

Thesis Proposal Defense Guidance for Students in the Master's of Geosciences Degree

Department of Earth and Planetary Sciences

One key step toward completing the M.S. degree in Geosciences is defending a thesis research proposal. This document provides general guidelines for completing this step. Completion of GEO 5103 Current Topics in the Geosciences and GEO 5113 Research Design in the Geosciences provides materials that form the foundation for proposal development. Be sure to discuss both the proposal document and presentation with your faculty research supervisor as well as other faculty members or external experts desired as members of your thesis committee., which must be constituted prior to completing the defense.

I. Research proposal guidelines

The purpose of the research proposal is to articulate the scope and plan for a thesis project. This will help you stay on track with completing the thesis component of the degree, which will facilitate degree completion in two years (for full-time enrollment), as recommended in the Graduate Handbook for the degree. It also provides a mechanism to improve the research through constructive input offered by thesis committee members.

A research proposal outlines the research to be undertaken and explains its significance. As such it requires specific aspects to be described in sufficient detail so that your graduate committee is convinced you are prepared to take on the research (i.e., you are knowledgeable enough) and the plan to complete it is sound (i.e., defensible, valid results will be produced in a timely manner). In the proposal it is appropriate to use illustrations to make and support points about the research similar to what is typically done in journal articles (see Appendix for suggestions). Research proposals can vary somewhat in organization but the following components should be included.

1. Introduction

This component introduces the reader to the general topic of the thesis research and should include a statement about the overall significance of the topic to the broader field of study. This section need not be long.

Length guideline: One to two paragraphs is usually sufficient to make the needed points.

2. Background knowledge

This component outlines what is known about the topic in detail drawing upon the relevant scientific literature. This section should be written critically in that all information presented helps to identify the current status of understanding of the topic and the gaps in knowledge. In other words, it should not simply be a reporting of information. What should be evident in the text is an overall framework that links details and provides an overall argument about the state of knowledge about the topic at hand.

Length guideline: The text should provide sufficient demonstration of knowledge of the

scientific literature relevant to the research aim. This will vary across subfields but aim for around 5 double spaced pages. Write more or less as needed.

3. Problem statement

If the background knowledge section is written well, the state of knowledge and gaps in knowledge will be evident and the problem statement is then a logical outcome from this content. A problem statement summarizes the key points of knowledge related to the specific research aim. It then discusses the gaps relevant to your research focus, which is followed by the overall aim or objective of your research, which will logically help fill this specific gap identified. After the overall aim is stated, it should be followed by specific research questions that, when answered, will meet the aim. Each research question would have a working hypothesis or expected answer. Hypotheses come from understanding background knowledge and using deductive reasoning where appropriate.

Length guideline: One to two paragraphs is usually sufficient to make the needed points.

4. Methodology

This component is the research design or, if you prefer, the experimental design and analysis section. It outlines how observations will be collected and analyzed to test the working hypotheses. If the research involves field work, this section should start with a short description of the key characteristics of the field site. A good methodology section provides enough detail so that someone else could replicate the work. It is also written for an informed audience so that low-level details about the data collection and analysis that can be assumed to be known or standard protocol within the scientific community are not needed. Finally, a good methodology section includes a rationale or justification for every decision made in the process of site selection, data collection, and analysis that is supported by citations from the literature.

Length guideline: This will vary across subfields but aim for around 5 double spaced pages. Write more or less as needed

5. Significance of the research

This section explains why the research is worth conducting. Put in another way, how will it fill the gap in knowledge and what could be credibly expected to be the benefit once the research question(s) are answered? The significance can fall under two general categories of basic science and application of that science (e.g., management of landscapes).

Length guideline: One to two paragraphs is usually sufficient to make the needed points.

6. Preliminary results (optional)

If some results have been generated it is appropriate to include them so the committee is fully aware of progress. Preliminary results should be presented in a separate section of the proposal.

Length guideline: This will depend on the extent of preliminary results. Write enough to convey the needed points to the committee.

7. Schedule for completion

Provide a general timetable for completing major tasks (e.g., field or laboratory work) of the thesis project and give an anticipated semester for the thesis defense.

Length guideline: One table containing all information about tasks and completion dates should be sufficient.

II. Proposal defense

The purpose of the proposal defense is to provide a forum for the exchange of ideas before the research is completed to keep you on track with thesis research. It also provides a mechanism to improve the research through constructive input offered by thesis committee members.

The proposal defense is a meeting in which a short presentation will be given on the research proposal that is followed by a question and answer session. This is an open forum for all interested parties. The defense will be advertised to the geoscience community in the department very similar to the thesis defense.

The presentation should cover each aspect of the proposal document, highlighting key points. It should be prepared in PowerPoint or comparable software. The presentation should typically last for about 20 minutes, followed by the question and answer exchange. The entire proposal defense should take no more than an hour.

The proposal document must be circulated to committee members two weeks prior to a scheduled defense date. The faculty research supervisor must approve the proposal document prior to its circulation. Once the defense date is set, the date, time, and location plus thesis title and members of the thesis committee should be forwarded to Laurie Gay (Laurie.Gay@utsa.edu) for advertising purposes.

III. Timeline

GEO 5103 and GEO 5113 build the foundation for developing a thesis proposal document, and hone skills in giving scientific presentations. Therefore, these courses should be completed before a proposal defense.

For full-time enrolment, the defense should be completed after the first academic year in the program. The target period for the defense is within one month of the second semester. For part-time enrolment, the timeline is extended to one month after the end of the fourth semester. However, the defense may occur earlier upon the recommendation of the thesis research supervisor.

Appendix. Possible Illustrations for Proposal Sections

| Section | Possible figures |
|----------------------|---|
| Introduction | Visualization of reason topic important in the field |
| Background knowledge | Schematic of conceptual model; visualization of current understanding of predictive relation, etc.; important results from prior study; synthesis of data from literature highlighting current knowledge and gaps |
| Problem statement | Photograph of fossil being investigated; Conceptual model; Illustration upon which hypothesis based |
| Methods | Map of study area, schematic of workflow for lab analysis |
| Preliminary results | Diagram illustrating specific result; table containing data or analysis outcome |
| Significance | Image that connects study to its broader scientific importance or application to societal problem |
| Schedule | Table that contains key benchmarks for completion. |

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