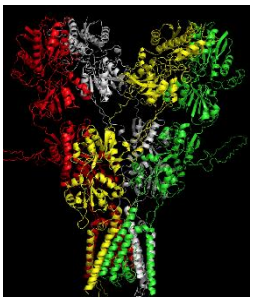
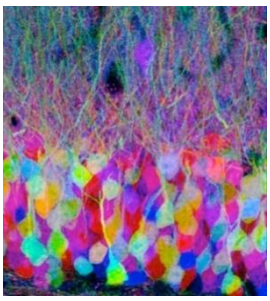
BIPN 140: Cellular Neurobiology

UC San Diego – Spring 2023





"[Las neuronas son] células de formas delicadas y elegantes, las misteriosas **mariposas del alma***, cuyo batir de alas quién sabe si esclarecerá algún día el secreto de la vida mental…"*

"[Neurons are] cells with delicate and elegant forms, the mysterious **butterflies of the soul***, the beating of whose wings may someday clarify the secrets of mental life…"* Santiago Ramon y Cajal, 1917.

Welcome to BIPN 140!

BIPN 140 is an introduction to how the nervous system works on the **cellular and molecular level.** Neurons, when they communicate to each other in a brain, allow us to sense, remember, and think. However, they themselves are cells that are built from molecules that follow the laws of chemistry and physics. Therefore, we will dive deeply into the **chemistry and biophysics of how neurons receive and send signals,** including their **mathematical expression.** We will then use that understanding to understand how neurons allow us to **sense** and how neurons change their properties to allow us to **learn and remember**. The prerequisites are BILD 1 and 2 or equivalent courses from another college (see http://web2.assist.org/web-assist/UCSD.html). Also helpful is basic knowledge of physics concepts like current and voltage as well as familiarity with using logarithms.

This section of BIPN 140 will be **have in-person lectures.** We know that you may experience challenges coming in person. However, we know from extensive educational research that **people from all sorts of backgrounds learn best** when they are **actively engaging with the material through thinking, writing, and discussing**.[1] We would like to foster that kind of classroom through encouraging regular in-person attendance.

In addition, we know from educational research that **courses with lots of low-stakes opportunities to explore ideas and get feedback** are generally better for student learning. Therefore, in addition to lectures, we will provide many opportunities for you to think about biology in low-stakes ways. These include **pre-lecture journal assignments, post-lecture discussion section problem sets,** and **post-lecture weekly quizzes.** You will be able to take the quizzes up to 3 times to get feedback on whether you understood the lecture concepts.

We will also give you many opportunities to **connect with the teaching team and your fellow students.** These include **live and Zoom office hours** by the professor and the IAs and **live discussion sections.** If you cannot make those, there will be a **discussion board on Piazza** (www.piazza.com, or linked through Canvas) where you can ask questions of your fellow students, the IAs, and the professor. Finally, the post-lecture comprehension quizzes **will also ask for your feedback for the teaching team.** All of these (except the post-lecture weekly quizzes) will be **optional but highly encouraged.**

As the quarter progresses, we will use your feedback to adjust the course. Let's face this challenge together!

[1] Freeman *et al.* 2014. Active learning increases student performance in science, engineering, and mathematics. http://www.pnas.org/content/111/23/8410 ; Theobald *et al.* 2020. Active learning narrows achievement gaps for under-represented students in undergraduate science, technology, engineering, and math. https://www.pnas.org/content/117/12/6476

[2] Eddy and Hogan. 2017. Getting Under the Hood: How and for Whom Does Increasing Course Structure Work? *CBE-Life Sciences Education*. 13(3): 361. https://www.lifescied.org/doi/full/10.1187/cbe.14-03-0050

How a typical week may look: connecting with neurobiology every day

Day	Do
Monday	Do pre-lecture journal for Tuesday's lecture.
Tuesday	Come to lecture. Do the problem set to prepare for discussion section.
Wednesday	Do pre-lecture journal for Thursday's lecture. Come to discussion section.
Thursday	Come to lecture. Ask about a confusion on Piazza.
Friday	Complete weekly quiz. Get one question wrong, so immediately re-take it for full credit.

Required and Optional Materials

Required materials: **- iClicker, iClicker+, or iClicker2.** ***It must be registered on Canvas****. See details below.*
Optional materials: - *Neuroscience* by Purves et al. (4th, 5th, or 6th editions)
Lecture slides and all required course readings will be posted on the class website.

