

Weber State University
Biennial Report on Assessment of Student Learning

Cover Page

Department/Program: **Department of Earth and Environmental Science**

Academic Year of Report: 2023 and 2024 (covering Summer 2022 through Spring 2024)

Date Submitted: 12/15/2024

Report author(s): Marek Matyjasik

Contact Information:

Phone: 8016267726

Email: mmatyjasik@weber.edu

Additional contributors (include sections and contact information if feedback is desired):

Table of Contents

- [A: Mission Statement](#)
- [B: Student Learning Outcomes](#)
- [C: Curriculum Grid](#)
- [D: Program Contact Information](#)
- [E: Assessment Plan](#)
- [F: Student Achievement](#)
- [G: Student Learning](#)

- Appendices
 - [A: Program Review Updates](#)
 - [B: Program Faculty](#)
 - [C: Questions](#)
 - [D: Evidence of Learning Templates](#)

[Glossary of Terms \(OIE Website\)](#)

The Institutional Effectiveness [website](#) hosts a page for each program that displays assessment reports and information. All available biennial assessment and program review reports are located at the bottom of the program's page on our site. As a part of the biennial report process, we ask that you **please review your page (link below) for completeness and accuracy and indicate below the updates that need to be made in sections A-E.**

Program page link:

A. Mission Statement

Is the Mission Statement current? Yes/No YES

Update if not current:

B. Student Learning Outcomes

(Please include certificate and associate credential learning outcomes)

Are the Student Learning outcomes current? Yes/No YES

Update if not current:

C. Curriculum Grid

You may request access to the Google Sheet on our site if that is easiest, or we can make the updates. Please reach out to oie@weber.edu if you wish to have access)

Is the Curriculum Grid current? Yes/No YES

Update if not current

D. Program and Contact Information

Is the Program and Contact Information current? Yes/No YES

Update if not current:

E. Assessment Plan

Is the Assessment Plan current? Yes/No YES

Update if not current:

F. Student Achievement

Elements to consider (remove this textbox from the submitted report):

Student achievement measures focus on retention and completion. Identify two measures of student achievement that are particularly relevant to your program and report on what you see – both successes and challenges! Here are some examples:

- First-year retention of new students
- Retention of part-time and full-time students; retention by ethnicity or preparation
- Time to and completion of degree after 90 credit hours
- Percentage of 90 CH students who leave w/out a bachelor degree
- DFWI rates of gateway courses – aggregate and disaggregate

Please provide an explanation of the variables selected including why those are particularly relevant to your program.

[Guides on how to find these data are available here (link to Daniel’s documentation)]

STUDENT LEARNING OUTCOMES AND ASSESSMENT

Measurable Program-Level Learning Outcomes:

Department of Earth and Environmental Sciences Assessment Plan

4-Year Cycle presented below was originally approved in January 2015 and updated for this report.

Persons Responsible for Collecting and Analyzing the Data:

The tenure-track faculty of the Department of Earth and Environmental Sciences will serve as the Assessment Committee, responsible for overseeing and implementing the department’s assessment plan. The Chair of Geosciences will serve as the committee chair.

Assessment Measures to be Used:

The Earth and Environmental Sciences assessment plan will evaluate the Physical Science (PS) outcomes in each of the general education courses offered by the department, the program-level learning outcomes (PLOs) for geoscience majors, and the high-impact learning practices integrated into the department’s curricula. Each general education and program-level learning outcome will be assessed using at least one direct measure (DM), typically a course-specific assessment instrument or assignment. Indirect measures, such as exit surveys of program graduates, will supplement the direct measures of the PLOs.

Four-Year Assessment Cycle:

1. 2020-2022 (data collected); subject report submitted November 2022

Program-Level Learning Outcomes 1-9

Courses: GEO 1110, 1220, 2050, 3080, 3150, 3550, 4210, 4060

Summary of exit interviews

2. 2022-2023 (data collected); report to be submitted Fall 2024

General Education: Physical Science Intended Learning Outcomes (ILOs) 1-8

Courses: GEO 1030; 1060; 1110, 1130; 1350

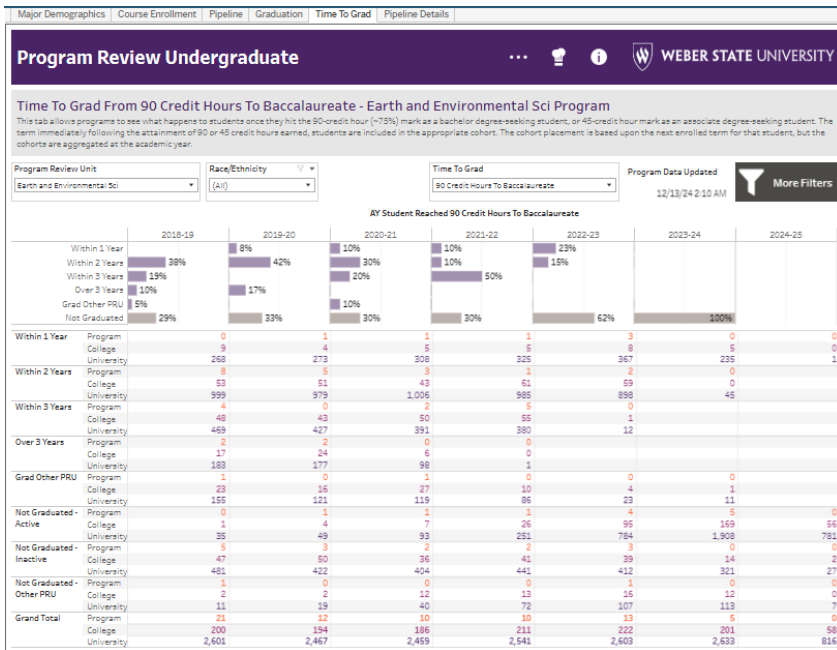
High-Impact Educational Practices: Undergraduate Research; Internships; Study Abroad;

Capstone courses (GEO 4060, 4510)

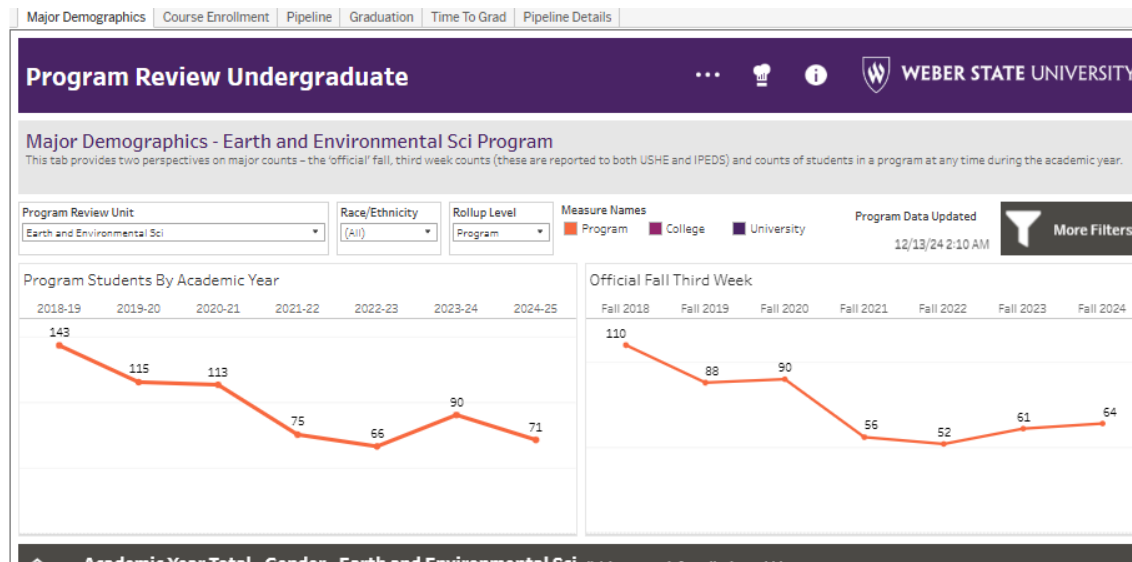
Repeat beginning 2026.

This report provides information relevant to the General Education: Physical Science Intended Learning Outcomes (ILOs) 1-8. The courses included in this evaluation are GEO 1030, GEO 1060, GEO 1110, GEO 1130, and GEO 1350. Additionally, High-Impact Educational Practices such as Undergraduate Research, Internships, Study Abroad, and Capstone Courses (GEO 4060, GEO 4510) were partially addressed in the 2022 Biennial Report. However, further discussion is needed regarding the assessment of these high-impact practices, and we will provide an update on our findings in the next biennial report.

In addition to the General Education Assessment we summarized the following general trends in student achievements in our department. From 2018-19 through 2023-24, our department averages a 37.8% completion within 2 years of 90CH. This number is not satisfactory and we will need to address this measure. Our approach to the student success in our program is to advise students to take appropriate math courses as soon as possible. This also translates to taking chemistry series and physics series classes as soon as possible. We also consult students about their realistic time commitment related to taking their semester teaching load.



The number of majors in our department has been gradually recovering from the low levels observed in 2022, which coincided with the rapid growth of the Environmental Science degree within the College of Science. Recently, we have observed a steady increase in the number of new majors transitioning from the Environmental Science program. Additionally, the total number of student credit hours (SCHs) has begun to recover from the low values recorded in 2021-2022, reflecting a similar trend in the growth of majors. Most of our incoming majors are transferring from the General Studies program.



