

MARS4910: RESEARCH SEMINAR IN MARINE BIOLOGY

www.pelagicos.net/classes_marbio_research_seminar_sp19.htm

HAWAII PACIFIC UNIVERSITY	Session 1: Monday	8:00 – 11:00
HAWAII LOA CAMPUS (HLC)	Session 2: Wednesday	14:00 – 17:00
SPRING SEMESTER, 2019	LOCATION: -----	HLC, AC 102B

INSTRUCTOR:

David Hyrenbach, Ph.D.

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Office: CTSA Building #1, at Oceanic Institute (www.pelagicos.net/images/office_map)

OFFICE HOURS:

Mon (HLC 2nd floor lanai) 11:00 – 13:00

Tues (HLC 2nd floor lanai) 11:00 – 13:00

Other days and times, by appointment

Course Description and Overview: Marine Science 4910 is the seminar requirement for the capstone experience in Marine Biology. In this course students learn to develop a research proposal, to design an ecological study, and to prepare a scientific manuscript. The course strongly emphasizes hands-on learning in the field.

The capstone for HPU Marine Biology majors is designed to provide students with ecological research experiences in marine science. Thus, the focus of the course is to design and complete a senior research project. While the capstone experience spans all key aspects of marine research, from the formulation of the study to the reporting of the results, data collection for the independent projects takes place in the concurrent MARS 4911 laboratory. The primary elements of the seminar course are described below.

Planning research will involve developing a testable hypothesis, designing and planning a sampling design to test that hypothesis and devising the statistical approaches required to summarize and test the data. Research planning will be the focus of the first part of the course, whereby students will begin to explore potential research topics and will define a research project for their senior project.

This process involves the following steps:

1. identifying a research area of interest
2. developing a testable hypothesis
3. planning and documenting a research approach that will test the hypothesis

Projects will be developed with guidance from the seminar and the lab instructors, in an area that is of interest for the student and is feasible, given the constraints of the semester and resources. Students will develop a formal research plan to address a testable hypothesis. The plan will include a well-defined approach, including all the details necessary to carry out the research, such as the timing and location of the various activities, the equipment and supplies required for the work, the measurements and ancillary data that will be analyzed, and the personnel that will be needed to do the work.

Marine field research experience will involve learning about a variety of marine ecology sampling and survey techniques, some of which will be implemented in the lab. This experience is acquired in the concurrent laboratory component of the course (MARS 4911), using an assortment of survey and sampling methods aboard the R/V Kaholo. Field work planning, record-keeping, efficiency, teamwork, and safety will be emphasized. Each student will carry through data analysis and interpretation of one aspect of a field activity.

Conducting research will involve devising protocols for sampling and data collection, and completing the analysis and interpretation of the results. These activities will occur during the central portion of the course. Students will carry out research projects under guidance of the instructors of the lab and seminar, and with collaboration of other students while using HPU's facilities and supplies (including the R/V Kaholo). Working together as a research team, students will act as leaders for their own projects, and as team members for other students' projects. Different lab days will be dedicated to different students' research activities. Students may need to conduct some of their research activities outside of class time. Students will assemble the data collected, conduct analyses and graphs, and synthesize the research results in the context of the peer-reviewed literature to address the research question being addressed.

Communicating findings will involve presenting the project results to the class and writing up a fully referenced paper describing the research project. These activities will occur during the latter portion of the course. Each student will present a presentation and will write a research paper independently, even if working in a team.

Student Learning Outcomes: By the end of this course students with 1) sufficient mental faculties (see last page), 2) proper preparation, 3) adequate time, and 4) honest effort are expected successfully complete the course, by demonstrating the following abilities / competencies listed below.

- Be well versed with field research in marine science and analyses of ecological data
- Implement a research plan, including coordination of activities, data collection, processing of samples and delegation of responsibilities to team members
- Produce professional data figures and tables conforming with formatting guidelines in scientific journals appropriate to the individual students' disciplines
- Synthesize scientific findings in the marine sciences in the context of the peer-reviewed literature
- Produce research reports that meet the standards expected at national and international scientific conferences
- Produce oral presentation that meets the standards expected at national and international scientific conferences

Prerequisites: Students must be enrolled in MARS 4911. Students must also have senior standing and have completed, or be concurrently enrolled in MARS 4050.

Textbooks: No textbook will be assigned for this course. However, students will be required to find and read primary scientific literature to incorporate into their write-ups.

