Environmental Science BS

G1: Train Environmental Science Students to have a strong Physical Science foundation

Goal Description:

Students will develop core competencies across the disciplines of Biology, Chemistry, Geography, and Geology.

Providing Department: Environmental Science BS

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

G1 LO1 Intro Physical Science Foundation

Learning Objective Description:

Students will demonstrate proficiency in the intro physical lab science course material that serves as a foundation/pre-requisite for upper-level Environmental Science courses.

RELATED ITEM LEVEL 2

G1 LO1 ICF1 Core Physical Science Knowledge

Indicator Description:

Students will take a comprehensive exam that includes introductory (1400-level) Biology, Chemistry, Geography, and Geology concepts. This will be developed in collaboration with the Environmental Science committee that teaches the 1400-level courses required of all three Environmental Science concentrations (BIOL 1401, BIOL 1 and 2, CHEM 1411, GEOG 1401, and GEOL 1403 and 1405). Students will take the core exam toward the beginning of BIOL/GEOG 3320 that they should be enrolled in Fall of junior year.

Criterion Description:

75% of Environmental Science students will earn a 70% or higher on the interdisciplinary core physical science exam. Given student retention rates in the 70's for SHSU, it seems reasonable that 3/4 of Environmental Science students should have a C-level or better understanding of foundational concepts as they begin their advanced coursework.

Findings Description:

We are working on putting the comprehensive exam together across disciplines. The exam will be given for the first time Fall 2022.

RELATED ITEM LEVEL 3

Action - G1 Core Physical Science Knowledge

Action Description:

The comprehensive physical science exam is in development and will be given the first time Fall 2022.

RELATED ITEM LEVEL 1

G1 LO2 Advanced Physical Science Knowledge

Learning Objective Description:

Students will demonstrate proficiency in explaining concepts in the 3000- and 4000-level physical science courses that are required in each Environmental Science concentration.

RELATED ITEM LEVEL 2

G1 LO2 ICF 1 - Advanced Physical Science Concepts

Indicator Description:

Students will demonstrate knowledge of advanced physical science concepts that all three environmental science concentrations require: General Ecology; Environmental Geology; Soil Science; and one of Geomorphology OR Hydrology and Water Resources. Pooled comprehensive final exams from each of these courses will serve as the instrument.

Criterion Description:

75% of students will earn 70% or better on the comprehensive final exams in these courses. Given SHSU's retention rates in the 70's, this seems like a reasonable goal for a rigorous physical science program.

Findings Description:

This exam is in development. The proposal to add a seminar course (GEOG/GEOL 4199) was approved and will be available to teach in 2023-24.

RELATED ITEM LEVEL 3

Action - G1 Advanced Physical Science Concepts Action Description:

The exam is being developed and will be given once GEOG/GEOL 4199 is on the books and can be offered 2023-24.

G2: Develop systems thinking

Goal Description:

Students will be able to link physical science, social science, and policy (i.e., human-environment) concepts by the time they graduate.

Providing Department: Environmental Science BS

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

G2 LO1 Linking Physical and Social Science Systems

Learning Objective Description:

Students will be able to connect physical and social science concepts by looking through a systems thinking lens.

RELATED ITEM LEVEL 2

G2 LO1 ICF1 Systems Thinking to Link Physical and Social Science Indicator Description:

Students will be asked questions that link physical science, social science, and policy concepts in BIOL/GEOG 3320 (Sustainability and Environment) that should be taken Fall of their junior year. Similar questions will then be asked in the Applied Environmental Seminar Capstone class for last-semester seniors. In addition to BIOL/GEOG 3320, students should be taking GEOG 4331 (Conservation of Natural Resources) and POLS 3395 (Env Policy) their junior and senior year. These four courses should all help them understand the context of how physical and social science work informs policy and how policy and social factors guide the need for physical science work. The Applied Environmental Seminar will also include guest speakers that work across disciplines and at the interface of physical science and policy. The matching pre-post exam style questions will be administered at the start of BIOL/GEOG 3320 and at the end of the Applied Env Seminar.

