Descriptive Information

A. Course Number and Title: EDEL 450- Elementary Science Instruction
B. Catalog Description: Instructional approaches and methods for teaching science in elementary grades.
C. Course Credit: 3 semester hours (undergraduate)
D. Prerequisites: Admission to the professional program
E. Intended Audience: Designed for undergraduates seeking elementary teacher certification.

Statement of Purpose: EDEL 450 is designed to provide B.A. Interns with an understanding of the study and practice of elementary science education. Throughout the course participants will explore learning theories, content, standards, instructional strategies, assessment practices, teaching as a data driven practice and classroom management methods that are appropriate for grades 2-6. There will be opportunities for Interns to experience, discuss, and critique the various issues that will be presented. The knowledge acquired should form the basis for science teaching and learning in an elementary classroom.

II. Course Objectives

• To develop a knowledge, understanding, and use of fundamental concepts in the natural sciences and health.
• To develop an understanding of science teaching and learning research for planning, delivering, and managing hands-on/minds-on science instruction with an emphasis on meeting the needs of diverse student populations.
• To identify and select appropriate formal and informal assessment strategies (focusing on using student outcome data to inform instruction).
• To develop knowledge, understanding, and use of the role of fundamental concepts in the subject matter of science and the unifying concepts of science and inquiry processes.
• To develop dispositions of an effective, caring professional educator, as outlined in the College of Education’s Conceptual Framework.
• To identify naïve theories and misconceptions that most children have about scientific and technological phenomenon.
• To develop elementary students’ critical thinking, problem solving, and performance skills.
• To identify relevant connections between science and the real world.

III. Required Texts:
B. Selected science education readings distributed via course Blackboard site.

Other Key Readings

This course will use the Blackboard system extensively. In order to successfully complete the course students must demonstrate proficiency with its use. Training on Blackboard will not be provided as part of the course. However, Computer Services is offers free assistance to all USC students who would like to learn more about Blackboard. For more information, contact Computer Services-Academic Services at 777-6015.

IV. Academic Course Requirements:

A. Lessons with Children: You will be required to complete a minimum of two (2) lessons with children during your Internship experience. One of these will be a science lesson and the other a health lesson. The lessons may be conducted with the entire class or with small groups of students. Due November 24, each lesson will be worth 10 points for a total of possible 20 points.

B. Course Quizzes: During the semester two quizzes will be completed. These quizzes focus on science education concepts and processes as well as teaching and learning strategies addressed in your textbook and class discussions. Each quiz will be worth 10 points for a total of 20 possible points.

C. Teaching and Learning Experiences at Killian: Throughout the semester the class will engage elementary students in science activities. This work will require preparation outside of class to ensure understanding of content as well as resource/materials development. Students will be expected to fully participate and engage in thoughtful reflection of these experiences. This assignment will be worth a total of 10 possible points.

D. Contemporary Issues in Science: As a small group, students research an important issue related to science, technology and society (also known as STS). Each group develops a firm understanding of the issue, and collaboratively creates and presents a PowerPoint presentation that summarizes multiple perspectives related to the issue. This assignment will be worth a total of 10 possible points.
E. **Final Exam:** This exam will focus on science concepts as well as teaching and learning strategies addressed in your textbook and class discussions. This assignment will be worth a total of **15 possible points.**

F. **Science Journals:** A science journal will be used to document your evolving understanding of scientific inquiry as well as your developing beliefs related to science teaching. Journals are expected to have detailed observations, drawings, diagrams, notes, etc. which will demonstrate student thinking during engagement in various science activities completed during class. Class absence will impact journal entries and thereby impact grades for this assignment. This assignment will be worth a total of **5 possible points.**

G. **Participation:** Both attendance and active participation are expected. The university attendance policy will be enforced. Additionally students are required to engage fully in all course activities (which requires completion of all assigned readings prior to class) in order to earn maximum credit for participation (**14 points**). In addition to the readings listed on the course syllabus, other readings may be assigned.

H. **Content Enhancement Exercises:** Students will individually complete content enhancement activities such as an ungraded elementary content exam. These activities will focus on developing students’ understanding of key elementary science concepts. This assignment will be worth a total of **6 possible points.**

V. **Administrative Course Requirements**

A. Professional behavior/manner is expected during all class and field experience activities consistent with the College of Education Conceptual Framework ([http://www.ed.sc.edu/pdf_files/CF%20Handout.pdf](http://www.ed.sc.edu/pdf_files/CF%20Handout.pdf)).