Assignments: There are eight assignments required of students taking this course:

Research Plan

Logistical preparations are essential to make efficient data collection possible at sea. Your cruise plan is due 1 (preferentially 2) week prior to the first meeting of MARS 4911 during which you will collect data for your research project. The details of the cruise plans must be identical for all research collaborators, but each student will submit a separate and independent plan.

Research plans will be evaluated on the completeness, organization and clarity of your plan. Figures (Kaneohe Bay map showing station locations) and tables (dates, station latitude and longitude, equipment and supplies) must be included.

Research plans must address the following:

- Names of collaborators working in the same research group
- Hypothesis being tested
- Dates for data collection (negotiated with entire class)
- Sampling gear needed – please be as specific as possible:
(plankton nets, multi-corer, fish ID slates, wet-writing platforms, transect tapes, quadrats, sample jars, calipers)
- Station locations: description and latitude and longitude
- Time needed for transit and sampling at each station
- Station(s) shared with other research groups
- Team chief scientist (point of contact for crew and instructors)
- Type of samples to be collected and equipment needed to process them
(sieves, sample jars, squirt bottles, buckets, dish pans, waterproof paper, forceps, mud knives, core-extruders)
- Potential hazards involved in data collection and steps to avoid those dangers

Research Proposal

Students will submit the Introduction and Methods sections of the research proposal, which will allow the instructor to provide feedback on the writing / content and the emphasis of the research project to the students. The full proposal, including the revised Introduction and Methods will be graded in MARS 4911.

Field Report

Students will write up and present a field report, addressing progress relating to their field-work and data collection. Each student will submit an independent written report and work collaboratively on a single presentation per research team.

Research Paper

Students will write up a research paper based on the investigation that they completed during the course. Students will produce their own final report, even if they worked on a research team. The final paper should be 12 to 15 pages (not including figures / tables) of double spaced, 12-point font text, formatted following the guidelines to authors of Marine Ecology Progress Series: <http://www.int-res.com/journals/meps/guidelines-for-meps-authors/>) and include the following sections: Introduction, Methods, Results, Discussion, Conclusions, Figures. Tables, Literature Cited.

Peer Review and Reply

Students will prepare a written peer-review evaluation of the work of another student and will receive a peer-review of their own work. Students will respond to the suggestions of the peer-review and will explicitly explain how they incorporated the suggestions into their revised work.

Self-Assessment

Students will submit a written self-evaluation of their work in the class and their group research project, addressing the limitations / shortcomings of the various research components.

Grading Policy:

Grades will be calculated as follows and will be rounded to the nearest whole integer:

Written Project Proposal (Introduction and Methods) (the complete proposal will be graded in MARS 4911)	5%
Written Research Plan (the complete proposal will be graded in MARS 4911)	5%
Field Report, Oral Presentation	10%
Field Report, Written	10%
Witten Research Paper	40%
Peer-Review	10%
Peer-Review Reply	5%
Class Participation	10%
Project Self-Assessment	5%

Grading Scale:

A	93-100	B+	87-89	C+	77-79	D+	67-69
A-	90-92	B	83-86	C	73-76	D	60-66
		B-	80-82	C-	70-72		

COURSE POLICIES:

Attendance and Participation:

Regular class attendance is expected (unless specified). Absence from class does not alter the requirements for this course. Students who are absent from class for legitimate reasons are still responsible for all assignments. Participation is a key component of the final grade. Students who miss class must complete make-up assignments. Students with more than 3 unexcused absences will be dropped from the class.

This course depends nearly entirely upon student participation in the field and laboratory, and absences will only be excused for documented medical necessity. Any undocumented absence will result in as much as 10% deduction from your final grade. Absence due to documented medical emergencies (...a note from your physician indicating that you are too ill to attend classes) will be excused if you complete a make-up assignment (normally a 4-6-page paper); however, the lack of participation cannot be made-up. Thus, students with more than three absences, documented or undocumented, will be dropped from the course. Yet, if you need to miss a class let your instructor know before the absence.

Turning in Assignments:

Assignments will be turned in electronically – as an attachment via email addressed to khyrenba@gmail.com. To ensure receipt of the emails, label your message and file “MARS4910 – *Assignment Name -Your Name*”. I will penalize assignments not labeled properly by removing 5% of the points.

Late work:

To facilitate the timely completion of the proposal, this course will follow a schedule of milestones and deadlines. Failure to meet these deadlines will result in a penalty of 5% of the assignment grade for every complete or partial day.

