EDEE 641
Science for Elementary School Teachers
Spring 2010
T 4:00 - 6:45 Education Center 215

Instructor: Dr. William Veal
Office: Room 315
School of Education, Health, and Human Performance
Contact information: vealw@cofc.edu 953-8045 (office)
Please use email as a primary form of contact
Office hours: T/H 2:30-4:00 and By Appointment

Course Description:
This is an introductory course in teaching science at the 2-6 grade levels. In this course you will study the nature of science, inquiry methods of teaching, process skills, assessment, and lesson planning focused within the context of science. As a result, the organization, content, and delivery of this course will focus on scientific processes and inquiry-based instruction. The course will provide the candidate with learning experiences in which he/she is engaged in science learning and instruction.

Course Goals and Objectives:
The successful student will be able to:
• Plan Science Activities
• Understand Scientific Content
• Recognize Inquiry Teaching and Learning
• Comprehend Content Pedagogy
• Appreciate Learner Diversity

It is not the intent of the instructor to make students teach in an inquiry fashion; rather this class will teach the components of inquiry teaching and constructivist learning using an inquiry approach. Ultimately each student must develop their own style of teaching.

National and State Objectives:

Association for Childhood Education International
2c. Science—Candidates know, understand, and use fundamental concepts in the subject matter of science—including physical, life, and earth and space sciences—as well as concepts in science and technology, science in personal and social perspectives, the history and nature of science, the unifying concepts of science, and the inquiry processes scientists use in discovery of new knowledge to build a base for scientific and technological literacy.

National Middle School Association Standards

Standard 3. Middle Level Curriculum and Assessment

Middle level teacher candidates understand the major concepts, principles, theories, standards, and research related to middle level curriculum and assessment, and they use this knowledge in their practice.

Standard 4. Middle Level Teaching Fields
Middle level teacher candidates understand and use the central concepts, tools of inquiry, standards, and structures of content in their chosen teaching fields, and they create meaningful learning experiences that develop all young adolescents’ competence in subject matter and skills.

**Standard 5. Middle Level Instruction and Assessment**

Middle level teacher candidates understand and use the major concepts, principles, theories, and research related to effective instruction and assessment, and they employ a variety of strategies for a developmentally appropriate climate to meet the varying abilities and learning styles of all young adolescents.

**National Science Teachers Association Standards**

**NSTA-2** NATURE OF SCIENCE: The program prepares teachers to engage students in activities to define the values, beliefs and assumptions inherent to the creation of scientific knowledge within the scientific community, and contrast science to other ways of knowing.

**NSTA-3** INQUIRY: The program prepares candidates to engage students regularly and effectively in science inquiry and facilitate understanding of the role inquiry plays in the development of scientific knowledge.

**NSTA-4** CONTENT OF SCIENCE: The program prepares candidates to relate science to the daily lives and interests of students and to a larger framework of human endeavor and understanding.

**NSTA-5** SKILLS OF SCIENCE: The program prepares candidates to create a community of diverse student learners who can construct meaning from science experiences and possess a disposition for further inquiry and learning.

**NSTA-6** CURRICULUM: The program prepares candidates to develop and apply a coherent, focused science curriculum that is consistent with state and national standards for science education and appropriate for addressing the needs, abilities and interests of students.

**NSTA-7** SOCIAL CONTEXT: The program prepares candidates to relate science to the community and to use human and institutional resources in the community to advance the education of their students in science.

**NSTA-8** ASSESSMENT: The program prepares candidates to use a variety of contemporary assessment strategies to evaluate the intellectual, social, and personal development of the learner in all aspects of science.

**NSTA-10** PROFESSIONAL PRACTICE: The program prepares candidates to participate in the professional community, improving practice through their personal actions, education and development.

**National Science Education Standards for Teachers**

**NSES-T-A** STANDARD: Teachers of science plan an inquiry-based science program for their students.

**NSES-T-F** STANDARD: Teachers of science actively participate in the ongoing planning and development of the school science program.

**Required texts:**


Additional articles will be located on WebCT.

**DUE DATES:**

Due dates for course assignments, as well as scheduled quizzes and assignments, are listed in the course calendar or are announced in class. No LATE assignments will be accepted. If there is a problem with submitting the assignment on time, please contact the professor ahead of time to ask for an extension (only extenuating circumstances will be allowed).
Grading and Assignments
Late submissions of assignments are unacceptable under normal circumstances. Please do not attempt to submit any assignments after the due date. I will NOT accept any late work.