Criterion Description:

After completing physical science, social science, and policy coursework over their junior and senior years, including an applied interdisciplinary seminar their final semester, Env Sci students will demonstrate growth in linking physical science, social science, and policy as interconnected within a larger system. 85% of seniors in the seminar course should be able to answer similar questions to those they received at the start of their junior year in BIOL/GEOG 3320 with 80% accuracy or better. These gains are reasonable to expect given the coursework required and Applied Env Seminar capstone that will review these concepts over the final semester prior to students graduating.

Findings Description:

This exam has not been given yet, as it is intended for GEOG/GEOL 4199 that was just approved this year and will begin 2023-24 once in the the catalog.

RELATED ITEM LEVEL 3

Action - G2 Systems Thinking

Action Description:

This exam has not been given yet, as it is intended for GEOG/GEOL 4199 that was just approved this year and will begin 2023-24 once in the the catalog.

G3: Proficiency in quantitative methods

Goal Description:

Students will be able to apply concepts from their required math courses to environmental problems.

Providing Department: Environmental Science BS

RELATED ITEMS/ELEMENTS ------

RELATED ITEM LEVEL 1

G3 LO1 Apply Quantitative Methods to Environmental Problems

Learning Objective Description:

Students will be able to use quantitative skills gained in their required statistics and/or calculus courses to work on real-world problems.

RELATED ITEM LEVEL 2

G3 LO1 ICF1 Quantitative Methods and Applied Environmental Problems

Indicator Description:

Students will be asked applied quantitative questions on comprehensive final exams in Biostatistics, Hydrology and Water Resources, Hydrogeology, and Geomorphology.

Criterion Description:

75% of students will earn a 70% or higher on quantitative-related questions across these courses. Environmental Science students need to be able to analyze numerical data, and it reasonable to expect 3/4 of juniors and seniors to demonstrate C-level proficiency of better in this area.

Findings Description:

More than 75% of Environmental Science students were able to earn C grades or higher in BIOL 4374 during Spring 2022. 100% of Environmental Science students were able to earn passing grades on the GEOG 4432 exam Spring 2022, which included 25% applied, quantitative questions.

RELATED ITEM LEVEL 3

Action - G3 Quantitative Methods and Applied Environmental Problems Action Description:

More data will be collected across quantitative courses over 2023-24 beyond BIOL 4374 and GEOG 4432.

G4: Maintain strong interdisciplinary relationships across contributing departments

Goal Description:

The Environmental Science coordinator will continue to convene meetings with the COSET Environmental Science Committee and with dept. chairs and

coordinators for contributing programs. Changes will be made as necessary given feedback from committee and contributing faculty.

Providing Department: Environmental Science BS

RELATED ITEMS/ELEMENTS

RELATED ITEM LEVEL 1

G4 PO1 Consistent Interdepartmental Coordination

Performance Objective Description:

The Environmental Science coordinator will meet with AG, BIOL, CHEM, GEOG, and GEOL coordinators to make sure course schedules work for Env students (i.e., limit upper-level conflicts across depts.). The Env Sci coordinator will also work to communicate with dept. chairs and coordinators to help make sure there are enough seats available to meet growing demand.

The Environmental Science committee members (a group of faculty that's been in place since 2016) will continue to meet and work together annually to make changes to the degree concentrations if issues arise.

As a result of meetings and coordination, Env Sci majors and minors will be able to get seats in all required courses as juniors and seniors.

RELATED ITEM LEVEL 2

G4 PO1 KPI1 Student Satisfaction with Interdisciplinary Degree

KPI Description:

Students will be given a survey their last semester before graduation to give feedback on any issues with the program, including scheduling, course offerings, course content, and overall satisfaction with the depts. contributing to Env Sci and the program as a whole.

Results Description:

The survey is in development, but during informal exit interviews and Spring advising, students biggest concerns were scheduling conflicts, available seats in popular courses, and the desire to make sure all required courses in the degree program clearly touch on environmental science and applied problems.

