

Course Syllabus: BI 411 Laboratory Spring 2024

[Chaminade University Honolulu](http://www.chaminade.edu)

3140 Waialae Avenue - Honolulu, HI 96816

Class time: Tuesday 2:30-5:30pm HENRY LAB 4

Instructor Information:

Dr. Claire Wright, Ph.D.

Associate Professor of Biology, School of Natural Science and Mathematics, Wesselcamper 106

Office Hours: Thursdays 2-5pm or by Zoom (you choose the time) and its set when I confirm.

Claire.wright@chaminade.edu

Required Text:

Neuroscience Exploring the Brain.

Bear, Connors and Paradiso. 3rd Edition (or higher)

All other reading materials will be provided or sourced from free access on the internet.

Course title: BI-411 Advanced Human Physiology II –Neurophysiology Lab

Course Description:

Fundamentals of neurophysiology from the cellular to the system levels. Discussion of neuroanatomy followed by the ionic and pharmacological basis of nerve and synaptic function. Specialized neuronal geometries and synaptic circuitries associated with a variety of sensory, motor and central systems. The laboratory covers extracellular and intracellular techniques in neurophysiology as well as sectioning and immunocytochemistry.

Course Elements

This course provides an overview of the human central nervous system (CNS). It covers the principles of neurophysiology, chemistry and anatomy. It also focuses on the central control of movement and the physiological mechanisms responsible for the translation of sensory information into the CNS. Thus, the fundamentals of neuroscience, from the cellular to the systemic level will be discussed, including both a discussion of the neuroanatomy followed by the ionic and pharmacological basis of nerve and synaptic function, and also specialized neuronal geometries and synaptic circuitries associated with a variety of sensory, motor and central systems.

Grading Scale

A	Excellent	>90%	450 points or more
B	Good	>80%	400 points
C	Average	>70%	350 points
D	Below Average	>60%	300 points
F	Failure	<60%	299 points or less

Assignments and Grading

<u>Specific Assignment</u>	<u>Points</u>	<u>% Of Grade</u>	<u>Due Date</u>
Attendance	100	20%	Each week -semester long
Lab Olympics (plus lab book)	200	40%	Once, lab book x3 times
Project and Final Paper	200	40%	Due before finals week

Learning Outcomes

Marianist Values – Refer to your Canvas WELCOME learning module to see specifically how this class aligns with 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 ('Olelo 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 ('Olelo 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 ('Olelo 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 ('Olelo 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 ('Olelo No'eau 203) All knowledge is not taught in the same school

Learning Outcomes

Student Learning Outcomes	Linkage to Program Learning Outcomes
1) Understand how the different cells of the nervous system function independently and as a unit.	PLO 4,5
2) Be able to describe how neurons communicate with each other and the limits of plasticity in this system.	PLO 1,2,4,5,6
3) Examine the processes important for the development of the nervous system.	PLO 1,2,4,5,6
4) Understand the structural and physiological adaptations of the nervous system through evolution.	PLO 1-4, 7
5) Appreciate the physiological mechanisms behind the various human sensory organs.	PLO 1,2,3,5,6

Biology Program Learning Outcomes

Upon completion the program in Biology, a graduating student will demonstrate the following competencies:

1. Apply the scientific method in the design and testing of hypotheses
2. Transform and display, statistically evaluate, validate, and interpret scientific data and communicate the results of such analyses effectively both orally and in writing
3. Acquire, summarize, and synthesize information from published scientific literature, databases and bioinformatics software to extract and interpret biological data
4. Recognize the chemical and physical principles that underlie all life forms, and the biological organization at the molecular, cellular, tissue, organ, organism, and system levels that emerge from these principles

5. 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. Evaluate the etiology of major human disease burden in terms of, pathophysiological mechanisms, epidemiology within populations and possible therapeutic approaches
7. Integrate an awareness of bioethical issues to positively influence the application of science to service, justice and peace in the solution of societal problems.

Technical Assistance for Canvas: This information can also be found in the WELCOME MODULE in 'Instructions for using Technology in this class'.

- Search for help on specific topics or get tips in [Canvas Students](#)
- [Live chat with Canvas Support for students](#)
- Canvas Support Hotline for students: +1-833-209-6111
- Watch this [video to get you started](#)
- [Online tutorials](#): click on "Students" role to access tutorials
- Contact the Chaminade IT Helpdesk for technical issues: helpdesk@chaminade.edu or call (808) 735-4855

Tutoring and Writing Services

Chaminade is proud to offer free, one-on-one tutoring and writing assistance to all students. Tutoring and writing help is available on campus at Kōkua 'Ike: Center for Student Learning in a variety of subjects (including, but are not limited to: biology, chemistry, math, nursing, English, etc.) from trained Peer and Professional Tutors. Please check Kōkua 'Ike's website (<https://chaminade.edu/advising/kokua-ike/>) for the latest times, list of drop-in hours, and information on scheduling an appointment. Free online tutoring is also available via TutorMe or Smarthinking. Tutor Me and Smarthinking can be accessed 24/7 from your Canvas account. Simply click Account – Notifications – TutorMe or Smarthinking. For more information, please contact Kōkua 'Ike at tutoring@chaminade.edu or 808-739-8305.