The Basics: Where to Find Lectures, Office Hours, and the Discussion Board

Where and when are the lectures? TuTh 3:30-5:00pm at **Tata 3201**
Where are the lecture slides and podcast?

- **Slides** will be posted in the Modules on the Canvas site for BIPN 140 (go to https://canvas.ucsd.edu/).
- A lecture **videocast** can be found on https://podcast.ucsd.edu/ and in the Media Gallery on Canvas.

Where are the professor's office hours?

- In-person office hours are on the patio outside Tata 3201 before Tuesday's lecture (2:30-3:20pm)
- Zoom office hours are Mondays at 2-2:50pm and Wednesdays at 3-3:50pm. Go to the "**Zoom LTI Pro**" link on the side and click on the tab "**Upcoming Meetings**."

Where are discussion sections? Please see the table below. **You may attend any discussion section. Sections start Week 1.**
Where is the discussion board? This term we will be using Piazza for class discussion (www.piazza.com, or linked on Canvas). We encourage you to post your questions there instead of emailing the teaching team, so that we can attend to your questions more quickly.

The Basics: When to Find the BIPN 140 Teaching Team

Section times: You may go to **any** section in a given week.

Section	Day	Time	IA	Location
A01	M	7-7:50pm	Verina Leung	Center 217A
A02	M	8-8:50pm	Saba Heydari-seradj	Zoom
A03	F	10-10:50am	Avi Zaveri	HSS 1128A
A04	F	11-11:50am	Vy Dang	Zoom
A05	W	1-1:50pm	Gray Meister	APM 2301

Office hours and contact information: You are encouraged to go to anyone's office hours. As you can see, we have office hours at a variety of dates and times! If these times do not work for you, you may also contact us with your availability for a different time.

Name	Role	Email	Date/ Time	Location
Melinda T. Owens	Assistant Teaching Professor, Neurobio.	mtowens@ucsd.edu Text: 415-290-9953	M 2-2:50pm Tu 2:30-3:20pm W 3-3:50pm	M: Zoom Tu: Tata 3rd Fl. W: Zoom
Vy Dang	IA, 4th yr, Hum. Bio.	h0dang@ucsd.edu	Tu 2-2:50pm	Zoom & Revelle Commuter Lounge
Saba Heydari-seradj	IA, 2nd yr, Neurobio.	sheydariseradj@ucsd.edu	Th 2-2:30pm	Zoom & Student Success Center
Verina Leung	IA, 3rd yr, Neurobio.	vhleung@ucsd.edu	Tu 11:15-12:05pm	Earl's Transfer & Commuter Lounge
Gray Meister	IA, 4th yr, Hum. Bio.	gmeister@ucsd.edu	Th 10-10:50am	Geisel (tables near Audrey's)
Avi Zaveri	IA, 3rd yr, Neurobio.	a1zaveri@ucsd.edu	M 10-10:50am	Zoom

The Basics: Enrollment and the Waitlist

If you are on the waitlist, you may be concerned and frustrated about whether you can enter the class. You may need this course to graduate on time. However, in Biological Sciences, **the instructor has no control over the waitlist or who can enter the course.**

Movement off the waitlist is handled **solely** by the Registrar and is based only on whether people enrolled **in your discussion section** drop the course. If someone does drop, the next person on the waitlist is automatically enrolled. The instructor cannot add more seats or more sections. (Any information online that implies otherwise is either outdated or not applicable to Biological Sciences.) In short, **there is nothing you or the instructor can do to get you off the waitlist and into the class.**

There is usually a great deal of movement in and out of the class in the first week. If you are on the waitlist and want to get into the course, we encourage you to complete assignments as if you were enrolled, so that you won't be behind if you do get in. Waitlisted students should all have Canvas access, starting from roughly 24hr after you get on the waitlist. That means that being on Canvas does not mean you are enrolled.

Good luck! If it looks like you may not be able to get into the course but you really need to take it, please contact the Virtual Advising Center (vac.ucsd.edu) or another advisor to discuss your options.

What will we learn in BIPN 140?

