

## Master's Thesis Handbook

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## **Introduction to the Master's Opus**

As part of their degree requirements, all SEAS master's students must complete a project, thesis or practicum. All master's students are admitted as a project student. The project option gives students a team experience that approximates future work environment. Students can petition for the thesis option when they plan to conduct original research and produce a scholarly work. Although students are not admitted under the practicum option, a student may petition into this option under circumstances described below.

Projects, theses, and practica share common academic expectations and provide different educational experiences. Regardless of the opus type, all include the following academic expectations:

- the mastery of an appropriate set of academic material;
- an understanding of the major steps of the scientific approach (research design) or decision analysis (evaluation of management alternatives) and the successful application of these steps to an environmental problem;
- the ability to demonstrate critical thinking about an environmental problem and the application of appropriate analytical techniques in solving that problem;
- experience in both writing a scientific paper or technical report and giving an oral seminar to peers on the process and results of the study; and
- faculty evaluation of the final product.

Occasionally, students wish to substitute another opus option for the one they were admitted to complete. SEAS's policy is that changes in the form of the opus must be supported by a faculty advisor and approved by the Associate Dean. Students should submit a written statement that explains why this change is needed. Project students who wish to substitute a thesis must show that they have had or will acquire the integrative team problem-solving experience missed by not participating in a project. Likewise, thesis students who wish to substitute a project must show how they have had or will acquire the training in research methodology. In addition, a student may petition the Associate Dean to undertake a practicum as his/her opus work. The practicum is an individual experience, often developed around an internship experience or the design of a project (see the Practicum Handbook.) All

To request a substitution, use the "Petition to Change Master's Opus" form. SEAS established these substitution requirements to protect the focus and intention of the different Masters options. Petitions will be evaluated on the basis of the rationale for substitution and the availability of faculty resources to support the proposed opus. Such changes must be approved by the Associate Dean. All petitions must be accompanied by an advisor approved Development and Mentoring Plan for Master's Students form.

Master's students who wish to change their opus option should do so by the drop/add deadline of their second semester (fourth semester for three-year or dual degree programs.) Students who are enrolled in EAS 701.888 (the Master's Project Planning Course) and wish to change their opus option need to make their decision in advance of the drop/add date or expect to continue with the course and project team through completion.

## **The Thesis**

### What is a Master's Thesis?

A thesis is an individual work that is creative, scholarly, and from independent research. The research usually includes a review of literature to delineate a problem or gap in knowledge, statement of

objectives, formulation of hypotheses, explanation of methods, collection and analysis of data, report of results, and discussion of conclusions. An abstract, or summary that restates the problem, objectives, methods, results, and conclusions (on a separate page following the title page), is also required. The thesis is reviewed by the student's thesis committee and must meet that committee's standards of quality and quantity. Results of a thesis should be publishable in a peer-reviewed journal.

### Objectives of a Thesis

A thesis gives students the opportunity to develop their creative abilities in one or more of the following activities:

- the definition and understanding of environmental issues;
- the development of new knowledge, design and management strategies to address such issues;
- the understanding of the structure and function of biophysical and socio-behavioral systems, and their relationship to environmental issues.

### Who May Write a Thesis?

Students admitted as project students may not substitute a thesis without approval from the Associate Dean. In accordance with SEAS's policy, a change in opus type must be supported by a faculty advisor and approved by the Associate Dean. Students should submit a written statement that explains why this change is needed (please see above for Petition and Mentoring forms).

### **Master's Thesis Structure and Planning**

#### Student Responsibilities

The student is responsible for knowing and meeting deadlines, submitting forms, establishing a thesis committee, and making sure that the thesis is prepared in an acceptable way. The student's thesis committee and SEAS's Office of Academic Programs will provide assistance, but the student ultimately is responsible for timely completion of the thesis.

#### Developing a Topic

Students should consult with their faculty advisor during their first term of enrollment to begin discussing the appropriate master's opus for them and defining the topic and scope of their work. Once the thesis committee has been formed and the thesis description approved by the thesis committee, work should begin as promptly as possible. The workplan should allow enough time to obtain and analyze information and write the thesis.

#### Developing a Thesis Committee and Workplan

The thesis committee consists of at least two faculty members, one of whom must be an SEAS faculty member serving as advisor or co-advisor. SEAS adjuncts, as well as research scientist-track appointees, may also serve as co-advisor. When an advisor who does not hold an appointment in SEAS guides a student's thesis research, that person is listed as co-advisor with an SEAS faculty member serving as the other co-advisor of the committee. The committee is expected to help the student focus on a topic that

both meets the student's academic goals and is practicable in the "real" world. It is important that the student and his/her thesis committee clearly understand their mutual expectations with respect to the amount of work to be done—particularly the work being done in the field (e.g., how many summers of field work will be required?).

