

Program Assessment Plan

Department: Environmental Science & Management

Contact: Catherine de Rivera derivera@pdx.edu

Mission:

Environmental Science and Management (ESM) is an interdisciplinary program that focuses on coupled human and natural systems and helps solve local to global environmental challenges. Working collaboratively with community partners, we study how biological, chemical, physical and social systems function and how they can be effectively restored and managed. Our research spans atmospheric, freshwater, marine, and terrestrial systems, as well as the processes and flows that link them in urban through undeveloped areas. Our faculty experts address biological invasion, global climate change, pollution, and land use and habitat fragmentation. Building on our research expertise and partnerships, we provide high quality education for professional environmental scientists and science-driven policy makers, giving students the skills and critical training opportunities they need in order to perform effectively in environmental jobs.

Plan

Every year each NTTIF and TTF member will sign up to bring an assignment from a course that addresses the learning outcome selected as a focus for the year. During our annual faculty retreat, each will present for five minutes about the assignment and how and how well it addresses the learning goal in question. Faculty will contribute assignments across learning levels so we capture the progression from introductory through mastery levels. We will also examine the grade distribution on the assignment from the past approximately 100 students (1-3 sections of the course) in order to assess student learning or we will look at other relevant evaluations. For example, for the learning objective about working collaboratively as a team, self and peer evaluations will be used on assignments or rubric scores as part of the assignment. Faculty will also bring in an example of work that received an A, a B, and a C (names redacted). After examining specific assignments, we will discuss (for ~ ½ hr) how well we have created and scaffolded assignments to meet the learning outcomes and how to improve those objectives. Assignments from other courses may be brought in to this discussion as well.

Finally, we will discuss the WDF rates of the courses being represented and what drives them as well as ways to decrease them. For example, we may identify courses that need more outreach to students and other student support.

The curriculum committee will prepare a brief report about that year's learning outcome using the assessment outputs (assignment and course grades and context for them) and the discussion about them that addresses program improvement.

Below we present our Seven Learning Goals and their Outcomes, which courses address them, how they relate to the campus-wide learning outcomes. Core courses are bolded.

Table 1. ESM Learning Outcomes. Seven ESM learning goals and their outcomes, which courses address them, how they relate to the campus-wide learning outcomes. Core courses are bolded.

ESM Learning Goals	Desired Outcomes	Assessment methods and Procedures: Courses to be evaluated for each LO, rotating through the courses	Campus-wide learning outcomes pertinent to ESM learning goals
Explain interactions among physical, biological, chemical, and human components of the environment	Students will be able to approach problem solving with an integrated perspective that acknowledges that environmental systems include ALL of these components	ESM 220, ESM 221, ESM 321/4, ESM 322/5, ESM 335, SCI 341, SCI 342, ESM 343. ESM 410 (environmental justice), ESM 416, ESM 424, ESM 435, ESM 464, ESM 483, ESM 485	Disciplinary and/or Professional Expertise: Students will gain mastery at a baccalaureate level in a defined body of knowledge through attainment of their program's objectives and completion of their major. And Sustainability: Students will identify, act on, and evaluate their professional and personal actions with the knowledge and appreciation of interconnections among economic, environmental, and social perspectives in order to create a more sustainable future.
Generate and communicate informed positions on current local, regional, and global environmental issues	Students will communicate about environmental issues from a confident and informed position.	ESM 222, ESM 335, ESM 343, ESM 410 (environmental justice), ESM 435, ESM 464, ESM 483, ESM 485,	Communication: Students will communicate effectively in a range of social, academic, and professional contexts using a variety of means, including written, oral, numeric/quantitative, graphic, and visual modes of communication using appropriate technologies. Also Engagement: Students will engage in learning that is based on reciprocal and mutually beneficial relationships, and through this engagement will apply theory and skills in diverse venues, linking the conceptual to the practical.
Identify anthropogenic	Students will be able to identify the key	ESM 222, ESM 335, SCI 342, ESM 343,	Disciplinary and/or Professional Expertise; and

