APPENDIX E: THESIS OPTION INFORMATION

SELECTING THE THESIS OPTION

"The thesis is a scholarly contribution to knowledge...The thesis may take the form of a study, an experiment, a survey... and may delve deeply into some aspect of a specialized academic field or may concern itself with methodology and materials of instruction. The preparation of a thesis should develop in the student a broader understanding of the world’s knowledge and a more genuine appreciation of the research efforts of others” (UNI Graduate College Thesis Manual, p. 1-2).

The following guidelines augment the Graduate College Thesis and Dissertation Manual, addressing specific content and methodology requirements of the Science Education thesis. Students should refer to the Graduate College Website for the full UNI Graduate College Thesis Manual for stylistic requirements and deadlines (listed under “Important Dates for Graduate Students”).

The thesis should result from a rigorous experimental, quasi-experimental, or qualitative research study that adheres to the protocols used in professional science education research. Successful completion of SCI ED 6500 Research Methods in Science Education (or MEASRES 6205) will provide a solid foundation in designing a sound research project. It should focus on a problem or question which, upon completion, adds to the knowledge base in science education. The generation of a thesis topic therefore requires familiarity with the work of others as published in the science education research literature.

KEY REQUIREMENTS OF THE THESIS

THESIS COMMITTEE

The thesis committee consists of a minimum of three (maximum four) UNI Faculty members, at least two of which must be Science Education Faculty where one of them serves as the Chair of the committee and major research advisor. Additional members must be CHAS or CoE faculty and all members must be on the UNI Graduate Faculty. Your assigned graduate faculty advisor may serve as the Thesis Committee Chair and act as your major research advisor, or if the area of research warrants, a new major advisor can be selected and become the Thesis Committee Chair. Committee members must be
selected **before** the research project is designed and conducted and should be chosen with the assistance of your advisor. A **Thesis Committee Approval form** must be submitted to the Science Education Graduate Coordinator and Graduate College for approval. The thesis committee assists the student in research design and in the writing of the thesis. The committee eventually accepts or rejects the thesis.

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**THESIS PROPOSAL**

A draft of the **Introduction, Cursory Literature Review** and proposed **Methodology** (Chapters 1-3, described below) should constitute the Thesis Proposal. This Thesis Proposal is formally presented to the committee and MUST BE ACCEPTED **BEFORE** research starts.

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**HUMAN PARTICIPANTS**

Student research involving human participants must be conducted in compliance with the University policy for protection of human subjects. Students planning such projects must consult their thesis advisor about University human participant regulations **before** beginning any research activities that involve human participants. Further information about regulations and completing a Human Subjects Review Form are available on the [IRB Website](http://irbwebsite.com).

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**REQUIRED STYLE AND TIME LINE**


The time line for completion of thesis preview and thesis submission is not intuitive and may appear to be over zealous. For example, deadlines for a May graduation occur in March of that semester. Consequently, a greater than average level of planning and forethought is required to meet these deadlines and the writing process often takes much longer than expected. See the [Important Dates for Graduate Students](http://importantdates.com) for exact dates.

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**THESIS COMPONENTS**

Length and specific components of the science education master’s thesis vary depending on the nature of the study. The following are suggestions intended to guide the student:

**The Title:** The best title for a thesis is one that indicates its content as precisely and briefly as possible.
The Abstract: The first element of a thesis document is the abstract, however it should be written last. The abstract should present an account of the thesis that will enable an interested person to determine the desirability of reading the entire work. It needs to be dense with information but also readable, well organized, brief, and self-contained. The maximum length of the abstract is 200 words.

Chapter 1 Introduction: This is an overview of the entire study and should address the following:

1. The framework/context for the research topic; and the problem or question being addressed (including hypotheses if statistical analysis is being used).

2. A brief synopsis of existing research/literature that addresses similar problems or questions and their shortcomings (a more thorough review should be saved for Chapter 2).

3. How the resolution of that problem or question will inform the practices or knowledge of other science education professionals.

4. An overview that clarifies the basis for conducting the study, the methods for executing the study, and the means by which results of the study may be analyzed and interpreted.