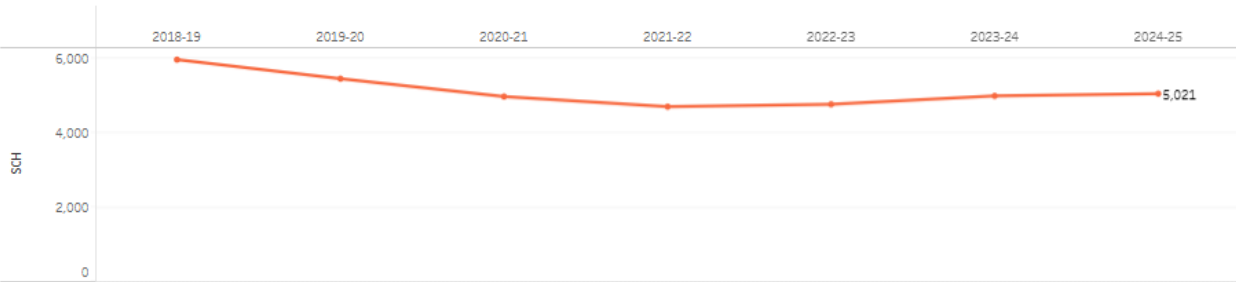
Report due 11/15/2024

Program Review Undergraduate

Course Enrollment - ALL PROGRAMS Program Majors enrolled in Earth and Environmental Sci Program Courses

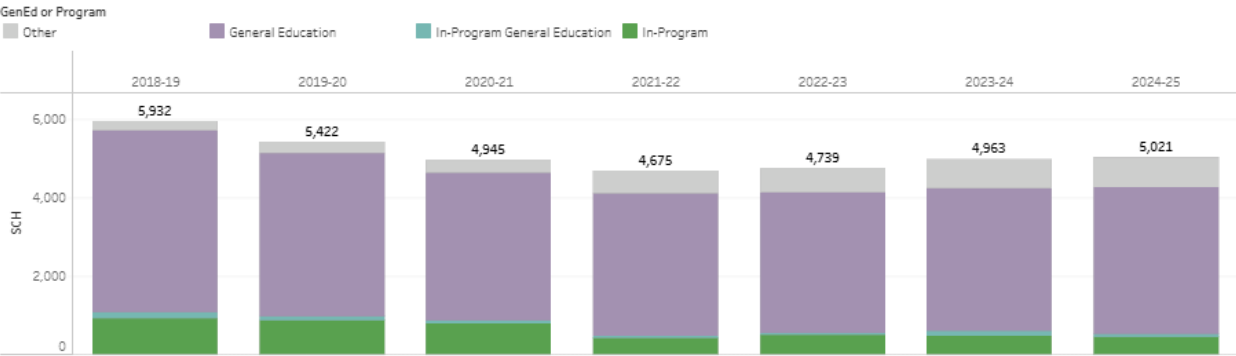
This tab provides detailed counts about courses taught in the program and gives the end-user insight into where SCH/FTE are generated and from what students. There are two critical filter selections to be made based upon the questions being asked.

Course Program Review U...: Earth and Environmenta...
 Student Major Program Review U...: ALL PROGRAMS
 Race/Ethnicity: (All)
 View By: SCH
 Data Switch: Active Enrollments
 Enrollment Data Updated: 12/13/24 1:04 AM
 More Filters



| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
|------------|---------|---------|---------|---------|---------|---------|---------|
| Program | 5,932 | 5,422 | 4,945 | 4,675 | 4,739 | 4,963 | 5,021 |
| College | 77,121 | 77,062 | 75,848 | 70,733 | 68,995 | 71,579 | 77,012 |
| University | 419,880 | 416,965 | 412,545 | 396,463 | 390,577 | 401,834 | 412,300 |

Earth and Environmental Sci Program SCH click button on left to display or hide



Program Review Undergraduate



Pipeline

This tab allows program faculty to get a better understanding of where their students are coming from when they declare the major or where they are going when they change majors.

Program Review Unit: Earth and Environmental Sci |
 Change Group: Detailed |
 Academic Year: 2016 - 2024 |
 Include GS & NDS: True |
 Program Data Updated: 12/13/24 2:10 AM |
 [More Filters](#)

| | First Term | Incoming GS or NDS | Incoming Program Change | Continuing | Outgoing Program Change | Grad | Not Enrolled |
|---------|------------|--------------------|-------------------------|------------|-------------------------|------|--------------|
| 2023-24 | 23 | 4 | 15 | 22 | 9 | 11 | 21 |
| 2022-23 | 10 | 3 | 6 | 31 | 4 | 8 | 7 |
| 2021-22 | 5 | 6 | 5 | 33 | 7 | 10 | 16 |
| 2020-21 | 19 | 3 | 16 | 32 | 13 | 24 | 23 |
| 2019-20 | 10 | 2 | 11 | 58 | 12 | 13 | 19 |
| 2018-19 | 34 | 5 | 13 | 56 | 15 | 14 | 25 |
| 2017-18 | 25 | 7 | 9 | 62 | 18 | 10 | 18 |
| 2016-17 | 31 | 7 | 16 | 53 | 10 | 17 | 24 |
| 2015-16 | 32 | 4 | 18 | 57 | 18 | 13 | 20 |

Incoming Change (Top 15)

| | |
|------------------------------|----|
| General Studies | 35 |
| Geography | 8 |
| Zoology | 8 |
| Botany | 7 |
| Physics and Astronomy | 7 |
| Non-Degree Seeking | 6 |
| Criminal Justice | 5 |
| Electrical and Computer E.. | 5 |
| Economics | 4 |
| Environmental Science | 4 |
| Health Sciences | 4 |
| Teacher Education | 4 |
| Visual Arts | 4 |
| Athletic Therapy | 3 |
| Bachelor of Interdisciplin.. | 3 |
| Computer Science | 3 |
| Mechanical Engineering T.. | 3 |

Outgoing Change (Top 15)

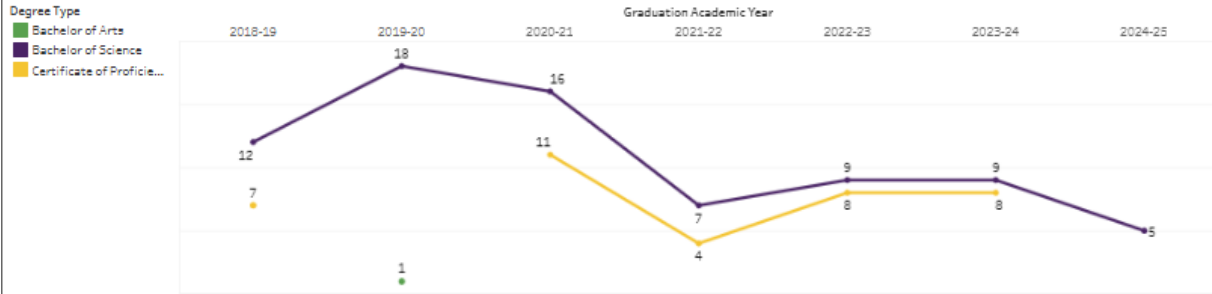
| | |
|------------------------------|----|
| Geography | 10 |
| Environmental Science | 9 |
| General Studies | 6 |
| Botany | 5 |
| Computer Science | 5 |
| Criminal Justice | 5 |
| Health Administrative Serv.. | 5 |
| Anthropology | 4 |
| Bachelor of Interdisciplin.. | 4 |
| Communication | 4 |
| Visual Arts | 4 |
| Zoology | 4 |
| Business Administration | 3 |
| Chemistry and Biochemistry | 2 |
| Construction Management | 2 |

Program Review Undergraduate

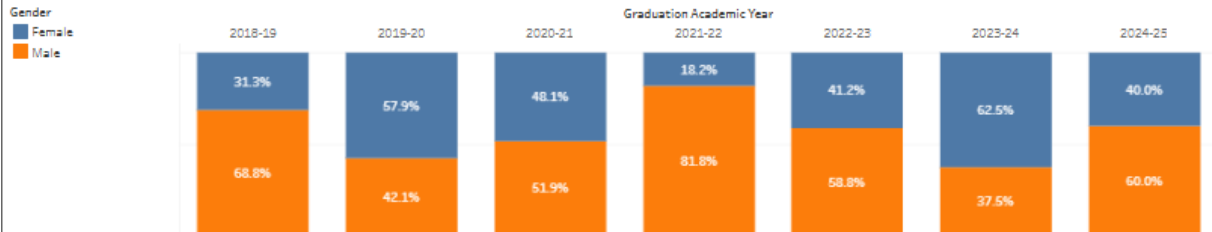
Graduation - Earth and Environmental Sci

This tab shows undergraduate awards earned in any given academic year. Credentials include undergraduate certificates, associate degrees, and bachelor degrees. If a master's degree appears in the visualization that is an indication of miscoding in Banner.

Program Review Unit: Earth and Environmental Sci |
 Race/Ethnicity: (All) |
 Degree Category: (All) |
 Program Priority: (All) |
 Program Data Updated: 12/13/24 2:10 AM

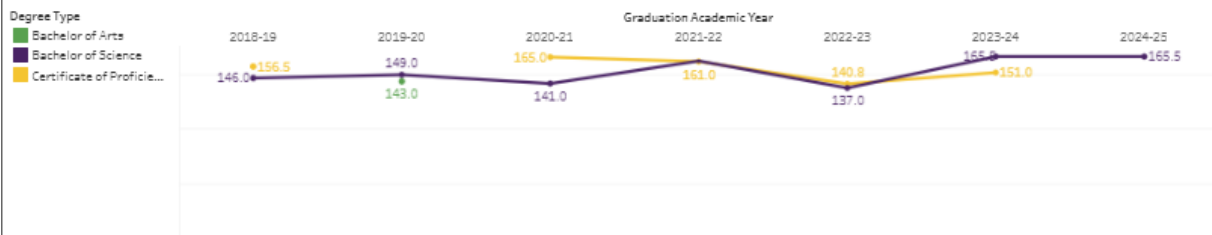


Graduation Demographics - Gender - Earth and Environmental Sci



| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Certificate of Proficiency - Female | 2 | 0 | 6 | 0 | 3 | 5 | 0 |
| Certificate of Proficiency - Male | 5 | 0 | 5 | 4 | 5 | 3 | 0 |
| Bachelor of Science - Female | 3 | 10 | 7 | 2 | 4 | 5 | 2 |
| Bachelor of Science - Male | 9 | 8 | 9 | 5 | 5 | 4 | 3 |
| Bachelor of Arts - Female | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

Graduation - Median Hours To Degree - Earth and Environmental Sci



| | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
|----------------------------|---------|---------|---------|---------|---------|---------|---------|
| Bachelor of Arts | 146.0 | 143.0 | 141.0 | 161.0 | 137.0 | 165.5 | 165.5 |
| Bachelor of Science | 146.0 | 149.0 | 141.0 | 161.5 | 137.0 | 165.5 | 165.5 |
| Certificate of Proficiency | 156.5 | 149.0 | 165.0 | 161.0 | 140.8 | 151.0 | 165.5 |

Program Review Undergraduate

Time To Grad From 90 Credit Hours To Baccalaureate - Earth and Environmental Sci Program

This tab allows programs to see what happens to students once they hit the 90-credit hour (~75%) mark as a bachelor degree-seeking student, or 45-credit hour mark as an associate degree-seeking student. The term immediately following the attainment of 90 or 45 credit hours earned, students are included in the appropriate cohort. The cohort placement is based upon the next enrolled term for that student, but the cohorts are aggregated at the academic year.

Program Review Unit:
 Race/Ethnicity:
 Time To Grad:
 Program Data Updated: 12/13/24 2:10 AM
 [More Filters](#)

AY Student Reached 90 Credit Hours To Baccalaureate

| | | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
|---------------------------|------------|---------|---------|---------|---------|---------|---------|---------|
| Within 1 Year | | | 8% | 10% | 10% | 23% | | |
| Within 2 Years | | 38% | 42% | 30% | 10% | 15% | | |
| Within 3 Years | | 19% | | 20% | 50% | | | |
| Over 3 Years | | 10% | 17% | | | | | |
| Grad Other PRU | | 5% | | 10% | | | | |
| Not Graduated | | 29% | 33% | 30% | 30% | 62% | 100% | |
| Within 1 Year | Program | 0 | 1 | 1 | 1 | 3 | 0 | 0 |
| | College | 9 | 4 | 5 | 5 | 8 | 5 | 0 |
| | University | 268 | 273 | 308 | 325 | 367 | 235 | 1 |
| Within 2 Years | Program | 8 | 5 | 3 | 1 | 2 | 0 | |
| | College | 53 | 51 | 43 | 61 | 59 | 0 | |
| | University | 999 | 979 | 1,006 | 985 | 898 | 45 | |
| Within 3 Years | Program | 4 | 0 | 2 | 5 | 0 | | |
| | College | 48 | 43 | 50 | 55 | 1 | | |
| | University | 469 | 427 | 391 | 380 | 12 | | |
| Over 3 Years | Program | 2 | 2 | 0 | 0 | | | |
| | College | 17 | 24 | 6 | 0 | | | |
| | University | 183 | 177 | 98 | 1 | | | |
| Grad Other PRU | Program | 1 | 0 | 1 | 0 | 0 | 0 | |
| | College | 23 | 16 | 27 | 10 | 4 | 1 | |
| | University | 155 | 121 | 119 | 85 | 23 | 11 | |
| Not Graduated - Active | Program | 0 | 1 | 1 | 1 | 4 | 5 | 0 |
| | College | 1 | 4 | 7 | 25 | 95 | 169 | 56 |
| | University | 35 | 49 | 93 | 251 | 784 | 1,908 | 781 |
| Not Graduated - Inactive | Program | 5 | 3 | 2 | 2 | 3 | 0 | 0 |
| | College | 47 | 50 | 36 | 41 | 39 | 14 | 2 |
| | University | 481 | 422 | 404 | 441 | 412 | 321 | 27 |
| Not Graduated - Other PRU | Program | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| | College | 2 | 2 | 12 | 13 | 16 | 12 | 0 |
| | University | 11 | 19 | 40 | 72 | 107 | 113 | 7 |
| Grand Total | Program | 21 | 12 | 10 | 10 | 13 | 5 | 0 |
| | College | 200 | 194 | 186 | 211 | 222 | 201 | 58 |
| | University | 2,601 | 2,467 | 2,459 | 2,541 | 2,603 | 2,633 | 816 |

Program Review Undergraduate

Time To Grad From Total Time in Program - Earth and Environmental Sci Program

This tab allows programs to see what happens to students once they hit the 90-credit hour (~75%) mark as a bachelor degree-seeking student, or 45-credit hour mark as an associate degree-seeking student. The term immediately following the attainment of 90 or 45 credit hours earned, students are included in the appropriate cohort. The cohort placement is based upon the next enrolled term for that student, but the cohorts are aggregated at the academic year.

Program Review Unit:
 Race/Ethnicity:
 Time To Grad:
 Program Data Updated: 12/13/24 2:10 AM
 [More Filters](#)

| | | First AY In Program | | | | | | |
|---------------------------|------------|---------------------|---------|---------|---------|---------|---------|---------|
| | | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 | 2023-24 | 2024-25 |
| Within 1 Year | | 5% | 7% | 16% | 11% | | 4% | 5% |
| Within 2 Years | | 5% | 10% | 2% | 5% | 5% | | |
| Within 3 Years | | 9% | 14% | 7% | 5% | | | |
| Over 3 Years | | 14% | 10% | 11% | | | | |
| Grad Other PRU | | 5% | 7% | 7% | | | | |
| Not Graduated | | 61% | 52% | 57% | 79% | 95% | 96% | 95% |
| Within 1 Year | Program | 3 | 2 | 7 | 2 | 0 | 2 | 1 |
| | College | 21 | 30 | 41 | 15 | 23 | 10 | 1 |
| | University | 599 | 623 | 717 | 495 | 566 | 494 | 22 |
| Within 2 Years | Program | 3 | 3 | 1 | 1 | 1 | 0 | |
| | College | 34 | 27 | 26 | 18 | 17 | 0 | |
| | University | 1,331 | 1,342 | 1,333 | 1,285 | 1,175 | 47 | |
| Within 3 Years | Program | 5 | 4 | 3 | 1 | 0 | | |
| | College | 55 | 41 | 61 | 44 | 0 | | |
| | University | 950 | 862 | 804 | 711 | 25 | | |
| Over 3 Years | Program | 8 | 3 | 5 | 0 | | | |
| | College | 93 | 83 | 57 | 0 | | | |
| | University | 987 | 772 | 513 | 5 | | | |
| Grad Other PRU | Program | 3 | 2 | 3 | 0 | 0 | 0 | 0 |
| | College | 99 | 71 | 51 | 29 | 3 | 3 | 0 |
| | University | 1,059 | 944 | 754 | 444 | 212 | 83 | 2 |
| Not Graduated - Active | Program | 2 | 1 | 2 | 4 | 8 | 23 | 20 |
| | College | 18 | 34 | 82 | 113 | 220 | 336 | 431 |
| | University | 227 | 368 | 745 | 1,353 | 2,704 | 5,166 | 8,438 |
| Not Graduated - Inactive | Program | 29 | 11 | 19 | 8 | 9 | 16 | 0 |
| | College | 378 | 323 | 352 | 318 | 233 | 188 | 24 |
| | University | 6,359 | 5,926 | 5,010 | 4,862 | 4,528 | 3,722 | 742 |
| Not Graduated - Other PRU | Program | 3 | 3 | 4 | 3 | 2 | 7 | 0 |
| | College | 30 | 48 | 83 | 95 | 92 | 72 | 3 |
| | University | 354 | 489 | 764 | 957 | 1,169 | 1,008 | 284 |
| Grand Total | Program | 56 | 29 | 44 | 19 | 20 | 48 | 21 |
| | College | 724 | 650 | 748 | 628 | 584 | 603 | 458 |
| | University | 11,575 | 11,000 | 10,366 | 9,850 | 10,060 | 10,149 | 9,336 |

Program Review Undergraduate

Pipeline Details

This tab allows exploration of pipeline data at the student level

Program Review Unit: **Earth and Environ...** |
 Adder/Remove Set: **{All}** |
 Details Set: **{All}** |
 Academic Year: **2006** - **2024** |
 Include GS & NDS: **True** |
 Function: Adder Remover |
 Program Data Updated: **12/13/24 2:10 AM**

Earth and Environmental Sci Set Adder click button on left to display or hide

| Year | First Term | Incoming GS or NDS | Incoming Program Change | Continuing | Outgoing Program Change | Grad | Not Enrolled |
|---------|------------|--------------------|-------------------------|------------|-------------------------|------|--------------|
| 2023-24 | 23 | 4 | 15 | 22 | 9 | 11 | 21 |
| 2022-23 | 10 | 3 | 6 | 31 | 4 | 8 | 7 |
| 2021-22 | 5 | 6 | 5 | 33 | 7 | 10 | 16 |
| 2020-21 | 19 | 3 | 16 | 32 | 13 | 24 | 23 |
| 2019-20 | 10 | 2 | 11 | 58 | 12 | 13 | 19 |
| 2018-19 | 34 | 5 | 13 | 56 | 15 | 14 | 25 |
| 2017-18 | 25 | 7 | 9 | 62 | 18 | 10 | 18 |
| 2016-17 | 31 | 7 | 16 | 53 | 10 | 17 | 24 |
| 2015-16 | 32 | 4 | 18 | 57 | 18 | 13 | 20 |
| 2014-15 | 19 | 13 | 13 | 52 | 10 | | |
| 2013-14 | 17 | 5 | 12 | 26 | 8 | | |
| 2012-13 | 17 | 4 | 3 | 19 | 4 | | |
| 2011-12 | 7 | | 8 | 12 | 11 | | |
| 2010-11 | 4 | 1 | 2 | 14 | 2 | | |
| 2009-10 | 7 | | 6 | 7 | 2 | | |
| 2008-09 | | | 1 | 8 | 2 | | |
| 2007-08 | 1 | 1 | 2 | 8 | 3 | | |
| 2006-07 | 4 | | | 7 | 3 | | |
| 2005-06 | 9 | | | | | | |

Earth and Environmental Sci Set Details click button on left to display or hide

| | | | | | | | |
|-----------------------|--------------|--------------|--------------|--------------|--------------|--------------|------------|
| 2023-24 | 23 | 4 | 15 | 22 | 9 | 11 | 21 |
| 2022-23 | 10 | 3 | 6 | 31 | 4 | 8 | 7 |
| 2021-22 | 5 | 6 | 5 | 33 | 7 | 10 | 16 |
| 2020-21 | 19 | 3 | 16 | 32 | 13 | 24 | 23 |
| 2019-20 | 10 | 2 | 11 | 58 | 12 | 13 | 19 |
| 2018-19 | 34 | 5 | 13 | 56 | 15 | 14 | 25 |
| 2017-18 | 25 | 7 | 9 | 62 | 18 | 10 | 18 |
| 2016-17 | 31 | 7 | 16 | 53 | 10 | 17 | 24 |
| 2015-16 | 32 | 4 | 18 | 57 | 18 | 13 | 20 |
| 2014-15 | 19 | 13 | 13 | 52 | 10 | | |
| 2013-14 | 17 | 5 | 12 | 26 | 8 | | |
| 2012-13 | 17 | 4 | 3 | 19 | 4 | | |
| 2011-12 | 7 | | 8 | 12 | 11 | | |
| 2010-11 | 4 | 1 | 2 | 14 | 2 | | |
| 2009-10 | 7 | | 6 | 7 | 2 | | |
| 2008-09 | | | 1 | 8 | 2 | | |
| 2007-08 | 1 | 1 | 2 | 8 | 3 | | |
| 2006-07 | 4 | | | 7 | 3 | | |
| 2005-06 | 9 | | | | | | |
| Total | 274 | 64 | 154 | 236 | 147 | 120 | 173 |
| % Total In/Out | 56.7% | 13.3% | 31.9% | 33.9% | 27.6% | 39.9% | |
| Full Total | 483 | | | 434 | | | |

G. Student Learning

Elements to consider (remove this textbox from the submitted report):

At the recommendation of the Faculty Senate Assessment Committee we are moving to a narrative reflection of assessment practices and findings from the last two years. This reflection must be supported by data you include in the appendix (traditional evidence-of-learning tables or some other data presentation of findings), but the main focus will move from the data itself, to the program's/department's interpretation and use of that data in support of continuous improvement. The narrative must:

- Address each assessed outcome and discuss findings, faculty discussions, changes implemented, etc.
 - o For example, if Outcome A was assessed in three courses, the narrative could include information about the types of assessment used (quizzes in lower division, presentations in 3000-level courses, final projects in a capstone course), the number of sections/students assessed, the thresholds established at each level, the findings at each level, and an overall plan for improvement.
- Identify how the program will 'close-the-loop' on the assessment findings, i.e., how will the improvements put into place be evaluated?

Direct evidence can come from many sources: quizzes/exams, papers, projects, presentations, performances, ePortfolios, etc.

Indirect evidence can nicely augment direct evidence: course grades, student self-assessment, peer-assessments, preceptor feedback, etc.

Here are a couple of examples of narratives.

General Education course assessment needs to continue to be reported at the course level using either the [traditional template](#) or a more [narrative-based format](#). See the [Checklist and Template](#) page for area-specific worksheets as well.

Note: if you cannot download templates directly from this document, please visit our [template page](#) for downloads.

We have evaluated five General Education courses offered within our department: GEO 1030 Earthquakes and Volcanoes, GEO 1060 Environmental Geoscience, GEO 1110 Dynamic Earth – Physical Geology, GEO 1130 Introduction to Meteorology, and GEO 1350 Principles of Earth Sciences. For the first three courses, two measures were used to assess each learning outcome, while the last two courses utilized a single measure for every outcome. All measures successfully met the criteria for general education learning outcomes. Further details regarding each of these courses are provided in the section below.

2024 GEO 1030 (Earthquakes and Volcanoes) General Education Learning Outcomes Assessment

Data

- 4 courses / 2 instructors / 324 students (Fall 2022, 2023 and Spring 2023, 2024 semesters) were evaluated to determine if the General Education Learning Outcomes were exceeded by students based on measured evidence and findings.
- 4 online courses taught by both Sara Summers (2 courses) Michael Hernandez (2 courses)
 - o These instructors have been consistently teaching multiple sections for several years and are the most experienced GEO 1030 instructors in the department.

Findings

- **Summary: Metrics reported in Evidence of Learning rubric (table) demonstrate student understanding of all eight General Education Learning Outcomes based on a standard threshold of 70 percent (reported in the Evidence of Learning table).**

- All measures evaluated to the standard threshold for each course were met or exceeded for all eight learning outcomes!
 - At least 70% of students scored 70% or better on the measured assignment (questions, concept sketches, signature assignment, activities) for ALL learning outcomes.
 - There were TWO measures evaluated for each learning outcome.
 - Findings for all 16 measures showed 84% or more students scored above the 70% threshold on the given assignments.
 - 12 of the 16 measures (75%) showed over 90% of students scored above the 70% threshold.
- **Action Plan**
 - *For all eight learning objectives, no curricular or pedagogical changers are needed at this time for GEO 1030.*
 - NOTE: Students who completed and submitted the assignments do very well. I did note that there were a range of students (4 – 24) in my online sections who did not submit a given assignment.
 - This is not a problem in understanding the material and achieving the learning outcomes. Rather, as with many online courses, some students don't comply with deadlines for a variety of reasons and don't engage with the instructor for resolution. This can be addressed with periodic check-in with students using Progress check-ins using Starfish or other method.

2024 GEO 1060 (Environmental Geosciences) General Education Learning Outcomes Assessment

Data

- 2 courses / 1 instructor / 96 students (Fall 2023 and Spring 2023 semesters) were evaluated to determine if the General Education Learning Outcomes were exceeded by students based on measured evidence and findings.
- 2 online courses taught by Marek Matyjasik
 - This instructor has been consistently teaching multiple sections for several years and is the most experienced GEO 1060 ONLINE instructor in the department.

Findings

- ***Summary: Metrics reported in Evidence of Learning rubric (table) demonstrate student understanding of all eight General Education Learning Outcomes based on a standard threshold of 70 percent (reported in the Evidence of Learning table).***
 - All measures evaluated to the standard threshold for each course were met or exceeded for all eight learning outcomes!
 - At least 70% of students scored 70% or better on the measured assignment (questions, concept sketches, signature assignment, activities) for ALL learning outcomes.
 - There were TWO measures evaluated for each learning outcome.
 - Findings for all 16 measures showed 92% or more students scored above the 70% threshold on the given assignments.
 - 16 of the 16 measures (75%) showed over 90% of students scored above the 70% threshold.
- **Action Plan**
 - *For all eight learning objectives, no curricular or pedagogical changers are needed at this time for GEO 1060.*

2024 GEO 1110 (Dynamic Earth-Physical Geology) General Education Learning Outcomes Assessment

Data

- 4 courses / 1 instructor / 232 students (Fall 2022, Spring 2023, Fall 2023, and Spring 2024) were evaluated to determine if the General Education Learning Outcomes were exceeded by students based on measured evidence and findings.
- 4 online courses taught by Elizabeth Balgord
 - o This instructor has been consistently teaching multiple sections for several years and is the most experienced GEO 1110 ONLINE instructor in the department.

Findings

- **Summary: Metrics reported in Evidence of Learning rubric (table) demonstrate student understanding of all eight General Education Learning Outcomes based on a standard threshold of 70 percent (reported in the Evidence of Learning table).**
 - o All measures evaluated to the standard threshold for each course were met or exceeded for all eight learning outcomes!
 - At least 70% of students scored 70% or better on the measured assignment (questions, concept sketches, signature assignment, activities) for ALL learning outcomes.
 - There were TWO measures evaluated for each learning outcome.
 - Findings for all 16 measures showed 90.2% or more students scored above the 70% threshold on the given assignments.
- **Action Plan**
 - o **For all eight learning objectives, no curricular or pedagogical changers are needed at this time for GEO 1110.**

NOTE: In **Measure 1**: 16% of students earned a 0 for not completing concept sketch. Plan to notify students multiple times of upcoming deadline to help minimize missing assignment.

2024 GEO 1130 (Introduction to Meteorology) General Education Learning Outcomes Assessment

- 1 course / 1 instructor / 21 students (Fall 2023, CRN 22868) was evaluated to determine if the General Education Learning Outcomes were exceeded by students based on measured evidence and findings.
- This course taught by Caitlin Tems
 - o This instructor has been consistently multiple sections for a few years and in our department is the only instructor who teaches this class.

Findings

- **Summary: Metrics reported in Evidence of Learning rubric (table) demonstrate student understanding of all eight General Education Learning Outcomes based on a standard threshold of 70 percent (reported in the Evidence of Learning table).**

- This course was offered by a new instructor in the Department of Earth and Environmental Sciences, and thus new materials including lectures, activities, homework assignments, quizzes, exams, and a signature assignment were developed for the course. This course is being offered by the instructor for a second time this semester during Fall 2024 and additional new activities have been developed to reinforce and assess student learning outcomes for the course. This course is also offered by an instructor in the Department of Geography, Environment, and Sustainability.

- - The students met and exceeded the threshold to pass each student learning outcome. The student learning outcomes were assessed through a combination of Canvas quizzes, in-class and independent activities, and the signature assignment for the course, which was to complete a meteorological hazards assessment for an assigned location and develop an infographic to communicate the information.
 -
 - Overall, the physical sciences (PS) learning outcomes are challenging to assess in this course. The current PS outcomes have a distinct physics slant and would benefit from integrating a more Earth Sciences approach.
- **Action Plan**
- o *For all eight learning objectives, no curricular or pedagogical changers are needed at this time for GEO 1130.*

2024 GEO 1350 (Principles of Earth Science) General Education Learning Outcomes Assessment

Data 1 course / 1 instructor / 6 students (Fall 2024, CRN 36940) was evaluated to determine if the General Education Learning Outcomes were exceeded by students based on measured evidence and findings.

- This course taught by Caitlin Tems

This was the first time this course was offered by a new instructor and thus the course was redesigned and new lectures, labs, and assignments were created for the course.