Any written assignment submitted is considered a final product that will be graded on both what is written (clarity, depth, and insight) and how it is written (the form of the written work). Therefore, it is crucial to realize that correct grammar and spelling, proper punctuation, adherence to assignment guidelines, and neatness will affect your grade. As an educator, you will be expected to demonstrate competency not only in verbal but also in written communication with parents, administrators, and other educators. Please use the resources around you to proofread and to edit your work. Rubrics for all assignments are provided on WebCT to assist you. The Writing Lab provides FREE, INDIVIDUALIZED help on all parts of the writing process. See www.cofc.edu/~csl/ for further information.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>N/A</td>
<td>25</td>
</tr>
<tr>
<td>Website Comparison</td>
<td>1/26</td>
<td>50</td>
</tr>
<tr>
<td>5E Learning Cycle Lesson Plan (pairs)</td>
<td>2/23</td>
<td>50</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>3/2</td>
<td>80</td>
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<tr>
<td>5-E Inquiry LP (pairs)</td>
<td>4/6</td>
<td>50</td>
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<tr>
<td>Assessment Portfolio</td>
<td>3/30</td>
<td>50</td>
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<tr>
<td>Science Ed. Reform Discussions</td>
<td>3/23 – 4/13</td>
<td>50</td>
</tr>
<tr>
<td>Final Exam – Tuesday 5/4</td>
<td>5/4</td>
<td>120</td>
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GRADING SCALE:

<table>
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<tr>
<th>Grading Scale</th>
<th>A</th>
<th>C</th>
<th>B+</th>
<th>D+</th>
<th>B</th>
<th>D</th>
<th>C+</th>
<th>F</th>
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<tbody>
<tr>
<td></td>
<td>93-100</td>
<td>79-81</td>
<td>89-90</td>
<td>75-76</td>
<td>86-88</td>
<td>72-74</td>
<td>82-83</td>
<td>0-69</td>
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Course Readings and Assignments:
Listed in the table below are the topics, due dates, and assignments that are projected in this course.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Date</th>
<th>Readings/Assignments</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Nature of Science</td>
<td>Jan. 12</td>
<td></td>
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<tr>
<td>2</td>
<td>Nature of Science Website Comparison</td>
<td>Jan. 19</td>
<td>TSEC-1 (Science Teaching) TSEC-8 (Nature of Science)</td>
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<tr>
<td>3</td>
<td>Inquiry Design an Experiment</td>
<td>Jan. 26</td>
<td>TSEC-7 (Inquiry) Website Comparison</td>
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<tr>
<td>4</td>
<td>Discrepant Events Constructivism</td>
<td>Feb. 2</td>
<td>TSEC-4 (Science Instruction) TSEC-5 (Learning Cycle)</td>
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<tr>
<td>5</td>
<td>Graphic Organizers Lesson Planning</td>
<td>Feb. 9</td>
<td>TSEC-6 (Questioning)</td>
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<tr>
<td>6</td>
<td>Diverse Learners Misconceptions</td>
<td>Feb. 16</td>
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<tr>
<td>7</td>
<td>Assessment 5-E Activities</td>
<td>Feb. 23</td>
<td>5-E Learning Cycle Lesson Plan</td>
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<tr>
<td>8</td>
<td>5-E Activities MidTerm</td>
<td>Mar. 2</td>
<td>MidTerm Exam – Chaps. 1, 4, 5, 6, 7 &amp; 8</td>
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<tr>
<td>9</td>
<td>Spring Break</td>
<td>Mar. 9</td>
<td>NO CLASS NO CLASS</td>
</tr>
<tr>
<td>10</td>
<td>Science Education Reform</td>
<td>Mar. 16</td>
<td>TSEC-11 (Assessment) Sci. Ed. Reform Summaries</td>
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<tr>
<td>11</td>
<td>Science Kits Curriculum - Levers</td>
<td>Mar. 23</td>
<td>Science Reform Discussion</td>
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<tr>
<td>12</td>
<td>Batteries &amp; Bulbs</td>
<td>Mar. 30</td>
<td>TSEC-14 (Science Communities Sci. Ed. Reform Online Disc. 5-E Inquiry LP Due</td>
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<tr>
<td>13</td>
<td>Science Teaching Stations</td>
<td>Apr. 6</td>
<td>Sci. Ed. Reform Online Disc. Assessment Portfolios</td>
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<tr>
<td>14</td>
<td></td>
<td>Apr. 13</td>
<td>TSEC-10 (Science Integration)</td>
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<tr>
<td>15</td>
<td>Literature and Science Integration</td>
<td>Apr. 20</td>
<td>Tradebooks, Evaluation Freddy the Fish</td>
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<tr>
<td>16</td>
<td>FINAL EXAM</td>
<td>Tues. May 4</td>
<td>4-7</td>
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Participation: Each teacher candidate is expected to participate in classroom discussions and group work. You will not be allowed to text, phone, or email during class. These are all aspects of your professionalism and dispositions. Tardies and absences are also considered part of this assignment.

Quiz and Exams:
There will be two Quizzes and one Final Exam. The first Quiz will cover content on the Nature of Science, Designing an Experiment, and all PowerPoint presentations to that date. A Final Exam will cover information learned over the course; readings, in-class discussions, class notes. The Final will include short answer and multiple choice questions and 5-E lesson plan development. A test blueprint will be given for the final exam.