#### Funding Sources

Funding may be allocated by the School, received from a sponsoring organization, accumulated by additional fundraising, or a combination of the above. OAP oversees various funding opportunities. Potential funding sources include:

- SEAS Thesis Research Grant: Thesis students may apply for the SEAS Thesis Research Grant. Application and budget template forms are available on the [SEAS website](#). Each student is eligible for up to \$1,000.
- It also may be appropriate to solicit funding from outside the School: the Horace H. Rackham Graduate School awards (limited) Travel and [Graduate Student Research Grant funding](#) the International Center awards (limited) funding for work overseas.

All of these opportunities require that a student submit a completed application form and proposal (including a budget) and receive approval before incurring expenses. Contact the appropriate office for additional information.

## **Format**

### Margins

The gutter margin must be a 1.25-1.5 inches wide to allow for binding. All other margins must be a least one inch wide. Typing should be started one inch from the top of the page and end at least one inch from the bottom. (This does not include headers or footers.)

### Spacing

Spacing should be used uniformly throughout the document. Single, one and one-half, and double spacing are all acceptable.

### Pagination

A number should appear on every page except the title page and the blank page following it.

The preliminary pages receive small Roman numerals (i, ii, iii, etc.) that are placed in the center of the typing page, one-half inch above the bottom of the page. The numbering should begin with "ii." The blank page following the title page is neither counted nor numbered. This page should be the only blank page. The blank page and the title page are the only two pages that do not receive numbers.

The page numbers in the body of the text are placed in the center of the typing space, one-half inch below the top of the page. An exception in the placing of the page number should be made for pages carrying a major heading (e.g., the first page of a chapter, bibliography, or appendix). On all such pages, the number should be placed at the bottom, in the center of the typing space. If the description of a figure is too long to be placed on the same page as the figure, it may be placed on the left side facing the figure. The figure number must appear on both the figure and the page carrying the description of the figure. This page must carry the number that would normally precede the page number of the figure itself (letter suffixes such as 10a, 10b, etc. should not be used).

Typing should appear on both sides of the paper (i.e., double sided). Each page of the text should be filled unless it is a preliminary page or the last page of a chapter. Chapters are the only sub-division in the text

that require new pages. When the text is not divided into chapters, each major division should be treated as a chapter and begin a new page.

#### Table of Contents

There should be a table of contents; the captions should be clear and informative and agree with captions in the text.

#### Abstract

The abstract is a summary of the main objectives, methods, results, and conclusions or recommendations, concisely and precisely written, and limited to 25 typed lines. Since most readers will read the abstract to determine the value of examining the entire document, give critical information such as "The three criteria used in the study were ...." and "results showed that 29% of 358 respondents favored ...." as opposed to "criteria will be discussed" or "some respondents felt", respectively. The abstract will be reprinted with an index of all master's projects, and may eliminate the need for a longer executive summary. Good examples of abstracts are seen preceding articles in refereed research journals and in Dissertation Abstracts.

#### Footnotes

These are explanatory notes not properly a part of the text. They should be placed at the bottom of the page to which the note applies.

#### References

Bibliographical material may be indicated by footnotes, but it is usually better practice to give all references used or consulted in a single "Literature Cited" or "Bibliography" section at the end of the text (but ahead of appendices). In this case, references should be: 1) identified by name and date in the text (e.g., Dana 1948) and listed alphabetically in the bibliography, or 2) indicated in the text by numbers cumulative throughout the paper (e.g., 12) and listed by numbers at the end.

#### Literature Cited or Bibliography

There are several accepted styles. Clarity should not be sacrificed for brevity. The important thing is to be accurate, complete, and consistent. Students should consult their major professor, style manuals, published books, or bulletins for the style used in their field. Students often use a style similar to that used by the journal to which they plan to submit a manuscript.

#### **Thesis Completion Requirements**

The student must have enrolled in at most 6 credit hours of EAS 700. Each thesis must culminate in a written document.

#### Written Document

The final report should be uploaded directly to MBox. Jennifer Taylor, the School Registrar, will provide you access to MBox to upload your final document(s). You will also need to submit, in hard copy, the signed Opus Verification Form and Deep Blue License Agreement. The finished copy of the final report required by the School must be uploaded by 5:00 p.m. on the last day of scheduled classes for the term in which the degree is expected. Failure to submit this copy will delay your graduation.

The copy of record for all SEAS opus documents is stored in "[DeepBlue](#)". DeepBlue is the University of Michigan's permanent, safe, and accessible service for representing our rich intellectual environment online. The electronic copy will be stored in DeepBlue maintained by the Shapiro Science Library.

#### Presentation

The School requires a presentation of a student's thesis findings, open to the SEAS community. SEAS hosts a Capstone Conference at the end of each Winter term where all students can present their opus work. Please note, that failure to present at your given time during the Capstone Conference, could delay your graduation. Students who miss their presentation will need to work out an alternative presentation time with the Associate Dean for Academic Programs. Notification of the new event needs to be sent to the SEAS community. An oral presentation and defense is mandatory, although, with approval of the thesis committee, students may substitute presentation at a professional meeting for a public defense at SEAS.

The finished copy of the final thesis must be submitted to OAP by 5:00 p.m. on the last day of scheduled classes for the term in which the degree is expected. Failure to submit this copy will delay your graduation.