

# SOEST

School of Ocean & Earth Science & Technology  
University of Hawaii at Manoa

## Undergraduate Thesis Policy & Guidelines



**SOEST Student Academic Services**

HIG 135

August 2019

# SOEST Undergraduate Thesis Policy & Guidelines

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## SYNOPSIS

The undergraduate research thesis project is the culminating experience bridging classroom instruction with research participation and is typically afforded only through graduate education. Relatively few fields of study require an undergraduate research project and thesis; however, those that offer the opportunity encourage students to develop transferable skills that can be carried into the job market and/or utilized to further academic undertakings (e.g., graduate education/research).

The undertaking of an undergraduate thesis research project requires a significant level of effort on the part of the student. The thesis research is no small task and the undertaking of this project should be taken very seriously. Efforts necessary for a successful project include not only carefully planning the project but also having the discipline to carry out the study in a timely fashion.

Global Environmental Science majors and students who are in the UHM Honors Program are **required** to successfully complete an undergraduate thesis and provide an oral presentation of their research. Majors in Atmospheric Sciences, Environmental Earth Science, and Earth Sciences may participate in the undergraduate thesis project as **an option** to advance and enhance their educational experience. The UHM Honors Program has additional and extensive thesis requirements that are separate from those for SOEST. All requirements from both SOEST and Honors must be met.

To understand the significance and commitment of an undergraduate thesis, please view the Guide for Students. Approval to begin a research project towards an undergraduate thesis requires at least two years of advance planning. Refer to the SOEST Approval Forms for more details.

## COURSES

SOEST Students may register for ATMO/ERTH/GES/OCN 499 after the *Pre-Approval Form* has been submitted and accepted by the SOEST Student Academic Services Office.

ATMO/ERTH/GES/OCN 499 can be repeated and the number of repetitions depend on the course description in the UHM Catalog. If the course is repeated, any Writing Intensive (WI) designation offered can be counted only once.

ATMO/ERTH/GES/OCN 499 is for active undergraduate thesis research and writing only. Should an Atmospheric Sciences, Environmental Earth Science, or Earth Sciences major decide not to complete the thesis, the student must immediately withdraw from the course. Depending on when the withdrawal is made, a W-grade may be recorded.

## WRITTEN THESIS

### Style Guides:

- **ATMO:** <http://www.soest.hawaii.edu/MET/MET495GuidelinesandPolicy.pdf>
- **ERTH:** [http://www.soest.hawaii.edu/GG/resources/docs/GG\\_STYLE\\_POLICY\\_MANUAL.pdf](http://www.soest.hawaii.edu/GG/resources/docs/GG_STYLE_POLICY_MANUAL.pdf)
- **GES:** [http://www.soest.hawaii.edu/oceanography/GES/STYLE\\_POLICY\\_MANUAL\\_2015.pdf](http://www.soest.hawaii.edu/oceanography/GES/STYLE_POLICY_MANUAL_2015.pdf)

### Submission Deadline:

SOEST undergraduates must submit their final thesis by 4:00 pm on the last day of instruction of the semester to be considered for graduation in the same semester. If the thesis is not submitted by 4:00 pm of the deadline, then the student must re-enroll for the following semester. Undergraduate theses must be submitted to each degree program office for archiving.

Students who applied for graduation may request up to four weeks from the last day of classes (not exam date or date of graduation) to complete their written thesis and have their grades changed by their instructors. Requests for extensions are to be made in advance to the SOEST Director of Student Services and must be accompanied by a memo from the mentor with additional supporting documentation where applicable. If the thesis remains incomplete after the deadline, then the student must complete the thesis, re-apply for graduation, and graduate in subsequent semester(s).

### Submission Deadline for SOEST Students in UHM Honors Program

Student must request the following memos from Honors Program to the SOEST Director of Student Academic Services.

- By the Friday after the Last Day of Instruction: Confirmation of Work in Progress (via Honors Mentor form).
- By the Monday after Graduation: Confirmation of Work Completed (via Honors Submitted Thesis form).

## PRESENTATION

All SOEST students must present their research findings at a public forum on the UHM campus during normal business hours. Presentations may be hosted by a campus- or department-sponsored venue.

### Presentation Deadlines:

- **ATMO Majors:** Before final exam week. Check with the ATMO program advisor.
- **ERTH Majors:** Before final exam week. Check with the ERTH program advisor.
- **GES Majors:** After the last day of classes. Check with the GES program office.

## **SUMMARY**

- Work on research project outline with mentor.
- Submit *Pre-Approval Form*.
- Begin research.
- Register for ATMO/ERTH/GES/OCN 499 as part of research.
- Complete research.
- Register for ATMO/ERTH/GES/OCN 499 (WI) as part of thesis writing.
- Complete thesis.
- Work on presentation outline with mentor.
- Schedule presentation.
- Submit *Approval Form*.

