



**Chaminade**  
**University**  
OF HONOLULU

## **Course Syllabus:** **BI 411 Lecture Spring 2021**

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

3140 Waiialae Avenue - Honolulu, HI 96816

**Class time: Tues/Thurs 11:30-12:50**

### **Instructor Information:**

Dr. Claire Wright, Ph.D.

Associate Professor of Biology, School of Natural Science and Mathematics

### **Classroom - Henry Hall 104**

Wesselcamper 106

Office Hours: Tuesdays and Thursdays 1-3pm or by Zoom (you choose the time) - email for calendar access to book your appointment!

[Claire.wright@chaminade.edu](mailto:Claire.wright@chaminade.edu)

### **Required Text:**

Neuroscience Exploring the Brain.

Bear, Connors and Paradiso. 3<sup>rd</sup> Edition (or higher)

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

### **COURSE TITLE: BI-321 ADVANCED HUMAN AND COMPARATIVE VERTEBRATE ANATOMY**

**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 antibody technologies.

## 1. 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

## Student Learning Outcomes

- 1) Understand how the different cells of the nervous system function independently and as a unit.
- 2) Be able to describe how neurons communicate with each other and the limits of plasticity in this system.

## Linkage to Program Learning Outcomes

PLO 4,5

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 (PLO)**

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

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](mailto: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](mailto:tutoring@chaminade.edu) or 808-739-8305.

## VII. 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!!!

## VIII. 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>
Participation	75	15%	Each week -semester long
Assignments	75	15%	Each week semester long
Semester exams	200	40%	Three during semester
Final Exam	150	30%	Final week of semester

## **Additional Departmental and University Polices**

### 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. ADAA Statement

2.1 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.

#### **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 Kōkua 'Ike: Center for Student Learning 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 Kōkua 'Ike Coordinator at (808) 739-8305 for further information (ada@chaminade.edu).

### 3. Attendance & Tardiness

3.1 Students are expected to attend regularly all courses for which they are registered. Students should notify their instructors when illness or other extenuating circumstances prevents them from attending class and should make arrangements to complete their 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 (Natural Science and Mathematics - 1 (808) 440-4204). It is the instructor's prerogative to modify deadlines of course requirements accordingly.

**1. Chaminade administrative withdrawal policy. If you miss **two** consecutive classes in an unexcused fashion (i.e. with prior email approval from me) then you will be withdrawn from the class.**

**2. Additional attendance requirements. No more than four classes may be missed across the whole semester. Failure to score at least 20 points on attendance will result in failure of the course.**

3.2 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.

### 3.3. 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.

### 3.4 . 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.

## 4. Policy on Communication

4.1 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](mailto:helpdesk@chaminade.edu).

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

## 5. 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.

## 6. Academic Conduct Policy

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 \(Links to an external site.\)](#).

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

**7. 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.

<b>Week</b>	<b>Class Date</b>	<b>Topic</b>	<b>Text Book Chapters to Focus on and Tasks to Do</b>
<b>The First Module: How a neuron works</b>			
<b>1</b>	2/2	<b>Batman vs. Superman: Why can't everyone just get along?</b> <i>(Overview: Cell Types and Information Transfer in the Nervous System)</i>	Read Chapter 1 and 2

