2022-2023

Geology BS

Goal 1: Basic skills for geology majors

Goal Description:

Deliver basic skills that geology majors will need to be successful in their subsequent coursework.

After our success in developing a field methods course (GEOL 3301) that does an excellent job of preparing our students for their capstone summer field camp we decided to assess the entire curriculum in terms of student preparation starting with the most basic skills and eventually working our way toward the advanced skills.

Providing Department: Geology BS

Progress: Draft

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Goal 1 Objective 1: Apply Basic Skills Required of a Geology Major

Learning Objective Description:

Students completing the introductory geology courses will demonstrate an understanding of the basic skills required of a geology major to succeed in subsequent coursework.

This is where we want to assess how well we are training students to develop necessary basic skills. We are using student performance for the assessment, but we are really experimenting to find ways to improve our training methods.

RELATED ITEM LEVEL 2

ICF Goal 1 Objective 1: Basic Geology Skills Evaluation

Indicator Description:

All students enrolled in Physical Geology complete two practical exams that measure their ability to apply basic geological skills such as observing mineral properties necessary for mineral identification and being able to read maps and make geological interpretations based on map observations. Certain embedded questions, samples, or problems will be evaluated to measure student performance on specific basic skills.

Criterion Description:

At least 70% of the students will be able to perform 70% of the required skills in the embedded questions, samples, or problems. The remaining 30% of the students will be able to perform 50% of the required skills.

Findings Description:

Below is an example of what we have done in the past. The current lab coordinator did not collect necessary data.

On the rock and mineral practical we embedded samples where students had to determine mineral cleavage, a basic skill for identifying minerals. We did this because we had the sense that students were having difficulty determining mineral cleavage and wanted to try measuring their ability to do so. 46% of the students were able to determine the mineral cleavage correctly 70% of the time or better. This is up from last year's 35%. And 23% of the students were able to determine the mineral cleavage less than 50% of the time. Compare this to 45% last year.

On the rock and mineral practical we also embedded samples where students had to determine the texture of an igneous rock, a basic skill for classifying igneous rocks. We had noticed students having issues with this concept, but wanted to get a quantitative measure of student skill levels. Only 31% of the students were able to determine the appropriate texture correctly 70% of the time or better.

Compare this to 45% last year. 38% were only able to determine the appropriate texture correctly 50% of the time. Compare this to 45% last year.

On the map skills practical we embedded questions regarding the use of basic coordinate systems. We had observed that students seem to be having difficulty stating locations using various coordinate systems. 67% of the students were able to determine location coordinates correctly 70% of the time or better. Compare this to 0% last year. 22% were only able to determine the correct coordinates 50% of the time. Compare this to 44% last year.

On the map skills practical we also embedded questions where students had to make a geological interpretation based on map observations. Students always seem to struggle with this, but we had not previously quantified their struggle. Only 33% of the students were able to make a correct geological interpretation based on map observations 70% of the time. Compare this to 22% last year. 33% were only capable of making the correct geological interpretation 50% of the time. Compare this to 11% last year.

RELATED ITEM LEVEL 3

ICF Goal 1 Objective 1: Basic Geology Skills Evaluation

Action Description:

We need to meet as a program and decide on how we want to develop a coherent assessment plan for the introductory courses.

Goal 2: Development Of A Geologic Knowledge Base

Goal Description:

Each student is required to have developed a level of knowledge above and beyond the basic skills in various areas of geology prior to attending the capstone geology field course.

This is the follow-on to Goal 1 where advanced skills are to be assessed.

Providing Department: Geology BS

Progress: Draft

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Goal 2 Objective 1: Mineral Recognition

Learning Objective Description:

After completing Geology 3404, students will be able to recognize minerals. Every geology student must take Geology 3404, Mineralogy. One of the objectives of this course is to be able to recognize minerals, which is a skill that will be needed when they take the capstone geology field course. This requires that the students be familiar with the physical properties of minerals.

RELATED ITEM LEVEL 2

ICF Goal 2 Objective 1: Final Mineral Practical Exam

Indicator Description:

Students completing Geology 3404, Mineralogy, must take a final practical exam that requires the recognition of minerals. The recognition process requires an understanding of the physical properties of minerals.

Criterion Description:

60 percent of the students will be able to recognize 15 or more of the 30 minerals presented to them on the final mineral practical. This year's exam will serve as a baseline for measuring student success in regard to using the physical properties of minerals in order to identify the mineral correctly.

Findings Description:

Very low enrollment in Mineralogy this year. Therefore, any results would not be statistically significant.

RELATED ITEM LEVEL 3

ICF Goal 2 Objective 1: Final Mineral Practical Exam

Action Description:

We will continue the trend that began with the Fall 2019 Mineralogy class, i.e. a greater emphasis on mineral identification and recognition. The goal here is to better prepare students for Petrology, Field Methods, and Summer Geology Field Camp. Fall 2023 will see an increased emphasis on identification and recognition of minerals in rocks. This is something that has not been done before in mineralogy. We usually wait until Petrology. But that slows our progress and students do not advance in their understanding of rocks as quickly as needed to complete everything in one semester.