Overall Philosophy

Our aim in this course is not just a surface-level understanding of neuronal function. Instead, we aspire to have students be able to **solve problems** and **ask good scientific questions** about how neurons work so that you can **apply what you learn about biology in whatever context you find yourself in your future**. That requires **going beyond memorization of facts** to acquire an understanding of how and why neurons function as they do, and what happens when the components of neurons do not function properly. Therefore, instead

of memorization, we will focus on developing an understanding of **fundamental concepts as they apply to different examples**. Exams will include questions that are based on solving problems in new contexts.

In addition, the teaching strategies in this course will attempt to **engage all of you as a community of scientists in the classroom** to develop leadership and communication skills as well as support each other in understanding biological concepts.

High-level learning goals

We anticipate that you will learn many different things in BIPN 140! We anticipate that what you will be able to do by the end of the quarter includes, but is not limited to, the following:

- **Demonstrate an understanding of the structure and function of neurons,** particularly how the **receive and transmit signals**.
- **Predict how a perturbation** of a molecule or chemical or biophysical conditions (like through a disease or experimental manipulation) **will affect the function of the neuron and the organism** as a whole.
- **Demonstrate a mechanistic (how) and teleologic (why) understanding** of the physiological processes underlying neurons.
- **Develop critical thinking skills** to be able to think like a neuroscientist and **solve biologically-relevant problems**.
- **Increase your understanding of your own learning (metacognition)**, including recognizing what topics are easy or difficult for you to learn, learning what study strategies work best for you, and seeking help from instructors and colleagues at appropriate times.

At the beginning of each unit, we will also provide you with specific neuroscience-related learning outcomes to guide your learning of that material. The exam problems will be tied to those specific learning outcomes. All questions on exams, as well as nearly all questions on homework and in-class and in-section activities, will be tied to at least one of these learning outcomes.

COVID Safety and Quarantine Planning

Because we will be together in person indoors, it is important to stay safe. However, it is also important to male contingency plans in case anyone in the course needs to quarantine.

Staying safe

Your health is important. **If you feel sick, please stay home.**

- If you miss a regular lecture, you can catch the podcast. The attendance policy provides for missing 6 days (3 weeks) of class, so please do not worry about your attendance score.
- If you miss section, please complete the Alternate Section Assignment for that week.
- Exams will be take-home and online. However, if you are too sick to take an exam, please contact us right away to schedule a make-up or to decide whether to drop that midterm (the lowest midterm is dropped automatically).

If you are quarantined

While you never have to share more information that you are comfortable with, letting us know that you are quarantined will help us make accommodations for you. The attendance policy provides for missing 6 days (3

weeks) of class. However, if you need to miss more time than that (for example, for a second quarantine), please contact us right away to discuss your options.

Grading

The activities, requirements, and assignments that comprise this course are designed to **promote your learning** and facilitate your understanding of neuroscience using many different teaching methods. In addition, these assignments (particularly lecture activities and Neuroscientist Journal assignments) give us valuable information that allows us to adjust the course to meet your educational needs.

How Your Letter Grade will be Assigned

Grade assignments will be based on the percentage of total points earned. We do not decide your grade, but rather **you as a student do the work to earn your grade**.

%	Grade	%	Grade	%	Grade	%	Grade
>98	A+	87-89	B+	77-79	C+	60-69	D
93-97	A	83-86	B	73-76	C	0-59	F
90-92	A-	80-82	B-	70-72	C-		

How Your Grade will be Calculated

Course Component	Total Points	~% of Grade
Lecture Participation (Attendance and Homework)	**245**	**22%**
Lecture attendance (9 @ 5 points each)	45	
More About You survey	10	
Follow-up survey	10	
Pre-lecture Neuroscientist Journals (14 @ 5 points each)	70	
Post-lecture Weekly Quizzes (9 @ 10 points each)	90	
Final Reflection	20	
Section Participation	**90**	**8%**
Section participation credit (9 @ 10 points)	90	
Exams	**740**	**68%**
Highest scoring midterm	185	
Next highest scoring midterm	185	
Final Exam	370	
Professionalism	**15**	**1%**
TOTAL	**1090**	**100%**

Grades will be posted regularly on Canvas.

A note on re-grading

We are always happy to communicate with you **to discuss your learning.** If you believe that a grading error has been made, please contact your IA with an explanation of the error. If your IA agrees that an error has occurred, email me with an explanation of the error. **If you think your work deserves more points,** please include in your explanation a concise description of how your answer compares to the rubric and why you think it should have earned more points.