<b>1</b>	2/4	<b>What Happens when the Train is on Strike?</b>	Class Welcome Video Assignment due to Canvas before 11:30 (2/4)
<b>2</b>	2/9	<b>Biology is Simply Three-Dimensional Chemistry that Adheres to the Laws of Physics</b> <i>(Electrical Signaling: Ionic Equilibrium Potentials and the Resting Membrane Potential)</i>	Read Chapter 3
<b>2</b>	2/11	<b>Electrical Healing is Something that's Good for Me?</b>	Assignment due to Canvas before 11:30 (2/16)
<b>3</b>	2/16	<b>Feeling Numb - The Elegance of Anesthesia</b> <i>(Ionic Currents, Action Potentials, Ion Channels)</i>	Chapter 4
<b>3</b>	2/18	<b>Poisons, Toxins and Venoms Oh My!</b>	Assignment due to Canvas before 11:30 (2/23)
<b>4</b>	2/23	<b>Depression and Mania Two Sides of the Same Coin</b> <i>(Intercellular Signaling: Synaptic Transmission and Neurotransmitter Chemistry)</i>	Chapters 5 and 6
<b>4</b>	2/25	<b>Brains on Drugs</b>	Exam 1 - Released on 2/25 at 1:00pm, to be completed and submitted BEFORE 12pm on 3/1.
<b>The Middle Module: Building and Repairing the Central Nervous system</b>			
<b>5</b>	3/2	<b>The Most Valuable Information You'll Ever Hear as a Student</b> <i>(Synaptic Integrations, Modification, Plasticity)</i>	Chapter 24 and 25
<b>5</b>	3/4	<b>Another Good Reason it Totally Sucks to get Old</b>	Assignment due to Canvas before 11:30 (3/9)
<b>6</b>	3/9	<b>Autism and Schizophrenia</b> <i>(Neurogenesis 1: Induction and Patterning: Cellular Birth and Migration)</i>	Chapter 23
<b>6</b>	3/11	<b>Mind Altering Meditation</b> <i>(Neurogenesis II: Axon Guidance and Synaptogenesis)</i>	1. Chapter 23 2. Assignment due to Canvas before 11:30 (3/16)
<b>7</b>	3/16	<b>Zika virus, Folate deficiency and Ventriculomegaly</b>	Chapter 7



		<i>(Gross Development and Evolution of the NS)</i>	
<b>7</b>	3/18	<b>The Sacrificial Lessons from War</b> <i>(Neuroanatomy: Major Brain Structures and their Function)</i>	1. Chapter 7 plus Appendix 2. Start working on Chronic Stress and Mental Health Project (see Marianist Value in Welcome module). 3. Assignment due to Canvas before 11:30 (3/23)
<b>8</b>	3/23	<b>The Value of your Hardworking Entourage (even if you're not Queen Bey)</b> <i>(Glial-Neuronal Interactions: Regeneration and Repair)</i>	(Provided) Article reading
<b>8</b>	3/25	<b>Talk and Die, and Foreign Accent Syndromes</b>	Exam 2 - released on 3/25 at 1:00pm, to be completed and submitted BEFORE 12pm on 3/29.
<b>The Final Module: Moving and Feeling</b>			
<b>9</b>	3/30	<b>Do Zombies dream of dead sheep?</b> <i>(Overview of Motor Systems)</i>	Chapter 13
<b>9</b>	4/1	<b>Christopher Reeves vs. Michael J Fox</b>	1. Chapter 14 2. Assignment due to Canvas before 11:30 (4/6)
<b>10</b>	4/6	<b>Do Two Negatives Really Make a Positive?</b> <i>(Spinal Cord vs Central Control of Movement)</i>	Chapter 14
<b>10</b>	4/8	<b>Phantom limbs</b> <i>(The Somatic Sensory System)</i>	1. Chapter 12 2. Assignment due to Canvas before 11:30 (4/13)
<b>11</b>	4/13	<b>The Grasshopper Mouse is a Magical Creature</b> <i>(Pain)</i>	Chapter 12
<b>11</b>	4/15	<b>Synesthesia: Yes, I want Chicken with my Ice Cream thank you.</b> <i>(Chemical Sensory Systems)</i>	1. Chapter 8 2. Chronic Stress and Mental Illness Assignment due (Friday 16 <sup>th</sup> Midnight).

<b>12</b>	4/20	<b>Optical Illusions: Are we all Hallucinating all the time?</b> <i>(The Visual System and Visual Perception)</i>	1.Chapters 9 and 10
<b>12</b>	4/22	<b>With our Blind Sight we are all Reptiles Underneath</b>	1. Chapter 15 2. Assignment due to Canvas before 11:30 (4/27)
<b>13</b>	4/27	<b>Turn down the 'Wife Filters' please!!! (Dr. Wright direct quote at least once a week)</b> <i>(The Auditory and Vestibular Systems)</i>	Chapter 11
<b>13</b>	4/29	<b>Why don't we need our Big Toes to Balance (and other asinine questions)</b>	Exam 3 released on 4/29 at 1:00pm, to be submitted BEFORE 12:00pm 5/3
<b>14</b>	5/5	<b>Cumulative Final Exam</b>	Study EVERYTHING like study machines!!!!