## **FORMS**

Pre-Approval

Approval

Submit completed form to SOEST Student Academic Services (HIG 135)

**PRE-APPROVAL FORM:** Form needs to approved **before** the project commences and **prior** to registering for XXX499.

Atmospheric Sciences

Environmental Earth Science/Earth Sciences

Global Environmental Sciences

**TOPIC AND MENTOR INFORMATION FOR UNDERGRADUATE THESIS** (print legibly)

NAME: \_\_\_\_\_

SEMESTER OF GRADUATION: \_\_\_\_\_

NAME OF MENTOR: \_\_\_\_\_

IS THESIS ALSO PART OF THE UHM HONORS THESIS (Y/N?) \_\_\_\_\_

DESCRIPTION OF RESEARCH TOPIC (200 WORDS MAXIMUM): \_\_\_\_\_

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\_\_\_\_\_  
NAME & SIGNATURE OF MENTOR

\_\_\_\_\_  
DATE

\_\_\_\_\_  
NAME & SIGNATURE OF DEPARTMENT CHAIR

\_\_\_\_\_  
DATE

Original: Department's student file  
Copy: Mentor  
Copy: Student  
Copy: SOEST Student Academic Services

**COMPLETION FORM**

Atmospheric Sciences

Environmental Earth Science/Earth Sciences

Global Environmental Sciences

**COMPLETION OF PRESENTATION**

STUDENT NAME: \_\_\_\_\_

PRESENTATION DATE: \_\_\_\_\_

PASS/FAIL: \_\_\_\_\_ If re-presenting, date; pass/fail: \_\_\_\_\_

**COMPLETION OF THESIS**

THESIS TITLE: \_\_\_\_\_

*We certify that this thesis, in our opinion, is satisfactory in scope and quality as a thesis for the  
Bachelor of Arts/Science*  
(select one)

*in Atmospheric Sciences/Environmental Earth Science/Earth Sciences/Global Environmental Science.*  
(select one)

\_\_\_\_\_  
NAME & SIGNATURE OF MENTOR

\_\_\_\_\_  
DATE

\_\_\_\_\_  
NAME & SIGNATURE OF DEPARTMENT CHAIR

\_\_\_\_\_  
DATE

Original: Department's student file  
Copy: Mentor  
Copy: Student  
Copy: SOEST Student Academic Services

For SOEST Student Academic Services Only:

Degree granted: \_\_\_\_\_ (semester/year)

**GUIDE FOR STUDENTS**

## Preparing for an Undergraduate Research Project

This abbreviated informational guide is designed to assist SOEST undergraduates with understanding and preparing their undergraduate research project, which includes a formal written thesis and oral presentation. Concepts and guidelines are provided to understand the project requirements and processes to carry out a successful project.

The undergraduate research thesis project is the culminating experience bridging classroom instruction with research participation and is typically afforded only through graduate education. Relatively few fields of study require an undergraduate research project and thesis; however, those that offer the opportunity encourage students to develop transferable skills that can be carried into the job market and/or utilized to further academic undertakings (e.g., graduate education/research).

The undertaking of an undergraduate thesis research project requires a significant level of effort on the part of the student. The thesis research is no small task and undertaking of this project should be taken very seriously. Efforts necessary for a successful project include not only carefully planning the project but also having the discipline to carry out the study in a timely fashion.

Some important steps/questions/factors that will help students determine what and how to undertake an undergraduate thesis research project include the following.

- When should you start thinking about the senior thesis research project?
- How much time should you allocate to the execution of the project?
- How do you pick an appropriate mentor?
- Availability of existing projects suitable for research.
- Identification of a problem of interest to you and evaluation of its relevance/importance to science (pragmatically, this will also include a determination of the suitability of the proposed project with respect to what you can reasonably expect to accomplish in the course of an undergraduate thesis project).
- Evaluating the risk/reward ratio of the proposed research.
- Identifying sources of funding and applying for funding for the project.
- Scheduling of the time needed to design and carry out the project.

We cannot emphasize enough how important it is to begin to plan **EARLY** for this culminating experience in the degree program of study. It is strongly suggested that students begin thinking seriously about their undergraduate thesis research project **by the end of their second year of study**. Because most

students face substantial time constraints well into their fourth year, we believe that the best approach to doing the undergraduate thesis research is to plan on beginning the project during the summer between your second and third years. Those already in their fourth year are, to some extent, already at a disadvantage in that much will need to be accomplished in a relatively short period of time. In order to meet the objectives of the undergraduate thesis research, for example, learn how to develop a research project that answers specific questions and test hypotheses (derived from either preliminary observations or from a literature search on a given topic), a series of (logical) steps should be followed.