Chapter 2 Literature Review: This section explores the research literature that addresses the problem or question of the thesis. All dimensions of the question should be situated within the context of a theoretical framework around which other researchers have explored the question or some facet of the question. It should culminate in a summary that situates this study atop prior works—how it is intended to advance what we know about the problem or question, i.e., how it "fills a gap" in our knowledge base. Use primary literature, including the Journal of Research in Science Teaching, the Journal of Science Teacher Education, and others as recommended by your advisor and discussed in SCI ED 6500 Research Methods in Science Education.

Chapter 3 Methodology: This section should thoroughly describe the data collection and analysis techniques used in developing an answer to the research question. Defend the chosen techniques by reference to prior studies (from the literature review) or by reference to appropriate research protocols designed for this type of study. Data collection and analysis methods (statistics or qualitative) must be defensible as valid and reliable by external standards and accepted practice in science education research.
**Chapter 4 Results:** This section presents the results of data collection through qualitative, quantitative, or mixed methods. Quantitative data should include tables, graphs, and figures where appropriate. Qualitative data should be logically organized and presented.

**Chapter 5 Conclusion:** This section is where the answer to the research question is directly addressed. Discuss your findings in the context of prior work established in the literature review. How do the outcomes of your study agree with, contradict, or in some other fashion merge with current thinking in science education? What explanations might be proffered for reconciling your study’s insights with prevailing notions? Also address shortcomings of your study—potential sources of bias, flaws, or other identifiable shortcomings of the research study to which the reader should be advised. Finally, suggest future research options related to this study.

**References:** Be sure to include all references cited.

The finished thesis study should be of sufficient rigor and design quality for the development of a publishable manuscript in a science education research journal.

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**THESIS PRESENTATION**

Upon satisfactory completion of the thesis document, a public presentation must be conducted. The presentation should be ~45 min in length and summarize all elements of your project. The presentation should be done during “regular” UNI sessions and according to the Important Dates for Graduate Students.

This presentation can NOT occur before the thesis document is in its final edited form. The writing and editing process often takes several drafts (and several months) during which, students will work mainly with the thesis committee chair but other committee members are available as additional resources.

Use the Thesis Check List and Timeline below to help plan your thesis.
THESIS CHECK LIST AND TIMELINE (IN ORDER)

- Take SCI ED 6500 Research Methods in Science Education (or MEASRES 6205).
- Meet and consult with your advisor on selection of a possible topic, committee selection and file student request to change Advisement Report to the Thesis option.
- Select thesis committee members and submit Thesis Committee Approval Form.
- With advisement from your Thesis Committee Chair, write the Thesis Proposal. At this point, you may start taking some of the required 6 hrs of SCI ED 6299 Research credit. All 6 hrs are expected to be spread out over the following semesters until graduation.
- Formally present the thesis proposal to your Thesis Committee and obtain approval of the project from the committee before proceeding.
- Obtain IRB approval (if using human participants).
- Conduct your research study.
- With advisement from your Thesis Committee Chair, edit the Thesis Proposal to reflect what actually occurred in your study and write the Results and Conclusions chapters. Consult with other members of your committee as needed.
- Inform the Science Education Graduate Coordinator of plans to graduate by:
  a. Jan 1 for May graduation
  b. March 1 for Summer graduation
  c. Sept 1 for December graduation
- File Application to Graduate and check your Advisement Report in MyUNiverse. File any necessary student requests to finalize your Advisement Report.
- Schedule the Thesis Preview (contact Janet.witt@uni.edu) according to the dates outlined in the Important Dates for Graduate Students.
- Arrange a time when the entire thesis committee can be present (NOTE: this is often difficult during the summer months) for the public presentation of your thesis. Bring 5 copies of the Thesis Approval Signature page (see the Thesis Manual) printed on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton for signing.
- Pay the thesis binding fee (for 2 copies) at Cashier’s window, Office of Business Operations. Save the receipt.
- After the thesis has been approved by all committee members, been publically presented and previewed by the graduate college, print the thesis on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton. Deposit the thesis, the 5 copies of the signed Thesis Approval Signature page, and the binding fee receipt in the graduate college by the date listed in the Important Dates for Graduate Students.
- The hard copy of the thesis will be formally previewed one last time and you will be contacted if any further changes are required (often, only 1-2 more pages need to be edited and reprinted).
- After final approval from the Graduate College, submit 3 additional copies of the thesis (except the Thesis Approval Signature page) on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton to the Science Education Office. These copies will be bound and are for you, your thesis chair, and the Science Education Resource Center.