NORTHERN ILLINOIS UNIVERSITY

College of Liberal Arts and Sciences

Major: Geology

Degree: Ph.D.

Date Revised: March 2022

Student Learning Outcomes and proposed Methods for collecting data (from assessment plan)

	Student Learning Outcomes
1	Specialized Geoscience Knowledge Graduate students are key agents in the advancement of scientific knowledge, generally in a fairly specialized realm. This knowledge can be subdivided into four general areas of earth materials, earth features, earth processes and interpretation of the geological record. For example, graduate research may involve reconstructing the depositional environment of glacial sediments, petrographic analysis of rocks and minerals, or modeling of geological processes. Students are expected to develop and demonstrate unique geoscientific skills and knowledge of their chosen sub-discipline, and to impart this knowledge to others, including non-specialists.
2	Collection, Evaluation, and Manipulation of Data Scientific inquiry and interpretation relies on accurate collection and evaluation of observational and experimental data. Interpretations are only as good as the data that support them, and scientists must strive to maintain excellence in collecting and handling data. Consequently, students must be able to accurately collect and synthesize field and laboratory observations or data. They must be able to assess the data quality, recognize sources of data error and bias, and demonstrate basic proficiency with computer programs used to organize, manipulate, analyze and present data.
3	Scientific Analysis Scientific analysis is higher-order critical thinking and creative reasoning that requires students to apply their knowledge and skills in novel ways. Students who can effectively perform this critical thinking will be able to devise original research plans, formulate testable scientific hypotheses, develop multiple working hypotheses to interpret scientific data and observations, assess the quality and accuracy of scientific reporting in the modern media, and assess the approach and results of their own research, as well as the research of others.
4	Communication The successful advance and use of scientific knowledge and understanding requires effective communication, not only amongst scientists, but also amongst scientists, governments, educators,

Methods of Assessment
• Annual progress report (1-3)
• Teaching Evaluations (1, 4, 5)
• Colloquium (1-4)
• Dissertation defense (1-5)
• Candidacy exam (1-4)
• External review of scholarship (1-5)
• Employer survey (1-4)

	and the public. To ensure that graduates of the program are effective communicators, students will be able to conduct literature research, summarize the work of others, write technical summaries of research, prepare public presentations, and explain technical information to general audiences, including primary and secondary school students and teachers.	
5	<u>Societal Significance of Geoscience</u> Geoscientists have long been at the forefront of the battle for environmental preservation and for the safe, efficient and logical exploitation of Earth's natural resources. To continue this tradition, and to assist in producing an environmentally conscientious public, students will be able to recognize, describe and explain short- and long-term environmental issues and risks faced by humans and induced by human activities. In addition, they will be able to explain the ways that geoscience contributes to society, including natural hazard assessment, water and mineral resource management, energy resource exploration and utilization, waste management, environmental protection, environmental and climate change, and education.	