UNIVERSITY OF SAN FRANCISCO | College of Arts and Sciences

ASSESSMENT REPORT REMOTE/DISTANCE LEARNING

MS in Biology

ACADEMIC YEAR 2019 - 2020

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).**

Naupaka Zimmermann (nzimmerman@usfca.edu) – Program Director

2. **Please indicate if you are submitting report for (a) a Major, (b) a Minor, (c) an aggregate report for a Major and Minor (in which case, each should be explained in a separate paragraph as in this template), (d) a Graduate or (e) a Certificate Program.**
   Please also indicate which report format are you submitting –Standard Report or Reflections Document

Graduate program—Master of Science in Biology. This is a reflections document.

3. **Have there been any revisions to the Curricular Map in 2019-2020 academic year? If there has been a change, please submit the new/revised Curricular Map document.**

No changes or revisions in 2019–2020.

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 <u>an aggregate report, please provide the current mission statements of both the major and the minor program</u>

Mission Statement (Major/Graduate/Certificate):

No change in the Mission Statement.

The MS graduate program in Biology offers a research-intensive experience for post–baccalaureate students in a focused field of Biology. The program seeks to prepare students for further postgraduate work or a technical research profession by developing proficiency in scientific research through critical thinking, inquiry, analysis, teaching, and communication.

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 <u>an aggregate report, please provide the current PLOs for both the major and the minor programs.</u>**

   Note: Major revisions in the program learning outcomes need to go through the College Curriculum Committee (contact: Professor Joshua Gamson, <u>gamson@usfca.edu</u>). Minor editorial changes are not required to go through the College Curriculum Committee.

   PLOs (Major/Graduate/Certificate):

   No changes were made to the PLOs in AY 2019-2020.

Learning outcomes	Assessment strategies
PLO1. Describe, synthesize, & apply concepts and techniques in the current literature within a specific research area.	• Directed Reading (BIOL 695) • Graduate Seminar (BIOL 600) • Graduate course electives
PLO2. Develop mastery of content through direct instruction of basic biological concepts.	• Teaching evaluations • Supervisor evaluations
PLO3. Conduct original research, evaluate data, & demonstrate research skills within a specified research area.	• Biannual progress reports of research performance • Directed Research (BIOL 698) • Assessment of committee members
PLO4. Communicate results of independent scientific inquiry through oral & written discourse.	• Thesis writing (BIOL 699) • Thesis outline assessment • Final thesis evaluation • Assessment of committee members

1. **What elements of the program were adaptable to a remote/distance learning environment?**

In terms of research projects, many students had to work with their advisors and thesis committees to rethink what would be possible in terms of their thesis research projects given the new constraints. Some students had to abandon their old projects completely and start over from scratch working on computational projects that could be completed entirely remotely. I think in some cases these new computational projects are entirely compatible with the goals and learning outcomes of the program, while other projects that involve molecular lab work or extensive field work are not easily converted or substituted for in a remote environment, and expectations had to be adjusted by both the student and their committee. The teaching component of the program adapted as well for the students in the program as it did for faculty nationwide—we all made it work but it was less than ideal. The thesis writing and presentation components were easily adapted to a remote format; these are generally prepared by students working individually.

2. **What elements of the program were not adaptable to a remote/distance learning environment?**

As the MS Biology program is heavily research based, it was difficult in many cases for students to be able to progress with their research during the most restrictive shutdown periods of the last year. Students in the program generally take around 2 four-unit courses in addition to their lab or field research, and these classes were subject to the same challenges facing science classes at many other levels. The wet lab skills or field research trips were not possible to take; these types of learning experiences are hard if not impossible to translate into a distance learning environment.

3. **What was the average proportion of synchronous versus asynchronous learning for your program or parts thereof? A rough estimate would suffice.**

Much of the work in the program is done by students working independently, so they can do this whenever their schedule allows (Directed Reading, Directed Research, Thesis Writing) even in normal years. This could be considered asynchronous, although in many cases it does require access to the research lab space to do that independent work, so it is asynchronous but not remote. The regular meetings with students' thesis advisors are synchronous, because the entire point is to give specific and targeted feedback to the student throughout the entire research process, but these can be remote in many cases. If I had to estimate, half of the 12 units for each student each year were in normal class settings, which were generally synchronous remote, and half of the units were directed studies or research, which are generally more asynchronous (and often not remote) with regular meetings for discussion between advisor and advisee (remote).

4. **For what aspects of learning is synchronous instruction effective and for which ones is asynchronous instruction more effective?**

For directed research graduate programs such as this one, the individual 1-on-1 training in research, including literature assessment, experimental design, experimental execution, and data analysis and writing up results are necessarily a combination of asynchronous work done by the student and synchronous meetings for feedback from the advisor. This doesn't change regardless of the pandemic circumstances. The meetings could often but not always be conducted remotely with only minor loss in quality.

5. **As remote/distance learning continues in the current environment, what changes has the program instituted based on experiences with remote instruction?**

Through concerted effort to coordinate with the Dean's office and the SF Dept of Public Health, we were able to get permission for single occupancy use of the research laboratories by late summer, so that students could continue their lab research despite much else being done online. This was essential to allow students to progress in the program. Since we are a small program (only 12 students total in all cohorts), we were able to develop schedules to avoid any overlap in shared spaces, and had students go through a training session on the rules for safe conduct when on campus and in the research spaces. This has enabled students to continue their research in a way that would have otherwise been impossible. Given the short 2-year duration of our program, not being able to have access to the laboratory spaces, equipment, or samples for more than a year would have severely jeopardized the ability of students to complete their research and complete the program. Committee meetings and thesis defenses have become entirely remote, which works well because it enables more people to join from distant locations but lack some of the feeling of going through these professional milestones in person. In the yearly required 1-unit graduate Research Writing and Methods section, we spent some time this fall focused on how students can communicate more effectively with their advisors and committee members when working in a remote and often asynchronous environment.

OPTIONAL ADDITIONAL MATERIALS

(Any relevant tables, charts and figures, if the program so chooses, could be included here)

Despite the challenges of remote learning, more than half of the students in our program were able to present their research at national or international conferences (held virtually online) over the past year. This is obviously not the same experience as being at a large professional research conference in person, but students still were able to share their work, get feedback, and network with colleagues.