UNIVERSITY POLICIES:

Academic Honesty:

Students are expected to comply with HPU’s academic honesty policies. Furthermore, students are required to understand the reasons for this policy and internalize the principles of scientific integrity. Any infringements can result in a grade of “F” for the course.

All students will follow these guidelines:

- It is academically dishonest to **plagiarize** (i.e., to pass off someone else's intellectual work as your own), or to help someone else to do so.
- All work must be original: research results must be documented with laboratory notebooks, computer files of raw data.
- Directly quoting others, even with proper attribution of the source, is never done in scientific writing. Thus, **there are no circumstances in which including someone else's writing in your papers will be acceptable in this course.**
- Data analysis and results must be accompanied by clear and accurate descriptions of the methods used; the results of others must be clearly identified and the appropriate sources must be cited.
- If you use published materials (for facts, statements, images, data, etc.) in completing an assignment, credit must be given by citing the source – failure to properly cite sources is considered plagiarism.

For more information on what constitutes plagiarism, see the links in Campus Pipeline, under the Libraries folder. Another excellent site describing how to avoid committing plagiarism can be found at Purdue University's Online Writing Lab:

http://owl.english.purdue.edu/handouts/research/r_plagiar.html

Hawaii Pacific University provides a learning environment based upon academic excellence and integrity. In this course, it is expected that you will adhere to all Hawaii Pacific University guidelines regarding academic dishonesty. It is Hawaii Pacific University policy that any act of Academic Dishonesty will incur a penalty up to and including expulsion from the University. Any student who cheats on an academic exercise, lends unauthorized assistance to others, or who hands in a completed assignment that is not his or her work will be sanctioned. The term "academic exercise" includes all forms of work submitted for points, grade, or credit. Please see the Student Handbook for the full policy.

If you copy another student's assignment or use their homework or test to guide your work, each will receive a grade of "0" for that assignment and may receive an automatic "F" for the course. Any single occurrence of academic dishonesty in any form whatsoever may result in a grade of "FD" for the course. The grade of "FD" represents an "F" for academic dishonesty and it will remain a permanent part of your academic record, and is not subject to HPU's normal retake policy. Depending on the severity of the case, a single event of academic dishonesty, in any form whatsoever, may result in either a zero on the assignment for everybody involved, an "F" in the course, or expulsion from the University.

If you unclear on what is and what is not plagiarism, please discuss it with me. All major writing assignments will be analyzed at Turnitin.com. For homework problems and any other take-home assignment, students may work with each other but must turn in their own answers to assigned problems. For additional information on plagiarism see the links in Campus Pipeline under the Libraries folder. Another excellent site explaining plagiarism (and how to avoid committing it) can be found at the Council of Writing Program Administrators website: <http://www.wpacouncil.org/node/9>

Special Needs Policy:

Under the Rehabilitation Act of 1973 (Section 504), the Americans with Disabilities Act, Title III (Public Accommodations) and Title V (Employment), and the Hawai'i Fair Employment Practice Law, Hawai'i Pacific University does not discriminate against individuals with disabilities. HPU will make reasonable accommodations in its policies, practices and procedures in order to: 1) allow students with disabilities to benefit from the services and facilities offered by the University and 2) employ otherwise qualified individuals with disabilities who are able to do essential tasks of specific jobs. HPU will accommodate known disabilities, unless to do so would impose an undue hardship. This is interpreted to mean significant difficulty (fundamentally altering the nature of the services and facilities provided by the University) or expense.

Note: Any student with a documented disability who would like to request accommodations should contact the University Disability Services Office (933-0816 (V), 933-3334 (TTY), Campus Center Room 311) as early in the semester as possible.

Counseling and Behavioral Health Services:

The Counseling and Behavioral Health Services (CBHS) department provides FREE and CONFIDENTIAL counseling services to current registered HPU students including the following counseling services: individual; couples; family; crisis Intervention; consultation services for students, parents, faculty and staff; grief and loss. To schedule an appointment or for more information, please contact the Academic Advising & Behavioral Health office at either of the following: DOWNTOWN (808) 544-1198 or HAWAII LOA (808) 236-3578. The CBHS department can also be reached by email at: counseling@hpu.edu. They are unable to take appointments online or through email. All appointments must be scheduled by calling the numbers listed above. If this is an emergency, please call 911 or go to the nearest emergency room or hospital.

