

PROGRAM ASSESSMENT REPORT

AY 2008-2009

Report Date: 10 June 2009

School/College: Arts and Sciences

Department/Program: Biology/Graduate Program

Person completing the Report: Jennifer Dever

1. **Overview Statement:** Briefly summarize the assessment activities that were undertaken this academic year, indicating:

a. Which program learning outcomes were assessed this year.

1A) Describe, synthesize and apply concepts & techniques in the current literature within a specific research area.

1B) Ask scientific questions based upon the literature and construct research hypotheses and design experiments to test hypotheses.

2A) Select and meet with graduate committee members. 2B) Conduct original research, demonstrating research skills within the specified research area and evaluate collected data.

3) Prepare a written thesis to be reviewed and accepted by the graduate committee. The thesis will consist of the following sections: Introduction, Materials and Methods, Results, Discussion and References.

4) Present findings in a public format accepted by the graduate committee members.

b. Who in your department/program was involved in the assessment of the above learning outcomes.

Jennifer Dever, Chair of graduate program and Thesis Advisor for graduate student Ryan Peek
Christina Tzagarakis-Foster, Thesis Advisor for graduate students Matt Boitano and Lhia Delores
Scott Nunes, Thesis Advisor for graduate student Mikael Langner

2. Please Answers the Following Questions for Each of the Student Outcomes Assessed:

a. What did you do?

Describe clearly and concisely how you assessed the learning outcomes that were evaluated this year (e.g., measures, research methods, etc.). [please use bullet points to answer this question]

There were four students enrolled in our program this year: two first year students (Lhia Delores and Ryan Peek) and two second year students (Matt Boitano and Mikael Langner). To assess learning outcomes for these students the following assessment tools for each outcome were employed:

Outcome #1 [1A) Describe, synthesize and apply concepts & techniques in the current literature within a specific research area. 1B) Ask scientific questions based upon the literature and construct research hypotheses and design experiments to test hypotheses.]

Assessment tools for this outcome

- Directed Reading (BIOL 695)
- Seminar (BIOL 600)
- Thesis proposal

Both of our first-year students enrolled in BIOL 600 and 695.

- ☑ A thesis proposal was written by graduate student Ryan Peek and submitted to the following committee members for review: Jennifer Dever, Christina Tzagarakis-Foster and David Saah. The student was advised by the committee members and upon revision the proposal was accepted by each member.
- ☑ Graduate student Lhia Dolores began the program in the Spring and recently formed her committee. She is currently working on her proposal.

Outcome #2 [2A) Select and meet with graduate committee members. 2B) Conduct original research, demonstrating research skills within the specified research area and evaluate collected data.]

Assessment tools for this outcome

- Research performance – progress report, student evaluation form
- Directed Research (BIOL 698)
- Committee members assessment interview

- ☑ Progress reports & student evaluation forms were submitted by each student and their major professor.
- ☑ Second & third semester students were enrolled in BIOL 698.
- ☑ Committee members met with students to assess their progress on their respective research project.

Outcome #3 [Prepare a written thesis to be reviewed and accepted by the graduate committee. The thesis will consist of the following sections: Introduction, Materials and Methods, Results, Discussion and References]

Assessment tools for this outcome

- Thesis Writing (BIOL 699)
- Thesis Outline
- Thesis
- Committee members assessment interview

- ☑ Students in their final semester were enrolled in BIOL 699. Outlines and completed theses were submitted to committee members by these students.
- ☑ Committee members Scott Nunes, Pat Schulz and Karen Francis met with Mikael Langer to discuss the thesis progress and provide feedback for revisions. They have accepted his thesis and rated it as “satisfactory”.
- ☑ Committee members Christina Tzagarakis-Foster, Mary Jane Niles and John Sullivan have approved Matt’s outline as “satisfactory” and are in the process of working with Matt Boitano on his thesis writing which is still in progress.

Outcome #4 [Present findings in a public format accepted by the graduate committee members.]

Assessment tools for this outcome

- Oral Presentation
- Exit Interview

- ☑ Matt Boitano presented his research findings to the department on May 16.
- ☑ Mikael Langer presented his research findings to the department on May 14.
- ☑ An exit interview was conducted by the graduate chair for both graduating students Mikael and Matt (see attached documents).

b. What did the faculty in the department or program learn?

Summarize your findings and conclusions as a result of the assessment indicating strengths and

weaknesses in student learning demonstrated by this assessment.

