

Program Name Environmental Science

Program Mission The Environmental Science major is an interdisciplinary program of the Biology and Chemistry Departments at The University of Scranton and is administered by a co-director from each department. The program fits closely with the college mission of addressing critical problems of the world and disseminating knowledge to the world. It also fits the university and college missions relative to the pursuit of and growth of wisdom in our students. The major provides students with a deep background in both chemistry and biology, leading to courses which emphasize the biological and chemical aspects of the environment. Hands on experience is provided by an internship or research project in environmental science. The major prepares students for employment in the private, public and nonprofit sectors, and for graduate and professional study. The Environmental Science major has the following objectives: 1. To prepare students for positions (in the public or private sector) in the broad field of environmental analysis, compliance, and technology; 2. To prepare students for advanced study in environmental science; 3. To provide a sufficiently comprehensive science and liberal arts background to allow students to pursue advanced training or work in other fields that deal with environmental issues, e.g., environmental law, environmental health, and environmental regulation in business and industry.

Referring to your annual assessment reports, please reflect on and report any changes or improvements you have made to your program as a result of evidence you have gathered

We have revised PLO narrative to enhance our ability to assess student performance. ESCI majors performed well on embedded questions in BIOL 274 and BIOL 371 relating to PLO #3 (ESCI majors will have an appreciation of the social and economic implications of environmental science). Further ESCI majors demonstrated proficiency in embedded questions associated with PLO #4 (ESI majors will have a sound knowledge of sustainability and how science can contribute to sustainable development) in BIOL 274, BIOL 371 as well as CHEM 232L and CHEM 233L, so only minor improvements and updating of material seem necessary. Plans for improvement include, 1) add more sustainability questions to quizzes and/or exams to enhance learning and 2) establish a committee of faculty with expertise in environmental science to unify efforts in teaching.

Curriculum

The curriculum provides more than one opportunity for students to meet the Program Learning Objectives

Which key courses and assignments does the program use to ensure that students are meeting these program learning outcomes?

Required courses, including CHEM 121/121L, CHEM 112/113L, CHEM 232/232L, CHEM 233/233L, CHEM 370/370L, CHEM 340, BIOL 141/141L, BIOL 142/142L, BIOL 274, BIOL 371, BIOL 379, NSCI 201, ESCI 440/441, ESCI 480/481, ESCI 493/494. Major electives, including BIOL 195, BIOL 295, BIOL 250, BIOL 272, BIOL 273, BIOL 349, BIOL 370/370L, BIOL 374/374L, BIOL 375, BIOL 472, BIOL 473, CHEM 240, CHEM 330, CHEM 361, CHEM 362, CHEM 363, CHEM 351, CHEM 450, CHEM 451

Program Learning Outcomes to be Assessed

Program Environmental Science

Program Learning Outcome

1).Environmental Science majors will demonstrate a sound knowledge of both chemistry and biology, and the biological and chemical aspects of environmental science.

How will you collect and analyze the evidence that students are meeting the PLO (e.g. Review aggregate scores on embedded questions; review scores on standardized tests; use a rubric to score samples of student writing).

Collect data on student performance in required classes and also using embedded questions within required classes.

Where in the program does the evidence reside? Evidence can reside in a particular course, sections of a particular course, or outside of courses (e.g. survey of graduates)

Assorted courses required by the major, e.g., Biol 141/142, Biol 371, ESCI 201, Chem 112/113, Chem 232, Chem 233, Chem 340

Is the evidence direct or indirect Direct evidence is actual student outputs, which can be analyzed or aggregated using quantitative or qualitative methods. Indirect is secondary information, such as perceptions, attitudes, or self-ratings.

Direct

What tools are necessary to collect evidence? (Rubrics, Portfolio,Embedded Exam Questions etc.)

Grade records, embedded exam questions

Are there benchmarks that you will use to interpret your results? Benchmarks are associated with quantitative evidence and can be determined based on disciplinary norms or previous results on the same assignment, survey, etc.

C or better

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Program Learning Outcome

2). Environmental Science majors will demonstrate an ability to apply critical thinking to the analysis and devising of possible solutions to conservation problems, sustainability issues and environmental problems.

How will you collect and analyze the evidence that students are meeting the PLO (e.g. Review aggregate scores on embedded questions; review scores on standardized tests; use a rubric to score samples of student writing).

