

<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, FDCC, Arts – [adamati@usfca.edu](mailto:adamati@usfca.edu)
2. Prof. John Lendvay, FDCC, Sciences – [lendvay@usfca.edu](mailto:lendvay@usfca.edu)
3. Prof. Mark Meritt, FDCC, Humanities – [meritt@usfca.edu](mailto:meritt@usfca.edu)
4. Prof. Michael Jonas, FDCC, Social Sciences – [mrjonas@usfca.edu](mailto:mrjonas@usfca.edu)
5. Prof. Suparna Chakraborty, AD Academic Effectiveness – [schakraborty2@usfca.edu](mailto: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](mailto: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

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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](mailto:nunes@usfca.edu)
  - Assessment Committee:
    - Leslie Bach, [lbach@usfca.edu](mailto:lbach@usfca.edu)
    - Louise Goupil, [lgoupil@usfca.edu](mailto:lgoupil@usfca.edu)
    - Brian Young, [byoung3@usfca.edu](mailto: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 Biology Major.
  
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 Biology Major is attached, and was last updated in October of 2018.

## II. MISSION STATEMENT & PROGRAM LEARNING OUTCOMES

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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 Major; the mission statement was last revised in spring of 2017):**

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 (Biology Major; the program learning outcomes were last revised in spring of 2017):**

Upon graduation, students who complete the Biology Major requirements should be able to meet the following program 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.

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

- **PLO(s) being assessed (Biology Major):**

- 1) Demonstrate both in-depth and broad knowledge of the concepts that comprise the biological sciences.
- 4) Discuss and critically review scientific papers and prepare oral and written reports in a standard scientific format. (Note: Assessment focused on oral reports; written reports and review of scientific papers have been assessed in prior years.)

The rubrics used to assess these learning outcomes are 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 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 (Biology Major):**

A total of 17 oral presentations were recorded in three upper division elective Biology courses: Ecology, Comparative Animal Physiology, and Comparative Anatomy. These upper division courses were selected because they had students nearing completion of the Biology Major, and because oral presentations were a mode of assessment within the courses. Oral presentations in courses were made in groups of 1-5 students, with all students in the group speaking during the presentation. Student presentations included both longer talks of 30-40 minutes (Ecology, Comparative Animal Physiology) and shorter talks of 5-10 minutes (Comparative Anatomy).

Video recordings of talks were rated by three members of the assessment committee. We note that because of a mix up one committee member viewed the wrong set of videos, so four of the videos were rated by two committee members, seven of the videos were rated by three committee members, and six of the videos were rated by all four committee members. Ratings were based on the attached rubrics, which had multiple criteria for assessing each 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. Raters assigned scores based on the overall group presentation rather than the components of the talks presented by each student. Ratings of committee members were averaged for each presentation, and then these values were averaged across presentations to determine an overall score for each criterion within each learning outcome.

## 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:

- how well students mastered the outcome at the level they were intended to,
- any trends noticed over the past few assessment cycles, and
- 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 (Biology Major):

#### Learning Outcome #1: Demonstrate both in-depth and broad knowledge of the concepts that comprise the biological sciences.

Ratings of student oral presentations are shown in Table 1. Students were able to meet expectations for explaining scientific concepts in all of the work rated, and were able to meet expectations for expressing broad knowledge in 76.5% of cases. These results suggest that students are achieving outcome #1.

Table 1. Ratings of students in upper division Biology electives for Biology Learning Outcome #1— Demonstrate both in-depth and broad knowledge of the concepts comprising the biological sciences.

	Average rating	% of ratings $\geq$ 3.00
Criterion 1: Explains scientific concepts and principles.	3.20	100
Criterion 2: Expresses knowledge in a broad range of biological topics.	3.10	76.5

We compared data from 2018-2019 assessing learning outcome #1 in upper division electives with data from 2017-2018 assessing learning outcome #1 in the foundational classes that all Biology majors take prior to enrolling in upper division electives: General Biology I, General Biology II, Cell Physiology, and Genetics. This comparison is shown in Table 2 and Table 3. We made this comparison to help assess the effectiveness of the foundational courses in preparing students for upper division coursework. Ratings were higher in upper division electives compared to foundational courses. This result is consistent with students being able to apply and build upon the knowledge they gain in foundational courses. This result also affirms that attaining knowledge is an ongoing process that is strengthened by establishing a solid foundation.

Table 2. Comparison of average ratings among foundational courses and upper division electives for Biology Learning Outcome #1—Demonstrate both in-depth and broad knowledge of the concepts that comprise the biological sciences.

	Average rating				
	General Biology I*	General Biology II*	Cell Physiology*	Genetics*	Upper Division
Criterion 1: Explains scientific concepts and principles.	2.93	2.73	2.95	3.05	3.20
Criterion 2: Expresses knowledge in a broad range of biological topics.	2.90	2.85	2.95	2.75	3.10

\*Data are from 2017-2018 assessment.

Table 3. Comparison of percentage of ratings > 3.0 among foundational courses and upper division electives for Biology Learning Outcome #1—Demonstrate both in-depth and broad knowledge of the concepts that comprise the biological sciences.

	% of ratings $\geq$ 3.0				
	General Biology I*	General Biology II*	Cell Physiology*	Genetics*	Upper Division
Criterion 1: Explains scientific concepts and principles.	65	50	60	80	100
Criterion 2: Expresses knowledge in a broad range of biological topics.	65	50	50	40	76.5

\*Data are from 2017-2018 assessment.

