Assessment Report for the 2023-2024 Academic Year
Natural Science Minor

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Mission Statement:

The core mission of the University of San Francisco is to educate students in the knowledge and skills required to succeed as professionals and as persons, while also teaching the sensitivity and values necessary to participate in a world shared by all people. The Department of Biology particularly emphasizes the core Jesuit value of advancing the freedom and responsibility to pursue truth and to follow evidence to its conclusion. In pursuit of these values, the faculty of the Department of Biology educates undergraduate students in current biological concepts, methodologies, and ethical practices in the laboratory and the natural environment to prepare them to succeed personally and professionally with the potential for advanced training in the sciences.

(No changes since last report)

Program Learning Outcomes:

The Natural Science Minor prepares students to:

1. Demonstrate broad knowledge of the concepts that comprise the natural sciences of biology, chemistry, and physics
2. Perform laboratory techniques used to evaluate and explore scientific problems
3. Apply the scientific process

(No changes since last report)

Curriculum Map:

See attached.

(No changes since last report)

Current Schedule for Assessment of Program Learning Outcomes (PLOs):

- 2023-2024: *Program review assessment/planning*
- 2024-2025: PLO #2 & #3
- 2026-2027: PLO #1 (Chemistry)
- 2028-2029: PLO #1 (Physics)
- 2030-2031: Assessment reflection

Methods for 2023-2024 Assessment:

The Biology Assessment Committee met several times over the course of the 2022-2023 academic year to discuss proposed revisions to the Biology Minor assessment protocol.

Results and Findings of 2023-2024 Assessment:

A persistent difficulty in meaningful assessment of the Natural Sciences (and Biology) Minor is the small number of students. This has meant that in past years our assessment of the Natural Science Minor has often required taking many non-minor students in our data sets who happen to be taking the same classes as minors. This could obscure results that are specific to minors.

One possible solution would be to assess minors every other year instead of every year. This would allow us to potentially aggregate enough work from students in the minor to allow meaningful analysis. This creates another difficulty, however, in that our usual approach of analyzing one PLO per assessment year would mean that we would not be able to analyze all PLOs within a given program review cycle.

After discussion within the department, we have arrived at a revised minor assessment method that alternates years of data collection, and that groups PLOs into clusters to allow enough time to study all student outcomes.

Our proposal for the Natural Sciences Minor is that we will begin alternating years with the Biology Minor, following the schedule outlined above. We will assess PLO #1 using representative exam questions from final exams in courses required for Natural Science minors, attempting to weave in courses from Biology, Chemistry and Physics over successive years. We will assess PLOs #2 and #3 together by collecting representative lab work from courses required for Natural Science minors, such as General Biology.

Department Discussion and Response to Results

The proposed changes to the Natural Sciences minor assessment method were shared with the department at the 4/29/2024 department meeting. No objections were noted for the change, so we will proceed with the revised timing and methods of assessment as noted above.

Response to Previous Year's Report Feedback

The previous year (AY22-23) Natural Science Minor Assessment Report was positive and did not suggest significant changes. The report noted that the department could consider clustering PLOs or alternative methods of assessment to help manage workload demands and aggregate the relatively small number of students in the minor into a useful data set.

	PLO1	PLO2	PLO3
Institutional Learning Outcomes X Program Learning Outcomes	Demonstrate broad knowledge of the concepts that comprise the natural sciences of biology, chemistry, and physics.	Perform laboratory techniques used to evaluate and explore scientific principles.	Apply the scientific process.
Institutional Learning Outcomes			
1. Students reflect on and analyze their attitudes, beliefs, values, and assumptions about diverse communities and cultures and contribute to the common good.			
2. Students explain and apply disciplinary concepts, practices, and ethics of their chosen academic discipline in diverse communities.	X		X
3. Students construct, interpret, analyze, and evaluate information and ideas derived from a multitude of sources.	X		X
4. Students communicate effectively in written and oral forms to interact within their personal and professional communities.			
5. Students use technology to access and communicate information in their personal and professional lives.		X	X
6. Students use multiple methods of inquiry and research processes to answer questions and solve problems.		X	X
7. Students describe, analyze, and evaluate global interconnectedness in social, economic, environmental and political systems that shape diverse groups within the San Francisco Bay Area and the world.			

	PLO1	PLO2	PLO3
Program Learning Outcomes X Courses	Demonstrate broad knowledge of the concepts that comprise the natural sciences of biology, chemistry, and physics.	Perform laboratory techniques used to evaluate and explore scientific principles.	Apply the scientific process.
Courses or Program Requirement			
BIOL 105-General Biology I/Lab	I	I	I
BIOL 106-General Biology II/Lab	I	I	I
CHEM 230 -Organic Chemistry I	M	M	M
CHEM 231 - Organic Chemistry II	M	M	M
PHYS 100 - Introductory Physics I/Lab	M	M	M
PHYS 101 - Introductory Physics II/Lab	M	M	M
Key:			
Key:			
I = Introductory			
M = Intermediate			
A = Advanced			
CLO = Course Learning Outcome			