPTS.GEN.P-3.9

Reflective Practice. Accomplished early childhood teachers regularly analyze, evaluate, and synthesize to strengthen the quality and effectiveness of their work.

NBPTS.GEN.1-7.5

Instructional Resources. Accomplished teachers create, assess, select, and adapt a rich and varied collection of materials and draw on other resources such as staff, community members, and students to support learning.

NBPTS.GEN.1-7.8

Assessment. Accomplished teachers understand the strengths and weaknesses of different assessment methods, base their instruction on ongoing assessment, and encourage students to monitor their own learning.

NBPTS.SC.5-10.1

Understanding Early Adolescents. Accomplished science teachers know the unique characteristics of their students and use this knowledge to determine students' understanding of science and to design and implement appropriate instruction to enhance student learning.

NBPTS.SC.5-10.2

Knowledge of Science. Accomplished science teachers have a broad and current knowledge of science, along with in-depth knowledge of one of the subfields of science, on which they draw to set appropriate learning goals for their students.

NBPTS.SC.5-10.3

Instructional Resources. Accomplished science teachers are innovative in their ability to select, adapt, and create instructional resources, including print, technology, laboratory, and community resources, to support active student explorations of science.

NBPTS.SC.5-10.7

Understanding Science Pedagogy. Accomplished science teachers understand and use a variety of instructional strategies to enhance student learning and help students make real-world connections from their scientific explorations.

NBPTS.SC.5-10.8

Science Inquiry. Accomplished science teachers involve students in the processes of inquiry that challenge students' thinking as they construct an understanding of nature and technology.

**Critical Assignment 2: Delivery of Lesson Plan** 20% Due 9/15

The student will deliver an inquiry-based lesson in the content area in a classroom setting. Elements to be assessed include preparation for instruction, presentation of organized instruction, and assessment of student performance.

A copy of the lesson presented in class should also be created in a Word document and attached in the section below this one titled ATTACH ASSIGNMENT HERE.

Once the assignment is complete click the pink Submit Assignment button located at the top of this assignment template to submit it to the instructor.

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	<b>Exceptional (4 pts)</b>	<b>Proficient (3 pts)</b>	<b>Basic (2 pts)</b>	<b>Unacceptable (1 pt)</b>
<b>Preparation for instruction (1, 25%) AL-TROY-COE-CF.1 AL-TROY-COE-CF.3 AL-TROY-COE-CF.5 AL-</b>	Candidate exceeds expectations in each of the following areas: clear long-range goals,	Candidate adequately addresses each of the following: clear long-range goals, measurable	Candidate addresses in a cursory manner each of the following: long-range goals, short-term	Candidate fails to address at least one of the following satisfactorily: long-range goals, short-term

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<b>TROY-COE-CF.6 AL-TROY-COE-CF.9 NBPTS.GEN.1-7.5 NBPTS.SC.5-10.3</b>	measurable short-term objectives, and instructional resources	short-term objectives, and instructional resources	objectives, and instructional resources.	objectives, and instructional resources.
<b>Presentation of organized instruction (2, 50%) AL-TROY-COE-CF.1 AL-TROY-COE-CF.3 AL-TROY-COE-CF.5 AL-TROY-COE-CF.6 AL-TROY-COE-CF.9 NBPTS.2 NBPTS.SC.5-10.2 NBPTS.SC.5-10.7</b>	Candidate demonstrates exceptional ability in each of the following areas: students are oriented to the lesson; directions are clear; lesson is developed logically; practice and summarization are provided; knowledge of subject matter and pedagogy are demonstrated.	Candidate demonstrates ability in each of the following areas: students are oriented to the lesson; directions are clear; lesson is developed logically; practice and summarization are provided; knowledge of subject matter and pedagogy are demonstrated.	Candidate demonstrates ability in at least four of the following areas: students are oriented to the lesson; directions are clear; lesson is developed logically; practice and summarization are provided; knowledge of subject matter and pedagogy are demonstrated.	Candidate fails to demonstrate ability in two or more of the following areas: students are oriented to the lesson; directions are clear; lesson is developed logically; practice and summarization are provided; knowledge of subject matter and pedagogy are demonstrated.
<b>Assessment (1, 25%) AL-TROY-COE-CF.1 AL-TROY-COE-CF.3 AL-TROY-COE-CF.5 AL-TROY-COE-CF.6 AL-TROY-COE-CF.9 NBPTS.2 NBPTS.GEN.1-7.8 NBPTS.GEN.P-3.3 NBPTS.GEN.P-3.9 NBPTS.SC.5-</b>	Candidate demonstrates exceptional ability in each of the following areas: student performance is monitored; student progress is measured; feedback is provided; assessment results are used to guide instruction.	Candidate demonstrates ability in each of the following areas: student performance is monitored; student progress is measured; feedback is provided; assessment results are used to guide instruction.	Candidate demonstrates ability in at least four of the following areas: student performance is monitored; student progress is measured; feedback is provided; assessment results are used to guide instruction.	Candidate fails to demonstrate ability in two or more of the following areas: student performance is monitored; student progress is measured; feedback is provided; assessment results are used to guide instruction.



ELE 6603 Lesson Plan Delivery

**Exceptional**  
**(4 pts)**

**Proficient**  
**(3 pts)**

**Basic (2 pts)**

**Unacceptable**  
**(1 pt)**

**10.10**

**NBPTS.SC.5-10.8**

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**NBPTS.SC.5-10.8**

Science Inquiry. Accomplished science teachers involve students in the processes of inquiry that challenge students' thinking as they construct an understanding of nature and technology.

**ASSIGNMENT 3: 20% Due by 9/22**

Develop fifteen on-line resources in the area of science. Include a brief description of each online resource to assist students and teachers in identifying those resources that are of interest to them. Annotations should clearly identify requirements needed to successfully utilize the website and should identify and assess the benefits and/or limitations of the website. Please include appropriate grade level(s).

**ASSIGNMENT 4: 20% Due 9/22**

Develop a lesson plan and then deliver the lesson in a classroom setting. Elements to be assessed include preparation for instruction, presentation of organized instruction, and assessment of student performance.

**FINAL EXAM 20% 10/6**

Final exam will begin at 10:00 a.m. on October 6th. Final questions will be determined be the topics discussed in class.

**POLICY FOR MAKE-UP EXAMINATIONS:**

Students missing an examination must provide evidence of medical or family emergency. The make-up exam is to be scheduled within a week of the student's return to class. It is the responsibility of the student to initiate the make-up process.

**ATTENDANCE POLICY:**

All class sessions are to be attended. If attendance is impossible, the professor should be

notified prior to the class session. Attendance and punctuality are crucial in the life of a professional.

**POLICY ON ACADEMIC MISCONDUCT:**

You may be submitted to an on-line plagiarism detection service. Cheating, plagiarism, or knowingly furnishing false information to the University constitutes academic misconduct, and disciplinary procedures specified in the Student Handbook will be followed.

**AMERICANS WITH DISABILITIES ACT:**

Any student whose disabilities fall within ADA must inform the instructor at the beginning of the term of any special needs or equipment necessary to accomplish the requirements for this course. If you have questions, contact the office of Counseling Services.