- Determining who, among the faculty, is involved in research of interest to the student and who might be willing to serve as a mentor.
- Choosing a general area of interest that will eventually lead to a suitable project.
- Actually selecting the mentor (this is very important as, ideally, this person will not only serve as a mentor, but should also become a colleague).
- Developing an original project idea (with guidance and input from the mentor).
- Making preliminary (field) observations and/or running laboratory experiments that will provide data that can be used to define/refine the problem at hand.
- Preparing a short (1-2 page) prospectus describing the proposed research project (this must be approved by the mentor and department chair before undertaking the project).
- Developing a primary hypothesis statement (and possibly secondary hypotheses) based on the preliminary data available.
- Developing a null hypothesis (this is the hypothesis of equality).
- Designing (laboratory, field, or theoretical) experiments that will allow testing of the hypothesis.
- Conducting experiments or making field observations (i.e., acquiring data).
- Evaluation of data (including determining their reliability, reproducibility, and how representative the data are of the system/problem at hand).
- Interpreting results.
- Writing the thesis.
- Presenting the thesis results in a public forum.
- Applying for a student research assistant position (job) in a laboratory or private company where you are interested in carrying out your undergraduate thesis research.
- Applying for an internship with a City and County, State or Federal agency and selecting a topic of internship that is suitable for the undergraduate research thesis project.
- Applying for financial assistance to help defray the costs of the undergraduate thesis research project if the research is not already funded (e.g., by grants to the mentor) and will otherwise cost you money in addition to time.
- Seeking the advice of students who have gone before you.
- Interacting closely and frequently with your mentor. Remember, he/she has been doing this for much longer than you and is experienced. This will include details on describing the research project, its results and their interpretation, as well as the significance and broader impacts of the findings of the project.



**Timeline and Important Deadlines for the Undergraduate Research and Thesis:**

Initiation of discussions of research project: 2<sup>nd</sup> semester of second year.

**Submission of research proposal to SOEST Student Academic Services:**

1st semester of third year.

**Draft copies of thesis to mentor and department office:**

At least 21 calendar days prior to last day of instruction.

**Oral presentation of research results:**

Before final exams by respective department offices.

**Final copies of thesis to mentor and department offices:**

By the last day of instruction.

## GUIDE FOR FACULTY MENTORS

### Advising and Mentoring Undergraduates With an Undergraduate Research Project

This document is designed to help facilitate faculty advising and mentoring of SOEST students preparing to undertake their “Undergraduate Thesis Research”. Below we provide some concepts/guidelines to help understand what is expected of the undergraduate research project and how faculty can facilitate the process and provide a nurturing learning environment for the student.

The undergraduate research thesis project is the culminating experience for GES students and optional for Atmospheric Sciences, Environmental Earth Science, and Earth Sciences students. It bridges classroom instruction with research participation and is typically afforded only through graduate education. Relatively few fields of study require an undergraduate research project and thesis; however, those that offer the opportunity encourage students to develop transferable skills that can be carried into the job market and/or utilized to further academic undertakings (e.g., graduate education/research).

Planning and implementing an undergraduate thesis research project requires a significant level of effort on the part of the student. In their efforts to identify suitable mentors and projects, SOEST students have been asked to follow the steps outlined above. You, as faculty advisors and potential mentors, can facilitate this task.

Many things that are obvious to seasoned researchers are not at all obvious to novice researchers. Please take a few minutes to review the above guide for students.

Although it is by no means a complete roadmap to research, we think it will help students get started. Students are kept very busy owing to our rigorous curriculum. Many students wait until late in their undergraduate career before thinking about an undergraduate research project. Thus, if at all possible, we encourage you to begin to talk to your advisees about their undergraduate research as early as their second year. Although some students are not prepared academically for research at that time, others are, and, by the time they reach their third year, most students can carry out significant research. You are encouraged to inform students that work (as a lab or field assistant) during their first and second years will give them experience that will help them later in their own endeavors.

Whenever possible, we encourage you to make available opportunities for SOEST students to participate in research in your own program. A good way for faculty to advertise job opportunities and existing projects, from which SOEST undergraduate thesis topics might derive, is to send out an email to all undergraduates and/or list job opportunities. You should describe in simple terms your research interests, list any upcoming cruises or other scheduled fieldwork and any assistance you might need. It is also important for students to know that they can be gainfully employed performing what might later become their research project.

It cannot be emphasized enough to students how important it is for them to begin planning **EARLY** for their undergraduate research project. Please advise students to begin thinking seriously about their undergraduate thesis research project **EARLY during their second year**. Because most students face substantial time constraints well into their fourth year, we believe that a good approach is to plan on beginning their project during the summer between the second and third years. Students already in their

fourth year are, to some extent, at a disadvantage, as much needs to be accomplished in the relatively short period of time remaining.

Although all students need to eventually learn how to develop and execute a project on their own, the first step is to help them design a study that answers specific questions and tests hypotheses. However, there are other important steps they must take before that. Your assistance can greatly facilitate this potentially daunting task and improve their overall experience.

Students will need to do the following.

- Determine who is doing research of interest to them and is willing to be a mentor.
- Choose a general area of interest that can lead to a suitable project.
- Meet with various faculty individually and then select a mentor.
- Develop a project idea (with guidance from the mentor).
- Make preliminary observations to define the problem at hand, if necessary (this may not be necessary if the prospective mentor has some well-constrained needs of appropriate scope that are already identified).
- Prepare a short (1-2 pages) prospectus describing the proposed research. The prospectus must be approved by the mentor and department chair. After the initial steps have been completed, the rest of the project is no different than what you, as professional researchers, undertake in your own work. However, students at this stage are novices and need extra mentoring. Ensuring sufficient time to devote to mentor your student is often critical to their ultimate success. Keep in mind that students will also likely need assistance when they reach the writing stage of their project. This task will also require time from the mentor (discussions, reviews, etc.).