The department did not have sufficient time to discuss these findings; however the graduate committee was able to do so as well as each faculty member advising students (Jennifer Dever, Scott Nunes, John Sullivan and Christina Tzagarakis-Foster). Students enrolled in the courses BIOL 600 (Seminar), 695 (Directed Readings), 698 (Directed Research) & 699 (Thesis Writing) each earned A's for these courses exhibiting their strengths in learning in each area.

The student who has completed two semesters of the program has submitted his proposal to his committee members who concluded that he had met outcome #1.

- ♦ Ryan peek earned an "Excellent" rating, his Research proposal submitted within the first year with clearly stated objectives; hypothesis highly supported by current literature. Research design is well defined and provides novel tests of problems. Proposal put forth relevant scientific questions that are highly significant to the field. His strengths in completing tasks in a timely fashion and demonstrating a thorough understanding of his research project were exhibited.

Students conducting research also met outcome #2.

- ♦ Ryan demonstrated "Good Achievement", having both completed the following: Graduate committee formed, regular meetings held to discuss research design. Research conducted independently, standard methods mastered and student receives good progress reports regarding lab/research performance. Data generated and analyzed.
- ♦ Matt demonstrated "Good Achievement", he works independently not only to carry out experiments, but also to trouble-shoot and research alternative methodologies. He has successfully gathered and analyzed data related to his project.

Second year students met outcomes #3 & #4.

- ♦ Mikael met outcome #3 with a "Satisfactory" rating. Thesis outline submitted to graduate committee. Preliminary draft and final draft submitted to graduate committee submitted in a timely fashion. Regular meetings to discuss thesis progress with graduate committee held. Thesis complete, including a comprehensive review of prior research; describes the research design; materials and methods used in the research; the findings in the described research; a summary of the findings with conclusions, implications for further research and significance of research. Moderate revisions needed as recommended by committee members. Final thesis approved by Graduate Chair.
- ♦ Matt has not yet completed his thesis, his outline has been approved as "Satisfactory" and he has assured his committee members that it will be finished by the end of the summer.
- ♦ Matt met outcome #4 with a "Good" rating having met the following criteria: Presentation performed in front of the department. Presentation is captivating and easily understood, while maintaining a scientific format. Background information, objectives, materials and methods, findings, conclusions and relevance described in a highly informative and engaging manner. Material presented is shown to be relevant to the current field of research. Data presented at a scientific meeting (poster or presentation).
- ♦ Mikael met outcome #4 with a "Satisfactory" rating - Prior practice session for committee members acceptable. Presentation performed to the department, with enough time given to adequately present the information in a basic scientific format. Background information, objectives, materials and methods, findings and conclusions clearly described. Presentation is clear and concise and understood by the audience.

The graduate committee found that these assessment tools were adequate methods to measure the learning outcomes for the students enrolled in our research-based graduate program. Each students' thesis

committee members are able to advise students directly and assess their progress through each step: thesis proposal, research, oral presentation and completed written thesis. However, additional methods for outcome assessment could be added. One item that did stand out was the fact that although the final oral presentation assessment does not provide enough time for the faculty to provide feedback that students can use in a manner that would allow for students to demonstrate improvement while still enrolled in the program. It would be beneficial to require students present data at an earlier point, perhaps at the end of their first year and then again at the end of their second year.

An exit interview was given to graduating students (see attached). From the results of this interview it is clear that the students are meeting our program goals.

c. What will be done differently as a result of what was learned?

Discuss how courses and/or curricula will be changed to improve student learning as a result of the assessment. Include a discussion of how the faculty will help students overcome their weaknesses and improve their strengths.

An additional assessment tool will be used in order to provide more timely feedback on their oral presentation skills in order to provide the help needed. Each student must take one seminar course during the second semester of the program. During this time they will be giving a presentation on their proposed research and this would be an opportune time to assess their progress in the areas of literature review, hypothesis construction and experimental design.

