

Geol 805: Seminar in Geoscience Education
Spring 2012

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Meeting Days: TBD, likely Weds afternoons from 3:45 to 5 pm at St Lawrence Place
(off-campus) <http://www.stlawrenceplace.org/cms/>

Texts: Handouts from the literature. This includes a series of articles published in:
Journal of Geoscience Education, *Journal of Science Education*, *Journal of Science Teacher Education*, and *Science Scope*. Examples of articles include:

Ross, S. (2000) Teaching the basics about Volcanoes to K-16 students, *Journal of Geoscience Education*, 48, 576-578.

O'Connell, S. (2000) An Ocean-Density Demonstration, *Journal of Geoscience Education*, 48, 581-583.

Kevitt, K. (2002) The nose knows...or does it? Using the learning cycle and questioning in a lesson about the sense of smell, *Journal of Science Education*, 6, 10-24.

Smith et al. (2003) The Electromagnetic Spectrum, *Science Scope*, 26, 40-52.

Cuicchi et al. (2003) Fun with Bouyancy, *The Science Teacher*, 81, 42-46.

Course Justification

Science education and outreach should be an integral part of the training and development of all Earth Scientists. Recent changes in proposal funding requirements now mandate that "Broader Impacts", which includes community outreach and education, be fundamentally incorporated into all proposals submitted to the National Science Foundation. Therefore, undergraduate and graduate students pursuing scientific research need to be introduced to these aspects prior to graduation. Specifically, the goal of this course is to teach undergraduate and graduate students how to conduct interactive scientific learning through hands-on scientific experimentation.

What is ScienceQuest?

ScienceQuest, provides an excellent opportunity for graduate students to learn how to include science education into their research programs. Science Quest is an informal science and technology program geared towards at-risk elementary school students (ages 6 -11). ScienceQuest currently takes place at St. Lawrence Place, a transitional housing facility located in Columbia, SC geared towards families in trouble. Students and social workers spend one afternoon a week conducting a series of experiments chosen by both

the SLP kids themselves and the undergraduate and graduate students participating in the program. Groups are split into 1-2 science mentors and 4-6 SLP students. Within each group, older students act as “assistants” in explaining scientific concepts to the younger members. Each group conducts the same experiments (designed by the mentors) on any given day. Some experiments may last several days as Inquiry Based Learning and questioning techniques are the core of the program.

Course Goals: The goal of this course is to introduce graduate students who are predominantly conducting scientific research to interactive and hands-on learning experiences with students at the Elementary School level. Students who take this course are expected to develop a specific hands-on experiment regarding a particular topic in geosciences. These topics may range over a variety of interests in the broad areas of geosciences. The goal is to pick an experiment that closely relates to the research/interests of each undergraduate/graduate student, but will engage the minds of elementary school students. Students will be paired into teams of two and meet with the Faculty advisor at the start of the semester to discuss potential hands on activities. Each science mentor with the faculty advisor, will then devise a series of questions that the elementary students will be required to answer throughout the experiment, with specific emphasis on the pieces of knowledge that are to be gained at the end of each experiment. The Faculty advisor will be present to evaluate and guide the effectiveness of the teaching topic during each class period. By the end of the course, students should have gained a perspective on effective mechanisms for teaching at the Elementary School level, and have developed an interactive experiment that they can use to explain scientific processes to future K-12 demonstrations.

Grading: This course is Pass/Fail and will meet for 1 hour each week. Passing grades will be awarded to students who develop and complete one hands-on activity throughout the semester and who demonstrate a progression in teaching effectiveness as they participate in hands-on activities developed by their peers. This effectiveness will be judged by the quality of activities developed and the observed interactions between the science mentors and elementary school students. Since this course also depends to some degree on the children involved in the program, we have elected to grade this course as Pass/Fail.

Schedule: ScienceQuest is expected to run on Weds throughout the semester from 3:34 to 5 pm at SLP.

January 18th, 2012: Introductory meeting of all team leaders. All students are required by law to fill out SLED paperwork appropriate for working with school-age children in the S.C. Public School system. Students will be provided information and demonstrations on how to develop hands on activities and will be expected to hand in a preliminary list of experiments by January 25th for further development.

February 1 – April 11th. SQ Experiments. Includes end of the semester Pizza Party. Note, NO Sciencequest during USC and Richland County Schools Spring Breaks.