

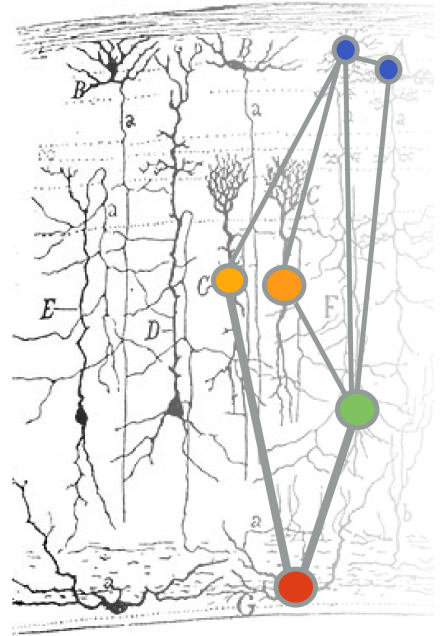
BIPN 145 Neurobiology Laboratory

WINTER 22

Welcome to BIPN 145! This is a course about how we study the nervous system. You'll be asked to think, plan, and write like a neuroscientist.

Course learning objectives

- **Collect** (pandemic permitting) and **evaluate** neural data from various organisms
- **Apply** principles of neural communication to multiple model systems
- **Describe** the breadth of techniques in neuroscience and the experimental questions they are suited to answer
- **Develop** an appreciation for and practical insight into the process of research
- **Communicate** research to peers as well as a broader audience



Course details

Lecture: MWF 11-11:50 AM (Location varies; see Schedule below)

Lab: WF 12:30-3:50 PM (Location varies; see Schedule below)

Course website: <https://sites.google.com/ucsd.edu/bipn145>



Instructor

Ashley Juavinett, PhD (she/her)
ajuavine@ucsd.edu

(Virtual) Office hours

Mondays at 1:30 pm
(Link on Canvas)

Instructional Assistants

Grace Padilla (g1padill@ucsd.edu)
Giulia Livrizzi (gilivriz@ucsd.edu)

Staff Research Associate

Koorosh Askari (koaskari@ucsd.edu)
Haley Stott (hstott@ucsd.edu)

Notes on our how class will run during a global pandemic

I realize it is tough to stay engaged and motivated during year two of a global pandemic. I also realize many of you are eager to get back to “normal” life at UC San Diego and beyond. We’re going to do what we can in this class to productively learn what we can together in person, while maintaining a safe and flexible environment. I appreciate your patience as we work together to figure out how to live and learn in these rather unreasonable times.

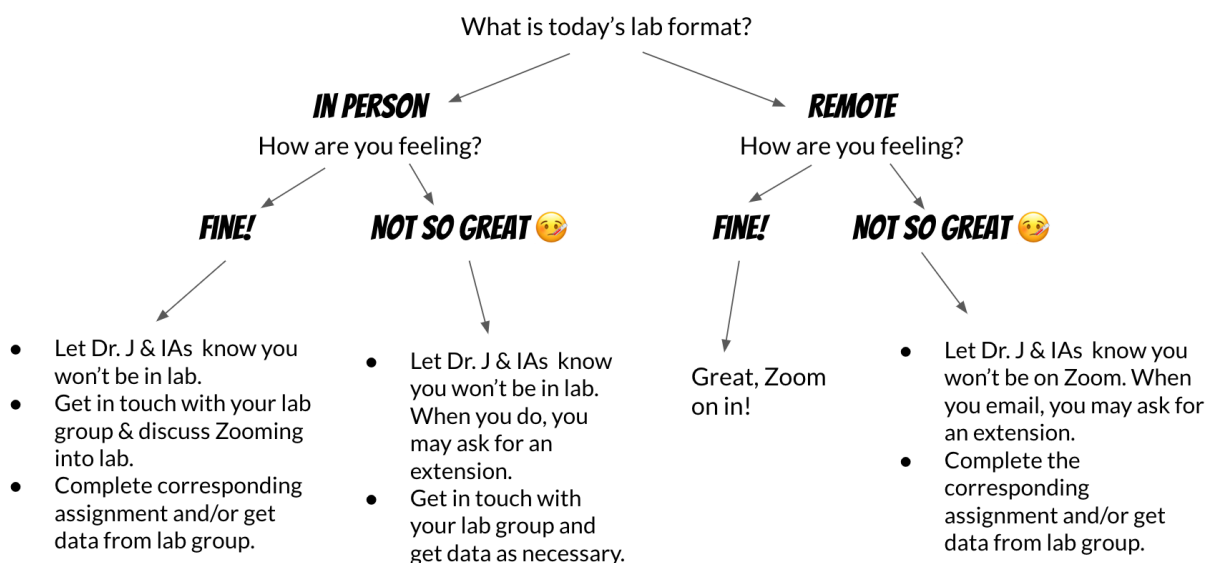
Just before holiday break, UC San Diego decided to switch back to remote learning for at least the first two weeks of the quarter. We’ve done our best to figure out how to teach this course as a hybrid course, and appreciate your collaboration as we try to make the most of it.