As a result of talking with students, BIOL and GEOG/GEOL updated pre-reqs to reduce registration barriers for advanced classes, including BIOL 4374, GEOG 3310, GEOG 3320, GEOG 4330, and GEOG 4432. Conversations are ongoing with PLSC re: Soils pre-req changes.

To address scheduling issues, a dept. scheduling committee was formed with member representing GEOG, GEOL, GIS, and Env Science to work with faculty and other dept. schedules to reduce conflicts when possible.

RELATED ITEM LEVEL 3

Action - G4 Student Satisfaction

Action Description:

A survey is being developed to give to students that are graduating that will focus on asking them to reflect on positives, negatives, issues, and suggestions for the program.

RELATED ITEM LEVEL 2

G4 PO1 KPI2 Meetings and Collaboration

KPI Description:

This will include a list of relevant meetings and changes and issues that arise from meetings between the Environmental Science coordinator and contributing dept. chairs and coordinators.

Results Description:

Coordinator had meetings with faculty in BIOL and AG re: ongoing pre-req issues, and multiple courses were updated to reduce student registration barriers.

Scheduling across multiple departments remains tough to reduce conflicts. However, the formation of a dept. scheduling committee is allowing Environmental and Geosciences to attempt to fit our courses around BIOL, AG, and CHSS requirements like POLS 3395.

RELATED ITEM LEVEL 3

Action - G4 Meetings and Collaboration

Action Description:

More meetings will need to be scheduled next year to updated all relevant faculty on the new assessment plan and to work on continued issues with scheduling, pre-reqs (only PLSC 3440 now), and to develop collaborative surveys and exams that are relevant across multiple disciplines in the degree.

RELATED ITEM LEVEL 1

G4 PO2 Interdisciplinary Internships

Performance Objective Description:

At least five junior and senior students will obtain internships across a range of environmental science disciplines.

RELATED ITEM LEVEL 2

G4 PO2 KPI1 Completing Internships KPI Description:

At least 5 junior or senior students will obtain and complete relevant internships annually that relate to different areas of focus related to AG, BIOL, CHEM, or ENV and GEO disciplines. Students will be supervised by Environmental Science-related faculty that are aligned most closely with their internship focus. Five completed internship packets jointly signed by employer and advisor will indicate completion. Students will also present internship experiences to fellow students to encourage networking and demonstrate opportunities to their peers.

Results Description:

4 junior and senior Env Sci students obtained full-time paid internships for the summer. 3 opted to take credit, while 1 graduated in May. 2 other

students in our dept. from GEOG and GEOL also obtained Environmental Science-related internships. So, I helped 6 total students secure internships, but missed the goal of 5 of them total being Environmental Science majors.

RELATED ITEM LEVEL 3

Action - G4 Internships

Action Description:

Given 4 internships were obtained by students for 2021-22, I will work to continue networking and push emails and announcements out to all students next year. It is possible 5 obtained internships, but only 4 have contacted me thus far. Some last year told me about their internships during the Summer only after Fall semester had started.

Update to Previous Cycle's Plan for Continuous Improvement Item

Previous Cycle's Plan For Continuous Improvement (Do Not Modify):

Closing Summary

The Environmental Science Committee and the Dept. will work on adapting the assessment plan as a whole for 2021-22 now that the degree is part of the Dept. of Environmental and Geosciences and Dr. Gillespie is no longer overseeing all advising and assessment of the degree. We will seek input from Env Sci faculty advisors in the dept. as well as faculty and chairs from the other contributing programs.

Update of Progress to the Previous Cycle's PCI:

This year, we re-wrote the entire Assessment plan from scratch given it's the first year the department was assessing Environmental Science and not the Dean's Office under Dr. Gillespie. We were able to get new course proposals approved and will be able to begin collecting more concrete data during 2023-24. However, it is positive that collaborations with other departments yielded some pre-req changes we've been discussing for at least two years. And our students are getting quality internship and job offers.

New Plan for Continuous Improvement Item

Closing Summary:

For 2022-23, we look forward to using this brand new assessment plan developed during the Winter of 2021-22 to determined where Environmental Science stands and what we can do to address student issues and potential shortcomings, as well as continuing to emphasize points and actions that are working well for our students.