

Earth Sciences BA

Program Mission Statement

Program Mission Statement (Full Description):

Earth Science is an interdisciplinary, applied science that explains how Earth's interior, surface, and atmospheric processes operate in interconnected ways with each other and with life on spatial scales from microscopic to global and on temporal scales from fractions of a second to millions of years. Thus, the Earth Sciences must be approached in an interdisciplinary manner in both the classroom and the field. The B.A. in Earth Sciences includes a set of core courses that provide students with the necessary background in geology, chemistry, and physics or biology. Concentrations in Geology, Environmental Studies, and unique student-designed concentrations established with faculty approval near completion of the core, are available. A B.A. in Earth Sciences pairs well with majors and minors across the university and provides a strong science-based major for those in pre-professional programs. The goal of this program is to equip students to solve dynamic, time-dependent Earth Sciences problems at both local and global scales. This program is delivered at the main SMU campus in Dallas, Texas and in a synchronous, in-person format.

Does your program offer courses at an off-campus instructional site (not at SMU Dallas campus)?: No

Does your program offer courses through distance education technology (e.g., asynchronous, synchronous, or both)?: No

During which academic year were students first enrolled in this program?: Prior to AY2020-2021

Progress: Complete

1 Students will be able to summarize the complex interaction of rock, water, air and life

Step 1C: PLO Statement (Full Description):

Students will be able to summarize the complex interaction of rock, water, air and life. The Outcome focuses on attaining fundamental knowledge of how and why the primary Earth systems interact and evolve rather than simply identifying said systems.

Step 2A: Measure :

The term project is designed to be an informative "travel guide" through the landscapes (tectonics), environments (climate and ecology), and biotic transformations (extinction and evolution/adaptation) of organisms within a specific unit of the Geological Time Scale. This project closely mirrors and encompasses the scope of the PLO.

Attached Files

 [GEOL2306TermProjectRubric_2022_ExploratoryScience.docx](#)

Step 2B: Type of Measure (check all that apply): Rubric

Written paper/project

Step 2C: Is Measure direct or indirect?: Direct

Step 3A: Target for Measure:

75% of students achieve 4.5/5 on this metric

Step 4A: Was the target met for this Measure?: Met

Step 4B: Results and Findings for this Measure:

80% of students assessed achieved the target

Attached Files

 [GEOL3206_BA.xlsx](#)

Step 4C: Interpretation of Results :

The project used for assessment is of high quality and is achieving the assessment goal.

Step 5A: Use of Results for Seeking Improvement (Action Plan) :

Assessment tools will be shared with the faculty and feedback for improvement will be requested.

Step 5B: Type of Action: Faculty involvement

Step 5C: Dialogue Participants (check all that apply): Faculty

Step 5D: Evidence of Dialogue :

Will be provided next year.

Step 5E: Type of other Improvements (check all that apply):

Step 5F: Other Improvements (Full Description):

Step 6A: Status Update on Action(s) Identified in the Previous Assessment Cycle (Full Description):

Action item of improving the assessment tool for this PLO was fully implemented.

Step 6B: Status Update on Previously Identified Action Plan(s): Fully implemented

Progress: Complete

2 Students will be able to describe the evolution of Plate Tectonic theory and the fundamental mechanical, compositional and dynamic processes involved

Step 1C: PLO Statement (Full Description):

Students will be able to describe the evolution of Plate Tectonic theory and the fundamental mechanical, compositional and dynamic processes involved. The Outcome focuses on understanding how the basic driving mechanism on Earth (Plate Tectonics) was developed through centuries of use of the scientific method. The Outcome also focuses on solid earth processes and their interactions.

Step 2A: Measure :

Essay question on the final exam focused on understanding the development of Plate Tectonic theory

Step 2B: Type of Measure (check all that apply): Essay exam

Step 2C: Is Measure direct or indirect?: Direct

Step 3A: Target for Measure:

70% of the students will score a 3-5 on the final exam essay

Step 4A: Was the target met for this Measure?: No data collected/reported this cycle (provided explanation)

Step 4B: Results and Findings for this Measure:

This PLO will be assessed during the next cycle.

Step 4C: Interpretation of Results :

Step 5A: Use of Results for Seeking Improvement (Action Plan) :

Step 5B: Type of Action:

Step 5C: Dialogue Participants (check all that apply):

Step 5D: Evidence of Dialogue :

Step 5E: Type of other Improvements (check all that apply):

Step 5F: Other Improvements (Full Description):

Step 6A: Status Update on Action(s) Identified in the Previous Assessment Cycle (Full Description):

Step 6B: Status Update on Previously Identified Action Plan(s):

Progress: Complete

3 Students will be able to identify basic Earth materials and/or organisms in the laboratory and in the field

Step 1C: PLO Statement (Full Description):

Students will be able to identify basic Earth materials and/or organisms in the laboratory and in the field. The Outcome focuses on recognizing, developing and analyzing fundamental datasets. The Outcome is flexible to accommodate specialization in the Earth Sciences.

Step 2A: Measure :

The students were assessed with laboratories and targeted questions on 2 lab exams

Step 2B: Type of Measure (check all that apply): Essay exam

Other

Step 2C: Is Measure direct or indirect?: Direct

Step 3A: Target for Measure:

70% of the students score a 4-5 on the final exam questions

Step 4A: Was the target met for this Measure?: No data collected/reported this cycle (provided explanation)

Step 4B: Results and Findings for this Measure:

This PLO will be assessed in the next cycle.

