**Annual Assessment Report**

Assessment year: 2015-16
College: Arts & Sciences
Degree program: MS in Biology

**Mission Statement (updated 5/2016):**

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.

**Program Learning Outcomes (updated 5/2016)**:

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

**Summary of Assessment Plan 2015-16:**

The MS in Biology Program sought to determine if students are gaining the skills to successfully communicate the results of independent scientific investigation conducted in research laboratories at USF by evaluating former *PLO9—Upon completion of the MS in Biology program, students will be able to communicate results of independent scientific inquiry through both oral & written discourse*. [Note that current program outcomes listed on page 01 have been modified based on comments from the University Assessment Committee to be more concise and less in number. The 2015-16 assessment plan evaluated current PL04.]

To assess this program learning outcome, panels of faculty members used rubrics to evaluate student work at USF's Creative Activity and Research Day (CARD) and oral presentations in the Spring 2016 Biology Seminar Series. All 2nd year MS students are required to present poster presentations at CARD and oral presentations in Biology Seminar. Rubrics were developed by the program director based on presentation standards at typical biological research societies, specifically those adopted by the Society for Integrative and Comparative Biology; rubrics were evaluated/approved by members of the Biology graduate committee. All faculty evaluators assessed all 2nd year MS students at both CARD and in Biology Seminar.

**Assessment results**:

Faculty evaluators were enlisted on a volunteer basis and included Drs. Ammon Corl, Darcy Ernst, Leslie King, and Mary Jane Niles (full time faculty members in the USF Biology Department). Poster presentations at CARD were evaluated on content, presentation, and abstract. The mean overall score for poster presentations was 42/55 with subsection assessment results as Content—4/5; Presentation—3.9/5; Abstract—3/5. Oral presentation at Biology Seminar were evaluated on content and presentation with a mean overall score of 38/50 with subsection assessment results as Content—3.8/5; Presentation—3.8/5). On average, faculty members rated posters in the top 50%-top 25% relative to other presentations given by graduate students at other venues, including scientific conferences. However, a few students were routinely evaluated well below these standards with poor presentation skills and abstract composition. These data suggest that some MS students are adequately meeting this program learning outcome, yet it was evident that some students are not gaining the skills necessary to effectively present scientific data through oral and written discourse.

Much of the preparation to meet this program learning outcome occurs as part of independent study courses (BIOL 695—Directed Readings & BIOL 699—Thesis Writing), which are developed and taught by research professors and principal investigators of each research group in the biology department. While common standards are provided to all faculty members, it seems that some students fail to gain the skills necessary as part of these directed study courses. The graduate director in collaboration with the Biology

graduate committee seeks to provide more direct instruction to meet this program learning outcome.

We propose the development of a pilot 1-unit graduate-level course that will specifically prepare students to gain skills in both writing and presenting scientific data. The 1-unit course will be field tested among all incoming MS students and taught for the first time in Fall 2016 by the program director with feedback from the graduate committee. The course will be designed to teach basic skills in abstract writing, proposal writing, and poster and oral presentation. Students will be evaluated using a diagnostic assessment rubric early in the course and again will be evaluated on presentation skills and research methodologies at the conclusion of the course. If the course meets these goals it will be submitted to the curriculum committee as an added requirement for the MS program in Biology. A tentative schedule of the fall course is attached; the course syllabus will be further refined during the remaining summer months.

**Attachments:**

Poster Presentation Rubric
Oral Presentation Rubric
Intro to MS in Biology course schedule (tentative)

# MS Program in Biology
# Faculty Assessment
# POSTER PRESENTATION

**Student Name _____ Poster No. _____**

Please rate each of the 11 categories from **1 (poor) to 5 (outstanding**). 5: in the top 5% of all posters ever seen, 4: top 25% of all posters, 3: top 50% of all posters, 2: top 75% of all posters, 1: poor relative to other posters

**CONTENT:**

1. **Objectives:** Were research objectives clearly stated? Was all background information relevant? Was sufficient background information given? _____
2. **Research Design:** Were methods and experiments/observations appropriate to the research objectives? _____
3. **Data Analysis and Conclusions:** Were data analysis and conclusions appropriate to the data and research objectives? _____
4. **Thoroughness:** Did methods, analyses, and conclusions indicate a thorough and technically sound study? _____
5. **Creativity and Significance of Research** _____

**PRESENTATION:**

6. **Layout:** Was poster layout well organized and easy to follow? _____
7. **Text:** Was text, especially methods and results, presented clearly and concisely, and not excessive? _____
8. **Graphics:** Were tables, graphs, photographs, etc., clear and easy to interpret? _____
9. **Discussion:** Did presenter explain the poster clearly and knowledgeably? _____
10. **Response to Questions**: Did presenter respond effectively to questions from the judge or viewers? _____

**ABSTRACT:**

11. Clear statement of the question and where the question comes from? Clear summary of approach? Informative summary of results and conclusions? _____

**TOTAL (55 pts. max.)** _____

# MS Program in Biology
# Faculty Assessment
# ORAL PRESENTATION

**Student Name _____**

Please rate each of the 11 categories **from 1 (poor) to 5 (outstanding)**, 5: in the top 5% of all talks ever seen, 4: top 25% of all talks, 3: top 50% of all talks, 2: top 75% of all talks, 1: poor relative to other talks

