

Table of Contents

2021 BS Geology, all options

Major-NH-PHSC-Geology, All Options (BS) 2021

Institutional Mission	2
Program Mission	2
1 2021.....	2
1.1 Licensure Ready	3
1.2 Problem Solvers	7
1.3 Intellectuals.....	9
Project Attachments	10

Major-NH-PHSC-Geology, All Options (BS)

2021

Completed

1 GOALS 3 OUTCOMES 11 MEASURES 14 TARGETS 12 FINDINGS 5 ATTACHMENTS

Institutional Mission

Arkansas Tech University is dedicated to student success, access, and excellence as a responsive campus community providing opportunities for progressive intellectual development and civic engagement. Embracing and expanding upon its technological traditions, Tech inspires and empowers members of the community to achieve their goals while striving for the betterment of Arkansas, the nation, and the world.

Program Mission

The mission of the Arkansas Tech University Geology Program is to provide a broad-based geological education with an emphasis on technological and field skills through continued improvement and success in teaching, community outreach, and research.

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
<p>1 Calendar Year Assessment Information 2021</p> <p>***** 2021 ANNUAL REVIEW ***** - DOWNLOAD AND COMPLETE THE "AUDIT TEMPLATE" FORM FOUND IN THE PROJECT ATTACHMENTS SECTION BELOW. - SAVE AND UPLOAD THE COMPLETED FORM IN THE PROJECT ATTACHMENTS *****</p> <p>APPROVALS & INFORMATION BLOCK (**NOTE**. This block provides a brief description of actions taking place (or planned to take place) during the current assessment cycle. If there are more (or less) outcomes assessed, please alter as necessary. Additional comments are also welcome.) Point of Contact for this year's assessment (add additional names as needed): 1) Dr. Mike Davis 2) Dr. Hamed Shojaei APPROVALS</p> <p>----- Department Head Approval: Hamed Shojaei Date: 03/24/2022 Dean Approval: John Jackson Date: 6/3/2022 Office of Assessment Approval: Amanda Gardner Date: 8/1/22</p> <p>----- Program Level Context: (ex. Second year using Weave Assessment Management System, or ADHE Program Review conducted on 3/15) Student Learning Outcomes Assessed during Calendar Year 2020 (Add more as necessary): Outcome 1: Curriculum Committee Proposals or Changes (erase choice not used): Y / N Assessment Data Used as Support for Change: (give Outcome #) Is Status of Project Noted in Title Bar Current? (erase choice not used): Y / N Change status in title bar above</p>			