Explanation of Course Components

The course may seem like a lot of work with all these assignments, but we believe that each of the course components is important for **supporting your learning** and structuring your studying. If it becomes apparent that this is not the case, we reserve the right to alter the course structure to support you and your learning.

Lecture attendance

Active participation in lecture is important for your learning. Therefore, every day, we will engage in in-class activities and use **iClickers**. iClicker usage is how we measure lecture participation for points.

For your iClicker to correctly be associated with your name, **you must register your clicker on Canvas** (not the iClicker website). You can use a used iClicker or share an iClicker with someone in another class, but you cannot share with someone else who is also in this class. Please be aware that it is dishonest and does not represent your learning if someone else uses your iClicker in class when you are not there, so in that situation we cannot give participation points to you or the person using your iClicker.

We will start counting iClicker participation for points starting on the Tuesday of Week 2. Everyone has different circumstances and life events. Therefore, to get full attendance points, you only need to attend and click in during 9 lectures (out of 17 total), which allows you to miss 3 weeks (6 class sessions) of class after the first week. **If you feel sick, we encourage you to use these dropped lectures and stay home.**

If you believe that you might have a situation or condition that will cause you to miss more than 3 weeks of lectures, please contact us right away, so we can strategize about accommodations.

Pre-lecture Neuroscientist Journals

Before every lecture, there will be an assignment called a **Neuroscientist Journal** posted on Canvas. The main purpose of these assignments is to **prepare you for class** by allow you to **reflect on what you already know,** do some **pre-reading**, and **give you practice on reading and interpreting scientific literature.** We on the teaching team also read them to better understand what our students know and think about the topic beforehand to adjust our teaching.

Each Neuroscientist Journal is different, but each one involves **writing to a specific prompt**. They are **graded solely on being turned in on time and for meeting the word count** by writing on topic**, not for correctness** or writing style. That is because Journals are about your *pre-class ideas*, so we do not penalize you if the words are awkward or if the ideas are not correct. Reading more about the topic online is a great idea, but ultimately, the Journals are about **exploring your own ideas and thoughts about the topic**. So, we expect you to **use your own words when writing these Journals.** (Please see the section on Academic Integrity for more about that.)

Neuroscientist Journal prompts will be posted on Canvas at least several days before they are due. They will be due most Monday and Wednesday nights, except if an exam is released the following day. **They will be due at 11:50pm the night before class.**

You can submit 85% of Neuroscientist Journals (14/16) and still receive full credit, as the lowest two Journal scores are dropped.

Post-lecture Weekly Quizzes

At the beginning of every week, there will be a **post-lecture weekly quiz posted on Canvas** that covers the material from that week to help you check your understanding. It will be multiple-choice. Some of the questions on the quiz will be fairly basic to make sure that you understood the basic ideas from the lecture. Other will be exam-level questions that test application of fundamental knowledge. Quizzes will be graded on correctness, but we will allow you **3 attempts** to get full credit. After each attempt, you will get feedback on incorrect answers.

In addition, we will ask 2-4 optional ungraded open-ended questions that allow you to give feedback to us about your experiences in the course.

Quizzes will be due every Friday night **no later than 11:50pm.** Completion of at least 85% of quizzes (9/10) will give you full credit, as the lowest quiz score will be dropped.

Final Reflection

A final reflection on your experiences in this course is due at the end of the quarter on the **Saturday of finals week at 11:50pm**. The prompt for this reflection will be: "What did you learn in BIPN 140 that will continue to influence you for many years to come? How did you learn these things?"

Discussion Sections

Weekly discussion sections are in person. They are designed to **engage you in applying your knowledge and** exercising your skills in **collaborative problem solving**. Most weeks, we will have a **problem set** with questions that are at the level of exam questions (and are often from previous years' exams). Problem sets will be posted several days before section. **Everyone should try to complete the problem set** before section, for your own learning.

