

Teaching Geoscience to Non-Science Majors: Using real-world examples and lecture worksheets  
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Teaching geology and earth science to my students can be a challenge, as typically only a few students are declared geoscience majors. Many non-science majors have had limited exposure to science in high school or experienced less than satisfactory outcomes in previous college science classes. Some students dread the class and feel science is just “too hard” to understand. In fact, I find a fair number of students delay taking their science classes until their final semester of their AA degree. Recognizing that students come to the class with a wide variety of levels and backgrounds, I have redesigned my classes to emphasize the application of geoscience to students’ everyday life. The goal of using this approach is to spark interest in the subject material by demonstrating its relevance to the student. Almost daily a geological event occurs somewhere in the world that can be a teaching tool. I utilize websites such as the USGS earthquake hazard monitoring site and the National Hurricane Center website; both provide real-time data along with maps. I also provide students learning activities specific to the region of Florida in which they live. Two examples are exercises involving groundwater depletion and flooding. The ultimate goal is to develop an informed citizenry that can recognize potential geologic hazards. The challenge of using current geologic events does require additional work. But the data is easily available online and many geologic events are documented by the news media. I have been able to gauge the effectiveness of this approach by seeing an increased student interest in these real-world events as a given semester progresses.

Another important change I have made is to modify the way I lecture in the face-to-face sections. Prior to the past few years, I would dutifully lecture the entire class period (one hour and fifteen minutes twice a week) assuming that the students were so enthralled by my vast knowledge of geology and entertaining colorful, picture-packed slideshow lectures that they just soaked up the material. Realizing that amount of time is too long for most students to concentrate and absorb the material, I modified my lectures to approximately forty-five minutes every class. During the last half hour of each class period, I now give students a worksheet that tests them on the materials covered in the preceding lecture. On the worksheets, I create figures similar to, but not exactly the same as, the text book or what was presented in lecture. I give full credit for completion and go over the more difficult answers the next class period. Although the worksheets are given a low point value, I have not had a problem with students working quickly and leaving early. In fact, the opposite happens, as most students now work diligently on the worksheets. During this time, I walk around the room to help any students that might need assistance. Although I have to move through lecture subject matter much more quickly than before, I do not feel I have sacrificed depth of learning. I require students to complete other assignments including review questions and computer-based review quizzes to cover subjects thoroughly. Implementation has required that I redo my class lectures to reflect the change in time available and prioritize the concepts. Because worksheets are used for every class, students have come to understand that being at lecture on time and attending each one is very important. Overall, I find that students like the format and become more enthusiastic learners. To test the effectiveness of this change in lecture delivery, I am planning to conduct a statistical analysis of student test scores before and after implementation, since I now have several years of data.

Websites: <http://earthquake.usgs.gov/> and <http://www.nhc.noaa.gov/>