1. Course Elements

This course provides an upper division presentation of Neurophysiology. It also constantly refers to other foundational materials studied in previously taken science classes. It starts with an overview of the human central nervous system (CNS) and then covers the principles of neurophysiology, chemistry and anatomy. It also focuses on the central control of movement and the physiological mechanisms responsible for the translation of sensory information into the CNS. Thus, the fundamentals of neuroscience, from the cellular to the systemic level will be discussed, including both a discussion of the neuroanatomy followed by the ionic and pharmacological basis of nerve and synaptic function, and also specialized neuronal geometries and synaptic circuitries associated with a variety of sensory, motor and central systems.

Students are responsible for all text assignments, as well as supplementary handouts. Students are encouraged to **read ahead** to keep up with high volume of material, do NOT underestimate how much this will help you in class!!!

Additional Departmental and University Policies

1. Electronic Devices

Use of music devices and cell phones is prohibited during all School of Natural Science and Mathematics classes at Chaminade, unless specifically permitted by your instructor. Use of cellphones and music devices in laboratories is a safety issue. In addition, use of cellphones and music devices in any class is discourteous and may lead to suspicion of academic misconduct. Students who cannot comply with this rule will be asked to leave class and may be subject to laboratory safety violation fines. You will be asked to leave class and marked absent if you do not comply. This will negatively affect your grade. Please refer any questions to the Dean of Natural Sciences and Mathematics.

2. Disability Access

If you need individual accommodations to meet course outcomes because of a documented disability, please speak with me to discuss your needs as soon as possible so that we can ensure your full participation in class and fair assessment of your work. Students with special needs who meet criteria for the Americans with Disabilities Act (ADA) provisions must provide written documentation of the need for accommodations from the Counseling Center by the end of week three of the class, in order for instructors to plan accordingly. 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 (counselingcenter@chaminade.edu).

3. Title IX Compliance

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. If you or someone you know has been harassed or assaulted, you can find the appropriate resources by visiting Campus Ministry, the Dean of Students Office, the Counseling Center, or the Office for Compliance and Personnel Services.

3.1 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.

4. Attendance Policy

The following attendance policy is from the 2018-2019 Academic Catalog (p. 57-58):

- Students are expected to attend regularly all courses for which they are registered. Student should notify their instructors when illness or other extenuating circumstances prevents them from attending class and make arrangements to complete missed assignments. Notification may be done by emailing the instructor's Chaminade email address, calling the instructor's campus extension, or by leaving a message with the instructor's division office.

- It is the instructor's prerogative to modify deadlines of course requirements accordingly. Any student who stops attending a course without officially withdrawing may receive a failing grade.
- Unexcused absences equivalent to more than a week of classes may lead to a grade reduction for the course. Any unexcused absence of two consecutive weeks or more may result in being withdrawn from the course by the instructor, although the instructor is not required to withdraw students in that scenario. Repeated absences put students at risk of failing grades.
- Students with disabilities who have obtained accommodations from the Chaminade University of Honolulu ADA Coordinator may be considered for an exception when the accommodation does not materially alter the attainment of the learning outcomes. Federal regulations require continued attendance for continuing payment of financial aid.
- When illness or personal reasons necessitate continued absence, the student should communicate first with the instructor to review the options. Anyone who stops attending a course without official withdrawal may receive a failing grade or be withdrawn by the instructor at the instructor's discretion.

4.1. Tardiness

Reasons for tardiness should be explained to the instructor at the end of the class. Repeated tardiness may lead to a grade reduction for the course. Repeated unexcused tardiness may result in discussion with the instructor regarding the ability of the student to commit to the class.

4.2 Policy on Make-Up Tests

Makeup exams and quizzes are not given unless a student is ill and contacts the instructor within 24 hours of missed class period. A **doctor's written excuse** should be supplied at the NEXT class attended. Extra credit opportunities may be available during the course of regular lectures or may be written into the exams.

5. Policy on Communication

5.1 The University provides a Chaminade email address for all students. Official Chaminade communications will be sent to the students' Chaminade email address and instructors will use only this email to communicate with students. It is the responsibility of the student to check their email frequently. Report email-related problems to the Helpdesk at 808-735-4855 or helpdesk@chaminade.edu.

Refer to the instructions in the WELCOME MODULE ON CANVAS – 'What should I expect from my Instructor?'

6. 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. If you or someone you know has been harassed or

assaulted, you can find the appropriate resources by visiting Campus Ministry, the Dean of Students Office, the Counseling Center, or the Office for Compliance and Personnel Services.

