**Geology program at Juniata College**

Juniata College is a small (~1500 students), residential, undergraduate-only liberal arts college in central Pennsylvania. Our geology department, which has existed since 1968, consists of three faculty and graduates approximately 6-10 students per year. We offer three majors: Geology, our traditional major; Environmental Geology, which is tailored for students who expect to become environmental consultants; and Earth & Space Science Secondary Education, which leads to state teaching certification at the high school level.

*How our program prepares students for the workforce.*—Our program attempts to develop a strong foundational understanding of geology in our students. To that end, we offer a classic curriculum of courses based on traditional subfields of geology, e.g., mineralogy, structural geology, sedimentology, etc., rather than more specialized offerings. Our labs and field experiences emphasize basic skills and practices such as microscopy and geologic mapping, and we provide opportunities for students to collect their own data and perform analyses.

Our curriculum is deliberate in exposing students to the breadth of the discipline. Our intention is to graduate geologists who have seen a wide variety of rocks in distinctly different settings, who have grappled with diverse data-gathering and analytical methodologies, and who are adaptable. We choose not to allow our students to specialize at the undergraduate level; viz we graduate no hydrogeologists, or paleontologists or stratigraphers or geochemists. Most of our students will have experience of all of these areas of geological inquiry and potential employment. We model that behavior in our teaching, intentionally wearing multiple hats and encouraging our students to see that they can as well.

We expect students to retain and use information and skills from prior courses. Our curriculum reflects this emphasis on building in that most of our courses have specific, and sometimes multiple, prerequisites. The fairly strict course sequencing means that students in our upper-level courses generally share a common set of skills and knowledge learned in earlier courses. This allows us to reinforce those abilities and integrate them into the new material. A capstone course is required.

We emphasize project- and field-based learning wherever possible. Many of our courses are deliberately focused on skill-building rather than just content-acquisition, e.g., our Geological Field Methods I and II courses, and the several project-based courses that integrate lecture and lab. Overall, three-quarters (12 of 16) of the course offerings for our majors incorporate project-based learning in some way, e.g., through labs, integrated lecture/labs, or field experiences. Our lecture-only courses also incorporate in-class demonstrations, hands-on activities, and field trips. Three of our courses deliberately work to develop our students’ writing and presentation skills, and most courses include experiences that attempt to develop our students’ analytical and critical thinking skills. Many of our students also participate in undergraduate student research with a faculty mentor.

Our overarching goal is to produce students who “think like geologists”. Frequent and diverse field experiences, integrative experiences, and a structured curriculum begin the process of building geology professionals. We also encourage all of our students to attend at least one professional conference (almost wholly funded by the College), even if they are not presenting their own work, so that they experience geology as a larger scientific community. We also take advantage of alumni-led extended field trips for the same reason. Thus, we hope that by graduation our students have acquired a set of knowledge, skills, and experiences that enable them to perceive the earth system as a geology professional does.

*Areas in which our alumni are employed.—*We closely track the outcomes of our graduates and maintain a nearly-complete alumni database. Over the past ten years, 37% of our students have gone directly to graduate school (17% MS, 20% PhD), 55% have directly entered the workforce, and 8% are unknown or are not employed as geoscientists. Most of our graduates are employed in the environmental consulting industry (~50%), or the oil & gas or mining industries (~30%). A large proportion of the remainder are teachers at the high school, community college, or college/university level.

*Knowledge and skills that have been most important in supporting success.*—We have found that our most successful students tend to be the ones who are most enthusiastic and passionate about geology. These students are hard, uncomplaining workers, and they are most likely to respond to challenging opportunities that oblige creative thinking across the discipline.