

College: CLAS
Department: Geology
Degree: B.A./B.S.

The department of Geology will be using the last required class (G485 Field Methods) in the major to assess knowledge and skill outcomes previously addresses in required major classes of: G318/319 Surface Processes+, G312/313 Mineralogy+, G314/315 Petrology+, G324 Data Analysis, G434 Structural Geology/Tectonics, and G435 Stratigraphy and Sedimentology. Many desired skills and knowledge surface in assignments of G485 and thus provide the ideal timing to assess our overall BA/BS Geology degree.

Alignment of knowledge and skills outcomes with assessment via performance on assignments in G485: Field Methods.

Undergraduate Program Learning Outcomes

Knowledge #01: Students will be able to identify rocks and minerals and know their genesis and usage.

Assessment:

- *When identifying basaltic andesite and fluvial sedimentary deposits in the field, students are demonstrating the ability to identify rocks and sediments, and the minerals they comprise.*
- *When describing the rock units in the final project unit descriptions, students are demonstrating their knowledge of the rocks' and sediments' genesis.*
- *When using the units to create and interpret the geologic map and cross section, students must have a working knowledge of the rock and sediment genesis.*

Knowledge #02: Students will be able to delineate landforms and know their development and characteristics.

Assessment:

- *When students interpret the stream and river terrace landscape using LIDAR maps, air photos, and field observations, they are demonstrating the ability to identify landforms in the field and on maps.*
- *When students create the geologic map, cross section, and geologic history of the stream and river landscape, students must be able to identify components of the landscape and must have a working knowledge of how this type of landscape develops and changes through time.*

Knowledge #03: Students will demonstrate an understanding of plate tectonic theory.

Assessment:

- *By creating a geologic map, cross section, and geologic history of an area on a subducting plate margin, students demonstrate how the field area fits within a larger plate tectonic context following plate tectonic theory.*

Knowledge #04: Students will demonstrate an understanding of Earth's history and the evolution of Earth's geological systems.

Assessment:

- *By creating a geologic map, cross section, and geologic history of the field area, students must have a working knowledge of how Earth's systems lead to the development of the rocks and landscape (i.e., evolution of Earth's geologic systems)*

Note: I am assuming this one refers to historical geology. I think this one is more of a stretch and may not really be assessed by the mapping project in G485.

Knowledge #05: Students will demonstrate an understanding of the principles of structural geology.

Assessment:

- *In order to make a geologic map and cross section of the field area, which contains a fault structure, the students need to have a working understanding of structural geology.*

Note: The students use more sed-strat in the field area than structure, so this one may not really be assessed by the current mapping project in G485.

Knowledge #06: Students will demonstrate an understanding of stratigraphy and the process of sedimentation.

Assessment:

- *By creating a geologic map, cross section, and geologic history of an environment build by river erosion and the deposition of river sediment, students must have a working knowledge of stratigraphy and sedimentation.*

Knowledge #07: Students will recognize the current and historical role of geology on society, the economy and the environment.

Assessment: Not assessed by the G485 project

Knowledge #08: Students will demonstrate an understanding of geological hazards.

Assessment: Not assessed by the G485 project

Knowledge #09: Students will recognize the relationships between Geology and other disciplines.

Assessment: Not assessed by the G485 project

Knowledge #10: Students will demonstrate an understanding of and be able to model physical and chemical processes in earth systems.

Assessment: Not assessed by the G485 project

Skills #01: Students will be able to apply statistics to geological data.

Assessment: Not assessed by the G485 project

Skills #02: Students will be able to apply computer skills relevant to Geology, including the use of databases, statistical and graphic software, and Geographic Information Systems (GIS).

Assessment:

- *In using GIS and LIDAR products to create geologic maps of the field area, students are demonstrating the ability to apply computer skills to a geologic problem.*

Not assessed: Statistical software and databases.

Skills #03: Students will be able to apply mathematics to describe geological phenomena.

Assessment: Not assessed by the G485 project?