PROFESSIONAL BEHAVIOR/DISPOSITIONS: Students are responsible for all content and assignments for each class. They will be expected to demonstrate professional behaviors consistent with the following dispositions:

- The belief that all students can learn.
- Value and respect for difference.
- Value of positive human interaction.
- Intellectual curiosity and willingness to learn new knowledge.
- A commitment to inquiry, reflection and self-assessment.
- Value of responsible, collaborative, and cooperative work.
- Sensitivity to community and cultural context.
- Responsible and ethical practice

ATTENDANCE:
Class attendance and punctuality are expected professional behaviors. Specific attendance requirements for each course are outlined in the syllabus. A candidate may be dropped from a course for excessive absences. Two absences for ANY reason will be allowed; however, you may not submit assignments if you are absent. Upon the third absence, a course participation grade will take into effect and reduce the candidate’s score by 3% points. Upon a fourth absence, the candidate will automatically be withdrawn from a course with the grade of WA/F. I will work with you, but it is your responsibility to contact me by phone or email ahead of time.

Students should not arrive to class late. Persistent infringement of tardies will result in the reduction of a candidate’s score by 5%. Leaving class is accepted only if prior approval is accepted by the professor.

MAKE-UP EXAMINATIONS, PRESENTATIONS, AND QUIZZES:
If an examination, presentation, or quiz (other than the final examination) was missed for a legitimate reason, as determined by the professor, the professor has the discretion to administer a make-up session. It is the responsibility of the student to contact the professor within 48 hours and make arrangements for the make-up. This is to be done as soon as possible after the missed examination, presentation, or quiz.
**FINAL EXAMS**: The final exam for each course (which may be in the form of an examination, performance, or project) will only take place during the period scheduled for the final exam for that course. (Students who have more than two finals scheduled on the same day may arrange for an alternate time for one final exam through the Office of the Undergraduate Dean).

**PAPERS**: Papers will be word processed using the style of the Publication Manual of the American Psychological Association (Fifth Edition, 2001).

**HONOR SYSTEM**:
All courses in the School of Education are conducted under the Honor Code of the College of Charleston. The Honor Code specifically forbids lying, cheating, attempted cheating, stealing, attempted stealing and plagiarism. Students at the College are bound by honor and by their acceptance of admission to the College to abide by the code and to report violations. As members of the College community, students are expected to evidence a high standard of personal conduct and to respect the rights of other students, faculty, staff members, community neighbors, and visitors on campus. Students are also expected to adhere to all federal, state, and local laws. Faculty members are required to report violations of the Honor Code or Code of Conduct to the Office of Student Affairs. Conviction of an Honor Code violation in this class will result in the grade of “F” for the course. As a student at the College you have agreed to uphold the policies outlined in *the Student Handbook: A guide to civil and honorable conduct* (2003/2004) both in your coursework and as a representative of the College of Charleston in field experiences and clinical practice situations. Violations to the Code of Conduct outlined on pages 10-11 in the *Student Handbook* will be reported to the Honor Board.

As EDEE is a dual program, in that we certify candidates for teacher certification, professors reserve the right to document violations that would impact student certification (e.g., attendance in field experiences and clinical practice, professionalism in schools, etc.).

**ADA Accommodations**:  
In compliance with the American with Disabilities Act (ADA), all qualified students are entitled to “reasonable accommodations.” Please notify the instructor during the first week of class of any accommodations needed.

**Required Technology**:  
Enrollment in this course requires you to utilize the following computer applications: PowerPoint, Excel, Internet/WWW, WebCT via Internet, e-mail, and Word Processing.

It is expected that you can utilize the above listed computer applications. These computer applications are available in the College of Charleston managed computer labs located in JC Long, the Library, and various other campus locations. If you do not have reliable access to these applications you should plan to use the campus computer laboratories.
School of Education Mission:
The mission of the School of Education at the College of Charleston is the development of educators and health professionals to lead a diverse community of learners toward an understanding of and active participation in a highly complex world. In pursuit of this mission, faculty and students will demonstrate:

- intellectual curiosity and rigor;
- reflective, research-based practice;
- collaboration and consensus building;
- field-oriented service and community outreach;
- and cultural sensitivity and understanding.

MAKE THE TEACHING AND LEARNING CONNECTION

This vision is further defined through elements of teacher competency that organize standards of effective teaching.

Element of Teacher Competency 1: Understand and value the learner.

Standard I: Evidence theoretical and practical understanding of the ways learners develop.

Element of Teacher Competency 2: Know what and how to teach and assess and how to create an environment in which learning occurs.

Standard II: Demonstrate understanding and application of the critical attributes and pedagogy of the major content area.

Standard III: Evidence a variety of strategies that optimize student learning.

Standard VI: Demonstrate an understanding of the continuous nature of assessment and its role in facilitating learning.

Element of Teacher Competency 3: Understand oneself as a professional

Standard IV: Participate in informed personal and shared decision making that has as its focus the enhancement of schooling and the profession.

Standard V: Communicate effectively with students, parents, colleagues, and the community.

Standard VII: Show an understanding of the culture and organization of schools and school system and their connection to the larger society.