Attendance Policies (once we’re back in person)

If you feel well and have *not* knowingly been exposed to COVID-19, **you are expected to attend our in-person lab sessions**. I personally believe that there is a benefit to conducting our experiments in-person as well as being in lecture together. As you soon will see, even our lecture sessions will not be unidirectional – these will be active learning sessions where we co-create our learning. **These lecture sessions will be podcasted/recorded**, but you will be expected to make up any activities that you missed.

If you have COVID-19 symptoms, received a positive COVID-19 test, was told to quarantine, or cannot make lab for any other reason, **please follow the flow chart below**. Enrolled and waitlisted students must attend the first lab session. Additional details: <http://biology.ucsd.edu/go/ug-labs>. You do not need to inform us if you will be missing a lecture session.

I HAVE COVID-19 SYMPTOMS, OR RECEIVED A POSITIVE TEST, AND/OR WAS TOLD TO QUARANTINE... WHAT DO I DO?



Isolation Policies

If you have any symptoms or test positive for COVID-19, please stay home. If you come in contact with someone who has tested positive for COVID-19 or has COVID-19 symptoms, **please quarantine for 10 days**. Please see the [Exposure & Contact Tracing page](#) on the UC San Diego website for the definition of “contact.” If someone in your lab group tests positive for COVID-19, you are encouraged but not required to quarantine.

Testing & Masking Policies

Everyone needs to wear a properly fitted mask when we are indoors together, without exception. In the lab space, everyone is required to wear a KN95 mask or be double masked (a disposable mask under a cloth mask).

If you are fully vaccinated, you do not need to complete COVID-19 testing, **but you are still encouraged to**. If you have an exemption and are not fully vaccinated, **you need to complete weekly asymptomatic testing**. [See details here](#).

Additional resources

If you need additional help getting online, please check out [this resource](#) from the Teaching+Learning Commons. There are many more resources listed [here](#) to help you thrive this quarter. If there is anything you think we can help you out with, please feel free to reach out to the IAs or Dr. J.

Grading

Laboratory reports (225 pts)

- Data collected as a group, **written individually**. See the [guide to writing lab reports](#) for details about how many points these are worth.

Assignments (300 pts)

- Includes smaller lab write-ups, pre-lab quizzes and lab practicals, and in-class assignments

Final group project (225 pts)

- Project proposal, presentation, and written report

Two midterms (125 pts each, 250 pts total)

Additional notes on grading

- Lab reports, essays, and assignments will lose -10% for each day they are late.
- Final scores will be converted to letter grades, where A=90-100%, B=80-89.99%, C=70-79.99%, D=60-69.99%, and F=0-59.99%. For positive and minus

grades, A+ = 97-100, A = 93-96.99, A- = 90-92.99, B+ = 87-89.99, B = 83-86.99, B- = 80-82.99, and so on.

- Final scores are as you see them on Canvas, once all of your assignments are graded. There is no rounding up to the closest score.

Please note that add/drop deadlines are different for lab courses than lecture courses. Students who drop a Biology lab class after the end of the second class meeting will be assigned a “W”. Additional details: <http://biology.ucsd.edu/go/ug-labs>.

