

Graduate Thesis Guidelines

CSUB Department of Biology

Approved 8/6/2020

Thesis research leading to the thesis will be the culminating experience for each student in the MS Biology program thesis track. The thesis should represent a substantial product of original empirical biological research carried out under the close supervision of the student's Thesis Committee Chair (e.g., thesis advisor) and at least two additional approved Thesis Committee members. In some cases, a student will rely primarily on the Thesis Committee Chair for thesis development; in other cases, the Thesis Committee members will be consulted more substantively. It is the student's responsibility to keep all committee members informed of his/her progress. Students are encouraged to meet with their committee at least twice per year to discuss progress. Students should be enrolled in BIOL 6911 (Thesis) while research toward the thesis is being conducted, analyzed, and written. Following approval from the Thesis Committee Chair, the student should distribute their thesis to their Thesis Committee for review. A thesis defense should be scheduled no earlier than two weeks following distribution of the entire complete thesis draft to the Thesis Committee.

Thesis students must be enrolled in BIOL 6921 during the semester in which their thesis is defended. The thesis defense consists of two separate events. First, students will give a public research presentation that must be announced publicly at least 2 weeks prior to the presentation. This formal presentation should be a detailed review of the thesis research. The presentation should be 30-40 minutes in duration with an additional 10-15 minutes for questions from the general audience. Second, and following the public presentation, the student will have a closed meeting with their Graduate Thesis Committee during which they will field additional, specific, and in-depth questions about their thesis research. After this question and answer session is completed, the Thesis Committee will excuse the student and, in private, decide to accept or reject the thesis.

Review of the thesis by the Thesis Committee will be primarily based on ensuring that the thesis meets the following requirements:

- 1) The thesis includes and clearly presents the completed research activities and outcomes that were established within the student's approved thesis proposal.
- 2) The thesis is appropriate in format, formatting, and tone, and meets university standards and requirements.
- 3) The thesis research is sufficient in scope and quality to qualify as the student's culminating experience for the graduate program. This includes verifying that the thesis:
 - a. represents student expertise in their chosen area of biological specialty,
 - b. includes results from a complete data-driven research project that is formatted for professional publication,
 - c. fairly presents the research of others and cites appropriately all outside information,
 - d. includes no protected or copyrighted materials or text, unless the student has received written permission from the copyright holder to use such material, and
 - e. the literature cited adequately represents the state of knowledge on a topic.

- 4) The thesis addresses how the student's research on their specific topic relates to general biological principles and topics, how their graduate research expands knowledge within a major domain of inquiry, and how it relates to research from other disciplines.
- 5) The thesis and thesis presentation represent intellectual products developed primarily by the student and represent their effort, knowledge, writing, analysis, and independent thought.

If the thesis defense is not passed during the student's first attempt, they may revise their thesis and redistribute it to the committee once within the same term. Any new distribution of a revised thesis resets the two-week timeline for review and a new defense may not be scheduled earlier than two weeks following the distribution of the revised version of the thesis. The Thesis Committee may also require that a second public research presentation occur. A thesis defense may not be attempted more than two times within a term. If the student does not successfully defend their thesis within a term, they will be assigned a grade of NC (no credit) and must re-enroll in BIOL 6921 in the semester in which they next attempt to defend their thesis. Credit for BIOL 6921 will only be received once the approved thesis has been submitted to the library.

Thesis formatting

All theses should be prepared following the formatting guidelines contained within the "Writing Standards in Biology" document available from the Department of Biology webpage (http://www.csub.edu/biology/files/How%20to%20Write_14.pdf). In addition, students should consult the information on thesis formatting from the CSUB Walter W. Stiern Library, which contains information on the required front materials of the thesis as well as sample pages with the required formatting for thesis front materials (copyright page, title page, signature page,...) (<https://csub.libguides.com/etd/forms>). All finalized theses must be submitted online as an *ADA compliant pdf* (<https://csub.libguides.com/etd/ada>).

