



The Citadel School of Education

| EART 201 - Earth Science for Teachers Fall 2016 | |
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| <i>Professor:</i> Dr. Jennifer Albert | <i>Class Meetings:</i> Tuesday and Thursday from 1:00-3:00 Capers 310 |
| <i>Office:</i> 301 Capers Hall | |
| <i>Telephone:</i> 843-953-7121 | <i>Office Hours:</i> Before and after class and by appointment. |
| <i>Email:</i> jalbert@citadel.edu | |
| <i>Credit Hours:</i> 4 hours | |

PREREQUISITES: None

CITLearn will be used for all assignments.

RESOURCES FOR THIS COURSE COME FROM THE FOLLOWING:

- Google Earth - www.googleearth.com
- National Aeronautics and Space Administration - www.nasa.gov
- National Geographic - www.nationalgeographic.org
- National Oceanographic and Atmospheric Administration - www.noaa.gov
- National Science Teacher's Association - www.nsta.org
- National Weather Service - www.nws.gov
- South Carolina Science Standards - (proposed to be presented to the SCEOC Feb. 2014)
https://ed.sc.gov/agency/se/Instructional-Practices-and-Evaluations/documents/SC_AcademicStandards_and_PerformanceIndicators_forScience2013_EOC_Feb2014.pdf
- TED Talks - www.ted.com
- United States Department of Agriculture - www.usda.gov
- United States Geological Service - www.usgs.gov

NSTA student membership is recommended - <http://www.nsta.org/pdfs/MembershipApplicationStudent.pdf>

STUDENT INFORMATION:

This course can be used to meet the Earth Science required component of The Citadel's Science Teacher preparation program but is open to all interested students. The course is intended for students with little or no background or experience with earth and space sciences. The course content is appropriate for students from various fields as well as those who anticipate further study and careers in education.

If you should encounter a computing issue, The Citadel's Information Technology Service may be able to help. Their web page includes computer recommendations as well as help center contact information:
<http://www.citadel.edu/root/its>

COURSE DESCRIPTION:

This undergraduate course is intended to be an introduction to Earth Science with special emphasis in regards to instructional applications for teachers. It includes the study of the materials and major processes of the earth including minerals and rocks, plate tectonics, hydrology, volcanoes, mountain building, oceanography and weather and climate. The geologic history of the earth and the fossil record will also be included. **This is a blended format**

course which includes in class meetings, lab activities, online posts of information, independent content research as well as Earth/Space Science lesson planning activities.

Additional information: While the connection for science education majors is clearly indicated in the course description, all students enrolled in the course will be encouraged to link the content of this course to their primary field of study. (Example: Social Studies Education majors will be expected to link their learning process to historical context and geographic influences as well as social implications for the application of earth/space science technologies. Business majors will be encouraged to connect their learning processes to small and large business applications as well as economic impact. Engineering majors will be encouraged to link the content to engineering applications in the past as well as problem solving for the future, etc.)

THE CITADEL'S SCHOOL OF EDUCATION'S CONCEPTUAL BASE: Developing Principled Educational Leaders for P-12 Schools

The Citadel's Professional Education Unit prepares principled educational leaders to be knowledgeable, reflective, and ethical professionals. Candidates completing our programs are committed to ensuring that all students succeed in a learner-centered environment.

The Citadel's Professional Education Unit is committed to the simultaneous transformation of the preparation of educational leaders and of the places where they work. Specifically, The Citadel's Professional Education Unit seeks to develop principled educational leaders who:

- have mastered their subject matter and are skilled in using it to foster student learning;
- know the self who educates (Parker J. Palmer) and integrate this self-knowledge with content knowledge, knowledge of students, and in the context of becoming professional change agents committed to using this knowledge and skill to ensure that all students succeed in a learner-centered environment; and
- exemplify the highest ethical standards by modeling respect for all human beings and valuing diversity as an essential component of an effective learner-centered environment.

The Citadel's Professional Educational Unit is on the march, transforming itself into a Center of Excellence for the preparation of principled educational leaders. Through our initial programs for teacher candidates for P-12 schools and our advanced programs for professional educators in P-20 schools, The Citadel's Professional Education Unit transforms cadets and graduate students into principled educational leaders capable of and committed to transforming our schools into learning communities where all children and youth succeed.

The Citadel's Professional Education Unit has identified 15 performance indicators for candidates to demonstrate that they are principled educational leaders who are knowledgeable, reflective, and ethical professionals:

Knowledgeable Principled Educational Leaders...

1. Have mastered the subject matter of their field of professional study and practice;
2. Utilize the knowledge gained from developmental and learning theories to establish and implement an educational program that is varied, creative, and nurturing;
3. Model instructional and leadership theories of best practice;
4. Integrate appropriate technology to enhance learning;
5. Demonstrate a commitment to lifelong learning;

Reflective Principled Educational Leaders...