- Chaminade Counseling Center 808 735-4845.
- Any priest serving as a sacramental confessor or any ordained religious leader serving in the sacred confidence role.

7. Academic Conduct Policy

From the 2018-2019 Undergraduate Academic Catalog (p. 42):

Any community must have a set of rules and standards of conduct by which it operates. At Chaminade, these standards are outlined so as to reflect both the Catholic, Marianist values of the institution and to honor and respect students as responsible adults. All alleged violations of the community standards are handled through an established student conduct process, outlined in the Student Handbook, and operated within the guidelines set to honor both students' rights and campus values. Students should conduct themselves in a manner that reflects the ideals of the University. This includes knowing and respecting the intent of rules, regulations, and/or policies presented in the Student Handbook, and realizing that students are subject to the University's jurisdiction from the time of their admission until their enrollment has been formally terminated. Please refer to the Student Handbook for more details. A copy of the Student Handbook is available on the Chaminade website. For further information, please refer to the Student Handbook: <https://studentaffairs.chaminade.edu/wp-content/uploads/sites/28/2018-19-NEW-STUDENT-HANDBOOK.pdf>

Cheating in the form of plagiarism, collusion, deception and will not be tolerated and will negatively affect your grade.

8. Credit Hour Policy

The unit of semester credit is defined as university-level credit that is awarded for the completion of coursework. One credit hour reflects the amount of work represented in the intended learning outcomes and verified by evidence of student achievement for those learning outcomes. Each credit hour earned at Chaminade University should result in 37.5 hours of engagement. For example, in a one credit hour traditional face to face course, students spend 50 minutes in class per week for 15 weeks, resulting in a minimum of 12.5 instructional hours for the semester. Students are expected to engage in reading and other assignments outside of class for at least 2 additional hours per week, which equals an additional 25 hours. These two sums result in total student engagement time of 37.5 hours for the course, the total engagement time expected for each one credit course at Chaminade.

The minimum 37.5 hours of engagement per credit hour can be satisfied in fully online, internship, or other specialized courses through several means, including (a) regular online instruction or interaction with the faculty member and fellow students and (b) academic engagement through extensive reading, research, online discussion, online quizzes or exams; instruction, collaborative group work, internships,

laboratory work, practica, studio work, and preparation of papers, presentations, or other forms of assessment. This policy is in accordance with federal regulations and regional accrediting agencies.

9. The instructor may modify elements of this syllabus according to the operational needs of the class. Please keep on track of changes given the fluctuating pandemic restrictions.

Tentative Course Outline: Every effort has been made to ensure that the material in this syllabus is accurate and complete. The instructor reserves the right to make any changes in the contents of this syllabus that she deems necessary or desirable.

Week	Class Date	Topic	Focus and Tasks to Do to prepare for subsequent class
Module 1: Welcome to Neurobiology			
1	1/9	Welcome and explanation of expectations and goals for course	- Basic lab skills assessment - Literature critique - Project to demonstrate scientific experimental technique and writing
2	1/16	Neuroanatomy - Deep dive	Get into lab groups, worksheets and brain dissections
3	1/23	How to review a scientific paper - back to basics of scientific method through a 'seniors' eyes'	Discuss hypothesis and discussion more deeply. Start editor's review Homework: finish review
Module 2: Practice Hypothesis testing, Data Gathering and Lab write ups			
4	1/30	Flexstation - live cell experiment data collection	Hand in review today Prepare data for next lab
5	2/6	Data presentation and antibody technology discussion	Prepare for next lab (data and antibody method) Lab book review #1 hand in at end of lab.
6	2/13	Data presentation and antibody technology discussion	
7	2/20	Synaptic integration, modification, plasticity (field trip)	Prepare for Olympics
8	2/27	Lab Olympics - Senior Lab Skills Challenge	
Module 3: Final projects preparation			

9	3/5	Final project background research	Hand in Experiment write up from week 4 NO LAB THIS WEEK
10	3/12	Plan project experiment 1	Dr Wright will comment on them and you should try to fix papers up to improve your score over spring break.
11	3/19	Spring break week.	
Module 4: Final projects			
12	3/26	First experiment run	You will all swap practice reports and comment on each others (anonymously). Lab book review #2 Hand in at end of lab.
13	4/2	Data review discussion Critique of approaches Student presentation of all projects.	Dr Wright will hand comments back to peer on their practice paper. Fix up and hand in by Saturday midnight.
14	4/9	Experiment run	Dr Wright will tell you your final points score for your practice paper. All students will assess each other's work during session
15	4/16	Experiment run	Review of applied biostatistics from BI311
16	4/23	Last Chance to run Experiment	Final papers due Saturday 27th midnight. Final lab book review - hand in with final paper or on Friday 26th (before 5pm)