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
<p>Are All Attachments Noted in Assessment Plan Added Below? (erase choice not used): Y / N _____ Additional Comments: If sample sizes are too small to use current learning outcome assessment measures other measures may be more appropriate or used in addition to what is currently being used.</p>			
<p style="text-align: center;">Outcome has action plan</p> <p>1.1 Licensure Ready</p> <p>Graduates have the knowledge and skills to become a Geologist in Training (GIT) immediately upon graduation and are able to become licensed Professional Geologists (PG) after completing the experience requirements.</p> <p>ACTION PLAN DUE no due date set</p>	<p>1.1.1 Knowledge of General and Field Geology</p> <p>ASBOG Domain Area 1: General and Field Geology</p>	<p>1.1.1.1 Not Met</p> <p>Ratio Analysis for Domain of General and Field Geology</p> <p>Normalized Ratio of All Candidate Domain Scores to National Domain Scores is 0.0 or Above</p>	<p>2021: Ratio was -0.297 indicating that our students did not perform well in this domain compared to national scores.</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: Results were received late Summer 2021. Faculty are currently unsure if the result is actionable. Only four students took the exam, including two students with low GPA's. It is likely that these scores are not a reflection of the quality of our program, but likely a reflection of the student's willingness to prepare for the external exam that has no real consequences. Faculty will continue to review details of ASBOG Domain during Fall 2021 and implement changes Spring 2022. With such small numbers of students taking exam, we may need</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			to reevaluate the applicability of using the ASBOG exam.
	<p>1.1.2 Knowledge of Mineralogy, Petrology, and Geochemistry</p> <p>ASBOG Domain Area 2: Mineralogy, Petrology, and Geochemistry</p>	<p>1.1.2.1 Not Met</p> <p>Ratio Analysis for Domain of Mineralogy, Petrology, and Geochemistry</p> <p>Normalized Ratio of All Candidate Domain Scores to National Domain Scores is 0.0 or Above</p>	<p>2021: Ratio was -0.352 indicating that our students performed well in this domain compared to national scores.</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: Results were received late Summer 2021. Faculty are currently unsure if the result is actionable. Only four students took the exam, including two students with low GPA's. It is likely that these scores are not a reflection of the quality of our program, but likely a reflection of the student's willingness to prepare for the external exam that has no real consequences. Faculty will continue to review details of ASBOG Domain during Fall 2021 and implement changes Spring 2022. With such small numbers of students taking exam, we may need</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			to reevaluate the applicability of using the ASBOG exam.
	<p>1.1.3</p> <p>Knowledge of Sedimentology, Stratigraphy, and Paleontology</p> <p>ASBOG Domain Area 3: Sedimentology, Stratigraphy, and Paleontology</p>	<p>1.1.3.1 Met</p> <p>Ratio Analysis for Domain of Sedimentology, Stratigraphy, and Paleontology</p> <p>Normalized Ratio of All Candidate Domain Scores to National Domain Scores is 0.0 or Above</p>	<p>2021: Ratio was 0.013 indicating that our students performed well in this domain compared to national scores.</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: We are pleased with this result. We will continue to look for ways to improve, but have see no need for immediate recommendations for improvement in this domain.</p>
	<p>1.1.4</p> <p>Knowledge of Geomorphology, Surficial Processes, and Quaternary Geology</p> <p>ASBOG Domain Area 4: Geomorphology</p>	<p>1.1.4.1 Not Met</p> <p>Ratio Analysis for Domain of Geomorphology, Surficial Processes, and Quaternary Geology</p> <p>Normalized Ratio of All Candidate Domain Scores to National Domain Scores is 0.0 or Above</p>	<p>2021: Ratio was -0.511 indicating that our students did not perform well in this domain compared to national scores.</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: Results were received late Summer 2021. Faculty are currently</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			<p>unsure if the result is actionable. Only four students took the exam, including two students with low GPA's. It is likely that these scores are not a reflection of the quality of our program, but likely a reflection of the student's willingness to prepare for the external exam that has no real consequences. Faculty will continue to review details of ASBOG Domain during Fall 2021 and implement changes Spring 2022. With such small numbers of students taking exam, we may need to reevaluate the applicability of using the ASBOG exam.</p>
