Academic Program	(2a) What are these learning outcomes? Students graduating with a degree should be able to:	(3) Other than GPA, what data/evidence are used to determine that graduates have achieved stated outcomes for the degree? (e.g., capstone course, portfolio review, licensure examination)?	(4) Who interprets the evidence? What is the process?	(5) How are the findings used?
Department: Environmental Systems **Major:** Environmental Systems/Earth Sciences Environmental Systems/Ecology, Behavior and Evolution Environmental Systems/Environmental Chemistry Environmental Systems/Environmental Policy	**Written Communication** Effectively communicate in written form with emphasis on writing that accurately applies principles and concepts in the natural sciences, math and social sciences to contemporary environmental problems.	**Written Communication** Written communication is taught, practiced, improved, and evaluated in ESYS103, which requires weekly writing reflections and a substantive research paper. Written communication is taught, practiced, improved and evaluated in ESYS187C, through completion of a substantive research paper that reports on the students' senior project outcomes. Many upper division electives effectively develop written communication skills.	**Written Communication** The ESYS103 instructors and teaching assistants read and evaluate written assignments and research papers. The ESYS 187C instructor and the ESYS faculty director read and evaluate all senior project reports. The ESYS program collects and reviews all student feedback on all ESYS courses. The ESYS program regularly reviews CAPE evaluations on courses in other departments that serve as electives in the ESYS majors. The ESYS program collects an exit survey of all majors just before graduation that asks about courses and the overall preparation of the major. This material is reviewed by the faculty director and program staff.	**Written Communication** Course instructors use student feedback to regularly modify and improve their courses. The ESYS faculty steering committee regularly reviews major requirements and makes suggestions to improve the curriculum.
(1) Have formal learning outcomes been developed? Yes **(6) Date of the last Academic Senate Review? [i.e. 2015-16 if the review takes place this academic year]**	**Oral Communication** Effectively communicate in oral form with particular emphasis on presentations that accurately apply principles and concepts in the natural sciences, math and social sciences to contemporary environmental problems for informational, persuasive and expressive purposes.	**Oral Communication** Oral communication skills are taught, improved and practiced in ESYS 187C, which requires all students to prepare a poster and give an oral presentation of their senior project in the ESYS symposium. The attendees of the symposium include fellow students, faculty from a variety of departments, alumni, and local environmental professionals. Many upper division electives also effectively develop oral communication skills.	**Oral Communication** The ESYS190B instructor and the ESYS faculty director preview and evaluate student poster presentations. The ESYS program collects and reviews student feedback on ESYS 190B and other ESYS courses. The ESYS program regularly reviews CAPE evaluations on courses in other departments that are electives in the ESYS major. The ESYS program collects an exit survey of all majors just before graduation that asks about courses and overall preparation from the major. This material is reviewed by the faculty director and program staff.	**Oral Communication** Course instructors use student feedback to regularly modify and improve their courses. The ESYS program regularly improves the ESYS symposium to increase the visibility of the ESYS student presentations to campus and the local environmental community.

2013-2014	**Quantitative Reasoning**:	**Quantitative Reasoning**	**Quantitative Reasoning**	**Quantitative Reasoning**
	Apply understanding of the fundamentals of natural sciences and math to the description and quantification of the interactions of the atmosphere, hydrosphere, lithosphere, and biosphere, including humans.	Met by completion of the required math courses, ESYS core courses, ESYS101, ESYS102 and ESYS103, and other upper division required courses and electives.	Instructors and teaching assistant grade exams, assignments and moderate classroom discussions.	Course instructors use student feedback to regularly modify and improve their courses.
	Plan and execute experiments that demonstrate the use and understanding of field techniques, modern instruments, accurate quantitative measurements, appropriate recording skills, safe lab and field practices, and appropriate use of computer and statistical applications. Demonstrate interpretative skills including the ability to analyze data statistically, assess reliability, interpret results and draw reasonable conclusions.		The ESYS program collects and reviews student feedback on ESYS core courses and other elective courses.	
			The ESYS program collects an exit survey of all majors just before graduation. This material is reviewed by the faculty director and program staff.	
Please date the form 03/03/2022	**Information Literacy**	**Information Literacy**	**Information Literacy**	**Information Literacy**
	Locate, understand and evaluate published literature on topics related to environmental science, policy, and related humanities.	Outcomes 6 and 7 are taught and developed through the research paper requirement for ESYS103 and in the final senior paper that is developed in ESYS187C.	The course instructors review and grade the bibliographies produced in ESYS103 and ESYS 187C.	Course instructors use student feedback to regularly modify and improve their courses.
	Demonstrate the ability to create an appropriately annotated bibliography.		The ESYS program collects and reviews all student feedback in these courses.	
	Critical Thinking	**Critical Thinking**	**Critical Thinking**	**Critical Thinking**
	Demonstrate capacity to investigate, diagnose and propose solutions to environmental problems in complex interdisciplinary, multi-stakeholder milieus.	Critical thinking is emphasized in most of the upper division required courses and electives.	A faculty mentor and the ESYS program director oversee all the ESYS senior projects.	The ESYS program regularly modifies internship listings and project suggestions based on feedback from students, faculty and alumni and environmental professionals.
	Use critical thinking skills to create practical solutions to environmental issues.	Student fully develop critically thinking skills in proposing a senior internship/project that addresses a complex interdisciplinary issue.	The ESYS seniors submit a contract, a signed progress report and a final evaluation of their internship/projects. These also include feedback and signatures from their internship supervisor, faculty mentor and the ESYS faculty director.	
	Have a sense of community responsibility and develop awareness of scientific issues in the larger social context.	Broader awareness of environmental issues is developed through the internship and/or research requirement in ESYS187C.	The ESYS program connects to alumni and other environmental professionals to assess the success of our graduates.	
	All other items not color coded	All other items not color coded	All other items not color coded	All other items not color coded
	Define and explain the basic principles and concepts of chemistry, physics, biology, calculus, statistics, economics and political sciences.	This outcome is met through successful completion of lower division prerequisites, including a year of math, physics, chemistry, BILD3 and required courses in economics (ECON1 and ECON131) and political science (POLI160AA)	The ESYS program regularly reviews CAPE evaluations on courses in other departments that regularly serve as requirements for the major.	The ESYS faculty advisory council regularly reviews and makes suggestions on major requirements.

	(2b) **Where are the learning outcomes published?** **Please provide your department/program** **website address.** **Learning outcomes published:** *https://scripps.ucsd.edu/esys*			