COURSE SCHEDULE: Weekly class meetings and assignments are listed below.
 (NOTE: This is a tentative schedule and it may change. Updated syllabi will be posted)

Note the Following University Holidays: Feb 19, March 4 - 5, March 26

Week	Dates	Class Topics and Activities	Assignment (due in class)
1	Jan 14/16	Review syllabus and discuss course content; discuss project guidelines and potential projects (2 hours) Research Planning: Form Teams and Explore Project Ideas	Share research interests with class; form groups (2 – 4 students)
2	Jan 21/23	Presentation of project ideas by each group (2 hours): Brief overview of 3-4 published papers followed by class discussion and recommendations. Each group uses 15-30 mins. Biometry Review Lecture (1 hour): Sampling and Analysis	Literature References Proposal outline: Hypothesis, field sites and sampling methods
3	Jan 28/30	Presentation of research projects by each group (2 hours): <ul style="list-style-type: none"> • Study sites, number of sampling days requested • Cruise Planning Discussion • Laboratory equipment requirements Discussion of research plans and feed-back from class	Research Plan
4	Feb 4/6	Scientific Writing Review: lecture and discussion (1 hour) Peer Review of Proposals (within research groups) (2 hours)	Research proposal: Introduction and Methods
5	Feb 11/13	Biometry Demonstration of R Software (2 hours): <ul style="list-style-type: none"> • In-class assignment: normality, transformations, statistical power, signal / noise, sample size • Data analysis workshop: variability • Discussion of data transformations and statistical inference depending on quality / quantity of data 	Complete peer-review of other student's proposals (within same group)
6	Feb 20	Report from team(s) that have lead field sampling (1 hour) Statistics / Writing / Sample Processing Workshop: Focusing on analysis and results (2 hours) <ul style="list-style-type: none"> • Discussion of data screening • Possible analysis / re-analysis • R assistance and mentoring • Laboratory equipment use 	Revised proposals (including response to peer review comments) Field report: team(s) that led previous week's lab
7	Feb 25/27	Report from team(s) that have lead field sampling (1 hour) Statistics / Writing / Sample Processing Workshop: Focusing on analysis and results (2 hours) <ul style="list-style-type: none"> • Discussion of data screening • Possible analysis / re-analysis • R assistance and mentoring • Laboratory equipment use 	Field report: team(s) that led previous week's lab

Week	Dates	Class Topics and Activities	Assignment (due in class)
8	Mar 11/13	Report from team(s) that have lead field sampling (1 hour) Statistics / Writing / Sample Processing Workshop: Focusing on analysis and results (2 hours) <ul style="list-style-type: none"> • Discussion of data screening • Possible analysis / re-analysis • SPSS assistance and mentoring • Laboratory equipment use 	Field report: team(s) that led previous week's lab
9	Mar 18-20	Discussion - Content and structure of the introduction and methods sections of a scientific paper (1 hour) Peer Review of Proposals (2 hours): students randomly pair up, work as peer reviewers reporting edits by page and line) <ul style="list-style-type: none"> • Time to work on reviews • Time to discuss reviews with authors • If time allows: Laboratory equipment workshop 	Peer review of the Introduction and Methods sections of research paper
10	April 1-3	Lecture - Making and giving oral presentations (1 hour) Presentation Workshop - students develop and present introductory slides; class provides feed-back (2 hours): <ul style="list-style-type: none"> • Time to work on / give presentations • Time to discuss presentations with authors If time allows: Laboratory equipment workshop	Final Introduction and Methods sections of paper – to be graded Explicit responses to peer-review
11	April 8/10	Presentation of results by 2-3 groups, followed by class critique of style / content of slides (1 hour) Data analysis and writing workshop (2 hours): <ul style="list-style-type: none"> • Instructor discusses analyses with presenting groups Other groups work on data analysis of their results	Presentation of results by 2-3 groups, followed by class critique of style and slides
12	April 15/17	Presentation of results by 2-3 groups, followed by class critique of style / content of slides (1 hour) Data analysis and writing workshop (2 hours): <ul style="list-style-type: none"> • Instructor discusses analyses with presenting groups • Other groups work on data analysis of their results 	Presentation of results by 2-3 groups, followed by class critique of style and slides
13	April 22/24	<ul style="list-style-type: none"> • Final presentations – in class and lab (up to 6 hours) 	Final report Final presentation
14		NO CLASS MEETING DURING FINAL'S WEEK	Self-assessment (Submit Via Email)

NOTE: The self-assessment consists of a series of questions that will help the instructors to identify course revisions, assess group members' effort, and assess the course learning outcomes.