Step 4C: Interpretation of Results :

Step 5A: Use of Results for Seeking Improvement (Action Plan) :

Step 5B: Type of Action:

Step 5C: Dialogue Participants (check all that apply):

Step 5D: Evidence of Dialogue :

Step 5E: Type of other Improvements (check all that apply):

Step 5F: Other Improvements (Full Description):

Step 6A: Status Update on Action(s) Identified in the Previous Assessment Cycle (Full Description):

Step 6B: Status Update on Previously Identified Action Plan(s):

Progress: Complete

4 Students will be able to communicate major concepts within Earth Science research fields through writing

Step 1C: PLO Statement (Full Description):


Students will be able to communicate major concepts within Earth Science research fields through writing. The Outcomes focuses on development of professional skills.

Step 2A: Measure :

The measure is a submission to a field guide for the Field Studies course (3243/3343). Each student writes a contribution to the guide for one of the localities that we will visit, creating a custom field guide for the field trip. This project is ideal for the PLO because it covers all aspects of technical writing, including use of figures and citations and synthesizing a variety of geological concepts. This project also has an immediate audience in that the field guide is distributed to all of the students in the course.

Attached Files

 [2023 Field Studies field report rubric V2.docx](#)

 [2023 FE Example BA.docx](#)

Step 2B: Type of Measure (check all that apply): Rubric

Written paper/project

Step 2C: Is Measure direct or indirect?: Direct

Step 3A: Target for Measure:

75% of students achieving a 5/5 on this measure.

Step 4A: Was the target met for this Measure?: Met

Step 4B: Results and Findings for this Measure:

8 total majors assessed, 7 scored 5/5 on this assessment

Attached Files

 [2023 FS Student Results BA.xlsx](#)

Step 4C: Interpretation of Results :

The assignment is completed over multiple rounds of edits. This appears to be an effective way to guide the students to a successful outcome.

Step 5A: Use of Results for Seeking Improvement (Action Plan) :

Additional improvements to the rubric will be made. Expansion of the library for the course so students have additional resources.

Step 5B: Type of Action: Redesign of activities or assignments

Step 5C: Dialogue Participants (check all that apply):

Step 5D: Evidence of Dialogue :

Step 5E: Type of other Improvements (check all that apply):

Step 5F: Other Improvements (Full Description):

Step 6A: Status Update on Action(s) Identified in the Previous Assessment Cycle (Full Description):

Previous feedback recommended "revising SLO4 to reflect an outcome not aligned with General Education assessment". PLO specifically on writing within the major is now requested for assessment. Please let us know if additional revision is necessary.

Action plan of identifying an ideal course and rubric for assessment of this PLO was fully implemented.

Step 6B: Status Update on Previously Identified Action Plan(s): Fully implemented

Progress: Complete

1 Sustained and improved post-graduation planning and outcomes

Step 1C: PO Statement (Full Description):

The Department of Earth Sciences will increase the number of successful applicants to graduate school or into postgraduate employment among the B.A. in Earth Sciences graduates.

Step 2A: Measure :

Assessment via survey of graduating seniors.

Step 2B: Is Measure direct or indirect?: Indirect

Step 3A: Target for Measure:

Minimum 75% of B.S. program students have a post-graduation plan

Step 4A: Was the target met for this Measure?: Not Met

Step 4B: Results and Findings for this Measure:

Only 1/3 survey respondents reported firm post-graduation plans

Attached Files

 [Undergrad Information Survey.doc](#)

 [BA Geology.xlsx](#)

Step 4C: Interpretation of Results :

Response percentage is low, and several students known to have lined up post-graduation plans did not return surveys. However, improvement needs to be made in facilitating transition into job or graduate school opportunities for students graduating with the BA degree.

Step 5A: Use of Results for Seeking Improvement (Action Plan) :

We will develop a plan to incentivize responses in order to more accurately assess our success in this area. This effort will be led by undergraduate advisors.

We will attempt to facilitate better outcomes for post graduation plans by advisors discussing plans with students during the Junior year. Also, strategies for additional alumni engagement will be implemented over the coming year. This will facilitate career opportunities for graduating seniors.

Step 5B: Dialogue Participants (check all that apply): Faculty

Student

Other

Step 5C: Evidence of Dialogue :

Evidence will be provided next year.

Step 5D: Type of other Improvements (check all that apply):

Step 5E: Other Improvements (Full Description):

Step 6A: Status Update on Action(s) Identified in the Previous Assessment Cycle (Full Description):

This PO was also not met last year. Our anecdotal data indicate that this is in part a reporting problem. We will integrate student surveys into the advising process, as these graduating seniors are closely advised ahead of graduation. This will ensure that our statistics for 2023-2024 accurately reflect our success on this PO. Documentation on communication about this problem will be provided in the next reporting cycle. We will also request additional survey results from Dedman College for the next reporting cycle.

The faculty will produce a strategy document for improving this metric that will also be provided in the next reporting cycle.

Step 6B: Status Update on Previously Identified Action Plan(s):

Progress: