

Weber State University
Biennial Report on Assessment of Student Learning

Cover Page

Department/Program: Environmental Science Major
Academic Year of Report: 2020/21
Date Submitted: 13 October 2021
Report authors: Carie Frantz & Chris Hoagstrom

Dr. Frantz contact Information:

Phone: 801-626-6181
Email: cariefrantz@weber.edu

Dr. Hoagstrom contact Information:

Phone: 801-626-7486
Email: christopherhoagstrom@weber.edu

We have updated the Institutional Effectiveness website, which includes an update for each program page. All Biennial Assessment and Program Review reports will now be available on a single page. Please review your page for completeness and accuracy, and indicate on the list below the changes that need to be made. Access your program page from the top-level [results](#) page. Select the appropriate college and then your program from the subsequent page.

A. Mission Statement

Information is current; no changes required.

The mission of Weber State University's Environmental Science Program is to prepare students to be leaders and problem-solvers in addressing the environmental challenges of our day. We will equip our graduates with the interdisciplinary training needed to understand and solve complex problems and help build a more sustainable future.

B. Student Learning Outcomes

(please note the addition of certificate and associate credential learning outcomes)

Information is current; no changes required.

Update if not current:

Environmental Science graduates will:

1. demonstrate an interdisciplinary approach to complex problems using the basic tools from geoscience, biology, chemistry, mathematics, economics and social science.
2. be able to develop and test hypotheses through collecting data in the field and/or analyzing samples in the laboratory, including qualitative and quantitative analyses.
3. understand the human and natural environment in the Intermountain West in the context of the varying timescales at which Earth systems operate.
4. be able to work effectively as a member of a team and independently.
5. be able to effectively communicate complex problems, approaches, and solutions to both specialists and general audiences in written and oral formats.
6. demonstrate an understanding of interconnected Earth and human systems to reflect critically on their roles in the protection and management of our environment and climate.

C. Curriculum (please note, we are using Google Sheets for this section so that updates are easier to make)

Information is current; no changes required.

Update if not current (you may request access to the Google Sheet if that is easiest, or we can make the updates):

(Please review your current curriculum grid and verify that at least one course has been identified for each outcome in which you expect your students to demonstrate the **desired** competency of a graduating student. This could be shown in a variety of ways: classroom work, clinical or internship work, a field test, an ePortfolio, etc.)

Course	Interdisciplinary approach	Testing environmental hypotheses	Natural environment, intermountain west	Effective worker	Effective communicator	Human-Earth interconnection
BTNY 1403	Emphasized	Introduced	Emphasized	-	Introduced	Course Focus
BTNY/CHEM/GEO/MICR/PHYS 2600	-	Supported	-	Supported	-	-
¹ GEO 1060	Course Focus	Introduced	Introduced	Introduced	Introduced	Course Focus
¹ GEO 1110	-	-	-	-	-	-
GEO 1115	Emphasized	Introduced	-	Introduced	Introduced	Introduced
GEO 3010	Course Focus	Emphasized	Introduced	-	-	Emphasized
GEO 3710	-	Course Focus	-	Course Focus	Course Focus	-
GEO 4990	Course Focus	Emphasized	Emphasized	-	Emphasized	Course Focus
MICR 2054	Introduced	-	-	Course Focus	Course Focus	-
MICR 3502	Course Focus	Emphasized	Emphasized	Introduced	Emphasized	Course Focus
PHYS 2090	Course Focus	Course Focus	Course Focus	Emphasized	Emphasized	Course Focus
² BTNY 2104	Course Focus	Emphasized	-	Introduced	Emphasized	-
² ZOOL 1110	Introduced	Emphasized	-	Course Focus	Course Focus	-
³ BTNY 3454	Course Focus	Emphasized	Introduced	Emphasized	Emphasized	Introduced
³ ZOOL 3450	Course Focus	Emphasized	Introduced	Emphasized	Emphasized	Introduced
⁴ MATH 1040	-	Supported	-	-	Supported	-
⁴ MATH 3410	-	Supported	-	-	Supported	-
⁴ SOC 3600	-	Supported	-	-	Supported	-
⁴ PSY 3600	-	Supported	-	-	Supported	-
⁵ MATH 1050	-	Supported	-	Supported	-	-
⁵ MATH 1080	-	Supported	-	Supported	-	-
⁵ MATH 1210	-	Supported	-	Supported	-	-
CHEM 1210	Course Focus	Emphasized	-	Introduced	Introduced	-
CHEM 1220	Course Focus	Emphasized	-	Introduced	Introduced	-
ECON 1100	Course Focus	Emphasized	Introduced	Emphasized	Emphasized	Emphasized

Footnotes: 1-5, students choose one course from each numbered set

D. Program and Contact Information

 Information is current; no changes required.

Update if not current:

Dr. Frantz contact Information:

Phone: 801-626-6181

Email: cariefrantz@weber.edu

Dr. Hoagstrom contact Information:

Phone: 801-626-7486

Email: christopherhoagstrom@weber.edu

E. Assessment Plan

We have traditionally asked programs to report on outcome achievement by students at the course level. We are encouraging programs to consider alternative assessment approaches and plans that are outcome-based as opposed to course-based, though course-based assessment can continue to be used. A complete assessment plan will include a timeline (which courses or which outcomes will be assessed each year), an overall assessment strategy (course-based, outcome-based, reviewed juries, ePortfolio, field tests, etc.), information about how you will collect and review data, and information about how the department/program faculty are engaged in the assessment review.

 Information is current; no changes required.

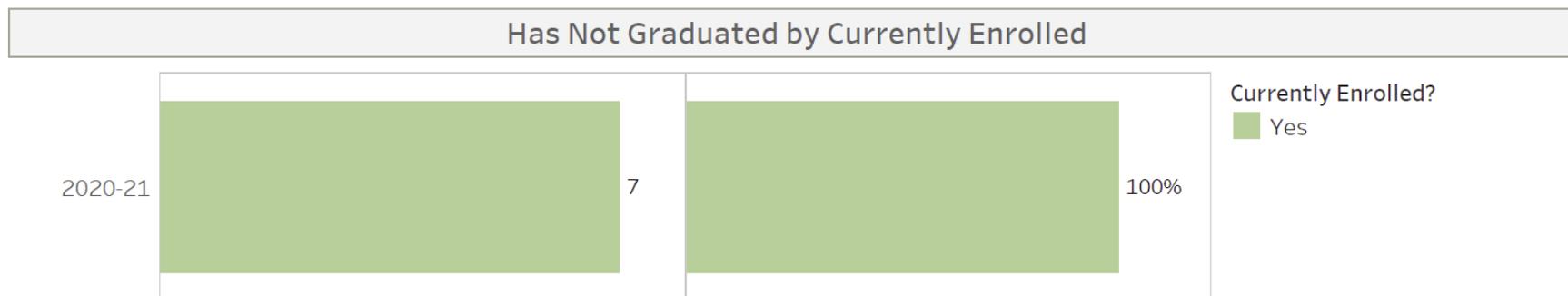
Update if not current:

- I. Timeline (which courses or which outcomes will be assessed each year)
 - a. Assessment will occur separately for each Environmental Science major in preparation for graduation.
 - i. At whatever time a student has completed their ePortfolio (described below) a student will be eligible to meet with one of the Environmental Science co-directors to request a review.
- II. Overall assessment strategy (course-based, outcome-based, reviewed juries, ePortfolio, field tests, etc.)
 - a. The Environmental Science co-directors will identify courses within the required curriculum that meet each of the six learning outcomes.
 - i. Instructors for each assessment-designated course will identify one or more assignments (e.g., a specific exam, a particular project) that are focused on the outcome.
 - ii. These assignments will be linked to the corresponding outcome.
 - iii. A list of outcome-linked course assignments will be provided to Environmental Science majors as part of advisement and degree planning.
 - b. Students will develop an ePortfolio consisting of artifacts indicating their proficiency in each learning outcome.
 - i. Artifacts for each outcome will result from the aforementioned, pre-identified, linked assignments (above).
 - c. This plan puts the onus on students to build a portfolio that demonstrates that they have met the learning outcomes for the program.
 - i. This should make students more invested in their courses and assignments.
 - ii. It will also providing hard evidence of skills that will help students when seeking future employment.
 - d. In their portfolios, students will demonstrate that they have achieved proficiency in the categories listed below, each of which will be represented by a significant artifact generated in one of the courses listed.
- III. Information about how you will collect and review data
 - a. Students will collect their own data in their portfolios as described above.
 - i. When completed, students will submit portfolios to the Environmental Science co-directors.
 - b. The Environmental Science co-directors will review portfolios to ensure the following criteria were met:
 - i. Artifacts were provided for each learning outcome from the identified course.
 - ii. Grades for each artifact met or exceeded the minimum level of performance (B-).

- IV. Information about how the program faculty are engaged in the assessment review.
- a. There are no program faculty *sensu stricto*.
 - b. As described above, faculty teaching identified courses that produce artifacts for students will be engaged via conducting and grading the assignments.
 - i. Instructors will include in their syllabus a notification of which assignment(s) will be used for Environmental Science learning outcome assessment.
 - ii. Students will be responsible for adding their graded assignments to their portfolios.
 1. If more than one assignment is included per outcome, students must combine the files to be uploaded to their ePortfolio as one artifact.
 2. The grade for all assignments submitted as evidence for each learning outcome must meet or exceed the minimum threshold (B-).

F. Student Achievement

- i. Percent of students completing degrees after 90 credit hours within 2 years and a reflection on that metric (this information can be accessed on the Program Review Undergraduate dashboard – tab labeled, ‘Time to Grad from 90CH – please reach out to ois@weber.edu if you need help with this metric). What department initiatives are in place to address this?
 1. Data below current as of 13 October 2021:



Reflection:

The Environmental Science Program is in its second year of existence, becoming active first within school year 2020-2021. Students with > 90 CH evidently switched to the Environmental Science major and did not begin college as majors within the program. To accurately assess time to graduation within the program, it will be necessary to have data from students who began in the program. The earliest availability of this data will be in 2023-2024. At this time, students who have switched into the major or have brought in credits from other sources (e.g., concurrent enrollment; transfer from another university) should be excluded from analysis.