**Learning Outcome #4: Discuss and critically review scientific papers and prepare oral and written reports in a standard scientific format (focus on oral presentations).**

Ratings on student oral presentations are shown in Table 4. In all of the student work assessed, students were able to meet expectations for presenting accurate information relevant to the topic of the presentation. Students met expectations in fewer cases in the stylistic elements of making an oral presentation such as organizing and clearly explaining information and using visual aids to illustrate points. However, a high percentage of students were able to meet expectations in presenting accurate information related to the topic. Overall, students demonstrated basic skills in oral communication which will likely become more polished with practice and experience.

Table 4. Ratings for Biology Learning Outcome #4 Discuss and critically review scientific papers and prepare oral and written reports in a standard scientific format (with focus on oral reports).

	Average rating	% of ratings $\geq$ 3.00
Criterion 1: Presents information in a well-organized and logical manner and clearly explains information.	2.93	82.4
Criterion 2: Presents accurate information relevant to topic.	3.05	100
Criterion 3: Includes visual aids that illustrate salient points of talk.	2.93	70.6

## 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 (Biology Major):**

The primary curricular adjustments being currently undertaken by the department are revisions to the foundational courses. Results of assessment of learning outcome #1 over the past two years indicate that foundational courses provide a solid framework upon which students are able to build as they progress through the major. However, a sizeable percentage of students in foundational courses do not meet expectations for learning outcome #1. We hope to make adjustments to these foundational courses that will strengthen the footing that students have for acquiring knowledge, developing communication skills, and achieving other learning outcomes in their future coursework.

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 (Biology Major):**

- For 2017-2018 we assess learning outcome #1 (demonstrate both in-depth and broad knowledge of the concepts that comprise the biological sciences) using data from foundational courses. It was suggested that we assess this outcome using data from courses students take closer to the time of graduation to get a better idea of whether an outcome had been achieved at the end of the program. For 2018-2019 we used data from upper division electives that had seniors enrolled in them to assess learning outcome #1. We were also able to use the data from 2017-2018 in conjunction with the data from 2018-2019 to assess whether foundational courses were effective in preparing students for upper division courses.
- For 2017-2018 we submitted an aggregate report for the Biology Major and Biology Minor. The learning outcomes were the same for the Biology major and minor, so there was no separate discussion of the major and minor in the report. It was suggested that we have separate analyses of how the data relate to the major and minor. For 2018-2019 we are submitting separate reports for the major and minor.



## 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 (Biology Major):**

Data from assessment is considered along with discussions in department meetings, observations by faculty members and many other factors to determine ways for the department to best help students achieve the learning outcomes that will help students be successful in their endeavors after graduating. The main area for improvement that has been identified among faculty members is the preparation provided by foundational courses. The department is currently exploring ways in which to reduce overlap between foundational courses to better allow for the full range of foundational topics to be covered in the classes. The department is also exploring ways to improve the way foundational topics are presented to students, for example by integrating presentation of classification, ecology, and physiology to emphasize that the diverse range of topics students learn have actual applications, and help students appreciate that establishing a strong foundations will have important uses as they advance academically and professionally.

## 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)

The Biology curriculum map is attached in a separate Excel file.

Rubric for learning outcome #1—Demonstrate both in-depth and broad knowledge of the concepts that comprise the biological sciences.

RUBRIC CRITERIA	PERFORMANCE STANDARDS			
	<i>Exceeds Expectations (4)</i>	<i>Meets Expectations (3)</i>	<i>Needs Improvement (2)</i>	<i>Below Expectations (1)</i>
<b>Explains scientific concepts and principles.</b>	Accurately explains scientific concepts while demonstrating understanding and insight (e.g., depth of analysis, cleverness, originality, thoroughness)	Accurately explains scientific concepts.	Explains scientific concepts with limited accuracy.	Does not explain scientific concepts, or makes excessive errors.
<b>Expresses knowledge in a broad range of biological topics.</b>	Expresses comprehensive knowledge within a wide variety of areas in biology.	Expresses competent knowledge within a wide variety of topics, with comprehensive knowledge of some topics.	Expresses competent knowledge within a range of biological topics, with limited knowledge of some topics.	Expresses knowledge within a limited range of topics.

Rubric for learning outcome #4—Discuss and critically review scientific papers and prepare oral and written reports in a standard scientific format (with focus on oral reports).

RUBRIC CRITERIA	PERFORMANCE STANDARDS			
	<i>Exceeds Expectations (4)</i>	<i>Meets Expectations (3)</i>	<i>Needs Improvement (2)</i>	<i>Below Expectations (1)</i>
<b>Presents information in a well-organized and logical manner and clearly explains information.</b>	The purpose of the talk and relevance of the topic are clearly and concisely explained. Information is presented in a logical sequence. Potentially difficult concepts are explained lucidly and in detail.	The information is presented in a logical sequence, and potentially difficult concepts are explained clearly.	Some information is not presented in a logical sequence OR some potentially difficult concepts are not adequately explained.	Information is not presented in a logical sequence AND potentially difficult concepts are not adequately explained.
<b>Presents accurate information relevant to topic.</b>	Information is provided in comprehensive detail with no errors.	Information is provided in sufficient detail to evaluate topic, but is not comprehensive and may have minor omissions or errors.	Information has some inaccuracies, OR does not fully evaluate topic.	Information has some inaccuracies AND does not fully evaluate topic.
<b>Includes visual aids that illustrate salient points of talk.</b>	Visual aids enhance information in talk and do not merely duplicate information. Visual aids relate to important points in talk. Visual aids provide sufficient information to illustrate points but do not provide excessive details that distract audience.	Visual aids illustrate important points in talk. Visual aids enhance talk rather than distract audience or merely duplicate information in talk.	Visual aids are not related to points discussed in talk. OR visual aids do not enhance talk but rather duplicate information in talk or act as a distraction.	Visual aids are not related to points discussed in talk. AND visual aids do not enhance talk but rather duplicate information in talk or act as a distraction.