**CONTENT:**

1. **Objectives:** Were research objectives clearly stated? Was all background information relevant? Was sufficient background information given? _____

2. **Research Design:** Were methods and experiments/observations appropriate to the research objectives? _____

3. **Data Analysis and Conclusions:** Were data analysis and conclusions appropriate to the data and research objectives? _____

4. **Thoroughness:** Did methods, analysis, and conclusions indicate a thorough and technically sound study? _____

5. **Creativity and Significance of Research** _____

**PRESENTATION:**

6. **Organization:** Was presentation well organized and easy to follow? _____

7. **Clarity:** Were procedures, data, and concepts explained clearly and concisely? _____

8. **Delivery:** Did the presenter speak clearly, knowledgeably, and at an appropriate pace, avoid distracting mannerisms, and hold the audience's attention? _____

9. **Visual Aids:** Were visual aids used effectively? Were they clear and easy to read or interpret? _____

10. **Response to Questions**: Did presenter respond effectively to questions from the audience? _____

**TOTAL (50 pts. max.)** _____

# UNIVERSITY OF SAN FRANCISCO
# DEPARTMENT OF BIOLOGY

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## BIOL 6xx—Introduction to MS in Biology

## FALL 2016

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|---|---|
| Course Number: | BIOL6xx |
| Credits: | 1.0 |
| Location: | TBA |
| Meeting Times: | Wednesdays, 1:00am-2:00pm |
| Instructor: | Prof. James Sikes |
| Office: | Harney Science Center, Room 315 |
| Telephone: | 415-422-6367 |
| E-mail: | jsikes@usfca.edu |
| Office Hours: | TBA |

**COURSE DESCRIPTION:**

This course will provide new graduate students joining the MS program at USF an opportunity to gain valuable skills in the methodologies of scientific research and the presentation of independent research. Students will develop writing and presentation skills through the preparation of a research proposal and group presentations. Students and the instructor will meet weekly to discuss readings, presentation strategies, and research preparation. Assessment will occur via oral discussions, interpretation of data/figures, written abstracts and a formal research proposal that will be submitted to the NSF graduate research fellowship program.

**COURSE GOALS & LEARNING OUTCOMES:**

My goals are for students in this course are:

(i) to develop a critical ability to read the primary literature and develop research projects based on current knowledge in the field;
(ii) to interpret figures and conclusions from novel scientific research;
(iii) to gain skills in critical analysis of the literature and oral communication;
(iv) to gain skills in written discourse including abstract, poster, and proposal preparation.

Grading scale:

| | | |
|---|---|---|
| A+ 100-97% | A 96-93% | A- 92-90% |
| B+ 89-87% | B 86-83% | B- 82-80% |
| C+ 79-77% | C 76-73% | C- 72-70% |
| D+ 69-67% | D 66-63% | D- 62-60% |
| F < 60% | | |

**ACADEMIC HONESTY:**

From the USF catalog: “The University expects students to be honest in their academic work. Academic dishonesty is viewed as an ethical issue and a violation of the principles of justice and personal responsibility inherent in the University's ideals as expressed in its Statement of Mission

and Goals. In particular, students must refrain from plagiarism, cheating and collusion in connection with examinations and must acknowledge fully all sources and all assistance received in work submitted to the faculty for evaluation."

Plagiarism of any assignments or exams will not be tolerated. You may not copy any part of anyone else's work and present it as your own. Any plagiarism or cheating will result in a grade of F for the course, and a report will be submitted to the Dean resulting in a permanent record of the incident in your academic file. If you observe someone else cheating, you also have the responsibility to bring this situation to the instructor's attention.

**LEARNING DISABILITY SERVICES:**

Pursuant to the Americans with Disabilities Act and Section 504 the Rehabilitation Act, students with disabilities who will need reasonable accommodations for this course should contact Disability Related Services (415) 422-2613 within the first two weeks of this course. Students with Learning Disabilities may contact Learning Disability Services (415) 422-6876.

**READING SCHEDULE:**

| DATE | TOPIC |
|---|---|
| 24 Aug | Introduction |
| 31 Aug | Concept maps; Research design; Setting realistic expectations; Building frameworks for success |
| 07 Sept | Mechanics of proposal writing; Funding & research environments; Abstract development |
| 14 Sept | Conducting a literature review; References; Developing a bibliography and properly citing sources |
| 21 Sept | Art of producing effective & publishable figures and tables |
| 28 Sept | Basic biostatistical methods |
| *05 Oct* | Career development; CV and resume development |
| *12 Oct* | Proposal completion; peer review |
| 19 Oct | Oral presentation of research proposals |
| 24 Oct | ***NSF GRFP due via FastLane*** |
| 26 Oct | Developing an "elevator" talk |
| 02 Nov | Peer review; oral presentation of "elevator" talks |
| 09 Nov | Developing effective scientific posters |
| *16 Nov* | Development of research posters |
| 23 Nov | Peer review; Presentatation of posters |
| 30 Nov | Ethics is biological research |
| 07 Dec | Attaining success in biological research; Tips and strategies |