To promote collaboration and community, we highly encourage everyone to attend section every week. However, we acknowledge that not everyone might be able to attend section in a given week. Therefore, each week, there are two options for getting section participation credit:

- **Attend and participate in section:** You may attend **any section**. In section, you will work with others to collaboratively explain and understand the problem set. Each IAs will let you know how to register your attendance.
- **Complete an alternate written assignment:** If you cannot attend any section, you can complete an alternate written assignment that will also take about an hour. Generally, you will not only have to complete the problem set, you will also have to compare your original responses against the answer key and reflect on your learning process. We reserve the right to grade the alternate written assignment for correctness.

Each week, you can decide whether to attend section on Zoom or to complete the alternate written assignment, depending on your schedule that week. If you choose to do the alternate written assignment, it

will be due the **Friday night of that week at 11:50pm.** Getting section credit, either through in-person attendance or doing the alternate assignment, at least 85% of the weeks (9/10) will award you full section participation credit, as the lowest score is dropped.

Exams

To facilitate developing useful knowledge and skills for the long term, tests in this course will focus on **applying knowledge to assess and solve novel problems.** Questions will be largely be short answer, including graphing. Any material covered in or closely related to each lesson's learning objectives may be tested.

Exams will be open-book, open-notes, and open-Internet. In fact, you may be asked to analyze papers or data that are freely available on the internet. That means that the answers to most exam questions will not be found by Googling or be directly in your notes. (However, you still should study, so that you can focus your time on analyzing and answering the questions, not learning the material.)

There will be 4 exams in this course: 3 midterms and 1 Final exam. Your lowest **midterm** grade will be dropped. If you miss one of the midterms, that will be the exam dropped. The Final will be longer and is worth more points, so it **cannot be dropped**.

All exams are cumulative (except the first midterm) to promote long-term retention of knowledge. If you want to remember this material years from now in your career or life, you certainly want to remember it until the end of the term.

You will be given at least 44hr to complete each exam. The dates for the exams are given on the Course Schedule at the end of this syllabus. More details will be given closer to the date of the exams. **If you need to have alternate timing, especially for the Final, please let us know as soon as possible** so we can make alternate arrangements.

Professionalism

This portion of the course grade is intended to motivate you to **consider the impact of your actions on your own learning and the learning of others** in the course. Unprofessional interactions consume time yet have no meaningful benefits to you, your fellow students, and/or the teaching team. Analogously in the workplace, being unprofessional to your colleagues or supervisors will only discount you. When you are discounted, you will not be invited for new opportunities that you may or may not be aware of.

By default, everyone is assumed to be professionally mature, so this component is automatically awarded to you at the beginning of the quarter. During the quarter, based on observations by the teaching team, including but not limited to one-on-one interactions, electronic communication, and follow-up conversations on grades, **your professionalism credit may be deducted** in steps of 5pts.

Examples of interactions with meaningful benefits:

- Working collaboratively to improve in building knowledge and skills
- Asking questions about course policies or course material to clarify it and facilitate learning
- Clarifying how a response was incomplete or incorrect in order to learn how to correct one's own ideas
- Reporting errors or issues in class, on assignments, or in other course material
- Respectfully giving feedback about the course
- Treating everyone in the class community, including the instructional team and other students, with respect

Examples of interactions that have no meaningful benefits and thus should be avoided:

- Contributing inequitably to team work in class, in discussion section, or on exams
- Harassing and/or bullying the instructional team or other students
- Ignoring the directions or requests from the instructional team
- Asking for course credit when such credit would conflict with stated course policies (such as the policy on late assignments), when it would be applied inequitably (such as just for you), or when the instructor has already explained that the answer did not earn such credit
- Being disruptive to fellow students online, in discussion section, or on exams

Extra Credit Opportunities

You have several opportunities for extra credit. Extra credit questions will be offered on each exam to make up for exam points missed. In addition, there are two other opportunities for extra credit:

- 10 points for **meeting with Prof. Owens or an IA during office hours** or another meeting. If the office hours times do not work for you, email us and let us know what times work for you!
- 5 points for completing CAPEs. **If 90% or more of all students complete all CAPEs**, 5 points will be awarded to everyone in the course.

Other opportunities may occur as necessary. Extra credit opportunities are always awarded to the entire class, **never to just one student.**

Late Policy

Because of the size of this class and to prepare you for hard deadlines later in your career, **we cannot award full points for assignments, quizzes, exams, or anything else submitted late** without our prior agreement. Late assignments will be given half-credit after the due date.