Review scores on embedded questions,

Where in the program does the evidence reside? Evidence can reside in a particular course, sections of a particular course, or outside of courses (e.g. survey of graduates)

BIOL 274, BIOL 370, BIOL 371, BIOL 379, ESCI 440/441, CHEM 340

Is the evidence direct or indirect Direct evidence is actual student outputs, which can be analyzed or aggregated using quantitative or qualitative methods. Indirect is secondary information, such as perceptions, attitudes, or self-ratings.

Direct

What tools are necessary to collect evidence? (Rubrics, Portfolio, Embedded Exam Questions etc.)

Grade records, embedded exam questions, as well as rubrics evaluating presentations and writing assignments

Are there benchmarks that you will use to interpret your results? Benchmarks are associated with quantitative evidence and can be determined based on disciplinary norms or previous results on the same assignment, survey, etc.

C or better

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3). Environmental Science majors will be able to discuss the social and economic implications of environmental science.

How will you collect and analyze the evidence that students are meeting the PLO (e.g. Review aggregate scores on embedded questions; review scores on standardized tests; use a rubric to score samples of student writing).

Where in the program does the evidence reside? Evidence can reside in a particular course, sections of a particular course, or outside of courses (e.g. survey of graduates)

Is the evidence direct or indirect Direct evidence is actual student outputs, which can be analyzed or aggregated using quantitative or qualitative methods. Indirect is secondary information, such as perceptions, attitudes, or self-ratings.

What tools are necessary to collect evidence? (Rubrics, Portfolio, Embedded Exam Questions etc.)

Are there benchmarks that you will use to interpret your results? Benchmarks are associated with quantitative evidence and can be determined based on disciplinary norms or previous results on the same assignment, survey, etc.

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Program Learning Outcome

4). Environmental Science majors will demonstrate a sound knowledge of sustainability and how science can contribute to sustainable development.

How will you collect and analyze the evidence that students are meeting the PLO (e.g. Review aggregate scores on embedded questions; review scores on standardized tests; use a rubric to score samples of student writing).

Where in the program does the evidence reside? Evidence can reside in a particular course, sections of a particular course, or outside of courses (e.g. survey of graduates)

Is the evidence direct or indirect Direct evidence is actual student outputs, which can be analyzed or aggregated using quantitative or qualitative methods. Indirect is secondary information, such as perceptions, attitudes, or self-ratings.

What tools are necessary to collect evidence? (Rubrics, Portfolio, Embedded Exam Questions etc.)

Are there benchmarks that you will use to interpret your results? Benchmarks are associated with quantitative evidence and can be determined based on disciplinary norms or previous results on the same assignment, survey, etc.

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5). Environmental Science majors will demonstrate proficiency in the recording, analysis and dissemination of data utilizing modern techniques, instrumentation and software.

How will you collect and analyze the evidence that students are meeting the PLO (e.g. Review aggregate scores on embedded questions; review scores on standardized tests; use a rubric to score samples of student writing).

Where in the program does the evidence reside? Evidence can reside in a particular course, sections of a particular course, or outside of courses (e.g. survey of graduates)

Is the evidence direct or indirect Direct evidence is actual student outputs, which can be analyzed or aggregated using quantitative or qualitative methods. Indirect is secondary information, such as perceptions, attitudes, or self-ratings.

What tools are necessary to collect evidence? (Rubrics, Portfolio, Embedded Exam Questions etc.)

Are there benchmarks that you will use to interpret your results? Benchmarks are associated with quantitative evidence and can be determined based on disciplinary norms or previous results on the same assignment, survey, etc.

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Program Learning Outcome

6). Environmental Science majors will be prepared to succeed in employment in the public and private sector, to continue their educations in environmental science, related fields, environmental education and environmental law.

How will you collect and analyze the evidence that students are meeting the PLO (e.g. Review aggregate scores on embedded questions; review scores on standardized tests; use a rubric to score samples of student writing).

Where in the program does the evidence reside? Evidence can reside in a particular course, sections of a particular course, or outside of courses (e.g. survey of graduates)

Is the evidence direct or indirect Direct evidence is actual student outputs, which can be analyzed or aggregated using quantitative or qualitative methods. Indirect is secondary information, such as perceptions, attitudes, or self-ratings.

What tools are necessary to collect evidence? (Rubrics, Portfolio, Embedded Exam Questions etc.)

Are there benchmarks that you will use to interpret your results? Benchmarks are associated with quantitative evidence and can be determined based on disciplinary norms or previous results on the same assignment, survey, etc.