6. Develop and describe their philosophy of education and reflect upon its impact in the teaching and learning environment;
7. Develop and manage meaningful educational experiences that address the needs of all learners with respect for their individual and cultural experiences;
8. Construct, foster, and maintain a learner-centered environment in which all learners contribute and are actively engaged;

9. Apply their understanding of both context and research to plan, structure, facilitate and monitor effective teaching and learning in the context of continual assessment;
10. Reexamine their practice by reflectively and critically asking questions and seeking answers;

Ethical Principled Educational Leaders...

11. Demonstrate commitment to a safe, supportive, learning environment;
12. Embrace and adhere to appropriate professional codes of ethics;
13. Value diversity and exhibit a caring, fair, and respectful attitude and respect toward all cultures;
14. Establish rapport with students, families, colleagues, and communities;
15. Meet obligations on time, dress professionally, and use language appropriately.

CLASS EXPECTATIONS:

This course is an online course. As you move through the course, you will discover that while there are content similarities, on-line instruction for this course is different from what you would experience in a traditional, face to face course. Please know that while the course is asynchronous in format and you will be working from different locations, interaction within the discussion boards is an essential part of the learning process for this course.

Assignments

In this course, you will have readings, videos, and activities to complete. The discussion posts are designed to help you learn the content and reflect on how best to teach a concept and to network and learn from others. You will also be working on several research type assignments throughout the course. As the course progresses, you will be reminded of the due dates. Please do remember that it will be your responsibility to keep up with the assignments. All assignments are to be turned in on time. Late assignments may not be accepted or will be assigned lower grades. ***Assignment instructions and assessment information will be provided throughout the course. Contact me if you have concerns or need help completing the work.***

Disability Disclosure

If you need accommodations because of a disability, please inform me immediately. Please e-mail me privately to let me know about your specific needs. If you need additional support as you move through this and other courses, The Citadel maintains an Office of Access Services, Instruction and Support (OASIS) located in room 105 Thompson Hall. To receive additional assistance, email Dr. Jane Warner - jane.warner@citadel.edu or call 953-1820 to set up an appointment. OASIS is responsible for reviewing documentation provided by students requesting academic accommodation and for accommodation in cooperation with students and instructors as needed and consistent with course requirements.

Honor Statement

Integrity is an expectation. Students of The School of Education at The Citadel are expected to meet the standards set forth in the Citadel Graduate School Catalog: "The Citadel has among its primary purposes teaching, research, and the expansion and dissemination of knowledge. Products of these endeavors include the development and use of intellectual property. It is the policy of the College that its faculty, staff, and students carry out their scholarly work in an open and free atmosphere that encourages publication and creation of such works without constraint but consistent with applicable laws and College policy. This policy will be in accord with the guidelines and criteria published in The American Association of University Professors' 'Statement of Copyright' (Policy Documents and Reports. Ninth Edition, 2001, or subsequent editions)."

ASSESSMENT PROCESS:

Grades for EART 201 are based on a variety of assignments. The relative weights used for calculating the course grade are as follows:

| Assignment Type | Percentage |
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| CITLearn Topical Posts linked to in-class and Lab Activities | 40 |
| Tests - 4 | 40 |
| Final Project | 10 |
| Professionalism | 10 |
| Total | 100 |

Final grading is based on the following scale:
 90.0-100.0=A, 80.0-89.9=B, 70.0-79.9=C, 60-69.9=D, 0-59.9=F

COURSE OUTLINE AND RELATIONSHIP OF COURSE GOALS TO SOUTH CAROLINA AND NATIONAL SCIENCE EDUCATION STANDARDS:

| | <u>Course Objectives</u> <i>modified from the National Science Teachers Association's (NSTA) Expected Earth Science preparation for Teachers, the National Science Teaching Standards and ETS PRAXIS II Middle and High School Science Content Tests</i> |
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| <p>All weeks Scientific Inquiry, Unifying Concepts, Methodology, Techniques, Technology, Historical Concepts and Personal/Social History will be infused with each of the major fields of study within the course: Geology, Physical Oceanography, Meteorology, and Astronomy</p> <p>South Carolina Earth Science <u>Standards for Science and Engineering Practices.</u></p> <p>Standard H.E.1: The student will use the science and engineering practices, including the processes and skills of scientific inquiry, to develop understandings of science content.</p> | <p><u>Inquiry</u>- The student will be able to:</p> <p>Use the scientific method and science process skills to solve problems.</p> <p>Explain earth/space science related facts, models, theories and laws.</p> <p><u>Mathematics, Measurement, and Data Manipulation</u> -The student will be able to:</p> <p>Use scientific measurement and notation systems in data collection, manipulation, interpretation, and presentation</p> <p>Identify and explain possible sources of error in scientific investigations and materials.</p> <p><u>Laboratory Procedures and Safety</u> - The student will be able to:</p> <p>Demonstrate safe preparation, storage, use, and disposal of laboratory and field materials as well as safety and emergency procedures for science activities.</p> <p><u>Historical Context and Personal/Social Perspectives</u> - The student will be able to:</p> <p>Link earth/space theories and laws to historical events and people.</p> <p>Explain how various disciplines and concepts in science are interconnected.</p> <p>Describe practical uses and applications for earth/space science and related technology concepts to daily life.</p> <p>Discuss of the social, political, ethical and economic issues arising from the use of earth materials and earth and space related technologies</p> |