Evidence of Learning

Because Environmental Science is a new, interdisciplinary program, no assessment data is yet available and it is necessary to first develop a tenable assessment plan (see above) before data can be collected. Although the program began in 2020-2021, there were no designated co-directors for the program until this year (2021-2022). We have now developed an assessment plan (above) that we will begin implementing in Spring 2022. Meanwhile our curriculum grid provides preliminary confidence that students are developing proficiency with each of the program learning outcomes.

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.

Because Environmental Science is a new, interdisciplinary program, there is yet to be a program review.

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.

Environmental Science is not part of any department as has no contracted faculty.

Faculty Headcount	2018-18	2019-20	2020-21
With Doctoral Degrees (Including MFA and other terminal degrees, as specified by the institution)			
Full-time Tenured			
Full-time Non-Tenured (includes tenure-track)			
Part-time and adjunct			
With Master's Degrees			
Full-time Tenured			
Full-time Non-Tenured			
Part-time and adjunct			
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			
Full-time Non-tenured			
Part-time			

Please respond to the following questions.

- 1) Review and comment on the trend of minority students enrolling in your classes (particularly lower-division, GEN Ed) and in your programs.

In 2020-2021 (first year of the program), Environmental Science majors were 79% white, 13% Latinx, and 9% other. Over time, we would like to increase minority representation within the major to at least the University average or, better yet, the regional demographic. Strategies to work toward this goal are yet to be developed.

- 2) What support (from enrollment services, advising, first-year transition office, access & diversity, etc.) do you need to help you recruit and retain students?

Retention efforts within the College of Science will benefit environmental science majors. Any advisor meeting with a student interested in Environmental Science will be directed to either Dr. Frantz or Dr. Hoagstrom for major-specific advising. We anticipate that support from the Development Office will allow us to offer dedicated aid to recruit and retain environmental science majors.

- 3) We have invited you to re-think your program assessment. What strategies are you considering? What support or help would you like?

See assessment plan (above).

- 4) Finally, we are supporting our Concurrent Enrollment accreditation process. Does your program offer concurrent enrollment classes? If so, have you been able to submit the information requested from the Concurrent Enrollment office? Staff from OIE will reach out to you in the next few months to assist in finalizing that data submission as well as gather information for concurrent Gen Ed assessment.

Environmental Science does not offer any classes within the program. All classes are housed elsewhere.

Glossary

Student Learning Outcomes/Measurable Learning Outcomes

The terms ‘learning outcome’, ‘learning objective’, ‘learning competency’, and ‘learning goal’ are often used interchangeably. Broadly, these terms reference what we want students to be able to do AFTER they pass a course or graduate from a program. For this document, we will use the word ‘outcomes’. Good learning outcomes are specific (but not too specific), are observable, and are clear. Good learning outcomes focus on skills: knowledge and understanding; transferrable skills; habits of mind; career skills; attitudes and values.

- Should be developed using action words (if you can see it, you can assess it).
- Use compound statements judiciously.
- Use complex statements judiciously.

Curriculum Grid

A chart identifying the key learning outcomes addressed in each of the curriculum’s key elements or learning experiences (Suskie, 2019). A good curriculum:

- Gives students ample, diverse opportunities to achieve core learning outcomes.
- Has appropriate, progressive rigor.
- Concludes with an integrative, synthesizing capstone experience.
- Is focused and simple.
- Uses research-informed strategies to help students learn and succeed.
- Is consistent across venues and modalities.
- Is greater than the sum of its parts.

Target Performance (previously referred to as ‘Threshold’)

The level of performance at which students are doing well enough to succeed in later studies (e.g., next course in sequence or next level of course) or career.

Actual Performance

How students performed on the specific assessment. An average score is less meaningful than a distribution of scores (for example, 72% of students met or exceeded the target performance, 5% of students failed the assessment).

Closing the Loop

The process of following up on changes made to curriculum, pedagogy, materials, etc., to determine if the changes had the desired impact.

Continuous Improvement

An idea with roots in manufacturing, that promotes the ongoing effort to improve. Continuous improvement uses data and evidence to improve student learning and drive student success.

Direct evidence

Evidence based upon actual student work; performance on a test, a presentation, or a research paper, for example. Direct evidence is tangible, visible, and measurable.

Indirect evidence

Evidence that serves as a proxy for student learning. May include student opinion/perception of learning, course grades, measures of satisfaction, participation. Works well as a complement to direct evidence.

HIEE – High Impact Educational Experiences

Promote student learning through curricular and co-curricular activities that are intentionally designed to foster active and integrative student engagement by utilizing multiple impact strategies. Please see <https://weber.edu/weberthrives/HIEE.html>