

<NAME OF YOUR PROGRAM/DEPARTMENT/MAJOR OR MINOR>

ASSESSMENT REPORT
ACADEMIC YEAR 2018 – 2019
REPORT DUE DATE: 11/01/2019

- Who should submit the report? – All majors, minors (including interdisciplinary minors), as well as 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 each assessment report not exceed 10 pages. Additional materials (optional) can be added as appendices.
- A curricular map should be submitted along with each assessment report (we suggest that the curricular map should be informed by recent assessment outcomes).

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 Young, byoung3@usfca.edu

2. Please indicate whether you are submitting report for (a) a Major, (b) a Minor, (c) a Major and Minor aggregated report (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. Have there been any revisions to the Curricular Map?

- 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 2018? 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 programs

- **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 2018? 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.

State the particular program learning outcome(s) you assessed for the academic year 2018-2019. What rubric did you use?

- **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.

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 score for responses to those questions.”

Important Note – WSCUC advises us to use “direct methods,” which consist of a direct evaluation of a student work product. “Indirect methods” like exit interviews or student surveys can be used only as additional complements to a direct method.

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 reports were randomly selected from the laboratory part of General Biology I. The reports described an experiment examining fermentation in yeast. The reports were rated by a panel of three faculty members using the rubric attached at the end of this report. The panel included three members of the Biology assessment committee (Louise Goupil, Scott Nunes, Brian Young). The rubric had four 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 asks 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.

To address this question, among many other options, one option is to use a table showing the distribution, for example:

Level	Percentage of Students
Complete Mastery of the outcome	8.7%
Mastered the outcome in most parts	20.3%
Mastered some parts of the outcome	66%
Did not master the outcome at the level intended	5%

Results (Natural Science Minor):

Learning Outcome #3: Apply the scientific process.

Ratings of student lab reports are shown in Table 1. Students' highest achievement was in criterion #2, describing experimental methods, meeting or exceeding expectations in 70% of cases. Student achievement was not as strong in criteria #1, #3, and #4, with only 40-50% of students meeting or exceeding expectations. These three criteria involved a slightly more sophisticated understanding of the experiment, assessing students' ability to explain the rationale behind the experiment and present and interpret results of the experiment.

Table 1. Ratings of student lab reports for learning outcome #3: Apply the scientific process.

	Average rating	% of ratings > 3.00
Criterion 1: States hypothesis and provides rationale for conducting the investigation.	2.65	40
Criterion 2: Describes methods used to conduct investigation. Provides sufficient detail for others to replicate the investigation and focuses on salient rather than non-essential details.	2.93	70
Criterion 3: Presents data collected during investigation. Clearly states results of investigation. Uses tables and graphs to summarize and illustrate results.	2.53	50
Criterion 4: Interprets results. Explains whether results support hypothesis. Discusses results in broad scientific context.	2.67	40

V. CLOSING THE LOOP: ACTION PLAN BASED ON ASSESSMENT RESULTS

1. Based on your analysis in Section 4, what are the next steps that you are 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 any changes to be implemented in the next academic year itself.

- **Closing the Loop (Natural Science Minor):**

Results of our assessment suggest that student achievement is higher in the more basic aspects of applying the scientific method, such as describing the methods of an experiment, but not as strong in the more sophisticated aspects such as explaining the theory behind an experiment or presenting and interpreting the results. Discussions of the Natural Science Minor are currently underway in the Biology Department. These discussions will evaluate how well the learning outcomes adequately reflect what students learn and achieve in completing the minor. We will discuss whether it can reasonably be expected for a student to have a sophisticated ability to apply the scientific method after completing the Natural Science Minor, and if so how it might be possible to help students gain a more well developed fluency with the scientific method, and if not what might be a more realistic learning outcome related to fluency with the scientific process.

2. What were the most important suggestions/feedback from the FDCD on your last assessment report (for academic year 2017-2018, submitted in October 2018)? How did you incorporate or address the suggestion(s) in the more recent assessment discussed in this report?

- **Suggestions (Natural Science Minor):**

- For 2017-2018 we assessed learning outcome #1 (Demonstrate both in-depth and broad knowledge of the concepts that comprise the biological sciences. It was suggested that the assessment committee continue discussion related to improving student achievement related to this outcome. The Biology department currently has a committee, which includes three members of the Biology assessment committee, reviewing General Biology I and General Biology II. The committee so far has come up with suggestions such as reducing the amount of detail covered in these classes and spending more time making

sure students have a strong grasp of basic concepts, and spending more time integrating topics so that students can better comprehend how they relate to each other.

VI. BIG PICTURE

What have you learned about your program from successive rounds of assessment? Is a picture of the whole program starting to emerge? For example, what areas of strength have emerged? What opportunities of improvement have you identified?

- **Big Picture (Natural Science Minor):**

The Natural Science Minor is housed in the Biology Department, but also includes courses in Chemistry and Physics. As part of a big picture review, the Biology Department is currently discussing the Natural Science Minor, focusing on which courses fit best into the minor and what learning outcomes students can be realistically expected to achieve after completing the minor.

VII. Feedback to your Assessment Team

What suggestions do you have for your assessment team (the Faculty Directors of Curriculum Development and the Associate Dean for Academic Effectiveness)? What can we do to improve the process?

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			
	<i>Exceeds Expectations (1)</i>	<i>Meets Expectations (2)</i>	<i>Needs Improvement (2)</i>	<i>Below Expectations (1)</i>
1. States hypothesis and provides rationale for conducting the investigation.	States hypothesis clearly. Provides detailed and insightful rationale for investigation.	States hypothesis and provides sufficient background to understand rationale for investigation.	Does not state hypothesis OR does not provide adequate context to understand rationale for investigation.	Does not state hypothesis AND does not provide sufficient background to understand rationale for investigation.
2. Describes methods used to conduct investigation. Provides sufficient detail for others to replicate the investigation and focuses on salient rather than non-essential details.	Describes methods in comprehensive detail so that investigation can be easily replicated. Identifies materials and quantities used. Does not include superfluous or unimportant details.	Provides adequate but not extensive description of methods. Identifies materials and quantities. Unimportant details are minimal.	Explains methods, but omits some important details. OR does not include complete description of materials and quantities. OR includes many unimportant details.	Does not sufficient detail to replicate investigation AND omits description of materials and quantities.
3. Presents data collected during investigation. Clearly states results of investigation. Uses tables and graphs to summarize and illustrate results.	Clearly and concisely states salient results of investigation. Includes tables and graphs that are correctly formatted, summarize data without restating raw data, and have captions that concisely describe the data presented.	States salient results of investigation. Includes graphs and tables with only minor formatting errors and that summarize data without restating raw data and have captions that adequately describe data.	Omits some salient results of investigation. OR includes graphs and tables with major formatting errors. OR has graphs that incorrectly summarize data or restate raw data. OR has graphs with captions that do not correctly explain data.	Omits salient results AND has graphs and tables that do not accurately summarize data.
4. Interprets results. Explains whether results support hypothesis. Discusses results in broad scientific context.	States whether results support hypothesis. Provides comprehensive and correct explanation of results. Explains results in detailed context of related scientific findings.	States whether results support hypothesis. Provides correct but not comprehensive explanation of results.	Does not state whether results support hypothesis. OR provides incorrect explanation of results.	Does not state whether results support hypothesis AND incorrectly explains results.