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| <p><u>August 25 - September 1</u></p> <p><u>Astronomy</u> South Carolina Standard H.E.2: The student will demonstrate an understanding of the structure, properties, and history of the observable universe.</p> | <p><u>Astronomy</u></p> <p>The student will be able to:</p> <p>Define and use large units of distance.</p> <p>Construct a working sun dial and explain how units of time (including time zones) are based on earth and sun movements and their geometry</p> <p>Illustrate the geometry of the Earth-Moon-Sun system, lunar and solar eclipses as well as moon phases and Earth's seasons</p> <p>Explain major theories of origin and structure of the universe, the origin and life cycle of stars, the solar system</p> <p>Identify the major features and characteristics of the Sun and trace the movement of sun spots and solar flares with a reflecting telescope and NASA's satellite technology</p> <p>Identify the components of the solar system and characterize the physical features and movements of the planets, asteroids, comets, and other solar system components</p> <p>Discuss the contributions and limitations of manned and unmanned space missions, space exploration, geosynchronous orbiting satellites and remote sensing.</p> |
| <p><u>September 6 - September 15</u></p> <p>South Carolina Standard H.E.5: The student will demonstrate an understanding of the dynamics of Earth's atmosphere.</p> <p><u>Test 1 - September 13</u></p> | <p><u>Meteorology</u> - The student will be able to:</p> <p>Illustrate the structure of the atmosphere and thermal and chemical properties of atmospheric layers.</p> <p>Distinguish among the terms relative humidity, absolute humidity, dew point, and frost point</p> <p>Investigate and explain differences in seasonal and latitudinal variation of solar radiation, the causes of global wind belts, as well as large and small-scale atmospheric circulation</p> <p>Identify regional and local natural factors that affect climate</p> <p>Describe and document various cloud and precipitation types and their formation</p> <p>Characterize major types of air masses in terms of temperature, moisture content, and source areas</p> <p>Identify and track high- and low-pressure systems as well as frontal boundaries and their associated weather patterns associated</p> <p>Interpret information on weather maps and compare short-term and long-term weather forecasting processes</p> <p>Explain some of the ways that humans affect and are affected by climate Utilize technology commonly available for metrological investigations.</p> |

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| <p><u>Sept. 20 - October 25</u></p> <p><u>Hydrosphere</u></p> <p>South Carolina Standard H.E.6: The student will demonstrate an understanding of Earth's freshwater and ocean systems.</p> <p><u>Test 2 - October 25</u></p> | <p><u>Hydrology and Oceanography</u></p> <p>The student will be able to:</p> <p>Geographically locate oceans and seas.</p> <p>Simulate and explain the processes involved in the formation and movement of ocean waves</p> <p>Explain primary causes and factors that influence tides</p> <p>Discuss major surface and deep-water currents in the oceans and the causes of these currents</p> <p>Describe processes that influence the topography and landforms of the ocean floor and shorelines and predict influences on shorelines due to major events such as flooding, seismic activity, and global climate change.</p> <p>Identify factors that influence the physical and chemical properties of seawater and nutrient cycles of the ocean and discuss how human activities influence the biotic environment.</p> |
| <p><u>October 27 - December 6</u></p> <p><u>No classes - November 8</u> <u>Election Day</u></p> <p><u>No classes November 22 & 24</u> <u>Thanksgiving Holidays</u></p> <p><u>Geosphere</u></p> <p>South Carolina Standard H.E.3: The student will demonstrate an understanding of the internal and external dynamics of Earth's geosphere.</p> <p><u>Paleobiosphere</u></p> <p>South Carolina Standard H.E.4: The student will demonstrate an understanding of the dynamic relationship between Earth's conditions over geologic time and the diversity of organisms.</p> <p><u>Test 3 - November 17</u></p> <p><u>Final Exam -</u> <u>December 14th at 0800</u></p> | <p><u>Physical Geology</u>- The student will be able to:</p> <p>Illustrate the structure of Earth and the physical characteristics of Earth's various layers</p> <p>Explain plate tectonic theory and other theories about Earth's internal processes and features, including folding, faulting, earthquakes, and volcanoes</p> <p>Describe the processes of mineral and rock formation</p> <p>Identify and classify different types of minerals, rocks, and soils</p> <p>Describe the hydrologic cycle as well as weathering, erosion, and deposition</p> <p>Utilize topographic maps and global positioning satellite imagery to make landform and process inferences</p> <p><u>Historical Geology</u> - The student will be able to:</p> <p>Explain the principles of uniformitarianism and stratigraphy</p> <p>Distinguish between relative and absolute time</p> <p>Describe the processes involved in the formation of fossils</p> <p>Discuss types of information fossils provide as well as the geologic time scale, how it was developed and its use by scientists in describing sequences of important events in the Earth's history</p> |

Note: Schedule subject to change based on class needs. Additional reading/activities/assignments may be assigned as course develops.