Goal 3: Sufficient Knowledge Of Geology To Qualify For A Bachelor Of Science

Goal Description:

Students will acquire a comprehensive knowledge of the discipline that encompasses both theoretical and field-based practical skills.

Providing Department: Geology BS

Progress: Draft

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

Goal 3 Objective 1: Successful Completion Of An Externally Evaluated Geology Field Camp

Learning Objective Description:

All SHSU Geology majors must attend a six credit, externally evaluated capstone Field Camp as a required component of their degree program. Such field camps are typically open to suitably qualified upper level students from geology programs situated anywhere in the country. They are conventionally evaluated using a letter grade system which the Department of Geography and Geology converted to a ranking system.

SHSU Geology students must be nationally competitive at this capstone task as indicated by at least 60% of our participants achieving at least a Limited Mastery ranking.

RELATED ITEM LEVEL 2

ICF Goal 3 Objective 1: Successful Completion Of Field Camp

Indicator Description:

All students must attend a six credit hour Field Camp that is externally evaluated on the following basis: Mastery, Limited Master, Adequate Comprehension, Limited Comprehension, and Very Low Comprehension. Students are free to choose from a very wide range of applicable courses, each of which offers slightly different emphases in terms of geographical location and course structure. ALL courses offer a capstone-like review with Mastery reflecting mastery of taught and examined modules as well as high levels of precision in final field review stand-alone projects. A ranking of Limited Mastery reflects mastery of one or more modules but with some imprecision; a ranking of Adequate Comprehension reflects broad comprehension but demonstrates a lack of sophistication in the use of basic course material; rankings of Low Comprehension and Very Low Comprehension reflect low levels of understanding and effort and indicate inappropriate general preparation prior to field camp participation.

Criterion Description:

60% of students will achieve at least a limited mastery ranking or better by the external evaluator of the Field Camp.

Findings Description:
Anecdotally, our students reported that they excelled in their respective field camps and that their field camp instructors were impressed by their performance. But no actionable data was generated this year.

RELATED ITEM LEVEL 3

ICF Goal 3 Objective 1: Successful Completion Of Field Camp
Action Description:
Last year's (2021-2022) plan of action still pertains...especially the last sentence.

Our response to the feedback from students and field camp directors over the past number of years was to develop our own introductory field methods course. That course has now been offered eight times, with the most recent six offerings including two faculty members. The feedback from students and field camp directors regarding this course has been extremely positive. There is not much more we can do to improve the introductory field methods course. However, now we are looking at ways to improve student preparation for the introductory field methods course. So far we have only focused on a few basic geology skills in the introductory geology courses and mineral recognition in the mineralogy course. We plan on expanding on this type of assessment.

Update to Previous Cycle's Plan for Continuous Improvement Item

Previous Cycle's Plan For Continuous Improvement (Do Not Modify):
Closing Summary
Again, progress is being made, but we are definitely still in the development stage for a number of these assessment processes. We will make use of the many new resources that were discovered as a positive result of having to teach remote and hybrid courses. There will be a new Physical Geology lab coordinator starting this year, so I am not sure whether he will continue using pre-labs or not. The field methods course continues to be a success based on the informal feedback that we have received from students and summer field camp directors. Still working on getting more faculty involved in this assessment process. Committees were set up but did not meet because everyone was scrambling to deal with changes associated with COVID. Hopefully things will start to return to normal.

Update of Progress to the Previous Cycle's PCI:
No progress this year. The data collection that we were doing did not occur this year for the introductory courses.

An issue that came to our attention this year is that our student demographic seems to be skewed by campus advising. Students are being steered away from Geology courses toward Weather and Climate (GEOG 1401) in order to ensure student success. Many students in introductory geology courses enroll in them as a last resort when the other classes fill up. These are generally students that do not take care of business. The average cumulative GPA in GEOG 1401 is about 3.1. The average cumulative GPA in introductory geology courses is about 2.1 to 2.3. This creates a death spiral. Campus advising says geology is too hard. Our student demographic tends to validate their statement because we end up with a high DFW rate. So, that's something we will be trying to figure out.

Mineralogy (GEOL 3404) and Petrology (GEOL 3405) showed moderate improvement in student success.

Our response to the feedback from students and field camp directors over the past number of years was to develop our own introductory field methods course. The feedback from students and field camp directors regarding this course has been extremely positive. There is not much more we can do to improve the introductory field methods course. We need to focus on ways to improve student preparation for the introductory field methods course.

New Plan for Continuous Improvement Item

Closing Summary:

The Geology Program has yet to have the meetings necessary to develop a coherent plan of assessment. We changed up the coordination of the labs to refresh and update our approach to teaching introductory lab courses but have not done anything to access our progress. These changes resulted in no assessment data being collected. We have regressed in our assessment procedures.

The field methods course continues to be a success based on the informal feedback that we have received from students and summer field camp directors.

Our primary action for the next cycle is to establish a new coherent assessment process.

Last year's meta-assessment was not helpful. One evaluator was obviously evaluating another program because the statements and recommendations had nothing to do with the Geology degree.