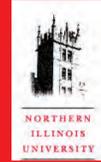


Using Program Emphases to Satisfy the Diverse Interests of Geoscience Students



Department of Geology & Environmental Geosciences
Northern Illinois University



Background

Despite being the second largest public university in Illinois (25,000 students), and having the second largest geology department (14 faculty), in 1999 we recognized several growing problems with our undergraduate program.

- the number of majors in our department had fallen from a high of over 100 to a near all time low of only 29
- our students were not excited about our existing, narrowly focused traditional geology curriculum
- our existing curriculum did not satisfy a growing student interest in topics such as climate change, geobiology and environmental science
- a newly created teacher certification program was experiencing rapid growth

Our solution to these problems was to redesign our curriculum

In this redesign we wanted to: (1) maintain rigorous coursework and high student expectations, (2) include a strong field component, (3) emphasize integrative science, (4) rekindle student interest.

Re-inventing the Geoscience Curriculum

Earth Science Education Emphasis

for students who will teach earth, space or environmental science in middle or high schools

Requirements include:

- 1 semester of Atmospheric Science
 - 2 semesters of Physical Chemistry
 - 2 semesters of either Physics or Biology
 - 1 semester of Calculus or 1 semester each of Business Calculus and Statistics
 - 3 credit hours of Inquiry-Based Field Experiences for Earth Science Teachers
- students in this emphasis must take a host of educational methods courses and meet a variety of state, national and professional standards

Geology Emphasis

for students with traditional geology interests

Requirements include:

- 2 semesters of Physical Chemistry
- 2 semesters of Calculus
- 2 semesters of Physics
- 1 semester of Stratigraphy
- 15 upper division credit hours in Geoscience
- 6 credit hours of Geological Field Methods



Geology students study Little Ubehebe crater in Death Valley, California. Field experiences are an integral part of most upper level courses in the geology emphasis.

Core Courses Common Across all Emphases

- GEOL 120/121 Introductory Physical Geology
- GEOL 322 Paleoenvironments and Paleoecology
- GEOL 325 Solid Earth Composition
- GEOL 330 Global Cycles
- GEOL 335 Dynamics and Structure of the Earth

Environmental Geoscience Emphasis

for students with multidisciplinary science interests

Requirements include:

- 1 semester of Calculus or 1 semester of Statistics and Calculus for Business and Social Science
- 2 semesters of Physical Chemistry
- 2 semesters of a laboratory science of the student's choosing
- 9-12 credit hours of upper division coursework in the co-disciplinary field of the student's choosing - common choices include Geography, Chemistry, Biology and Political Science
- 4 credit hours of Field Methods in Environmental Science

Environmental geoscience students preparing a well test during their summer field methods course.



Earth science education students, faculty and in-service teachers visit the Mexican National Library during an inquiry-based field experience in Mexico.

Preliminary Results...

- Since initiating our curriculum revision in 2001, our undergraduate majors have grown from 29 to almost 80. Majors are split roughly evenly between each of the three curriculum emphases.
- There has been a dramatic increase in the number of undergraduate students completing senior thesis and other independent study research projects.
- Our Earth Science Education program, under the direction of Dr. Kathy Kitts, has won nearly \$500,000 in grant support in the last 3 years.

Obstacles we encountered: overcoming faculty mindset that more integrative and greater breadth = less depth and less rigor, deciding what course content was most important, initial decline in students in the geology emphasis, drop in enrollment and subsequent loss of financial support for the traditional geology field camp.