OCN 399W: Introduction to GES Thesis/Project
Fall & Spring Terms

Instructor: Dr. Michael Cooney (956 7337; mcooney@hawaii.edu). Office hours @ POST 104B by appointment.

Lecture Schedule: Fridays, 12:30 – 1:30 AM Sakamaki D103.

Course Description. In this section of the 399 course students will be required to write experimental research plans and research proposals (Hallmark 1, 4). Students taking OCN 399W will have already taken OCN 399 wherein they selected their project and mentor. Students taking OCN 399 W will build upon their training in OCN 399 by now writing experimental plans and research proposals for projects selected while taking OCN 399.

Structure: Writing based with weekly writing assignments due each Friday. Students will be required to submit weekly drafts of their experimental plan, following a template provided by the instructor. The students are expected to write this experimental plan in collaboration with their project mentor, regularly submitting drafts (to their mentor) and incorporating feedback (from their mentors) into revised versions of their proposal (Hallmark 2). The OCN 399W student will meet with the instructor four times per semester to review and gauge progress (Hallmark 2). Upon completion of their experimental plan OCN 399W students will then be required to recraft their experimental plan into a short 6 page research proposal that follows the format of the UROP or similar extramural RFP (Hallmark 1).

Students are also expected to attend a (one-hour) class lecture/discussion per week with their OCN 399 classmates. During this time OCN 399W students will be expected to provide updates on their experimental plan and/or research proposal (Hallmark 2). In addition to giving the instructor the ability to gauge progress and address any deficiencies/problems as they arise, the effort will also give the OCN 399 students exposure to what lies ahead (for them). During this one hour session the OCN 399W students will also be expected to provide near peer mentoring to their OCN 399 counterparts on the subject of project and mentor selection as appropriate.

Learning outcomes: At the end of this course the students should have learned:

How to write an experimental plan (~ 4000 words).
How to convert their experimental plan into a shorter (~ 6 page) proposal that follows the RFP format of a UROP or similar extramural opportunity.

Grading: Letter, based upon completion (to the satisfaction of the GES Chair) of their experimental plan and research proposal (Hallmark 3).

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<thead>
<tr>
<th>Period</th>
<th>Due Dates (Hallmark 4)</th>
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<td>Week 1</td>
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<td>Week 2</td>
<td>Draft 1 - Goal</td>
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<td>Week 3</td>
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<td>Week 4</td>
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<td>Week 6</td>
<td>Draft 4 - Lit Review: General Overview</td>
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<td>Week 8</td>
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<td>Week 9</td>
<td>Draft 7: Methods for Specific Tasks</td>
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<td>Draft 8: Methods for Specific Tasks</td>
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<tr>
<td>Week 11</td>
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<td>Week 12</td>
<td>Draft 10: Methods for Specific Tasks</td>
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<td>Week 13</td>
<td>Draft 11: Timetable</td>
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GES Experimental Plan format

1.0 PROJECT DESCRIPTION
1.1 Goals and Objectives
1.1.1 Overall Goal: Two to three sentence description that sums up the overall purpose of the study

1.1.2 Specific objectives (what are the project deliverables?)
1.1.2.1 Specific objective 1
1.1.2.2 Specific objective 2
1.1.2.3 Specific objective 3 (if needed)
1.1.2.4 Specific objective 4 (if needed)

1.2 Justification
1.2.1 What is the key intellectual merit of this work?
1.2.2 What are the broader impacts of this study?

1.3 Literature review
1.3.1 General overview: Previous and current
1.3.2 Project overview: Where does your project fit within the literature?
1.3.3 New knowledge: Show forward progress

2.0 METHODOLOGY
2.1 Procedures for Objective 1:
2.1.1 Hypothesis (driving question) for objective 1
2.1.2 Proposed experiments. Describe in sufficient detail the exact experiments you propose to execute in order to answer your hypothesis.
2.1.3 Expected results. What results, from theory and the literature, can you expect to achieve? What do you expect? At limits, special conditions, for controls, at extremes?
2.1.4 Feasibility. How likely is it that you can execute your experiments?
2.1.5 Pitfalls. What experimental conditions or details can interfere with successful execution of experiments?
2.1.6 Alternatives. What can you do if your proposed experiments are not successful, or cannot be executed?