	<p>1.1.5 Knowledge of Structure, Tectonics, Seismology ASBOG Domain Area 5: Structure, Tectonics, Seismology</p>	<p>1.1.5.1 Not Met Ratio Analysis for Domain of Structure, Tectonics, and Seismology Normalized Ratio of All Candidate Domain Scores to National Domain Scores is 0.0 or Above</p>	<p>2021: Ratio was -0.293 indicating that our students did not perform well in this domain compared to national scores. REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS 2021: Score is slightly improved from previous assessment. Results were received late</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			<p>Summer 2021. Faculty are currently unsure if the result is actionable. Only four students took the exam, including two students with low GPA's. It is likely that these scores are not a reflection of the quality of our program, but likely a reflection of the student's willingness to prepare for the external exam that has no real consequences. Faculty will continue to review details of ASBOG Domain during Fall 2021 and implement changes Spring 2022. With such small numbers of students taking exam, we may need to reevaluate the applicability of using the ASBOG exam.</p>
	<p>1.1.6 Knowledge of Hydrogeology ASBOG Domain Area 6: Hydrogeology</p>	<p>1.1.6.1 Not Met Ratio Analysis for Domain of Hydrogeology Normalized Ratio of All Candidate Domain Scores to National Domain Scores is 0.0 or Above</p>	<p>2021: Ratio was -0.272 indicating that our students did not perform well in this domain compared to national scores. REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			<p>2021: Results were received late Summer 2021. This course has not been taught in a few years. It will be taught again in Spring 2022. It is likely that the lack of this course impacted scores. No action is currently needed as we will wait to see if scores improve after the next offering.</p>
	<p>1.1.7 Knowledge of Engineering Geology ASBOG Domain Area 7: Engineering Geology</p>	<p>1.1.7.1 Not Met Ratio Analysis for Domain of Engineering Geology Normalized Ratio of All Candidate Domain Scores to National Domain Scores is 0.0 or Above</p>	<p>2021: Ratio was -0.185 indicating that our students did not perform well in this domain compared to national scores.</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: Results were received late Summer 2021. We are currently not offering a course in this topic. Some of the topics covered in this portion of the exam are covered in other classes, but it is likely that the lack of offering this course is affecting the scores. Faculty will discuss the potential for including some</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			<p>engineering geology topics in other courses currently offered.</p>
	<p>1.1.8 Knowledge of Economic Geology and Energy Resources ASBOG Domain Area 8: Economic Geology and Energy Resources</p>	<p>1.1.8.1 Not Met Ratio Analysis for Domain of Economic Geology and Energy Resources Normalized Ratio of All Candidate Domain Scores to National Domain Scores is 0.0 or Above</p>	<p>2021: Ratio was -0.322 indicating that our students did not perform well in this domain compared to national scores.</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: Results were received late Summer 2021. Faculty are currently unsure if the result is actionable. Only four students took the exam, including two students with low GPA's. It is likely that these scores are not a reflection of the quality of our program, but likely a reflection of the student's willingness to prepare for the external exam that has no real consequences. Faculty will continue to review details of ASBOG Domain during Fall 2021 and implement changes Spring 2022. With such small numbers of students taking exam, we may need</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			to reevaluate the applicability of using the ASBOG exam.
<p data-bbox="128 386 562 428">Outcome has action plan</p> <p data-bbox="128 443 529 477">1.2 1 FINDING NOT ENTERED</p> <p data-bbox="128 500 327 526">Problem Solvers</p> <p data-bbox="128 553 558 758">Graduates will possess concepts, techniques, skills, and tools to aid in solving geological problems using a combination of laboratory and field skills.</p> <p data-bbox="128 802 308 828">ACTION PLAN</p> <p data-bbox="128 844 186 870">DUE</p> <p data-bbox="128 888 317 914">no due date set</p>	<p data-bbox="594 393 648 418">1.2.1</p> <p data-bbox="594 446 1016 472">ANSAC Criterion 1: Problem Solving</p> <p data-bbox="594 524 1001 813">ANSAC Criterion 1: An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.</p>	<p data-bbox="1062 393 1234 423">1.2.1.1 Met</p> <p data-bbox="1062 446 1493 573">Invert Paleo Aquifer Reef Project 75% of students receive B or above on project</p> <p data-bbox="1062 1203 1344 1234">1.2.1.2 Partially Met</p> <p data-bbox="1062 1256 1430 1328">Structural Geology: Final Exam Question</p> <p data-bbox="1062 1354 1457 1425">Students score 70% or better on the question.</p>	<p data-bbox="1530 393 1934 638">2021: 8 out of 9 students (100%) scored a B (80%) or above. 3 Students scored one percentage point above a B. The one student who did not score a B scored a 76.5%.</p> <p data-bbox="1530 665 1946 781">REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p data-bbox="1530 829 1959 1120">2021: Student scores meet expectations/target for this outcome. The faculty member may focus on the grading rubric for the assignment to determine the efficacy of discriminating student learning.</p> <p data-bbox="1530 1203 1955 1318">2021: Two of the five students who attempted the question reached or exceeded the target score.</p> <p data-bbox="1530 1346 1946 1461">REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p>





Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			<p>Spring 2021 - Student scores on this question (#7 of the Geol 3004: Structural Geology final exam) were 89%, 70%, 38%, 32% and 3%. Two students reached the goal on the question, while the other three students performed poorly, with one student only really attempting the problem but not having any grasp of the material. Compared to last year, there were no students who exceeded the goal, and several who were close. Perhaps the main reason for differences this year were due to a return to largely in person instruction for the two students who exceeded the requisite score. The other three students either spent a considerable amount of time in fully online instruction that took place due to COVID-19, with the lowest scorer missing much of the last month of class due to quarantine. As with the 2020 year, these students struggled with learning the material in this (online) way. While multiple attempts to convey the material were made,</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			including online video lectures, individual and group virtual study sessions, and example problems, I noticed a significant decline in student performance on the exam and in the class for students that were either fully or partially online . (M. Davis)
	<p>1.2.2</p> <p>ANSAC Criterion 3: Use scientific judgement to draw conclusion</p> <p>ANSAC 3: An ability to develop and conduct experiments or test hypotheses, analyze and interpret data, and use scientific judgement to draw conclusions.</p>	<p>1.2.2.1 Not Reported this Period</p> <p>Geochemistry: Design and conduct water quality project</p> <p>75% of students achieve B or above</p> <p>1.2.2.2 Partially Met</p> <p>Strat/Sed: Sediment Sorting, roundness, and maturity lab</p> <p>75% of students achieve B or above</p>	<p>Not Entered</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: 3 out of 8 students (50%) scored a B (>80%) or above on this 200 point project. One student scored a 79.25%, and if included that would mean half of the students scored close to that B or above.</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: This may have been a lower percentage than previous semesters. The standard deviation</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
			<p>of the entire course's project grade was 16.35 percentage points, with the low scores all falling within 5 percentage points (more precisely, 5.36, and 4.88 if removing the student who earned an F in the class). These scores are noted to make the interpretation that the students earning scores below 79% consistently earned their low grade because they failed to complete the same part of the project.</p> <p>We believe that while the goal was partially met, in other semesters it will be easy to be met, and the metric/rubric for grading the project should remain the same.</p>
<p>1.3 1 FINDING NOT ENTERED</p> <p>Intellectuals</p> <p>Graduates will possess a commitment to ethics, social and environmental responsibility, communication skills, and engage in lifelong learning to meet the needs of a rapidly changing society and world.</p>	<p>1.3.1</p> <p>ANSAC Criterion 5a: Understand ethical and professional responsibilities</p> <p>ANSAC 5: An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions</p>	<p>1.3.1.1 Not Reported this Period</p> <p>Environmental Geology: NPDES Project</p> <p>75% of students score B or better</p> <p>1.3.1.2 Met</p> <p>Environmental Geology: AGI Ethics Modules</p>	<p>Not Entered</p> <p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: All students taking ethics modules completed at 100%.</p>