drivers of environmental problems and analyze the relative merits of policy solutions	drivers of environmental issues and analyze the merits of variable approaches to address these anthropogenic drivers	ESM 410 (environmental justice), ESM 435, ESM 464, ESM 474	Sustainability, and Diversity: Student will recognize and understand the rich and complex ways that group and individual inequalities and interactions impact self and society.
Evaluate the validity and limitations of scientific theories and claims about the environment.	Students will be able to create a comprehensive framework that identifies areas of strong evidence and areas that more research needs to be conducted to develop confident and nuanced claims about the environment.	All ESM majors courses (ESM 220, ESM 221, and ESM 333/4, and ESM 340 especially aim to develop this so will be evaluated more often than our other courses)	Creative and Critical Thinking: Students will develop the disposition and skills to strategize, gather, organize, create, refine, analyze, and evaluate the credibility of relevant information and ideas.
Evaluate the advantages and limitations of public and private environmental management approaches	Students will be able to assess approaches and create an integrated management plan based on environmental and social factors	ESM 222, ESM 335, ESM 410 (environmental justice), ESM 435, ESM 464, ESM 483, ESM 485	Creative & Critical Thinking; Diversity; Ethics and Social Responsibility
Work collaboratively in a team to develop approaches to address environmental issues	Students will be able to reach consensus on approaches to address environmental issues by developing feasible timelines and action plans and by problem solving through using information and discussion.	All ESM majors courses except ESM 435 and ESM 480	Ethics and Social Responsibility: Students will develop ethical and social responsibility to others, will understand issues from a variety of cultural perspectives, will collaborate with others to address ethical and social issues in a sustainable manner, and will increase self-awareness.
Develop and test hypotheses to address environmental questions.	Students will observe, ask questions, develop robust strategies to test their hypotheses and thoughtfully evaluate their results in inquiry driven environmental topics.	ESM 220, ESM 221, ESM 324, ESM 325, ESM 335, SCI 341, SCI 342, ESM 343, ESM 410	Creative and Critical Thinking

Table 2. ESM Graduate Learning Outcomes. Four ESM learning goals and their outcomes, assessment methods, and how they relate to the campus-wide learning outcomes.

ESM Graduate Learning Goals (Degree programs applicable)	Desired Outcomes	Assessment methods and Procedures: Courses to be evaluated for each LO, rotating through the courses	Campus-wide learning outcomes pertinent to ESM learning goals (as applied to graduate programs)
<p>All graduates of ESM graduate programs have an integrated understanding of environmental systems that acknowledges the fundamentals and interactions among different disciplinary perspectives.</p>	<p>Students will be able to identify and describe the fundamentals and interactions of physical, ecological, and management processes, in environmental systems.</p>	<p>ESM 510 (Env Justice), 516, 535, 583, 585, 588,</p>	<p>Disciplinary and/or Professional Expertise: Students will gain mastery in a defined body of knowledge through attainment of their program's objectives and completion of their graduate degree. And Sustainability: Students will identify, act on, and evaluate their professional and personal actions with the knowledge and appreciation of interconnections among economic, environmental, and social perspectives in order to create a more sustainable future.</p>
<p>All graduates of ESM graduate programs can determine, demonstrate, and justify research designs appropriate for a given study.</p>	<p>Students will be able to identify research questions, develop a study design appropriate for the question, and conduct data analysis required to answer the research question.</p>	<p>ESM 554, 566, 567, oral defense of proposal or thesis, project or thesis write up</p>	<p>Disciplinary and/or Professional Expertise: Students will gain mastery in a defined body of knowledge through attainment of their program's objectives and completion of their major. Creative and Critical Thinking: Students will develop the disposition and skills to strategize, gather, organize, create, refine, analyze,</p>

			and evaluate the credibility of relevant information and ideas.
<p>All graduates of ESM graduate programs can:</p> <ul style="list-style-type: none"> Organize and manage project, including personnel, budgets, and logistics as appropriate Communicate and interact with stakeholders 	<p>Students will be able to independently complete a graduate thesis or non-thesis project and communicate/disseminate their findings with appropriate audiences.</p>	<p>ESM 551, & practicum course; ESM 555, 556, 557; proportion of students who present at stakeholder meetings; project or thesis write up</p>	<p>Communication: Students will communicate effectively in a range of social, academic, and professional contexts using a variety of means, including written, oral, numeric/quantitative, graphic, and visual modes of communication using appropriate technologies. Also Engagement: Students will engage in learning that is based on reciprocal and mutually beneficial relationships, and through this engagement will apply theory and skills in diverse venues, linking the conceptual to the practical. And Sustainability, and Diversity: Student will recognize and understand the rich and complex ways that group and individual inequalities and interactions impact self and society.</p>
<p>Graduates of ESM's PSM program can translate and apply their environmental science and management projects to professional and managerial settings.</p>	<p>Students will have experience with:</p> <ul style="list-style-type: none"> Project management Regulations, Policies and Laws Communications Professional ethics, <p>and can apply those experiences to environmental science projects.</p>	<p>Grades in PLUS courses; community partner evaluation; oral defense of proposal, project write up</p>	<p>Sustainability: Students will identify, act on, and evaluate their professional and personal actions with the knowledge and appreciation of interconnections among economic, environmental, and social perspectives in</p>

			<p>order to create a more sustainable future.</p> <p>Ethics and Social Responsibility: Students will develop ethical and social responsibility to others, will understand issues from a variety of cultural perspectives, will collaborate with others to address ethical and social issues in a sustainable manner, and will increase self-awareness.</p>
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