BI 495 IS Research Seminar I

Meeting times & Location:

We meet each week. Meeting location will be in Research Lab 9 or Dr Dohm's office. Days and times to be decided with student pending start of the semester

Instructor (Facilitator): Michael Dohm, PhD
Office: WSC 108
E-mail: mdohm [at] chaminade.edu
Web site: letgen.org
Office hours: Tuesday 9 - 11am and 1:30 - 3PM or by appointment. Office hours for research mentors should be established individually.

Course overview

Directed Senior Research is a capstone course, a culmination of study in biology at Chaminade University. The steps that you follow in BI495 are quite similar to steps taken by biologists in a wide variety of research labs, from generating ideas and research proposals to collection and analysis of data and finally to the communication of results to other scientists (including those at granting agencies) through a written publication and or a public presentation. You will work in a laboratory with a lab mentor; the BI495 instructor serves as facilitator for your experience learning and conducting research. The weekly meetings with the facilitator will be used to aid students in developing relevant questions, designing and implementing concept-based projects, review project progress, and to perform exercises that aim to increase your knowledge of topical issues in the realms of biological discovery, scientific ethics and recent technical advances.

Catalog description

BI 495 Research I (3) Weekly seminar course accompanying research project (approximately 10 hours per week) performed in Chaminade or other research laboratory under supervision of a practicing research scientist.

Prerequisites: BI 308 and BI 308L. Materials intensive fee applies.

The course has four components:

1. Hands-on Laboratory Research Project.
You may complete this on or off-campus. Off-campus research internships are typically during the summer prior to your registration in BI495. If you wish to perform on campus research you must be accepted by a research mentor from the list above by the end of week 2 of the semester. You should aim to spend at least 10 hours per week on your research project. Be aware that “10 hours per week” is a minimum; the nature of scientific inquiry means that it can sometimes be time-consuming and the demands on you can be unpredictable. Stay in communication with the BI495 faculty, work with your research mentor about expectations and discuss how you will be able to meet the expectations of both your research laboratory responsibilities and the requirements to complete this course

2. Weekly class meetings and assignments, including two papers:
(1) Research snapshot

(2) a Mini review

During the semester we will discuss aspects of conducting research, covering both practical and epistemological issues related to scholarship and research participation. Your attendance and participation is essential, required, and you will be expected to be prepared to participate by completing homework exercises before attending class.

Papers. Students will write two papers. Required elements of the Mini-review paper and the Research snapshot paper will be discussed during the semester. Elements of the required writing include the following.

Type of paper	Focus	Elements	Word limit
Research snapshot	A one page summary that describes why your study was done, key findings, and implications for practice and policy, presented in plain language.	Title page Abstract Text body APA student format	500 (±50)
Mini-review	Summarizes the background and important concepts relevant to the research topic. Includes discussion of fundamental concepts, perspectives and or controversies; current knowledge and any research gaps. Must not include unpublished material (i.e., do not present your summer research!)	Title page Abstract Introduction Text body • Must include sub-headings • Must include tables/figures (no more than 3 total) Conclusions References (primary & secondary literature sources) • Spell check, grammar check • APA student format	2000 (±200)

Due dates. Both papers must be submitted, first as as draft and then, as a final report after corrections are completed.

BI495 IS schedule with due dates will be discussed with the student at the start of the semester.

All papers will be submitted as pdf files to CANVAS.

3. Peer evaluation and editing of student papers, posters.
Although subjective and far from perfect, the peer review process is regarded as an essential component of doing science. Thus, students will learn how to conduct reviews of each other's work. In addition, some students will be asked to help with editing duties – those students who have already completed their research through participation in summer research will assist the instructor with improving all written materials produced in the class. Peer evaluation and/or editing must be completed by week 10 for Research snapshots and by week 12 for Mini-reviews. We will utilize anonymous peer review principles – only the instructor will know names of student authors and the names of students who reviewed the work of others. Similarly, names of student authors will be not be disclosed to student editors.