To mitigate the impact of this policy, remember that in nearly all cases, you can drop one or two assignments without any impact on your score. That means if you happen to miss one or turn it in late, or your life is too busy a certain week, it will not negatively impact your score. Even if you miss the deadline for an assignment, we still highly recommend doing the work to prepare for class and exams.

Exception: **if you have a situation that would require you to miss two or more weeks of assignments, please reach out to us as soon as possible** so we can discuss accommodations.

BIPN 140 Class Culture

BIPN 140 is a **community of scientists** trying to increase their understanding of the biological world. The classroom culture is designed to engage you in collaborating and thinking like a scientist.

When people collaborate to work towards a common goal, in this case building our learning, we must **establish shared values** so that everyone understands acceptable ways of working together. In organizations, these are commonly called codes of conduct or ethics. In this course, we use the following statement, adapted from the International Center for Academic Integrity (https://academicintegrity.org/) and Dr. Tricia Bertram Gallant, to explicitly state our values and describe the behaviors that maintain and protect these values.

	As students we will…	As the teaching team we will…
Honesty	• Honestly demonstrate your knowledge and abilities according to expectations listed in the syllabus or in relation to specific assignments and exams • Communicate openly without using deception, including citing appropriate sources	• Give you honest feedback on your demonstration of knowledge and abilities on assignments and exams • Communicate openly and honestly about the expectations and standards of the course through the syllabus and in relation to assignments and exams
Responsibility	• Complete assignments on time and in full preparation for class • Participate fully and contribute to team learning and activities • Take ownership of your own learning by using course and outside resources, including the teaching team, to clarify confusions and extend your knowledge	• Give you timely feedback on your assignments and exams • Show up to office hours and class on time and be mentally and physically present • Create relevant assessments and class activities • Providing selected resources and a helpful environment to help you address your confusions and extend your knowledge
Respect	• Speak openly with one another while respecting diverse viewpoints and perspectives • Provide sufficient space for others to voice their ideas	• Respect your perspectives even while we challenge you to think more deeply and critically • Help facilitate respectful exchange of ideas
Fairness	• Contribute fully and equally to collaborative work, so that we are not freeloading off of others on our teams • Not seek unfair advantage over fellow students in the course	• Create fair assignments and exams and grade them in a fair and timely manner • Treat all students and collaborative teams equitably
Trustworthiness	• Be open and transparent about what we are doing in class • Not distribute course materials to others in an unauthorized fashion	• Be available to all students when we say we will be • Follow through on our promises • Not modify the expectations or standards without communicating with everyone in the course
Courage	• Say or do something when we see actions that undermine any of the above values • Accept the consequences of upholding and protecting the above values	• Say or do something when we see actions that undermine any of the above values • Accept the consequences of upholding and protecting the above values

Course Policies

Students with Disabilities

If you have a disability, **including mental health issues,** that might affect your attendance or performance in this course, please contact us early in the quarter to work out reasonable accommodations to support your success. To ensure fairness and proper support, anyone who requests accommodations because of a disability must get a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD). To contact OSD, use the student portal: https://academicaffairs.ucsd.edu/sso/osdsp/home, email the Biology OSD liaison at bioosd@ucsd.edu, or call 858-534-4382.

Whenever possible, we strive to use universal designs that are inclusive. If you have feedback on how to make the class more accessible and inclusive, please get in touch!

Podcasts and Lecture Recording

Barring technical difficulty, **classes will be recorded and made available online** as a resource for learning (http://podcast.ucsd.edu and the course Media Gallery). However, remember that active participation and contribution are highly encouraged, and many important concepts and ideas will be developed collaboratively by doing in-class activities that cannot be replicated by watching a video.

Academic Integrity and Originality

Integrity of scholarship and learning is fundamental to creating our classroom community and the academic community at large. The University expects that both students and faculty will honor this principle and in so doing protect the validity of University intellectual work.

For you, this means that all academic work you submit for this course should be **your own new original work.** We emphasize this for several reasons. First, **using your own thoughts and putting things in your own words helps you learn.** There is no better way to discover quickly what you understand and what you don't than to explain a concept to someone else. Second, in professional settings, trying to hide dishonest behavior or pass someone else's words off as your own can lead to trouble. To encourage original thought and writing in this class, we take precautions. For example, Canvas uses Turnitin to scan Journals for plagiarized material. **Our goal is not to *catch* anyone** (although we can't give credit for dishonest work or plagiarized material), **but to help everyone make a habit of using their own thoughts and voice.**

In addition, part of being a good member of a community **is not facilitating dishonest behavior by others**. No course materials, particularly homework and exams, may be posted online, submitted to private or public repositories, or distributed to unauthorized people outside of the course.

