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

---

- **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
     - Brain Thornton, brthronton@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 Biology Major.

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 Curricular Map is attached and has not been updated since the last assessment cycle.

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 Major; the mission statement has not been revised since the last assessment cycle:**

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 (Biology Major; the program learning outcomes have not been revised since the last assessment cycle:**

  Upon graduation, students who complete the Biology Major requirements should be able to meet the following learning outcomes:

  1. Demonstrate both in-depth and broad knowledge of the concepts that comprise the biological sciences.
  2. Apply the scientific process, including designing and conducting experiments and testing hypotheses.
  3. Perform laboratory, field, and analytical techniques.
  4. Discuss and critically review scientific papers and prepare oral and written reports in a standard scientific format.
  5. Demonstrate an awareness of the significance ethics plays in the biological sciences.

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

PLO(s) being assessed (Major/Graduate/Certificate):

- PLO being assessed (Biology Major):

  2. Apply the scientific process, including designing and conducting experiments and testing hypotheses.

The rubric used to assess this learning outcome is attached.

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 Note – WSCUC advises us to use "direct methods" which relate to a direct evaluation of a student work product. "Indirect methods" like exit interviews or student surveys can be used only as additional l complements to a direct method.

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

- **Methodology used (Biology Major):**

  A total of six laboratory reports were collected from General Microbiology, an upper division elective course in the Biology Major. The reports described group research projects designed and conducted by students in the class. The reports included the hypothesis evaluated in the project, the methods used to evaluate the hypothesis, and presentation, interpretation, and discussion of data collected in the course of the project. The reports ranged in length from 31-41 pages, single-spaced with figures and tables.

  Reports were rated by two members of the assessment committee with background in microbiology (Brian Thornton and Brian Young). Ratings were based on the attached rubrics, which had multiple criteria for assessing each outcome. Raters scored each of the criteria on a scale of 1-4, with scores indicating the following: 4—exceeds expectations, 3—meets expectations, 2—needs improvement, and 1—below expectations. For each report, rater's scores were averaged to obtain a score for the report, and then scores were averaged across reports to determine an overall score for each criterion used to evaluate the learning outcome.

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 (Biology Major):

Ratings of student research reports are summarized in Table 1. Students were able to meet expectations for describing methods used in their investigations in all cases. In 86% of cases, students were able to meet expectations for stating and explaining their hypothesis, presenting data, and discussing data; one of the six reports was deficient in these three criteria.

The lowest overall rating was lowest for criterion 3—presenting data and results. According to comments from one of the reviewers (see below), students had difficulty editing their results and presenting tables and graphs that most clearly and concisely illustrated their salient findings. Overall, ratings were fairly high for the other three criteria.

Table 1. Ratings of student research reports for Biology Learning Outcome #2—Apply the scientific process, including designing and conducting experiments and testing hypotheses.

	Average rating	% of ratings $\geq$ 3.00
Criterion 1: States and explains hypothesis.	3.58	83.3%
Criterion 2: Describes methods used to evaluate hypothesis.	3.58	100%
Criterion 3: Presents data collected during investigation.	3.08	83.3%
Criterion 4: Interprets and discusses data.	3.33	83.3%

Comments from one of the raters (Brian Thornton):

These papers were impressive and represented considerable independent work on the part of students, both in terms of experimental protocols followed and research done on their study. Where students seemed to struggle was mostly in presentation of methods and results, where they tended to over-communicate large amounts of information without editing it down to the essentials. It might be helpful to consider hard limits on length for sections, for students to have to make hard choices about what to cut and what to keep. That being said, since this assessment is not for scientific writing but for design of experiments, I'd consider these reports all largely successful, with one exception where the student seems to have turned in a largely unfinished assignment.

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 (Biology Major):

Competence in applying the scientific method requires practice. Students in the Biology major are first exposed to the scientific method in General Biology, and gain further exposure in practice in scientific investigation throughout their coursework in the major. Biology courses expose students to the scientific method through reading and evaluating scientific papers, conducting experiments, and writing lab reports. Results of our assessment suggest that this approach of integrating the scientific method in various ways throughout the Biology curriculum has been effective. Students nearing the end of the program were able to demonstrate proficiency in devising and carrying out investigations and interpreting and discussing their results. The student work that was rated had some weaknesses, notably a lack of editing of the presentation of data to focus on points that best illustrate results of the investigation. However, our assessment also provided confirmation that our approach to teaching the scientific method provides students with a solid foundation for applying the scientific method that can become more sophisticated and polished as they pursue their educational and career goals beyond their undergraduate experiences.

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?

In our assessment effort, we attempted to keep the methods straightforward. For example, all student work was rated by the same two raters, and we did not include faculty members who taught the course from which student work was collected on the panel that rated the student work. We also evaluated work from students in an upper division class and thus near completion of the program to assess whether the program was effective in helping students achieve the program's outcomes.

ADDITIONAL MATERIALS

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

See below.

Students will be able to **2) Apply the scientific process, including designing and conducting experiments and testing hypotheses.**

RUBRIC CRITERIA	**PERFORMANCE STANDARDS**			
	Exceeds Expectations (1)	*Meets Expectations (2)*	*Needs Improvement (2)*	*Below Expectations (1)*
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.