3. Attach a copy of the components of the department/program assessment plan that have been modified since its initial submission:

- a. Program Mission
- b. Program Learning Goals
- c. Program Learning Outcomes
- d. Program Learning Rubrics aligned with outcomes
- e. Curriculum map that shows the courses that pertain to the outcome
- f. Exit interviews from graduating students

a. Program Mission

The Biology Master's degree program at the University of San Francisco is a research based program in which the student undertakes an active research project that culminates in a formal written thesis. A student who successfully completes the program will be well prepared to enter into a technical position in a related research or industrial laboratory or to continue further postgraduate work (e.g., Ph.D. or M.D.).

b & c. Program Learning Goals / Program Learning Outcomes

BIOLOGY GRADUATE PROGRAM GOALS, OUTCOMES & ASSESSMENT

PROGRAM GOAL	OUTCOME
Demonstrate an advanced knowledge in the areas of biology relevant to selected research interests and be able to identify research questions on a contemporary issue within the area, (as well as) critically analyze the relevant literature.	A) Describe, synthesize and apply concepts & techniques in the current literature within a specific research area. B) Ask scientific questions based upon the literature and construct research hypotheses and design experiments to test hypotheses.
PROGRAM GOAL	OUTCOME
Demonstrate an ability to apply knowledge through critical thinking, inquiry, analysis, and communication in the form of a Master's thesis which includes a rationale for the research project, a comprehensive review of prior research; describes the research design; materials and methods used in the research; the findings in the described research; a summary of the findings with conclusions, implications for further research and the impact and significance of the research completed.	Prepare a written thesis to be reviewed and accepted by the graduate committee. The thesis will consist of the following sections: Introduction, Materials and Methods, Results, Discussion and References.
Present and discuss orally the justification for the research, hypothesis tested, materials and methods used, findings with conclusions and implications for further research; as well as the relevance of the research to the general field of interest in a public format in front of peers.	Present findings in a public format accepted by the graduate committee members.

d. Program Learning Rubrics aligned with outcomes

BIOLOGY GRADUATE PROGRAM PERFORMANCE RUBRIC

OUTCOME	Unacceptable	Needs Improvement	Satisfactory	Good Achievement	Excellent Achievement
A) Describe, synthesize and apply concepts & techniques in the current literature within a specific research area. B) Ask scientific questions based upon the literature and construct research hypotheses and design experiments to test	Research proposal incomplete; objectives not stated; research design not discernible from text or not scientifically testable.	Research proposal submitted with substantial revisions needed. Limited level of background information provided, objectives unclear.	Research proposal submitted, objectives stated and supported by current literature, research project is justifiable with a testable hypothesis and	Research proposal submitted within the first year with clearly stated objectives that are highly supported by current literature. Hypothesis is	Research proposal submitted within the first year with clearly stated objectives; hypothesis highly supported by current literature. Research design is well defined and provides novel test(s) of problem(s). Proposal puts forth relevant scientific

hypotheses.			a proper research design.	relevant and a well developed research design is discussed.	questions that are highly significant to the field.
A) Select and meet with graduate committee members. B) Conduct original research, demonstrating research skills within a specific research area and evaluate collected data.	Graduate committee not formed. Unsatisfactory progress reports regarding lab/research performance.	Graduate committee formed, but not met with regularly. Attempts at research made, but unable to successfully utilize standard methods. Poor progress reports regarding lab/research performance received. No data generated.	Graduate committee formed, meeting held to discuss research design. Research conducted with moderate supervision, student receives satisfactory progress reports regarding lab/research performance. Minimal data generated and analyzed.	Graduate committee formed, regular meetings held to discuss research design. Research conducted independently, standard methods mastered and student receives good progress reports regarding lab/research performance. Data generated and analyzed.	Graduate committee formed, regular meetings held to discuss research design. Research conducted independently, methods mastered and novel approaches utilized. Student receives excellent progress reports regarding lab/research performance. High degree of data generated and quantitative methods are elegantly used to clearly describe results and analyzed, supporting the research hypotheses.
Prepare a thesis outline and a written thesis to be reviewed and accepted by graduate committee members. The thesis will consist of the following sections: Introduction, Materials and Methods, Results, Discussion and References.	Thesis outline not submitted to graduate committee, no meeting with committee members to discuss progress. Thesis incomplete with one or more sections not complete; does not follow standard formatting.	Thesis outline submitted to graduate committee. Preliminary draft and final draft submitted to graduate committee not submitted in a timely fashion. Minimal meetings to discuss thesis progress with graduate committee not held. Thesis complete including a review of prior research; describes the research design; materials and methods used in the research; the findings in the described research; a summary of the findings with conclusions; however part or all is found to be unacceptable by one or more committee members. Major revisions needed.	Thesis outline submitted to graduate committee. Preliminary draft and final draft submitted to graduate committee submitted in a timely fashion. Regular meetings to discuss thesis progress with graduate committee held. Thesis complete, including a comprehensive review of prior research; describes the research design; materials and methods used in the research; the findings in the described research; a summary of the findings with conclusions, implications for further research and significance of research. Moderate revisions needed as recommended by committee members. Final thesis approved by Graduate Chair.	Thesis outline submitted to graduate committee. Preliminary draft and final draft submitted to graduate committee submitted in a timely fashion. Regular meetings to discuss thesis progress with graduate committee held. Thesis complete including a comprehensive review of prior research; describes the research design; materials and methods used in the research; the findings in the described research; a summary of the findings with conclusions, implications for further research and significance of research. Thesis well written, error free and minimal revisions needed. All committee members highly satisfied. Portion of thesis	Thesis outline submitted to graduate committee. Preliminary draft and final draft submitted to graduate committee submitted in a timely fashion. Regular meetings to discuss thesis progress with graduate committee held. Thesis complete including a highly comprehensive review of prior research; describes the research design; materials and methods used in the research; the findings in the described research; a summary of the findings with conclusions and implications for further research. Significance of findings clearly stated and highly relevant. Thesis well written, error free with no revisions needed. Portion of thesis accepted for publication in a peer-reviewed journal. Final thesis approved by Graduate Chair.

				submitted for publication. Final thesis approved by Graduate Chair.	
OUTCOME	Unacceptable	Needs Improvement	Satisfactory	Good Achievement	Excellent Achievement
Present findings orally in a public format accepted by research committee members.	No practice session held with committee members. No presentation performed, data not presented.	Committee members recommend major changes at practice session prior to final presentation. Presentation performed at unsatisfactory level, lasting too long or not long enough. Unsatisfactory amount of background information, materials and methods and/or conclusions provided. Speech and/or slides difficult for the audience to understand.	Prior practice session for committee members acceptable. Presentation performed to the department, with enough time given to adequately present the information in a basic scientific format. Background information, objectives, materials and methods, findings and conclusions clearly described. Presentation is clear and concise and understood by the audience.	Presentation performed in front of the department. Presentation is captivating and easily understood, while maintaining a scientific format. Background information, objectives, materials and methods, findings, conclusions and relevance described in a highly informative and engaging manner. Material presented is shown to be relevant to the current field of research. Data presented at a scientific meeting (poster or presentation).	Thesis presentation is outstanding, student demonstrates an excellent ability to convey the research at both the scientific and general public level. Audience able to grasp the significance of the research and how it adds to the current body of science in the particular field. Data presented at a scientific meeting, (poster/presentation) generating inquiry from peers.

e. Curriculum map that shows the courses that pertain to the outcome.

BIOLOGY GRADUATE PROGRAM CURRICULUM MAP

LEARNING OUTCOMES	COURSES*	GRADUATE SEMINAR (BIOL 600)	RESEARCH (BIOL 698)	THESIS WRITING (BIOL 699)	ORAL PRESENTATION
A) Describe, synthesize and apply concepts & techniques identified in the current literature within a specific research area. B) Ask scientific questions based upon the literature and construct research hypotheses and design experiments to test hypotheses.	X	X	X	X	
A) Select and meet with graduate committee members. B) Conduct original research, demonstrating research skills within a specific research area and evaluate			X		

collected data.					
Prepare a thesis outline and a written thesis to be reviewed and accepted by graduate committee members. The thesis will consist of the following sections: Introduction, Materials and Methods, Results, Discussion and References.				X	
Present findings in a public format accepted by research committee members.		X			X

*Students can choose from any of the upper division biology courses offered (or courses from other departments provided they directly relate to the thesis research). As these are primarily undergraduate courses, the graduate students will be required to complete extra work and in cases where exams are given, they will be expected to answer different questions in a more in-depth fashion.

f. Exit interviews from graduating students

Graduate Program Assessment: Exit Interview – MATT BOITANO – S09

Please answer the following questions:

1. In what ways, if any, has your course work been valuable to you? How are courses you've taken during your program related to your thesis project?

I took Endocrinology and Immunology while a graduate student at USF. Both classes were very valuable to me because I did not have the chance to take them as an undergraduate. I also got much more out of these classes than when I was an undergraduate because they were the only classes I was taking so I could put more time into them. Endocrinology was directly related to my thesis project because I am working with molecular endocrinology. It was a good course to tie in lab learning with classroom learning.