4. Poster or video presentation to faculty and staff in week 14 - 15 of the semester.
Posters. You will create and present a poster documenting your research project at our mini-symposium. A single sheet poster will be required. The poster will include title, authors and affiliations, abstract, background, methods, results and data, discussion, literature cited and acknowledgments. PowerPoint templates for poster design are recommended and will be provided on request by the instructor. If a poster, your poster will be printed for you, provided you meet the deadline (week 11). The mini-symposium. At the mandatory poster presentation session you should be prepared to give a brief oral presentation of your poster and answer questions from faculty and your peers.

Presentations will be held on campus in week 15 of the semester. The room location and date of this symposium will be announced in class.

Credit Hour Expectations

BI-495 is a three-credit hour, capstone course and therefore requires a minimum of 135 hours of student engagement (see CUH Credit Hour Policy). One university semester credit hour typically includes one hour of in-class contact time with the professor plus two hours of preparation time by the student. BI-495 requires research activity; thus, over the course of the semester, students enrolled in BI495 are expected to spend about 70 hours in research, 15 hours in quizzes, and 50 hours on homework and research-related activities (data management, analysis, write-ups, meeting with research mentor). These times are approximate -- individual needs may vary.

Grading distribution

Graded items	Points
Proposed research • Project management plan • Weekly updates shared with PI and lab group	100
Lab notebook • Regularly up to date • Complete, follows rubric	100
Poster or video Presentation • Draft • Final version	100

Written papers, follows rubric

- Research snapshot
  - Draft paper 20
  - Final paper 10
- Mini-review
  - Draft paper 50
  - Final paper 20

Total 400

Grades assigned as follows

A	Outstanding scholarship and an unusual degree of intellectual initiative	360 – 400
B	Superior work done in a consistent and intellectual manner	320 – 359
C	Average grade indicating a competent grasp of subject matter	280 – 319
D	Inferior work of the lowest passing grade, not satisfactory for fulfillment of prerequisite course work	240 – 279
F	Failed to grasp the minimum subject matter; no credit given	< 239

Student (Course) Learning Outcomes

Successful completion of this course should provide students with the following learning outcomes (with mapping to PLO):

1. Apply the scientific method to ask testable biological or biomedical hypotheses and plan and implement experiment that evaluate the proposed hypothesis. (PLO1, PLO4, PLO5)
2. Locate, critically evaluate, and summarize the current scientific primary literature to defend methods and conclusions drawn from experiment results. (PLO3)
3. Acquire, collect, maintain, and share relevant information to describe and evaluate project data. (PLO2, PLO3)
4. Apply appropriate data analysis and visualization of project information to communicate project results by oral and written communication. (PLO2)
5. Demonstrate competence in use of biological techniques and instruments. Competence is demonstrated by identifying appropriate technique and instrumentation for the project, creating protocols to support reproducible research, troubleshooting (interpreting) error messages and adjusting protocols to ensure accuracy of collected data. (PLO3)

Biology Program Learning Outcomes (PLO)

Upon completion of the B.S. degree program in Biology the student will demonstrate:

1. An understanding of the scientific method and the ability to design and test a hypothesis
2. The ability to visualize, statistically evaluate, validate and interpret scientific data, and to communicate science effectively both orally and in writing
3. The ability to acquire and comprehend information from published scientific literature and to employ computational resources in the resolution of biological problems
4. An understanding of the chemical and physical principles that unite all life forms, and of biological organization at the molecular, cellular, tissue, organ, organism and system levels

5. The ability to define the components and processes of genetic and epigenetic information transmission, and their determinant effects on the adaptive and evolutionary processes that they drive
6. An understanding of the entry requirements, career pathways and progression for the major post-graduate fields of research, education and the health professions

University outcomes

Marianist Values

This class represents one component of your education at Chaminade University of Honolulu. An education in the Marianist Tradition is marked by five principles and you should take every opportunity possible to reflect upon the role of these characteristics in your education and development:

1. Education for formation in faith
2. Provide an integral, quality education
3. Educate in family spirit
4. Educate for service, justice and peace
5. Educate for adaptation and change

Native Hawaiian Values

Education is an integral value in both Marianist and Native Hawaiian culture. Both recognize the transformative effect of a well-rounded, value-centered education on society, particularly in seeking justice for the marginalized, the forgotten, and the oppressed, always with an eye toward God (Ke Akua). This is reflected in the ‘Olelo No’eau (Hawaiian proverbs) and Marianist core beliefs:

