

Department of Geography-Geology
Illinois State University

Program Learning Objectives

M.S. in Geohydrology
B.S. in Geology
B.A./B.S. in Geography

M.S. in Geohydrology

The goal of the MS in Geohydrology is to deliver a balanced set of core courses which, when combined with other required and elective courses, will enable students to become knowledgeable in applied environmental and resource Geohydrology. Graduates will enter the job market capable and ready to perform professional responsibilities from a solid academic base needed for career growth. The MS in Geohydrology will prepare students to:

1. become knowledgeable and proficient in theory and significance of sub-surface hydrodynamics;
2. design, implement and evaluate a groundwater exploration program;
3. design and supervise the installation of a monitor-well field and evaluate its results for the purpose of determining the nature and extent of groundwater contamination, in accordance with government regulations.
4. develop skills in the scientific management of water resources areas;
5. gather and evaluate geologic data necessary to prepare environmental impact reports;
6. identify and evaluate potential geologic and hydrologic hazards, such as those associated with seismic activity, volcanism, flooding, subsidence and slope instability; students will be competent to evaluate erosion and sediment depositional problems and will be able to recommend corrective and precautionary procedures to mitigate such hazards and problems;
7. plan and implement de-watering operations for underground construction, storm drainage alignments, foundation stability and pipeline laying;
8. evaluate the subsurface conditions which bear upon shallow burial and deep-well waste disposal;
9. critique the geologic aspects of engineering designs and proposals; and,
10. appreciate the social, ethical and legal implications of environmental issues faced by modern society.

B.S. in Geology

Geology is a field-based science that integrates the principles of chemistry, physics, biology and mathematics in the study of Earth processes and history. Geology emphasizes the central concepts of time, space, and scale in the study of planet Earth from the perspective of a unified Earth System—the atmosphere, biosphere, hydrosphere, and lithosphere. The ISU Geology program has gained recognition by employers and graduate schools for its traditional approach to the instruction of Geology, and its balance of application and theory that are firmly rooted in field studies.

The mission of the Geology B.S. program is to promote a scientific understanding of Earth systems--an awareness essential to an environmentally sound and sustainable future for the human race. The specific goals of the ISU Geology program are:

The B.S. in Geology is the only option that exists for Geology majors. Students who complete the B.S. in Geology are expected to:

1. be able to identify, describe, and classify common, and some uncommon, earth materials (minerals and rock); make scientific observations of these earth materials in the field and in the laboratory; and interpret their observations in a scientifically sound manner;
2. be familiar with the arrangement and structure of these earth materials, including how they originally form and how they are affected by physical, chemical, and biological activity after they form.
3. develop skill in the area of constructing and interpreting geologic maps;
4. develop models of the geometry and spatial relations of earth materials at depth;
5. develop an appreciation for the enormity of time and the history of the Earth;
6. develop an appreciation of society's dependence on Earth resources and on the interaction between human activities and the natural environment;
7. learn the theoretical bases of Geology and utilize opportunities to apply theoretical knowledge to field based problems;
8. develop appropriate analytical and quantitative skills for a career or advanced study in Geology; and
9. develop appropriate written and oral communication skills for a career or advanced study in Geology.

B.A./B.S. in Geography

The discipline of Geography is firmly rooted in the Liberal Arts tradition, and encompasses aspects of both the social sciences (human geography) and the natural sciences (physical geography). In addition, there is also a more technical side to the discipline, particularly in the areas of Geographic Information Systems and cartography. The Geography program at Illinois State reflects the traditional characteristics of the discipline by providing a firm grounding in the liberal art of geography with a significant technical component. Students are also exposed to both human and physical geography, although the social science component is emphasize over that of the natural sciences.

Students who complete a bachelor's degree in Geography are expected to:

1. understand the basic nature of most of the various sub-fields in human geography (e.g., cultural, economic, environmental, political, social, urban, etc.);
2. understand the major aspects of two of those sub-fields including an ability to read and understand basic research in the sub-field;
3. understand the basic nature of most of the sub-fields of physical geography (biogeography, climatology, geomorphology, hydrology, meteorology, etc) and if emphasizing physical geography have a more detailed understanding of one of those sub-fields;
4. understand the dominant forces that have shaped and continue to shape two major world regions;
5. apply the basic tools of geographic analysis (quantitative and qualitative) to investigate a geographic issue;
6. construct a map using appropriate cartographic design, visualization and quantitative data manipulation;
7. understand the fundamental concepts of Geographic Information Systems, which lay the foundation for further study of this evolving science;
8. develop the ability to integrate information from a range of academic disciplines, and appreciate the importance of holistic approaches to problem solving;
9. understand the importance of human/environment relationships – a traditional focus of geography;
10. develop appropriate written and oral skills necessary for graduate study or a professional career, including the ability to present oneself in a professional manner;
11. understand the importance of geographic inquiry and problem solving in a rapidly globalizing world, and be able to explain that importance to those who are ignorant of it.

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