B. Students are expected to attend all scheduled class meetings on time. Unsatisfactory class attendance (including tardiness) limits learning opportunities and affects academic performance. **The university policy regarding attendance will be strictly enforced.** This policy states that missing 10% of class sessions will result in a grade penalty.

C. In the case of absence from class Interns should communicate directly with the professor. It is the Intern’s responsibility to communicate in a timely and professional manner.

D. Assignments will be accepted **only on or before** the specified due date, unless previous arrangements were made with instructor.

E. Use of cell phones is prohibited and must be muted, unless you have the instructor’s consent.

VI. **Evaluation and Grading**

Evaluation of student performance will be based on the following grading scale:

- **A** 92-100%
- **B+** 88-91
- **B** 84-87
- **C+** 80-83
- **C** 75-79
- **D** 70-74
## VII. Major Course Topics

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
<th>Assigned Readings</th>
<th>Assignments Due</th>
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<tbody>
<tr>
<td>August 25</td>
<td>• Science as a Human Activity</td>
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<td>• Syllabus Review</td>
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<td>• Nature of Science I</td>
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<td></td>
<td>• College of Education Conceptual Framework</td>
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<td>September 1</td>
<td>• Nature of Science II</td>
<td>*Engaging Children in Science (Howe) Chapter 1</td>
<td>Content Exam (Pre)</td>
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<td>• Process Skills/ Direct Instruction I</td>
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<tr>
<td>September 8</td>
<td>• Process Skills/ Direct Instruction II</td>
<td>*Engaging Children in Science (Howe) Chapter 4</td>
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<td></td>
<td>• Science Standards</td>
<td>*Engaging Children in Science (Howe) Chapter 3</td>
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<td>September 15</td>
<td>• Children’s Thinking and Learning</td>
<td><em>South Carolina Science Education Standards (Grades 2-6)</em></td>
<td>Quiz 1</td>
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<td>• Learning Cycle I</td>
<td>*Engaging Children in Science (Howe) Chapter 2</td>
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<td>September 22</td>
<td>• Learning Cycle II</td>
<td>*Engaging Children in Science (Howe) Chapter 5</td>
<td>Contemporary Issues in Science Presentation</td>
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<td>• Guided Inquiry I</td>
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<td>September 29</td>
<td>• Guided Inquiry II</td>
<td>*Engaging Children in Science (Howe) Chapter 6</td>
<td>Contemporary Issues in Science Presentation</td>
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<td>• Conceptual Change Instruction</td>
<td>Inquiry and the NSES (course handout)</td>
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<td>October 6</td>
<td>• Assessment</td>
<td>*Engaging Children in Science (Howe) Chapter 7</td>
<td>Contemporary Issues in Science Presentation</td>
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<td></td>
<td>• Science, Technology and Society</td>
<td>Assessment and the NSES (course handout)</td>
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<td>October 13</td>
<td>• Interdisciplinary Aspects of Science / Science Across the Curriculum</td>
<td>*Engaging Children in Science (Howe) Chapter 8</td>
<td>Contemporary Issues in Science Presentation</td>
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<td>• Lesson Planning and Liability</td>
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Date | Topics | Assigned Readings | Assignments Due
---|---|---|---
October 20 | • Honoring Diversity - Including All Children in Science | • *Engaging Children in Science* (Howe) Chapter 10 | • Contemporary Issues in Science Presentation
October 27 | • Creating the Learning Environment | • *Engaging Children in Science* (Howe) Chapter 9 | • Contemporary Issues in Science Presentation • Quiz 2
November 3 | In Schools | In Schools | In Schools
November 10 | In Schools | In Schools | In Schools
November 17 | • Science Lab Safety • Instructional Resources | • *Engaging Children in Science* (Howe) Chapter 11 | • Content Exam (Post)
November 24 | • Science Beyond the Classroom | • *Engaging Children in Science* (Howe) Chapter 12 and 13 | • Lessons with Children
December 1 | • Final Exam Review | | • Journal
December 8 | • Final Exam | | • Exam

VIII. **Modes of Instruction**

A. Direct Instruction  
B. Guided Inquiry  
C. Five E Learning Cycle  
D. Conceptual Change Model of Instruction  
E. Lecture  
F. Cooperative Grouping  
G. Laboratory Activities  
H. Computer/Technological Presentations  
I. Small Group Activities

IX. **Bibliography**