Note: It depends on what is meant by apply mathematics to geological phenomena. If it refers to just using data, then students do use trig to calculate thicknesses of beds, but if it refers to using formula to describe phenomena, then it is not assessed.

Skills #04: Students will be able to summarize, analyze, and perform quality control on geological data.
Assessment: Not assessed by the G485 project?

Note: It depends on what is meant by geologic data....we'd have to look into the intention of this skill based learning objective.

Skills #05: Students will be able to communicate in writing effectively and in an organized manner according to the disciplinary conventions in Geology.

Assessment:

- *In creating the geologic map and accompanying written materials, including the geologic history summary, students are demonstrating the ability to communicate in writing through a standard geologic product (i.e., a geologic map and report)*

Skills #06: Students will be able to articulate and pursue geological research problems.

Assessment:

- *By investigating a previously unmapped field area, students are pursuing the same types of geological problems investigated by field geologists (i.e., the spatial distribution of geologic units and geologic history of an area).*

Not assessed: I don't think students articulate the research problems, just pursue them.

Skills #07: Students will be able to conduct projects based primarily on observation skills, including field data collection, analysis, synthesis, evaluation and explanation.

Assessment:

- *In conducting a mapping project that integrates field observation, background reading, and map usage, students demonstrate the ability to collect, analyze, synthesize, and evaluate geological observations and data relative to a geologic problem.*

Skills #08: Students will be able to conduct projects based primarily on literature research.

Assessment: Not assessed by the G485 project

Note: If they are using literature, then this is assessed to some degree by G485, but the word primary implies a term paper project rather than a field project.

Skills #09: Students will be able to perform clearly organized oral presentations with effective visual aids.

Assessment: Not assessed by the G485 project

Skills #10: Students will be able to read maps effectively, including topographic and geologic maps, GIS, and DEM's.

Assessment:

- *Students demonstrate the ability to read, use, and create maps by using topographic maps, aerial photos, field observations, and GIS to create a geologic map and cross section of the field area.*

Skills #11: Students will be able to perform essential field skills, including rock identification,

stratigraphy, structures, strike, dip, GPS, and surveying techniques.

Assessment:

- *Students demonstrate the ability to perform field skills (i.e., rock identification, stratigraphic analysis, surveying techniques, GPS) when they collect field observations needed to make the geologic map and cross section.*

Skills #12: Students will be able to execute group projects effectively.

Assessment:

- *Students must work effectively in groups when collecting field observations.*

Note: I'm not sure if working in field groups counts as a group project because their final map project is their own, so this may not apply to G485.

Skills #13: Students will be able to develop models to present geological data.

Assessment: Not assessed by the G485 project?

Note: It is unclear what is meant by models (conceptual model or computational model) or present data (e.g., oral presentation) so it is not clear how this applies to G485.

Skills #14: Students will be able to apply GIS effectively.

Assessment:

- *Students demonstrate the ability to apply GIS by using this tool to work with LIDAR and create a geologic map of the field area.*

Skills #15: Students will be able to use geological instruments effectively.

Assessment:

- *Students must use stereoscopes, compasses, and other mapping and surveying tools effectively in order to collect the data and observations needed to produce the final geologic map product and cross section.*

Skills #16: Students will demonstrate an understanding of ethics and social responsibility on relation to Geology.

Assessment: Not assessed by the G485 project

Skills #17: Students will demonstrate creative and critical thinking in relation to Geology.

Assessment:

- *By creating a geologic cross section of the field area, which is an interpretation of the 2-dimensional map data in the third dimension, students must demonstrate critical and creative thinking in relation to a geologic problem.*

Skills #18: Students will demonstrate an understanding of internationalization in relation to Geology.

Assessment: Not assessed by the G485 project

Skills #19: Students will demonstrate an understanding of diversity in relation to Geology.

Assessment: Not assessed by the G485 project

Skills #20: Students will demonstrate an understanding of engagement in relation to Geology.

Assessment: Not assessed by the G485 project

Skills #21: Students will demonstrate an understanding of sustainability in relation to Geology.

Assessment: Not assessed by the G485 project