Course Philosophy

A note on our course’s environment

We’ll be working together to create an equitable and inclusive environment of mutual respect, in which we all feel comfortable to share our moments of confusion, ask questions, and challenge our understanding. Everyone should be able to succeed in this course. If you do not feel that is the case please let me know.

Course accommodations

If you need accommodations for this course due to a disability, please contact the Office for Students with Disabilities (osd@ucsd.edu) for an Authorization for Accommodation letter. Please speak with me in the first week of class if you intend to apply for accommodations. For more information, visit <http://disabilities.ucsd.edu>.

This course, and the work it entails, is for *you*

So, you won’t benefit if others do your work. Cases of academic dishonesty or cheating will be first handled by me, and then by the Academic Integrity Office. If you become aware of cheating in this class, you can anonymously report it: <https://academicintegrity.ucsd.edu/>

Lab safety is important

Enrolled and waitlisted students must successfully complete the Biology Lab Safety Training and Assessment before the first lab session: <https://biolabclass-safetyquiz.ucsd.edu/introduction>.

Please note that courses offered by other departments (Chemistry, for example) may have additional safety training requirements. If you arrive at the first lab session having not passed the safety assessment, you’ll only be able to observe the lab. **You will not be allowed into the lab for the second in-person lab session unless you have successfully passed the safety assessment.**

Course management & texts

Lab Manual

BIPN 145 has a lab manual! You can purchase it in the bookstore by [searching for our course](#). Since we will not be using this for the first few weeks of class, you are not required to purchase it. We'll provide PDFs as needed.

Textbook

There is no mandated textbook for this course, but most of the background material can be found in Purves et al. (2018) *Neuroscience*. We'll also use Carter & Shieh (2015) *Guide to Research Techniques in Neuroscience*, which can be found online [here](#) (link is also under *Resources* on Canvas). In addition, for each module I have curated resources that will be useful to you. You can find these on Canvas, or on the [course website](#).

Canvas

This course will be using Canvas to manage content and grades. You can log in by going to <http://canvas.ucsd.edu>. It's recommended that you **avoid Safari** for Canvas quizzes and exams ([Firefox or Chrome works great](#)). If you need any technical assistance with Canvas, please alert your instructor and send an email to servicedesk@ucsd.edu.

DataHub

We'll be using the UCSD DataHub for coding exercises and to run analysis code. Check your login at <http://datahub.ucsd.edu>.

Software for this class

Since we'll often be relying on your personal computers (rather than our lab computers), there are also various programs you'll be asked to install and use throughout the quarter. If you have any issues with these or would prefer not to download anything onto your personal computer, you are welcome to rely on a teammate or reach out to us for additional accommodations.

Microsoft Office

It will be really useful to have Microsoft Office in this course. You can find it [here](#).

LabChart Reader

If you can, please download [LabChart Reader](#) on your personal computer. We'll be using this to analyze previously collected data.

Course schedule

SUBJECT TO CHANGE (see: Global Pandemic).

You can find readings & due dates for assignments on Canvas.

Date		Location	Topic	Due/Reading
Week 1				
Jan 3	Lecture	Zoom	An introduction to BIPN 145 & nervous systems	
Jan 5	Lecture	Zoom	Passive properties of the neuron & modeling neural activity	
	Lab	Zoom	Virtual Lab #1: Meet your lab group & Neuromembrane, Part I	
Jan 7	Lecture	Zoom	The action potential	READ: Hodgkin & Huxley (1939)
	Lab	Zoom	Virtual Lab #1: Neuromembrane, Parts II & III	DUE @ 5 pm: Lab Group Plan
Week 2				
Jan 10	Lecture	Zoom	Week 1 Recap & Review	DUE @ 5 pm: Neuromembrane
Jan 12	Lecture	Zoom	The simplest neural circuits: an introduction to Crescent Loom	
	Lab	Zoom	Virtual Lab #2: Crescent Loom, Parts I & II	
Jan 14	Lecture	Zoom	How to find & read scientific papers	
	Lab	Zoom	Virtual Lab #2: Crescent Loom, THE LOOM OFF.	
Week 3				
Jan 17	Lecture		No Class – Martin Luther King Day	DUE @ 5 pm: Crescent Loom
Jan 19	Lecture	Zoom	Coding in neuroscience	DUE @ 5 pm: Queen's Gambit Scavenger Hunt

