UNIVERSITY OF SAN FRANCISCO | College of Arts and Sciences

ASSESSMENT REPORT (REGULAR TEMPLATE)

NAME OF YOUR PROGRAM/DEPARTMENT/MAJOR OR MINOR/CERTIFICATE <INSERT HERE>

ACADEMIC YEAR 2019 - 2020

REPORT DUE DATE: December 4, 2020

This is our regular assessment template.
Given the unusual circumstances of the 2019-2020 academic year, each program/department/major/minor/certificate has two options of assessment:
(a) Usual assessment report based on this template OR
(b) Alternative assessment reflections on distance learning pivot based on the alternative attached template
Every program/department/major/minor/certificate can choose ONE of the two alternative reports to submit

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- **Who should submit the report? – All majors, minors (including interdisciplinary minors), graduate and non-degree granting certificate programs of the College of Arts and Sciences.**
- **Programs can combine assessment reports for a major and a minor program into one aggregate report as long as the mission statements, program learning outcome(s) evaluated, methodology applied to each, and the results are clearly delineated in separate sections**
- **Undergraduate, Graduate and Certificate Programs must submit separate reports**
- **It is recommended that assessment report not exceed 10 pages. Additional materials (optional) can be added as appendices**
- **Curriculum Map should be submitted along with Assessment Report**

Some useful contacts:

1. Prof. Alexandra Amati, FDCD, Arts – adamati@usfca.edu
2. Prof. John Lendvay, FDCD, Sciences – lendvay@usfca.edu
3. Prof. Mark Meritt, FDCD, Humanities – meritt@usfca.edu
4. Prof. Michael Jonas, FDCD, Social Sciences – mrjonas@usfca.edu
5. Prof. Suparna Chakraborty, AD Academic Effectiveness – schakraborty2@usfca.edu

Academic Effectiveness Annual Assessment Resource Page:

https://myusf.usfca.edu/arts-sciences/faculty-resources/academic-effectiveness/assessment

Email to submit the report: assessment_cas@usfca.edu

Important: Please write the name of your program or department in the subject line.

For example: FineArts_Major (if you decide to submit a separate report for major and minor);

FineArts_Aggregate (when submitting an aggregate report)

I. LOGISTICS

1. **Please indicate the name and email of the program contact person to whom feedback should be sent (usually Chair, Program Director, or Faculty Assessment Coordinator).**
   - Assessment Coordinator:
     - Scott Nunes, nunes@usfca.edu
   - Assessment Committee:
     - Leslie Bach, lbach@usfca.edu
     - Louise Goupil, lgoupil@usfca.edu
     - Brian Thornton, brthornton@usfca.edu
     - Brian Young, byoung3@usfca.edu

2. Please indicate if you are submitting report for (a) a Major, (b) a Minor, (c) an aggregate report for a Major & Minor (in which case, each should be explained in a separate paragraph as in this template), (d) a Graduate or (e) a Certificate Program

- This report covers the Natural Science Minor.

3. Please note that a Curricular Map should accompany every assessment report. Has there been any revisions to the Curricular Map since October 2019?

- The curriculum map for the Natural Science Minor is attached, and was last updated in fall of 2018

II. MISSION STATEMENT & PROGRAM LEARNING OUTCOMES

1. **Were any changes made to the program mission statement since the last assessment cycle in October 2019? Kindly state "Yes" or "No." Please provide the current mission statement below. If you are submitting an aggregate report, please provide the current mission statements of both the major and the minor program**

- **Mission Statement (Biology Department; the mission statement was last revised in spring of 2017—the Natural Science Minor is housed in the Biology Department):**

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.

2. **Were any changes made to the program learning outcomes (PLOs) since the last assessment cycle in October 2019? Kindly state "Yes" or "No." Please provide the current PLOs below. If you are submitting an aggregate report, please provide the current PLOs for both the major and the minor programs.**

- **PLOs (Natural Science Minor; the program learning outcomes were last revised in October of 2017):**

Upon graduation, students who complete the Natural Sciences minor requirements should be able to meet the following program learning outcomes:

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.

3. **State the particular Program Learning Outcome(s) you assessed for the academic year 2019-2020.**

- **PLO(s) being assessed (Natural Science Minor):**
  - (3) Apply the scientific process.

The rubric used to assess this learning outcome is included at the end of the report.

This learning outcome was assessed for the 2018-2019 academic year by rating student work from General Biology I, which is typically taken early in the coursework for the Natural Science Minor. Here we rate student work from Organic Chemistry II, which is typically taken toward the end of the progression of Natural Science Minor. Evaluating a course taken near completion of the Natural Science Minor will provide a better assessment of whether the program is effective at enabling students to achieve learning outcomes.

III. METHODOLOGY

Describe the methodology that you used to assess the PLO(s).

For example, "the department used questions that were inputted in the final examination pertaining directly to the <said PLO>. An independent group of faculty (not teaching the course) then evaluated the responses to the questions and gave the students a grade for responses to those questions."