2. How has your research training been valuable to you? What skills have you developed while in the graduate program?

I have learned an entire list of new molecular skills that will no doubt help me in the future. I also had the chance to work and get comfortable with mammalian tissue cultures.

3. What are the best things that the graduate degree has done to prepare you for a profession? Have you learned things in courses that you've used outside of the academic environment?

Working at USF as a graduate student has made me much more independent and, with that, a much better problem solver and troubleshooter. I have matured academically and become more patient and can use these in either my professional or personal life.

4. Other than acquiring coursework and research experience state how the graduate program has changed you or your perspectives on life.

The graduate program has really giving me direction. I know what I want to do when I graduate and I know what I don't want to do.

5. In what ways have you actively participated in the university learning community? As you think over your graduate career, what learning experiences stand out in your mind? What learning experiences have you had outside of the classroom?

I participated in university learning by being a TA for freshman bio and for genetics. I also feel I contributed to the learning community by presenting data at joint lab group meetings and guiding and aiding undergraduates in the lab.

6. During your degree program, was advising sufficient and appropriate?

Yes, available whenever I needed it.

7. Did you have adequate guidance in completing your proposal and thesis?

Yes.

8. What do you think are the strengths and weaknesses of the program?

I think a huge strength of this program is the size of the school. Graduate students are few and so are undergrads, which gives more time for one on one time with professors and advisors, and these professors and advisors truly care about your education. Also, normally with small size comes lack luster facilities, however USF relative to its size has so much to offer to a biology graduate student.

A weakness of the program is that there is no graduate only classes, i.e. a graduate level genetics class.

9. Do you have a job, medical school or Ph.D. program in the biological sciences lined up, or are you planning on staying in the biological sciences.

I am planning on getting a job in research.

10. Do you have any additional comments about the program or USF?

none

**Graduate Program Assessment:
Exit Interview – MIKAEL LANGER – S09**

Please answer the following questions:

1. In what ways, if any, has your course work been valuable to you? How are courses you've taken during your program related to your thesis project?

My coursework instilled valuable information into my knowledge framework, which will enable a lifelong pursuit of further knowledge. My neuroscience and physiology courses taken during my program are related to the maternal behavior of *Spermophilus beldingi*: behavior is a substudy of neuroscience and reproductive endocrinology is a subtopic of physiology.

2. How has your research training been valuable to you? What skills have you developed while in the graduate program?

My graduate training has instilled valuable experiences into my life journey, which will enable me to look forward with excitement to my future career and backward to a collection of important and formative experiences.

3. What are the best things that the graduate degree has done to prepare you for a profession? Have you learned things in courses that you've used outside of the academic environment?

The best thing the graduate degree has done to prepare me for a profession is to develop a theoretical framework upon which further knowledge and experiential development can occur. On a daily basis, I use what I learned in courses. Every time I make a decision or perform an action, I do so through the lens of my graduate experience.

4. Other than acquiring coursework and research experience state how the graduate program has changed you or your perspectives on life.

Other than coursework, I have had the opportunity to meet mentors and learn how academic researchers live their life outside the classroom. This experience is important to me because this aspect of academic life was a "black box" to me prior to these experiences.

5. In what ways have you actively participated in the university learning community? As you think over your graduate career, what learning experiences stand out in your mind? What learning experiences have you had outside of the classroom?

I am a member of the Club for Neuroscience Students. Probably the most important learning experience was camping. It provided me the opportunity to learn about myself.

6. During your degree program, was advising sufficient and appropriate?

Yes, advising was sufficient.

7. Did you have adequate guidance in completing your proposal and thesis?

Yes, guidance in completing my proposal and thesis has been appropriate from my thesis committee. We have a schedule for completion which makes it easier. Committee members have made valuable comments about my thesis.

8. What do you think are the strengths and weaknesses of the program?

Strengths: courses (small class size), mentoring, research, camping.

Weaknesses: no stipend (but not technically a weakness as I know of this fact prior to beginning program).

9. Do you have a job, medical school or Ph.D. program in the biological sciences lined up, or are you planning on staying in the biological sciences.

I am currently a research associate in the dermatology lab of Dr. Howard Maibach at UCSF through November, 2009.

10. Do you have any additional comments about the program or USF?

Thanks for all your help and support.