GEO 1350 is one of the three (3) “Principles” courses offered by the College of Science. These courses are specifically designed for Elementary Education majors. Thus, their audience is distinctly different from other general education courses. Their unusual format includes 2 hours of lecture and 3 hours of lab per week for 3 credits.

The students met and exceeded the threshold to pass each student learning outcome. Student learning outcomes were assessed through a combination of Canvas quizzes, lab exercise, lab quizzes—which provided a holistic assessment of a hands-on lab activity designed to have students apply their knowledge, conduct experiments, and analyze and interpret data—class activities, and the signature assignment which included the development and presentation of two teaching demonstrations and written lesson plans.

Appendix A

Most departments or programs receive a number of recommendations from their Five/Seven-Year Program Review processes. This page provides a means of updating progress towards the recommendations the department/program is enacting.

| Date of Program Review: ##### | Recommendation | Progress Description |
|-------------------------------|------------------------|----------------------|
| Recommendation 1 | Text of recommendation | ##### +1 progress |
| | | ##### +2 progress |
| | | ##### +3 progress |
| | | ##### +4 progress |
| Recommendation 2 | Text of recommendation | ##### +1 progress |
| | | ##### +2 progress |
| | | ##### +3 progress |
| | | ##### +4 progress |
| Recommendation 3 | Text of recommendation | ##### +1 progress |
| | | ##### +2 progress |
| | | ##### +3 progress |
| | | ##### +4 progress |
| (add as needed) | | |

Additional narrative:

Appendix B

Please provide the following information about the full-time *and adjunct faculty* contracted by your department during the last academic year (summer through spring). Gathering this information each year will help with the headcount reporting that must be done for the final Five-Year Program Review document that is shared with the State Board of Regents.

| Faculty Headcount | 2020-21 | 2021-22 | 2022-23 | 2023-24 |
|--|---------|---------|---------|---------|
| With Doctoral Degrees (Including MFA and other terminal degrees, as specified by the institution) | | | | |
| Full-time Tenured | 7 | 5 | 5 | 5 |
| Full-time Non-Tenured (includes tenure-track) | 2 | 3 | 2 | 3 |
| Part-time and adjunct | 1 | 2 | 2 | 1 |
| | | | | |
| With Master's Degrees | | | | |
| Full-time Tenured | | | | |
| Full-time Non-Tenured | 1 | 1 | 1 | 1 |
| Part-time and adjunct | 3 | 1 | 2 | 2 |
| | | | | |
| With Bachelor's Degrees | | | | |
| Full-time Tenured | | | | |
| Full-time Non-tenured | | | | |
| Part-time and adjunct | | | | |
| | | | | |
| Other | | | | |
| Full-time Tenured | | | | |
| Full-time Non-tenured | | | | |
| Part-time | | | | |
| | | | | |
| Total Headcount Faculty | | | | |
| Full-time Tenured | 7 | 5 | 5 | 5 |
| Full-time Non-tenured | 3 | 3 | 3 | 4 |
| Part-time | 4 | 3 | 4 | 4 |

Appendix C

Please respond to the following questions.

Academic integrity is a hallmark of higher education, but one that is being challenged. As a first attempt to address the issue, we are collecting data from departments on common practices to protect academic integrity. How do you ensure that your students' work is a meaningful representation of their learning? We would like you to share your concerns and approaches to the three following academic integrity issues:

1. ID verification – ensuring that the individual completing work in your course is the individual registered for the course. What steps do your faculty take to ensure that the students receiving credit are the students doing and submitting the work?
2. Online test proctoring – the ability to provide secure testing for online courses, as well as many face-to-face and hybrid classes is currently dependent upon tools such as Proctorio. What concerns do you have about the use of tools such as Proctorio? What strategies have you put into place to ensure security of your testing?
3. Artificial intelligence (AI) tools like ChatGPT pose significant challenges to academic integrity. These tools can generate high-quality written content, raising concerns about students using AI-generated work and passing it off as their own. This could enable new forms of cheating and plagiarism that undermine the principles of academic honesty. On the other hand there is potential for AI to positively impact and enhance the higher education experience for students. How is your department or program approaching AI broadly?

Ad 1) We are able to identify all students enrolled in our in-person classes. However, for assignments completed at home in online courses, we must rely on the registration process for verification.

Ad 2) Regarding the second point, Proctorio frequently prevents students from registering for and taking exams, leading many students to take exams in person on campus instead.

Ad 3) For the third point, instructors currently have the discretion to determine how they address the use of AI by students. We plan to continue the discussion on this topic in the upcoming semester.

Evidence of Learning worksheets: Courses within the Major

(This is a sample page for purpose of illustration only; a blank template can be found on the next page or at [this site](#))

Evidence of Learning: General Education, Physical Science Courses

Course: **GEO 1030 (Earthquakes and Volcanoes) Fall 2022 – Spring 2024 Semesters / 4 courses / ONLINE / 324 students**

Fall 2022 (CRN 21054) ONLINE – 79 students; Spring 2023 (CRN 33256) ONLINE - 69 students

Fall 2023 (CRN 21054) ONLINE – 77 students; Spring 2024 (CRN 32652) ONLINE - 99 students

| Gen Ed Learning Goal | Measurable Learning Outcome | Method of Measurement | Threshold | Findings Linked to Learning Outcomes | Interpretation of Findings | Action Plan/Use of Results/Closing-the-loop |
|---|---|---|---|--|--|---|
| Students will demonstrate understanding of: | Students will demonstrate their understanding by: | Direct and Indirect Measures* | | | | |
| Nature of Science. Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific. | Foundations of Natural Sciences Learning Outcome 1. | Measure 1 (CRNs 33256 & 32652): Responses to 20 multiple choice questions from Ch 1 Quiz – Nature of Geology. | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 98% of students scored at or above 70%. Average score for 154 students was 84.51%. | Measure 1 Threshold exceeded. Students adequately demonstrated knowledge of the nature of science. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRNs 21054 & 21054): Response to 5 multiple choice questions from Quiz 1 – Nature of Science and Plate Tectonics. | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 100% of students scored at or above 70%. Average Score for 156 students was 91.5%. | Measure 2: Threshold exceeded. Students adequately demonstrated knowledge of the nature of science. | Measure 2: No curricular or pedagogical changes needed at this time |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|---|---|---|---|--|---|
| Integration of Science All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive and integrated. | Foundations of Natural Sciences Learning Outcome 2. | Measure 1 (CRNs 33256 & 32652): <u>Ch. 9 Concept sketch</u> – Sketch & explain each of 5 principles of relative dating & provide example of each principle. | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 95% of students scored at or above 70%. Average score for 120 students was 93%. | Measure 1: Threshold exceeded. Students adequately demonstrated understanding of science integration. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2: (CRN 21054 and 21054): Assignment that explores the development of Plate Tectonics Theory. | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 97.43% of all students scored at or above 70%. Average score for all students was 91.90%. | Measure 2: Threshold exceeded. Students adequately demonstrated understanding of science integration. | Measure 2: No curricular or pedagogical changes needed at this time. |

*At least one measure per objective must be a direct measure.

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|---|---|--|---|---|--|---|
| Science and Society The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, and better understanding of human and other influences on the earth's environment. | Foundations of Natural Sciences Learning Outcome 3. | Measure 1 (CRNs 33256 & 32652): <u>Signature Assignment</u> – Prepare a report that discusses what earthquake hazards you need to be concerned about in Ogden, and where in Ogden these hazards pose a threat to the population. Include an earthquake insurance estimate for an Ogden home. | 70% of students who submitted the assignment will score 70% or better on questions. Composite average score of students on selected questions is $\geq 70\%$. | Measure 1: 87.6% of students scored at or above 70%. Average score for all students was 95.5%. | Measure 1: Threshold met. Students adequately demonstrated understanding of how science-based explanations support society. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRN 21054 & 21054): <u>Signature Assignment</u> – Students must prepare a presentation for a hypothetical town council that explains the earthquake hazards of their county and how the people of the county may prepare for an earthquake. | | Measure 2: 84% of students scored at or above 70%. Average score for all students was 84.9%. | Measure 2: Threshold met. Students adequately demonstrated understanding of how science-based explanations support society. | Measure 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|--|---|---|---|---|--|---|
| Problem Solving & Data Analysis Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner. | Foundations of Natural Sciences Learning Outcome 4. | Measure 1 (CRNs 33256 & 32652): Responses to 20 qualitative and graph analysis questions from Ch. 12 Quiz – Earthquakes and Earth’s Interior). | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 91.5% of students scored at or above 70%. Average score for all students was 81.5%. | Measure 1: Threshold exceeded. Students adequately demonstrated problem solving and data analysis skills. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 1 (CRN 21054 & 21054): Responses to an assignment where students used seismograph data from earthquakes to triangulate the location of the earthquake epicenter. | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 90.4% of students scored at or above 70%. Average score for all students was 88.7% | Measure 2: Threshold exceeded. Students adequately demonstrated problem solving and data analysis skills. | Measure 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|--|---|--|---|---|--|---|
| Organization of systems The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws. | Physical Sciences Learning Outcome 1. | Measure 1 (CRNs 33256 & 32652) <u>Ch. 2 Concept sketch</u> – Sketch, label, describe 4 principles used to determine the relative ages of rocks and geologic features (2.1c). | 70% of students who submitted the assignment will score 70% or better on questions. Composite average score of students on selected questions is $\geq 70\%$. | Measure 1: 96% of students scored at or above 70%. Average score for all students was 94.9%. | Measure 1 Threshold exceeded. Students adequately demonstrated knowledge on the organization of systems. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRN 21054 & 21054) Students completed an assignment addressing the Earth's spheres, the layers of the earth, geologic time, and the nature of geology. | | Measure 2: 97.4% of students scored at or above 70%. Average score for all students was 93.1%. | Measure 2: Threshold exceeded. Students adequately demonstrated knowledge on the organization of systems. | Measure 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|---|--|---|---|---|--|
| Matter Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales. | Physical Sciences Learning Outcome 2. | Measure 1 (CRNs 33256 & 32652): <u>Ch. 1 Concept sketch</u> – Sketch, label, describe the major layers of the Earth, including composition and thickness of each layer, lithosphere and asthenosphere, why some regions have high elevation (1.3a, 1.3b, 1.3c) | 70% of students who submitted the assignment will score 70% or better on questions. Composite average score of students on selected questions is $\geq 70\%$. | Measure 1: 96.1% of students scored at or above 70%. Average score for all students was 94.6%. | Measure 1 Threshold exceeded. Students adequately demonstrated knowledge on physical/chemical properties of earth materials. | No curricular or pedagogical changes needed at this time |
| | | Measure 2 (CRN 21054 & 21054) Responses to 9 multiple choice questions in a weekly quiz covering rocks, minerals, and volcanic materials. | | Measure 2: 85.3% of students scored at or above 70%. Average score for all students was 78.1%. | Measure 2: Threshold exceeded. Students adequately demonstrated knowledge on the organization of systems. | |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|--|---|--|---|---|---|---|
| Energy Interactions within the universe can be described in terms of energy exchange and conservation. | Physical Sciences Learning Outcome 3. | Measure 1 (CRNs 33256 & 32652): <u>Ch. 12 concept sketch</u> - Sketch and describe each of the two types of body waves and two types of surface waves (12.5a). | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 94.1% of students scored at or above 70%. Average score for all students was 96.1%. | Measure 1: Threshold exceeded. Students adequately demonstrated understanding energy | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRN 21054 & 21054): Responses to 10 multiple choice questions from a weekly quiz covering seismic waves. | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 88.6% of students scored at or above 70%. Average score for all students 81%. | Measure 2: Threshold exceeded. Students adequately demonstrated understanding energy | Measure 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|---|---|---|---|---|---|
| Forces Equilibrium and change are determined by forces acting at all organizational levels. | Physical Sciences Learning Outcome 4. | Measure 1 (CRNs 33256 & 32652): <u>Ch. 3 concept sketch</u> - Sketch and explain the driving forces of Plate Tectonics (3.8a). | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 94.7% of students scored at or above 70%. Average score for all students was 92.6%. | Measure 1 Threshold exceeded. Students adequately demonstrated knowledge about forces related to volcanic eruptions and volcanic landforms. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRN 21054 & 21054): Responses to 8 questions on second exam. | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 95% of students scored at or above 70%. Average score for all students was 87.3% | Measure 2: Threshold exceeded. Students adequately demonstrated knowledge about forces related to crustal deformation, plate tectonics, and earthquakes. | Measure 2: No curricular or pedagogical changes needed at this time. |

Evidence of Learning: General Education, Physical Science Courses

Course: **GEO 1060 (Environmental Geoscience) Fall 2021 – Spring 2024 Semesters / 2 courses / ONLINE / 96 students**

Fall 2023 (CRN 20985) ONLINE – 44 students; Spring 2023 (CRN 33261) ONLINE - 52 students

| Gen Ed Learning Goal Students will demonstrate understanding of: | Measurable Learning Outcome Students will demonstrate their understanding by: | Method of Measurement Direct and Indirect Measures* | Threshold | Findings Linked to Learning Outcomes | Interpretation of Findings | Action Plan/Use of Results/Closing-the-loop |
|---|--|---|--|--|--|---|
| Nature of Science. Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific. | Foundations of Natural Sciences Learning Outcome 1. | Measure 1 (CRN 20985 & 32652): Responses to 16 multiple choice questions from Ch 1 Quiz – Human and Geologic Environment | 70% of students who submitted the assignment will score 70% or better on questions. Composite average score of students on selected questions is ≥ 70%. | Measure 1: 95.4% of students scored at or above 70%. Average score for 44 students was 82.4%. | Measure 1 Threshold exceeded. Students adequately demonstrated knowledge of the nature of science. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRNs 20985 & 21054): Response to 12 multiple choice questions from Quiz 3 – Earth Structure. | | Measure 2: 90.9% of students scored at or above 70%. Average Score for 44 students was 91.7%. | Measure 2: Threshold exceeded. Students adequately demonstrated knowledge of the nature of science. | Measure 2: No curricular or pedagogical changes needed at this time |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|---|---|---|---|--|---|
| Integration of Science All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive and integrated. | Foundations of Natural Sciences Learning Outcome 2. | Measure 1 (CRNs 20985 and): Responses to 16 multiple choice questions from Ch 1 Quiz – Human and Geologic Environment | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 82.4% of students scored at or above 70%. Average score for 44 students was 95.5%. | Measure 1: Threshold exceeded. Students adequately demonstrated understanding of science integration. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2: (CRN 20985): Responses to 14 multiple choice questions from Ch 7 Quiz – Streams and Flooding | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 97.73% of all students scored at or above 70%. Average score for all students was 93.99%. | Measure 2: Threshold exceeded. Students adequately demonstrated understanding of science integration. | Measure 2: No curricular or pedagogical changes needed at this time. |

*At least one measure per objective must be a direct measure.

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|---|---|--|---|---|--|---|
| Science and Society The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, and better understanding of human and other influences on the earth's environment. | Foundations of Natural Sciences Learning Outcome 3. | Measure 1 (CRNs 20985 & 32652): Responses to 16 multiple choice questions from Ch 1 Quiz – Human and Geologic Environment | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 87.6% of students scored at or above 70%. Average score for all students was 95.5%. | Measure 1: Threshold met. Students adequately demonstrated understanding of how science-based explanations support society. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRN 20985 & 21054): Responses to 8 multiple choice questions from Ch 6 Quiz – Mass Wasting | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 84% of students scored at or above 70%. Average score for all students was 84.9%. | Measure 2: Threshold met. Students adequately demonstrated understanding of how science-based explanations support society. | Measure 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|--|---|---|---|---|--|---|
| Problem Solving & Data Analysis Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner. | Foundations of Natural Sciences Learning Outcome 4. | Measure 1 (CRNs 33256 & 32652): Responses to 14 multiple choice questions from Ch 4 Quiz – Earthquakes | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 91.5% of students scored at or above 70%. Average score for all students was 81.5%. | Measure 1: Threshold exceeded. Students adequately demonstrated problem solving and data analysis skills. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 1 (CRN 21054 & 21054): Responses to 12 multiple choice questions from Ch 5 Quiz – Volcanoes | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 90.4% of students scored at or above 70%. Average score for all students was 88.7% | Measure 2: Threshold exceeded. Students adequately demonstrated problem solving and data analysis skills. | Measure 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|--|---|--|---|---|--|---|
| Organization of systems The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws. | Physical Sciences Learning Outcome 1. | Measure 1 (CRNs 33256 & 32652) Responses to 18 multiple choice questions from Ch 2 Quiz – Earth Materials | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 96% of students scored at or above 70%. Average score for all students was 94.9%. | Measure 1 Threshold exceeded. Students adequately demonstrated knowledge on the organization of systems. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRN 21054 & 21054) Responses to 14 multiple choice questions from Ch 10 Quiz – Water Resources | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 97.4% of students scored at or above 70%. Average score for all students was 93.1%. | Measure 2: Threshold exceeded. Students adequately demonstrated knowledge on the organization of systems. | Measure 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|---|--|---|---|---|--|
| Matter Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales. | Physical Sciences Learning Outcome 2. | Measure 1 (CRNs 33256 & 32652): Responses to 12 multiple choice questions from Ch 9 Quiz – Soils. | 70% of students who submitted the assignment will score 70% or better on questions. Composite average score of students on selected questions is $\geq 70\%$. | Measure 1: 96.1% of students scored at or above 70%. Average score for all students was 94.6%. | Measure 1 Threshold exceeded. Students adequately demonstrated knowledge on physical/chemical properties of earth materials. | No curricular or pedagogical changes needed at this time |
| | | Measure 2 (CRN 21054 & 21054) Responses to 14 multiple choice questions from Ch 11 Quiz – Mineral and Rock Resources. | | Measure 2: 85.3% of students scored at or above 70%. Average score for all students was 78.1%. | Measure 2: Threshold exceeded. Students adequately demonstrated knowledge on the organization of systems. | |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|--|---|---|---|---|---|---|
| Energy Interactions within the universe can be described in terms of energy exchange and conservation. | Physical Sciences Learning Outcome 3. | Measure 1 (CRNs 33256 & 32652): Responses to 12 multiple choice questions from Ch 12 Quiz – Conventional Fossil Fuels. | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 94.1% of students scored at or above 70%. Average score for all students was 96.1%. | Measure 1: Threshold exceeded. Students adequately demonstrated understanding energy | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRN 21054 & 21054): Responses to 10 multiple choice questions from Ch 13 Quiz – Alternative Energy Resources. | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 88.6% of students scored at or above 70%. Average score for all students 81%. | Measure 2: Threshold exceeded. Students adequately demonstrated understanding energy | Measure 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|---|--|---|---|---|---|
| Forces Equilibrium and change are determined by forces acting at all organizational levels. | Physical Sciences Learning Outcome 4. | Measure 1 (CRNs 33256 & 32652): Responses to 12 multiple choice questions from Ch 8 Quiz – Coastal Hazards. | 70% of students who submitted the assignment will score 70% or better on questions. | Measure 1: 94.7% of students scored at or above 70%. Average score for all students was 92.6%. | Measure 1 Threshold exceeded. Students adequately demonstrated knowledge about forces related to volcanic eruptions and volcanic landforms. | Measure 1: No curricular or pedagogical changes needed at this time. |
| | | Measure 2 (CRN 21054 & 21054): Responses to 10 multiple choice questions from Ch 10 Quiz – Water Resources. | Composite average score of students on selected questions is $\geq 70\%$. | Measure 2: 95% of students scored at or above 70%. Average score for all students was 87.3% | Measure 2: Threshold exceeded. Students adequately demonstrated knowledge about forces related to crustal deformation, plate tectonics, and earthquakes. | Measure 2: No curricular or pedagogical changes needed at this time. |

Evidence of Learning: General Education, Physical Science Courses

Course: *GEO 1110 (Physical Geology) Fall 2022, Spring 2023, Fall 2023. And Spring 2024, all online sections (percentages for various classes will be shown in order), total students 232.*

| Gen Ed Learning Goal Students will demonstrate understanding of: | Measurable Learning Outcome Students will demonstrate their understanding by: | Method of Measurement Direct and Indirect Measures* | Threshold | Findings Linked to Learning Outcomes | Interpretation of Findings | Action Plan/Use of Results/Closing-the-loop |
|---|---|---|--|--|---|---|
| Nature of Science. Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific. | Learning Outcome 1. | Measure 1: Responses to quiz 1, focused on nature of science. | 70% of students who completed the assignment will score 80% or better on assignment. | Measure 1: 87%, 88%, 86% and 84% of students who completed the quiz scored | Measures 1, 2: Threshold exceeded. Students adequately demonstrated knowledge of the nature of science. | Measures 1, 2, 3, 4, 5: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|------------------------------------|---|--|---|--|---|
| Integration of Science All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive and integrated. | Learning Outcome 2. | Measure 1: HW3: combines questions on volcanoes, sedimentary rocks and metamorphic rocks, including a virtual field trip integrating topics. Measure 2: Geologic hazards | 70% of students will score 80% or better on concept sketch / activity / questions. Average score of all students on concept | Measure 1: 86%, 90%, 90%, and 88% of students scored above 80%. Measure 2: 92%. 100%. 89%, and 80% of students who completed the | Measures 1, 2 Threshold exceeded. Students adequately demonstrated understanding of science integration. | Measure 1: 16% of students earned a 0 for not completing concept sketch. Plan to notify students multiple times of upcoming deadline to help minimize missing assignment. |

| | | | | | | |
|--|--|--|--|----------------------------|--|--|
| | | virtual field trip assignment which integrates concepts including groundwater, geologic hazards, earthquakes and historical geology. | sketch / activity / questions is $\geq 70\%$. | activity scored above 80%. | | Measures 2, 3, 4, 5: No curricular or pedagogical changes needed at this time. |
|--|--|--|--|----------------------------|--|--|

*At least one measure per objective must be a direct measure.

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|---|-----------------------------|---|---|---|--|--|
| Science and Society The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, and better understanding of human and other influences on the earth's environment. | Learning Outcome 3. | Measure 1: Quiz covering the interrelationship between glaciers and climate change. Measure 2: Signature assignment. Essay where students look up and describe the geologic hazards that will impact them along the Wasatch front. | 70% of students will score 80% or better on the assignment. | Measure 1: 85%, 92%, 94%, and 96% of students who completed the assignment scored above 80%. Measure 2: 97%, 97%, 100% and 98% of student who completed the assignment scored 80% or better. | Measures 1, 2 Threshold exceeded. Students adequately demonstrated understanding of science integration. | Measures 1, 2: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|------------------|-----------------------------|-------------------|-----------|----------|----------------|-------------|
|------------------|-----------------------------|-------------------|-----------|----------|----------------|-------------|

| | | | | | | |
|---|----------------------------|---|--|---|--|--|
| <p>Problem Solving & Data Analysis Science relies on empirical data, and such data must be analyzed, interpreted, and generalized in a rigorous manner.</p> | <p>Learning Outcome 4.</p> | <p>Measure 1: Score on HW 1 Plate Tectonics. This assignment requires that students interpret map data, calculate spreading rates, determine plate motions, and draw cross sections across plate boundaries.</p> <p>Measure 2: HW 4.1 Geologic time. Students have to work through datasets related to geologic time, interpret biostratigraphic markers and use various visual analogues to understand geologic time. They also need to calculate absolute ages using radiometric data.</p> <p>-</p> | <p>70% of students will score 80% or better on questions / activities.</p> | <p>Measure 1: 91%, 83%, 88%, and 82% of students who completed the assignment received an 80% or better.</p> <p>Measure 2: 96%, 93%, 94%, and 86% of students who completed the assignment scored at 80% or better.</p> | <p>Measures 1, 2. Threshold exceeded. Students adequately demonstrated problem solving and data analysis skills.</p> | <p>Measures 1, 2, 4: No curricular or pedagogical changes needed at this time.</p> |
|---|----------------------------|---|--|---|--|--|

| GE Learning Goal | Measurable Learning Outcome | Method of Measure | Threshold | Findings | Interpretation | Action Plan |
|--|-----------------------------|---|--|--|--|--|
| Organization of systems The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws. | Learning Outcome 5. | Measure 1: Quiz 7, geologic time focus on changes in the geologic system over time which requires that students integrate concepts from multiple systems. Measure 2: Quiz 5 sedimentary rocks. Naming, identifying, and understanding sedimentary rocks requires that students understand relationships between physical and chemical processes and assess how they will control sediment types and patterns observed. | 70% of students will score 80% or better on questions. | Measure 1: 91%, 88%, 92%, and 87% of students who completed the assignment scored an 80% or better. Measure 2: 85%, 89%, 94%, and 80% of students who completed the assignment received an 80% or better. | Measures 1, 2 Threshold exceeded. Students adequately demonstrated knowledge on the organization of systems. | Measures 1, 2, 3, 4: No curricular or pedagogical changes needed at this time. |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|-----------------------------|---|--|--|---|---|
| Matter Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales. | Learning Outcome 6. | Measure 1: Responses to Quiz 2, which focuses on atoms, minerals and bonding. Measure 2: HW 2 Minerals and igneous rocks. This | 70% of students will score 80% or better on questions. | Measure 1: 95%, 96%, 93%, and 96% of students scored above 80%. Measure 2: | Measures 1, 2 Threshold met. Students adequately demonstrated knowledge on physical / chemical properties of earth materials. | Measure 1: 2: No curricular or pedagogical changes needed at this time. |

| | | | | | | |
|--|--|---|--|---|--|--|
| | | assignment focuses on processes that form minerals and igneous rocks and then how their identification helps up understand how they formed. | | 94%, 96%, 100%, and 96 % of students who completed the assignment scored 80% or better. | | |
|--|--|---|--|---|--|--|

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|--|-----------------------------|---|--|--|--|--|
| <p>Energy Interactions within the universe can be described in terms of energy exchange and conservation.</p> | <p>Learning Outcome 7.</p> | <p>Measure 1: <u>Quiz 4 focused on volcanoes and volcanic hazards. This assignment helps students understand the forces necessary to cause various types of volcanic eruptions.</u></p> <p>Measure 2: Quiz 9 earthquakes. This quiz test student on their understanding of the forces required to generate earthquakes of various sizes along with how we measure them and their impact on society.</p> | <p>70% of students will score 80% or better on concept sketch / questions.</p> | <p>Measure 1: 92%, 92%, 91% and 96% of students scored above 80%.</p> <p>Measure 2: 85%, 88%, 92% and 85% of students who completed the assignment scored 80% or better.</p> | <p>Measures 1, 2: Threshold exceeded. Students adequately demonstrated understanding energy</p> | <p>Measures 1, 2: No curricular or pedagogical changes needed at this time.</p> |

| GE Learning Goal | Measurable Learning Outcome | Method of Measure. | Threshold | Findings | Interpretation | Action Plan |
|---|-----------------------------|--|---|---|---|--|
| Forces Equilibrium and change are determined by forces acting at all organizational levels. | Learning Outcome 8. | Measure 1 Quiz 8 geologic structures. Geologic structures are the consequence of forces acting within the Earth. This quiz covers topics on which types and what amount of forces cause different types of structures. Measure 2: HW 4.2 Geologic structures. This is a virtual field trip showing and explaining geologic structures in the surrounding area. Students are answering questions | 70% of students will score 80% or better on questions / activities. | Measure 1: 87%, 90%, 87% and 93% of students who completed the assignment scored above 80%. Measure 2: 96%, 93%, 73% and 75% of student who completed the assignment scored 80% of better. | Measures 1, 2: Threshold exceeded. Students adequately demonstrated knowledge about forces related to geologic structures. | Measures 1: No curricular or pedagogical changes needed at this time. Measures 2: We generated a new specific assignment to cover identification and interpretation of geologic structures in the environment. Originally the assignment was combined with Geologic Time, which is why the scores change between the two years. We still feel this is a good exercise and we met out 70% threshold. |

Introduction to Meteorology - GEO 1130 PS / Fall 2023 / CRN 22868 / 21 students / Page 1.

| Evidence of Learning: General Education / Physical Science (PS) Breadth Courses | | | | | | |
|---|--|--|---|--|--|--------------------|
| Measurable Learning Outcome: | Method of Measurement: | Target Performance: | Actual Performance: | Interpretation of Findings: | Action Plan/Use of Results: | “Closing the Loop” |
| 1. Nature of Science. Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific | *Measure 1: Quiz 1 The Scientific Process, Earth’s Atmosphere and Heat | Measure 1: 70% of students will score 70+% | Measure 1: 100% scored 70% or higher (three students did not take the quiz and were not included in this calculation) | Measure 1: Threshold exceeded. Students adequately mastered LO1. | Measure 1: No curricular/ pedagogical changes needed at this time. | |

| Evidence of Learning: General Education / Physical Science (PS) Breadth Courses | | | | | | |
|---|---|--|---|--|--|--------------------|
| Measurable Learning Outcome: | Method of Measurement: | Target Performance: | Actual Performance: | Interpretation of Findings: | Action Plan/Use of Results: | “Closing the Loop” |
| explanations differ fundamentally from those that are not scientific. | Budget (10 multiple choice questions) | | | | | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 2.Integration of Science. All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive & integrated. | *Measure 1: Arctic Climate and Albedo Class Activity | Measure 1: 70% of students will score 70+% | Measure 1: 85% scored 70% or higher (one student did not submit an assignment and was not included in the calculation) | Measure 1: Threshold exceeded. Students adequately mastered LO2. | Measure 1: | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 3. Science and Society. The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, & better understanding of human & other influences on Earth’s environment. | *Measure 1: Signature Assignment Meteorological Hazards Infographic | Measure 1: 70% of students will score 70+% | Measure 1: 95% scored 70% or higher (two students did not submit the assignment and were not included in the calculation) | Measure 1: Threshold exceeded. Students adequately mastered LO3. | Measure 1: No curricular/ pedagogical changes needed at this time. | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 4. Problem Solving & Data Analysis. Science relies on empirical data, & such data must be analyzed, interpreted, & generalized in a rigorous manner. | *Measure 1: Arctic Climate and Albedo Class Activity | Measure 1: 70% of students will score 70+% | Measure 1: 87% scored 70% or higher (one student did not submit an assignment was not included in the calculation) | Measure 1: Threshold exceeded. Students adequately mastered LO4. | Measure 1: No curricular/ pedagogical changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |

*At least one measure per objective must be a direct measure; indirect measures may be used to supplement direct measure(s).

| Evidence of Learning: General Education / Physical Science (PS) Breadth Courses | | | | | | |
|---|---|---|---|---|--|--------------------|
| Measurable Learning Outcome: | Method of Measurement: | Target Performance: | Actual Performance: | Interpretation of Findings: | Action Plan/Use of Results: | “Closing the Loop” |
| 5. Organization of systems. The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws | *Measure 1: Quiz 5 Wind and Atmospheric Circulation (10 multiple choice questions) | Measure 1: 70% of students will score 70+% | Measure 1: 94% scored 70% or higher (three students did not take the quiz and were not included in the calculation) | Measure 1: Threshold exceeded. Students adequately mastered L05. | Measure 1: No curricular/ pedagogical changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 6. Matter. Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales. | *Measure 1: Quiz 3 Humidity, Clouds and Precipitation (10 multiple choice questions) | Measure 1: 70% of students will score 70+% | Measure 1: 84% scored 70% or higher (two students did not take the quiz and were not included in the calculation) | Measure 1: Threshold exceeded. Students adequately mastered L06. | Measure 1: No curricular/ pedagogical changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 7. Energy. Interactions within the universe can be described in terms of energy exchange and conservation. | *Measure 1: Wind Energy Activity | Measure 1: 70% of students will score 70+% | Measure 1: 100% scored 70% or higher (one student did not submit the activity and was not included in the calculation) | Measure 1: Threshold exceeded. Students adequately mastered L07. | Measure 1: | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 8. Forces Equilibrium and change are determined by forces acting at all | *Measure 1: Quiz 7 Fronts, Mid Latitude | Measure 1: 70% of students will score | Measure 1: 89% scored 70% or higher | Measure 1: Threshold exceeded. | Measure 1: No curricular/ pedagogical | |

| Evidence of Learning: General Education / Physical Science (PS) Breadth Courses | | | | | | |
|--|---|----------------------------|---|------------------------------------|------------------------------------|---------------------------|
| Measurable Learning Outcome: | Method of Measurement: | Target Performance: | Actual Performance: | Interpretation of Findings: | Action Plan/Use of Results: | “Closing the Loop” |
| organizational levels. | Cyclones and Forecasting (10 multiple choice questions) | 70+% | (three students did not take the quiz and were not included in the calculation) | Students adequately mastered L08. | changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |

*At least one measure per objective must be a direct measure; indirect measures may be used to supplement direct measure(s).

Additional narrative: This course was offered by a new instructor in the Department of Earth and Environmental Sciences, and thus new materials including lectures, activities, homework assignments, quizzes, exams, and a signature assignment were developed for the course. This course is being offered by the instructor for a second time this semester during Fall 2024 and additional new activities have been developed to reinforce and assess student learning outcomes for the course. This course is also offered by an instructor in the Department of Geography, Environment, and Sustainability.

The students met and exceeded the threshold to pass each student learning outcome. The student learning outcomes were assessed through a combination of Canvas quizzes, in-class and independent activities, and the signature assignment for the course, which was to complete a meteorological hazards assessment for an assigned location and develop an infographic to communicate the information.

Overall, the physical sciences (PS) learning outcomes are challenging to assess in this course. The current PS outcomes have a distinct physics slant and would benefit from integrating a more Earth Sciences approach.

It is proposed that these assessment results will be reviewed by the General Education Improvement & Assessment Committee, who will provide feedback on evidence of continuous improvement.

| Evidence of Learning: General Education / Physical Science (PS) Breadth Courses | | | | | | |
|--|--|---|---|---|--|--------------------|
| Measurable Learning Outcome: | Method of Measurement: | Target Performance: | Actual Performance: | Interpretation of Findings: | Action Plan/Use of Results: | “Closing the Loop” |
| 1. Nature of Science. Scientific knowledge is based on evidence that is repeatedly examined, and can change with new information. Scientific explanations differ fundamentally from those that are not scientific. | *Measure 1: In-class scientific process activity | Measure 1: 70% of students will score 70+% | Measure 1: 100% who completed the assignment scored 100% or higher | Measure 1: Threshold exceeded. Students adequately mastered LO1. | Measure 1: No curricular/pedagogical changes needed at this time. | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 2. Integration of Science. All natural phenomena are interrelated and share basic organizational principles. Scientific explanations obtained from different disciplines should be cohesive & integrated. | *Measure 1: Signature Assignment Teaching Demonstrations (combined) | Measure 1: 70% of students will score 70+% | Measure 1: 100% scored 70% or higher | Measure 1: Threshold exceeded. Students adequately mastered LO2. | Measure 1: No curricular/pedagogical changes needed at this time. | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |

| Evidence of Learning: General Education / Physical Science (PS) Breadth Courses | | | | | | |
|---|--|---|--|---|---|--------------------|
| Measurable Learning Outcome: | Method of Measurement: | Target Performance: | Actual Performance: | Interpretation of Findings: | Action Plan/Use of Results: | “Closing the Loop” |
| 3. Science and Society. The study of science provides explanations that have significant impact on society, including technological advancements, improvement of human life, & better understanding of human & other influences on Earth’s environment. | *Measure 1: Climate Change Lab Quiz | Measure 1: 70% of students will score 70+% | Measure 1: 83% scored 70% or higher | Measure 1: Threshold exceeded. Students adequately mastered LO3. | Measure 1: No curricular/ pedagogical changes needed at this time. | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 4. Problem Solving & Data Analysis. Science relies on empirical data, & such data must be analyzed, interpreted, & generalized in a rigorous manner. | *Measure 1: Properties of Seawater Lab Quiz | Measure 1: 70% of students will score 70+% | Measure 1: 83% scored 70% or higher | Measure 1: Threshold exceeded. Students adequately mastered LO4. | Measure 1: No curricular/ pedagogical changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |

*At least one measure per objective must be a direct measure; indirect measures may be used to supplement direct measure(s).

| Evidence of Learning: General Education / Physical Science (PS) Breadth Courses | | | | | | |
|---|---|---|---|---|--|--------------------|
| Measurable Learning Outcome: | Method of Measurement: | Target Performance: | Actual Performance: | Interpretation of Findings: | Action Plan/Use of Results: | “Closing the Loop” |
| 5. Organization of systems. The universe is scientifically understandable in terms of interconnected systems. The systems evolve over time according to basic physical laws | *Measure 1: Canvas Quiz 1 Scientific Process and the Solar System (10 multiple choice questions) | Measure 1: 70% of students will score 70+% | Measure 1: 100% scored 70% or higher | Measure 1: Threshold exceeded. Students adequately mastered L05. | Measure 1: No curricular/ pedagogical changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 6. Matter. Matter comprises an important component of the universe, and has physical properties that can be described over a range of scales. | *Measure 1: Minerals Lab | Measure 1: 70% of students will score 70+% | Measure 1: 100% scored 70% or higher | Measure 1: Threshold exceeded. Students mastered L06. | Measure 1: No curricular/ pedagogical changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 7. Energy. Interactions within the universe can be described in terms of energy exchange and conservation. | *Measure 1: Climate Change Lab Quiz | Measure 1: 70% of students will score 70+% | Measure 1: 83% scored 70% or higher | Measure 1: Threshold exceeded. Students mastered L07. | Measure 1: No curricular/ pedagogical changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |
| 8. Forces Equilibrium and change are determined by forces acting at all organizational levels. | *Measure 1: Plate Tectonics Lab | Measure 1: 70% of students will score 70+% | Measure 1: 100% scored 70% or higher | Measure 1: Threshold exceeded. Students mastered L08. | Measure 1: No curricular/ pedagogical changes needed at this time | |
| | Measure 2: | Measure 2: | Measure 2: | Measure 2: | Measure 2: | |

| Evidence of Learning: General Education / Physical Science (PS) Breadth Courses | | | | | | |
|--|-------------------------------|----------------------------|----------------------------|------------------------------------|------------------------------------|---------------------------|
| Measurable Learning Outcome: | Method of Measurement: | Target Performance: | Actual Performance: | Interpretation of Findings: | Action Plan/Use of Results: | “Closing the Loop” |
| | | | | | | |

*At least one measure per objective must be a direct measure; indirect measures may be used to supplement direct measure(s).

Additional narrative: This was the first time this course was offered by a new instructor and thus the course was redesigned and new lectures, labs, and assignments were created for the course.

GEO 1350 is one of the three (3) “Principles” courses offered by the College of Science. These courses are specifically designed for Elementary Education majors. Thus, their audience is distinctly different from other general education courses. Their unusual format includes 2 hours of lecture and 3 hours of lab per week for 3 credits.

The students met and exceeded the threshold to pass each student learning outcome. Student learning outcomes were assessed through a combination of Canvas quizzes, lab exercise, lab quizzes—which provided a holistic assessment of a hands-on lab activity designed to have students apply their knowledge, conduct experiments, and analyze and interpret data—class activities, and the signature assignment which included the development and presentation of two teaching demonstrations and written lesson plans.

It is proposed that these assessment results will be reviewed by the General Education Improvement & Assessment Committee, who will provide feedback on evidence of continuous improvement.

*Can be a mix of [direct](#) and [indirect](#) measures, but at least one measure must be direct

tive (optional – use as much space as needed):