	Lab	Zoom	Virtual Lab #3: Introduction to Jupyter Notebooks	
Jan 21	Lecture	Zoom	Statistics for neuroscience	DUE @ 5 pm: Virtual Lab #3
	Lab	Zoom	Virtual Lab #4: Statistics	

Week 4 (revised)

Jan 24	Lecture	Zoom	Writing Lab Reports in BIPN 145	
Jan 26	Lecture	Zoom	The speed of the nervous system	DUE @ 5 pm: Virtual Lab #4 (Quiz)
	Lab	Zoom	Virtual Lab #5: Reaction Time Lab	
Jan 28	Lecture	Zoom	Intrinsic physiology & neural computation <i>C. Elegans</i> : The Reckoning	
	Lab	Zoom	Virtual Lab #6: Allen Cell Types	

Week 5 (revised)

Jan 31	Lecture	Zoom	Comparative anatomy, or, does size matter?	DUE @ 5 pm: Virtual Lab #6
Feb 2	Lecture	Zoom	Mapping neural circuits	(Optional) DUE @ 5 pm: <i>C. Elegans</i> extra credit
	Lab	Zoom	Virtual Lab #7: Comparative anatomy	
Feb 4	Lecture	Zoom	Jeopardy Review for the midterm	DUE @ 5 pm: Virtual Lab #7
	Lab	Zoom	Virtual Lab #8: Allen Connectivity	DUE @ 11:59 pm: Reaction Time Lab Report

Week 6 (first week in person – lab preparation)

Feb 7	Lecture	N/A	Midterm #1 – no class meeting	Take home midterm due at 11:59 pm
Feb 9	Lecture	Zoom	Recording from the nervous system & Introduction to final projects	DUE @ 5 pm: Virtual Lab #8
	Lab	York 1310	Experiment #1: String Nervous Systems	Online safety test READ the string lab protocol
Feb 11 (drop date)	Lecture	Zoom	Intracellular recording equipment	DUE @ 5 pm: String Lab
	Lab	York 1310	Experiment #4: Intracellular Recording	READ the leech protocol (“Intracellular Equipment” only)

Week 7 (leech week)

Feb 14	Lecture	Zoom	Your Brain On Love	
Feb 16	Lecture	Zoom	Leech Physiology & Cell Types Project proposal details	
	Lab	York 1310	Experiment #4: Recording from a Retzius cell in the leech	READ the leech protocol and complete the pre-lab quiz
Feb 21	Lecture	Zoom	Visualizing the nervous system Time to discuss project proposals	
	Lab	York 1310	Experiment #4: Filling a cell in the leech	

Week 8

Feb 21	Lecture		No lecture – President’s Day	DUE TUESDAY @ 11:59 pm: Project proposals
Feb 23	Lecture	Zoom	Ethology & Drosophila behavior	READ your Drosophila behavior handout & complete the pre-lab quiz
	Lab	York 1310	Experiment #7: The Case of the Mislabeled Vials	

Feb 25	Lecture	Zoom	Drosophila genetics & optogenetics	WATCH Re-engineering the brain
	Lab	York 1310	Experiment #7: The Case of the Missing Methods	DUE @ SUNDAY 11:59 pm: Leech Lab Report

Week 9

Feb 28	Lecture	Zoom	Drosophila presentations	DUE before class: Drosophila slides
Mar 2	Lecture	Zoom	Recording & analyzing EEG signals	
	Lab	York 1310	Experiment #8: EEG	
Mar 4	Lecture	Zoom	Remaining Drosophila presentations IA Research Talks Review for Midterm #2	DUE @ 5:00 pm: Drosophila Part II write-up
	Lab	York 1310	Work on final projects	

Week 10

Mar 7	<i>No class meeting</i>		Midterm #2 due at 11:59 pm	
Mar 9	Lecture	Zoom	Careers in neuroscience	DUE @ 5 pm: EEQ Quiz
	Lab	York 1310	Work on final projects	
Mar 11	Lecture	York 1310	Final project presentations	
	Lab	York 1310	Final project presentations	

DUE MARCH 15th @ 11:59 pm: Final project lab reports