Masters of Arts in Science Teaching (MAST)
Culminating Experience Options
Center for Science Teaching and Learning

The culminating experience provides an opportunity for students to delve into an area of particular interest to them and to use what they are learning in a different context. Part of the purpose is to help students identify how they want to put their learning to use once they graduate from NAU as science education leaders. You must be registered for at least one portfolio or thesis credit in the term you plan to graduate. Students work with their advisors to develop an idea for their culminating experience before constructing a committee. Two options are available.

Option 1 — Thesis (includes 3 credits in SCI 699)
A thesis is an original work. It is typically an empirical or conceptual study that poses questions about some aspect of learning, teaching, or curriculum, and answers these by collecting and analyzing data or by synthesizing and critiquing prior work. This may include action research. Typically, those who plan to pursue careers in academia and/or research select this option. Please note that thesis projects often require IRB permission that may add to the timeline for completion. The thesis is completed in two phases:

Thesis Proposal: If you decide to complete a thesis, you must submit a project proposal to be approved by your advisor and committee in an initial proposal meeting. No research can be conducted before approval. A thesis proposal is generally composed of three sections:
1) **Introduction** - Outlines the argument for the study and concludes with the purpose and research question(s) to be studied.
2) **Literature review** - Provides a detailed account of the major concepts and ideas as outlined in the rationale as well as their connections to your study.
3) **Methods** – Describes the study’s setting, participants, data sources, data collection, and analysis procedures.

Final Report: Upon completion of the research, the thesis is submitted first to your advisor and then to your committee for your final oral examination. The thesis contains a revised and elaborated version of the proposal along with the following sections:
4) **Findings** – Details the results of the inquiry organized around the research questions. Must provide sufficient data (data tables, quotes, etc.) to ground your findings.
5) **Discussion and Conclusion** – Explains what you learned from the thesis, the contribution that has been made to the literature and/or professional practice, and implications for others interested in the same problem or topic.

The final version must also include a title page, table of content and abstract as per Graduate College guidelines. Appendices may be included if needed. The thesis must follow APA guidelines as well as those of the Graduate College. Initial drafts of the thesis must be submitted to the university for a format check. A final copy must be submitted electronically to the university before graduation is granted. Please see the Graduate College website for additional details, formatting requirements, and electronic submission procedures.
Option 2 — Portfolio (includes 3 credits in SCI 689)

A portfolio, like the thesis, is an original work and is typically selected by those who plan to pursue careers as practitioners. Unlike the thesis, which is an empirical or conceptual study, a portfolio entails the production, improvement, and/or evaluation of a product intended for use by practicing professionals. Examples could include:

- Developing and implementing a professional development program;
- Writing and submitting a manuscript to an academic or practitioner journal;
- Creating and testing curriculum for an outdoor learning center, museum, or science center; or
- Developing and pilot testing classroom curriculum materials.

A portfolio report is generally composed of the following sections:

1) **Purpose** - Describes your personal motivation and situation that has led to this specific project.
2) **Rationale** - Outlines your argument for the project using the concepts and ideas detailed in the literature review.
3) **Literature Review** – Provides a detailed account of the major concepts and ideas as outlined in the rationale as well as their connections to your study.
4) **Description of project and procedures** – Describes the project in detail and makes connections to the findings in the literature review.
5) **Conclusion** - Explains what you learned from the project, the contribution that has been made to the literature and/or professional practice, and implications for others interested in the same problem or topic.
6) **Appendices** – Contains the project itself including lesson plans, handouts, etc.

Upon completion of the portfolio project, the report is submitted first to your adviser and then to your committee for your final oral examination. The report must follow APA guidelines.

**Final Oral Examination**

Both the thesis and portfolio options require a final oral examination. The student, in consultation with the adviser, is responsible for scheduling the exam with the master’s committee. The final draft of the thesis/portfolio is due to the members of the committee at least two full weeks before the exam date. The exam covers the thesis/portfolio as well as content from the student’s coursework. Please consult the Graduate College website for appropriate deadlines for the exam. Exams are scheduled for two hours and begin with a presentation to the committee as described by your advisor.

**Master’s Committees**

All students are responsible for the creation of a master’s committee (in collaboration with their advisor). Committees must include at least three members who have earned terminal degrees in the field and have relevant expertise. In rare circumstances and with departmental approval, a committee member without a terminal degree in the field but who has relevant expertise unique to the project may be considered. The committee chair must be a full-time faculty member at NAU and affiliated with the Center for Science Teaching and Learning. At least one other committee member must also be faculty affiliated with the Center.