Important: ***Please attach, at the end of this report, a copy of the rubric used for assessment.***

- **Methodology used (Natural Science Minor):**

  A total of 20 lab assignments were randomly selected from the laboratory part of Organic Chemistry II. The assignments were rated by a panel of two members of the assessment committee (Leslie Bach, Louise Goupil) using the rubric attached at the end of this report. The rubric had three criteria for assessing the learning outcome. Raters scored each criterion on a scale of 1-4, with scores indicating the following: 4—exceeds expectations, 3—meets expectations, 2—needs improvement, and 1—below expectations. Ratings of faculty members were averaged for each student lab report, and then these values were averaged across reports to determine an overall score for each criterion.

IV. RESULTS & MAJOR FINDINGS

What are the major takeaways from your assessment exercise?

This section is for you to highlight the results of the exercise. Pertinent information here would include:

a. **how well students mastered the outcome at the level they were intended to,**
b. **any trends noticed over the past few assessment cycles, and**
c. **the levels at which students mastered the outcome based on the rubric used.**

Results (Natural Science Minor):

Ratings of student assignments from Organic Chemistry II from the 2019-2020 assessment are shown in Table 1 in comparison to ratings of student assignments for General Biology I from the 2018-2019 assessment. Organic Chemistry II is typically taken later in the Natural Science Minor that is General Biology I, so this comparison can help show the effectiveness of the Natural Science Minor curriculum in enabling students to achieve learning outcomes. Ratings of work done in Organic Chemistry II showed improvement over ratings of work done in General Biology I. Ratings were lowest for Criterion 2: States results of investigation.

Table 1. Ratings of student lab reports for learning outcome #3: Apply the scientific process. Ratings are compared between General Biology I, generally taken at the beginning of the minor, and Organic Chemistry II, taken toward the end of the minor.

	Average Rating		% of Ratings $\geq$ 3.0	
	General Biology I	Organic Chemistry II	General Biology I	Organic Chemistry II
Criterion 1: States purpose of investigation.	2.65	3.05	40	90
Criterion 2: States results of investigation.	2.53	2.75	50	55
Criterion 3: Discusses relevance of results of investigation.	2.67	2.85	40	75

V. CLOSING THE LOOP

1. Based on your results, what changes/modifications are you planning in order to achieve the desired level of mastery in the assessed learning outcome? This section could also address more long-term planning that your department/program is considering and does not require that any changes need to be implemented in the next academic year itself.

Closing the Loop (Natural Science Minor):

General Biology I is typically taken early in the Natural Science Minor, and Organic Chemistry II is typically taken later in the minor. Between General Biology I and Organic Chemistry II students in the minor typically take General Biology II, General Chemistry I and II, and Organic Chemistry I, which are all required in the minor. Ratings of student work improved in all criteria used to assess the program learning outcome "apply the scientific method" between General Biology I and Organic Chemistry II, suggesting that the courses in the Natural Science Minor are effective in helping achieve this outcome. The lowest ratings in student work were from the second criterion, "states the results of the investigation;" however, ratings for this criterion also showed improvement between General Biology I and Organic Chemistry II.

Proficiency in applying the scientific methods improves with practice. When we evaluated the same learning outcome (apply the scientific method) in the Biology Major, ratings from of student work from an upper division course were substantially higher than ratings from the student work from General Biology I and Organic Chemistry II evaluated here for the Natural Science Minor, supporting the idea that practice and continued exposure improves competency. Overall results of our assessment suggest that students completing the Natural Science Minor do not have a fully developed proficiency for applying the scientific method, but the minor does help students develop a solid foundation for doing scientific work that can become more sophisticated and polished as they pursue their educational and career goals.

2. What were the most important suggestions/feedback from the FDCD on your last assessment report (for academic year 2018-2019, submitted in October 2019)? How did you incorporate or address the suggestion(s) in this report?

We evaluated student work from classes taken near the end of the Natural Science Minor rather than classes taken near the beginning of the minor to assess whether the minor was effective in helping students achieve learning outcomes.

ADDITIONAL MATERIALS

(Any rubrics used for assessment, relevant tables, charts and figures should be included here)

Rubric for learning outcome #3—Apply the scientific process.

RUBRIC CRITERIA	**PERFORMANCE STANDARDS**			
	Exceeds Expectations (1)	*Meets Expectations (2)*	*Needs Improvement (2)*	*Below Expectations (1)*
1. States purpose of investigation.	Provides accurate and concise yet detailed summary of investigation.	Provides accurate summary with adequate detail to understand investigation.	Summary is not accurate OR does not provide enough detail to understand investigation.	Summary is not accurate AND does not provide enough detail to understand investigation.
2. States results of investigation.	Clearly and concisely provides thorough and comprehensive summary of results, including correct usage of scientific notation.	Provides accurate summary of main results, including correct usage of scientific notation.	Summary of results has some inaccuracies or incorrect usage of scientific notation OR omits some of the main results.	Summary of results has some inaccuracies or incorrect usage of scientific notation AND omits some of the main results.
3. Discusses relevance of results of investigation.	Provides discussion of results that demonstrates sophisticated understanding of outcome of investigation.	Provides accurate discussion that demonstrates basic understanding of outcome of investigation.	Provides discussion that has minor inaccuracies OR that lacks full comprehension of outcome of investigation.	Provides discussion that is inaccurate AND does not demonstrate comprehension of outcome of investigation.