2.2 Procedure for Objective 2
2.2.1 Hypothesis (driving question)
2.2.2 Proposed experiments
2.2.3 Expected results
2.2.4 Feasibility
2.2.5 Pitfalls
2.2.6 Alternatives

2.3 Procedure for Objective 3
2.3.1 Hypothesis (driving question)
2.3.2 Proposed experiments
2.3.3 Expected results
2.3.4 Feasibility
2.3.5 Pitfalls
2.3.6 Alternatives
### Timeline Overview: Role of OCN 399 and OCN 399W Introduction to GES Thesis/Project in the student’s progression towards completing their thesis degree requirement

<table>
<thead>
<tr>
<th>Course</th>
<th>What for</th>
<th>When take</th>
<th>Repeatable?</th>
<th>Credits</th>
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<tbody>
<tr>
<td>OCN 100 (fall)</td>
<td>Introduce students to a variety of environmental science research happening at UH</td>
<td>First fall semester enrolled at UH Manoa</td>
<td>No</td>
<td>1</td>
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<tr>
<td>OCN 399(^1) (offered every semester)</td>
<td>Designed to introduce students to the requirements of the thesis project and through their selection of a mentor and project.</td>
<td>Start ~ 5 semesters from graduation. If transfer into the program with less than 5 semesters, then take immediately.</td>
<td>Yes, every semester for 1 credit until student successfully finds thesis project.</td>
<td>1 per semester</td>
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<td>OCN 399 W(^2) Writing Intensive (offered every semester)</td>
<td>Designed to guide students through the writing of (1) experimental plan with thesis mentor (2) Research proposal following format for UROP, Space Grant, or equivalent.</td>
<td>After students finds appropriate project and mentor through OCN 399 or other means.</td>
<td>No</td>
<td>1 per semester</td>
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<tr>
<td>OCN 490 (spring)</td>
<td>When student is ready to present thesis outcomes</td>
<td>Semester of or before graduating</td>
<td>No</td>
<td>2</td>
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<tr>
<td>OCN 499(^3) or equivalent (offered every semester)</td>
<td>When conducting research project with thesis mentor</td>
<td>Once students begins research effort. Can be taken concurrently with OCN 399 Writing Intensive if thesis mentor has already started working with student on research.</td>
<td>Yes, up to 6 credits</td>
<td>Variable, but usually between 1 and 3 credits per semester.</td>
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<td>OCN 499 W(^4) (offered every semester)</td>
<td>Writing intensive credit for writing GES thesis with the assistance of thesis mentor</td>
<td>The semester that the thesis is written with the assistance of GES thesis mentor.</td>
<td>Yes, up to 6 credits</td>
<td>Variable, but usually between 1 to 3 credits per semester.</td>
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\(^1\)OCN 399 for GES students– This course is designed to introduce GES student to the GES thesis degree requirement. Enrollment is limited to one unit per semester. The GES version of OCN 399 requires regular attendance at the weekly
class meetings and also meeting regularly one-on-one with the course instructor. Not meeting the attendance requirements will result in an incomplete grade, which the student can address the following semester by making up missed attendance. Students can take additional OCN 399 credits with their prospective thesis mentor.

2OCN 399W for GES students – This course is designed as a writing intensive course to be taken after a student has taken at least 1 credit of OCN 399 for GES students and after they have selected a project and mentor. In this course students will write both an experimental plan and short proposal to UROP, Space Grant, or equivalent. It is expected that students will first complete their experimental plan prior to writing their proposal to submit to UROP, Space Grant, or the equivalent. Receipt of grade for completing a semester of the GES version of OCN 399 that is writing intensive designated requires regular attendance at the weekly class meetings, meeting regularly one-on-one with the course instructor to discuss the thesis proposal, and submitting their experimental plan and research proposal and description for approval by the GES Chair. Students must satisfactorily complete the research thesis project proposal to receive a grade. If one does not complete this requirement, an incomplete grade will be issued and resolved once the proposal has been satisfactorily completed.

3OCN 499 – OCN 499 Undergraduate Thesis is taken when students are engaged in the active process of research with their thesis project mentor. If the thesis mentor is in another department, it is possible their department has their own 499 flavor (e.g., Geology and Geophysics has GG 499) that students will take instead of OCN 499. Generally speaking, students can take up to 6 credits of any flavor of 499. For example, in the past, a GES student maxed out with 6 credits of OCN 499 and supplemented with addition ZOOL 499 credits as their faculty mentor was in the Zoology Department. Both OCN 499 and OCN 499 WI credits count towards the 6 credit maximum.

4OCN 499 Writing Intensive – Students take OCN 499 Writing Intensive (or again the 499 flavor of your mentor’s department if they offer it) when they are writing up their thesis results under the supervision of their thesis mentor.