1. Educate for Formation in Faith (Mana) E ola au i ke akua (‘Ōlelo No‘eau 364) May I live by God
2. Provide an Integral, Quality Education (Na’auao) Lawe i ka ma‘alea a kū‘ono‘ono (‘Ōlelo No‘eau 1957) Acquire skill and make it deep
3. Educate in Family Spirit (‘Ohana) ‘Ike aku, ‘ike mai, kōkua aku kōkua mai; pela iho la ka nohana ‘ohana (‘Ōlelo No‘eau 1200) Recognize others, be recognized, help others, be helped; such is a family relationship
4. Educate for Service, Justice and Peace (Aloha) Ka lama kū o ka no‘eau (‘Ōlelo No‘eau 1430) Education is the standing torch of wisdom
5. Educate for Adaptation and Change (Aina) ‘A‘ohe pau ka ‘ike i ka hālau ho‘okahi (‘Ōlelo No‘eau 203) All knowledge is not taught in the same school

Alignment of Natural Sciences Courses with Marianist and Hawaiian values of the University.

The Natural Sciences Division provides an integral, quality education: sophisticated integrative course content taught by experienced, dedicated, and well-educated instructors.

- We educate in the family spirit – every classroom is an Ohana and you can expect to be respected yet challenged in an environment that is supportive, inclusively by instructors who take the time to personally get to know and care for you.
- We educate for service, justice and peace, since many of the most pressing global issues (climate change, health inequity, poverty, justice) are those which science and technology investigate, establish ethical parameters for, and offer solutions to.

- We educate for adaptation and change. In science and technology, the only constant is change. Data, techniques, technologies, questions, interpretations and ethical landscapes are constantly evolving, and we teach students to thrive on this dynamic uncertainty.

The study of science and technology can be formative, exploring human creativity and potential in the development of technologies and scientific solutions, the opportunity to engage in the stewardship of the natural world, and the opportunity to promote social justice. We provide opportunities to engage with the problems that face Hawai'i and the Pacific region through the Natural Sciences curriculum, in particular, those centered around severe challenges in health, poverty, environmental resilience, and erosion of traditional culture. The Marianist Educational Values relate to Native Hawaiian ideas of mana, na'auao, ohana, aloha and aina. We intend for our Natural Sciences programs to be culturally-sustaining, rooted in our Hawaiian place, and centered on core values of Maiau, be neat, prepared, careful in all we do; Makawalu, demonstrate foresight and planning; `Ai, sustain mind and body; Pa`a Na`au, learn deeply.

Course and University Policies

Late assignments will not be accepted without prior written approval from the instructor.

Use of music devices and cell phones is prohibited during all Natural Science and Mathematics classes at Chaminade, unless specifically permitted by your instructor.

BI495 Electronic devices policy: "I encourage responsible use of your laptops, tablets or other electronic devices in this course, provided they do not interfere with participation and other class responsibilities," Dr. Dohm.

All other academic polices specified by the University Catalog and Student Handbook 2018-2019 apply to this course. Students performing research at off-campus locations are required to perform all applicable safety trainings prior to starting work

ADAA Statement. Pursuant to several federal and state laws, including the Americans with Disabilities Act of 1990, as amended by the ADA Amendments Act of 2008, and Section 504 of the Rehabilitation Act of 1973, all qualified students with disabilities are protected from discrimination on basis of disability and are eligible for reasonable accommodations or modifications in the academic environment to enable them to enjoy equal access to academic programs, services, or activities. If a student would like to determine if they meet the criteria for accommodations, they should contact the Counseling Center at 808-735-4845 for further information.

Title IX Declaration. Chaminade University of Honolulu recognizes the inherent dignity of all individuals and promotes respect for all people. Sexual misconduct, physical and/or psychological abuse will NOT be tolerated at CUH. If you have been the victim of sexual misconduct, physical and/or psychological abuse, we encourage you to report this matter promptly. As a faculty member, I am interested in promoting a safe and healthy environment, and should I learn of any sexual misconduct, physical and/or psychological abuse, I must report the matter to the Title IX Coordinator. Should you want to speak to a confidential source you may contact the following: Chaminade Counseling Center: 808 735-4845. Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role.

Details of the course, including syllabus and schedule, may be subject to change by instructor.