Program Learning Outcomes		Expectations/Target for this Outcome	Findings/Results
	in global, economic, environmental, and societal contexts.	75% of students will score 100%	<p>REFLECTION ON FINDINGS AND RECOMMENDATIONS FOR NEXT STEPS</p> <p>2021: Students are doing well, no action needed.</p>

Project Attachments (5)

Attachments	File Size
 2021-09-17 GeologyProgramMeetingAgenda.docx	36KB
 2021-12-17_Geology_Program_Meeting.docx	13KB
 2022-1-29 Program Meeting.docx	14KB
 2022-1-7 Program Meeting with Hamed Assesment discussion.docx	12KB

Geology Program Meeting
Friday, September 17, 2021

Agenda

1. Alumni Event
2. Advisory Board
3. Accreditation Update
4. Assessment Review and Calendar
5. Program Recruitment Plan
6. Restructuring
7. AEF Meeting
8. Instructional Issues (TA's, lab samples/space, future labs)

Meeting @ 10:00AM, Friday December 17th.

This meeting was the final program meeting of the semester.

Item 1: We will be setting up an accreditation plan to benefit our program in light of the news of restructuring of the college we are currently in to the new/rebranding of the college. This also comes with the new College Dean (engineering).

Item 2: We need to make sure Weave items are up to date for the end of the year reporting on the criteria that can be completed before the year end. Weave is now on a yearly cycle.

Item 3: Prepping for the Advisory Board meeting at the end of January:

- Topics to be discussed are accreditation, and curriculum adjustments to number of hours required in the geology curriculum under each option.

- We determined that compared to other geology programs in our region, we require more hours in each option than many other geology programs.

- Final topic of this manner to be discussed is the math requirements of our majors. We need to decide on what level of math is appropriate for a geology degree, presently. Calculus I, II, and Statistics are viable upper level math courses that should be required in some way, trigonometry is understood to have been taken prior to these math courses.

- Jason will compile a document based on our math suggestions in this meeting (Calc I and Calc II or Stats class), as well as, in plain-language the order of hours in required geology courses and where some courses being altered from required to an elective

Item 4: General education criterion consideration for Critical Thinking.

- We are tasked with either altering an assignment or creating an assignment that meets specific criteria of a detailed rubric for grading Critical Thinking criterion disseminated by the Gen Ed Committee. These completed assignments will be sent to the committee for review and grading.

- Jacob G., as member of the Gen Ed Committee will reach out to Erin Clair via email for examples of this rubric applied to science- and math-oriented courses.

(Transcribed by Jacob G.)

ASSESSMENT INFORMATION DISCUSSION (1-7-2022)

Major learning outcomes in our program: 3 (And those are heavily subdivided)

Performance indicators of the outcomes: Many are "percent of students get scores over a certain level"

Hamed: Do we have a summary of what the various levels of performance mean?

Response: Yes, but not explicitly present in Weave. We can provide the chart of this (Introduced to Mastered)

Need to review results of 2021 wholistically; act on the outcomes. "Close the loop".

Hamed: ANSAC has 6 outcomes for accreditation, needs to have all 6 outcomes (that are published [on Weave])

Response: Approached these 6 outcomes as adding in one each year or so to get to all the 6 outcomes; so far have few of the six

Plan for 2022: Assess in the classes on rotation; add adjustments to future curriculum based on advisory board -- set up assessment schedule from there.

Hamed: Identify problems in the past and not met expectations; document interp/discussions on Weave.

Response: We do plan to get this laid out. Starts with a timeline and sticking to a timeline. One option could be to operate on a two-year cycle with assessment type, data, and analyzation (adding in the new assessment questions as we proceed each year [not doing everything at once]).

Program Meeting Agenda January 20th, 2022

Discussion Item

ABET

- Accreditation timeline and steps

Key question here is identifying what the next steps are and deadlines for various tasks including the September 1st submission deadline for the readiness review.

- Program eligibility

Review the Geology Program's eligibility ***one of the primary concerns is regarding the student outcomes and how to incorporate the ANSAC #2, 4, 6. Jake has data (over the last 3 years) that will likely address #4 and #6.

- Student Outcomes

Reflected on the Geology specific student outcomes and the current curriculum and Geology program majors' options (environmental, professional, and Petroleum).

Alumni Advisory Board

Finalized the proposal regarding Geology Program options and required coursework. This proposal will be forwarded to the advisory board and discussed at the board meeting currently scheduled for January 29th.

Action Items

The primary issue for moving forward with ABET Self-Study work hinges on how long the ABET student outcomes need to be incorporated, assessed, and then evaluated. We may have informal data on #4 and #6 for the ANSAC outcomes, but the Geology Program doesn't currently incorporate ANSAC #2 ((2) An ability to formulate or design a system, process, procedure or program to meet desired needs). The plan is to seek more information from ABET program evaluators.

Jason will contact University of Arkansas @ Little Rock for contact information for their program assessor, so that Jacob S. can contact them and discuss application of the ABET Program Assessment Guidelines/Criterion.

Decisions made

In order to compile records of communications and discussion of program improvement, Jacob S. will take notes and submit them to the file on the program's shared ABET folder.