

UNIVERSITY OF SAN FRANCISCO
College of Arts and Sciences

Graduate Biology—Program Assessment Plan

Program Overview

The Master's program in the Biology Department is a two year program in which students undertake 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.). All Master's students must be paired up with a Professor that will serve as their Major Advisor and guide them in their research efforts while at USF.

Program Goals and Assessment

- 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.
- Engage in original, independent research activities within the specified research area with guidance from graduate committee members: Botany, Cancer Biology, Conservation Genetics, Electron Microscopy, Immunology, Marine Biology, Microbiology, Molecular Biology, Photobiology, Physiology, and Virology.
- 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.
- 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.

Learning Outcomes

Learning Outcomes	Assessment
Goal 1	
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.	<ul style="list-style-type: none"> ▪ Thesis proposal ▪ Seminar (BIOL 600) ▪ Directed Reading (BIOL 695)
Goal 2	
A) Select and meet with graduate committee members. B) Conduct original research, demonstrating research skills within the specified	<ul style="list-style-type: none"> ▪ Research performance – progress report ▪ Directed Research (BIOL 698)

research area and evaluate collected data.	<ul style="list-style-type: none"> ▪ Committee members assessment ▪ Interview
Goal 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.	<ul style="list-style-type: none"> ▪ Thesis Writing (BIOL 699) ▪ Thesis Outline ▪ Thesis ▪ Committee members assessment ▪ interview
Goal 4	
Present findings in a public format accepted by the graduate committee members.	<ul style="list-style-type: none"> ▪ Oral Presentation ▪ Seminar (BIOL 600) ▪ Exit Interview

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 indentified 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 collected data.			X		
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.

Outcome Rubrics

Outcome	Unacceptable	Needs Improvement	Satisfactory	Good Achievement	Excellent Achievement
<p>A) Describe, synthesize and apply concepts & techniques in the current literature within a specific research area.</p> <p>B) Ask scientific questions based upon the literature and construct research hypotheses and design experiments to test hypotheses.</p>	<p>Research proposal incomplete; objectives not stated; research design not discernible from text or not scientifically testable.</p>	<p>Research proposal submitted with substantial revisions needed. Limited level of background information provided, objectives unclear.</p>	<p>Research proposal submitted, objectives stated and supported by current literature, research project is justifiable with a testable hypothesis and a proper research design.</p>	<p>Research proposal submitted within the first year with clearly stated objectives that are highly supported by current literature. Hypothesis is relevant and a well developed research design is discussed.</p>	<p>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 questions that are highly significant to the field.</p>
<p>A) Select and meet with graduate committee members.</p> <p>B) Conduct original research, demonstrating research skills within a specific research area and evaluate collected data.</p>	<p>Graduate committee not formed. Unsatisfactory progress reports regarding lab/research performance.</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>
<p>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.</p>	<p>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.</p>	<p>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</p>	<p>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;</p>	<p>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</p>	<p>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</p>

		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.	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.	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 submitted for publication. Final thesis approved by Graduate Chair.	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.
Present findings orally in a public format accepted by research committee members.	Practice session not 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.	Prior practice session for committee members rated as good. 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).	Prior practice session for committee members rated highly. 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.

Measurement Tools

- Proposal Evaluation – assessed by research committee members
- Research Skills – assessed via progress reports submitted by both student and advisor, c committee member interview
- Seminar Presentation – assessed with seminar presentation rubric
- Course Assessment – assessed by individual course instructors
- Mid-Year Interview – conducted by Graduate Chair
- Thesis Outline – assessed by committee members
- Thesis – evaluated and assessed by committee members
- Presentation – assessed by committee members during practice session
- Exit Interview & Survey – conducted by Graduate Chair

How Assessment Data Will Be Collected and Used:

The Graduate Chair will collect progress reports and meet with the student's committee members annually. Every two years the Department Graduate Committee will compile the data and information gained from the assessments will be used to devise and implement changes to improve the program.

Exit Interview

Sample Exit Interview 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?
2. How has your research training been valuable to you? What skills have you developed while in the graduate program?
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?
4. Other than acquiring coursework and research experience how has the graduate program changed you or your perspectives on life? Identify university-related experiences that have changed you.
5. Regarding coursework, what were you required to do that went above and beyond the undergraduate requirements? Did you find your courses to be challenging and worthwhile?
6. Did serving as a departmental teaching assistant improve the quality of your education? What were the most beneficial and worst aspects of serving as a teaching assistant?
7. What values do you use to guide your life? Have those values changed since you have been in graduate program? Explain. Tell me a few experiences here that helped you to develop or demonstrate your values/rules.
8. During your degree program, was advising sufficient and appropriate?
9. Did you have adequate guidance in completing your proposal and thesis?
10. How would you improve the program?

Seminar Evaluation Sheet

Presentation Title:

Presenter:

Categories	Points		Suggestions
	Possible	Awarded	
Title: Clearly describes the topic presented.	2		
Introduction: Presents relevant background literature and explains the importance of the topic.	10		
Content: The topic is covered thoroughly. Enough information given to understand topic without excluding any important information or including any unnecessary information.	20		
Tables/Figures: Communication aids were clear and adequately explained. No superfluous graphics were used.	15		
Citations: Sources of information were properly cited so that the audience can determine the credibility and authority of the information presented.	3		
Summary/Closure: The closing statements summarize the material presented.	10		
Presenter:			
Organization: Information presented in a logical and interesting sequence that audience can follow.	10		
Mechanics: Presentation did not have spelling errors, font was easy to read, layout and background were aesthetically pleasing, and graphics/sound/animations enhanced presentation.	10		
Delivery: Presenter was heard and understood, maintained eye contact with audience, and seemed relaxed. The presenter looked and sounded professional.	10		
Subject knowledge: Student demonstrates full knowledge by answering all questions with explanations and elaboration.	10		
TOTAL	100		