There are no required minimum or maximum lengths for a biology thesis. Recent theses have varied from 50 to more than 120 double-spaced pages. Recent example theses from the CSUB MS Biology program are available through the library. Graduate students are strongly encouraged to work closely with their Thesis Committee Chair and Thesis Committee; however, the thesis should represent text, analyses, and organization that reflects the student's research and understanding of their selected biological research topic. Inclusion of material from other sources, including previously published figures, text, or any copyrighted material, is not permitted. All theses must adhere to university policies regarding Academic Integrity. Plagiarism of any kind is strictly prohibited and will result in denial of a degree or revocation of a degree from our program.

Biology theses are divided into chapters in addition to the required front material. All theses are minimally required to include one 'data chapter' that is formatted as a scientific paper and a broad conclusion chapter. Some theses may include additional data chapters, if the intent is to publish multiple journal articles from the thesis research. The appropriate structure for a thesis should be decided in consultation with the Thesis Committee. In general, theses follow one of the following outlines:

One data chapter:

- Introduction chapter (*optional*)
- Data chapter written in scientific paper format (if no introduction chapter is included, thorough introduction material should be incorporated into this chapter)
- Conclusion chapter

Multiple data chapters:

- Introduction chapter
- Data chapters written in scientific paper format
- Conclusion chapter

Additional information on what should be included in each chapter is described below.

Introduction chapter: If included, this chapter is composed of an introduction to and/or background information on the student's selected research topic. This chapter is often very similar to the material included within the "background" section of their thesis proposal and represents a review of the relevant literature related to the completed research and an introduction to the specific study system.

Data chapter(s): Each data chapter should be formatted as a scientific paper (Abstract, Introduction, Materials and Methods, Results, ...) and should represent the research project as a stand-alone unit. The chapter should be formatted and structured as described in the "Writing Standards in Biology" document available from the Department of Biology webpage (http://www.csub.edu/biology/files/How%20to%20Write_14.pdf). Multiple data chapters may be included if separate studies were conducted as part of the student's thesis research and the intent is to publish these chapters as separate units.

Conclusion chapter: The final chapter of the thesis places the student's research into the broader context of biological knowledge. This chapter addresses how the student's research on their specific topic relates to general biological principles and topics. This chapter ensures that theses within the biology program meet the university-wide requirement that students articulate how their graduate research expands knowledge within a major domain of inquiry and relates to research from other disciplines. In most theses, the final chapter is relatively brief.

Each chapter should include its own Literature Cited section. Figures or tables should be included at the end of each chapter rather than dispersed throughout the text or included at the end of the entire thesis. In text citations and the literature cited should follow the examples provided within the "Writing Standards in Biology" document available from the Department of Biology webpage (http://www.csub.edu/biology/files/How%20to%20Write_14.pdf)

Theses should contain the following sections, included in the final document in the order listed below:

Copyright Page (see online sample at <https://cslibguides.com/etd/forms>)

Title Page (see online sample at <https://cslibguides.com/etd/forms>)

Signature Page (see online sample at <https://cslibguides.com/etd/forms>)

Table of Contents

Dedication (optional)

Acknowledgements

Abstract (overall abstract for the entire thesis, including all chapters; this abstract is entered into a textbox during the online submission process and will be publicly available online)

Keywords (these terms are also entered during the online submission process and will be publicly available and searchable within the ProQuest database)

List of Tables

List of Figures

Chapters

Appendices (optional; if included, appendices can be used to include data, images, or additional research completed by the student and associated with their thesis research activities)

IACUC or IRB Letters (if necessary)

Thesis submission

As of Fall 2019, CSUB transitioned to electronic submission of theses that have received Thesis Committee approval. Electronic theses should be submitted through the following site: <https://csub.libguides.com/etd>. The library offers regular workshops on the thesis submission process.