To hold everyone accountable for their actions, any serious suspected instances of a breach of academic integrity will be reported to the Academic Integrity Office for review. For more information on academic integrity, please visit https://students.ucsd.edu/academics/academic-integrity/index.html.

Helpful Resources at UCSD

If you are experiencing anxiety, depression, or worse, you are not alone. On top of facing the normal stresses of college, many college students are in their late teens or early twenties, which is when many mental illnesses emerge for the first time because of brain maturation. In addition, you may be experiencing the effects of

trauma or violence. Or, you might be one of the 19% of UC students who report not being able to access adequate food[3] or who do not have a safe, stable place to live.

Whatever your situation, whether your problems feel big or small, we encourage you to seek help and support, either from us or from professional resources on campus. Some are listed below.

It is also important to find a community of like-minded people around you. You may be interested in the following resources: the Black Resource Center (brc.ucsd.edu), the Cross-Cultural Center (ccc.ucsd.edu), the LGBT Resource Center (lgbt.ucsd.edu), the Raza Resource Centro (raza.ucsd.edu), the Student-Parents Resource page (students.ucsd.edu/well-being/wellness-resources/student-parents), the Student Veterans Resource Center (students.ucsd.edu/sponsor/veterans), the Women's Center (women.ucsd.edu).

[3] Martinez *et al.* 2016. University of California Global Food Initiative: Student Food Access and Security Study. https://www.ucop.edu/global-food-initiative/best-practices/food-access-security/student-food-access-and-security-study.pdf

Help and Resources		
Academic Support	**Psychology & Physical Safety***	**Basic Needs**
OASIS (http://oasis.ucsd.edu) The Office of Academic Support & Instructional Services (OASIS) offers math and science tutorial Programs for everyone. They also have services and scholarships for those of you who have overcome significant obstacles to become successful (like being first in your families to go to college). **Teaching + Learning Commons (http://commons.ucsd.edu)** The Teaching + Learning Commons offers tutoring, consultations, and workshops on learning strategies as well as assistance with writing in the Writing + Critical Expression Hub.	**CAPS (http://caps.ucsd.edu)** CAPS offers free, confidential counseling. They can help with urgent crises, such as an assault or thoughts of self-harm. They can also talk if you are worried about a friend or classmate. **CARE at SARC** **http://care.ucsd.edu** Campus Advocacy, Resources, and Education at the Sexual Assault Resource Center (CARE at SARC) offers support for those of you who have experienced sexual violence or violence from a partner. They have free confidential counseling, including on nights and weekends.	**Triton Food Pantry (http://basicneeds.ucsd.edu/triton-food-pantry/)** The Triton Food Pantry discreetly offers food for current UCSD students to ensure each of you has enough nutrition to get through the day. **The Hub (https://basicneeds.ucsd.edu)** The Hub serves those of you who have trouble accessing basic needs, including food or stable housing, or who have financial emergencies. They can help you connect with a variety of on- and off-campus programs, including the Food Pantry, CalFresh, emergency loans, emergency housing, or changes to your financial aid.

*Please note that while we on the instructional team are here to support you, instructors are obligated by law to notify UCSD's Title IX coordinator if a student (or any person at UCSD) discloses to us a personal experience of sexual harassment, sex or gender discrimination, domestic violence, or stalking. This is so that the University can properly address the issue. If you do not want your experiences to be reported, please contact CAPS or CARE, which can talk to you confidentially.

Lecture Overview and Course Schedule

More specific information will be provided weekly on Canvas. We may adjust the schedule, assignments, and readings as necessary while still focusing on the foundational concepts listed below.

Date	Guiding Questions	Neuroscientist Journals Due 11:50pm Night Before Class
Class #1 Tu Apr. 4	Welcome! Who are we? What are neurons and glia?	
Class #2 Th Apr. 6	How do we represent neuronal function? How do neurons behave at rest?	Neuroscientist Journal #1 Due! More About You Survey Due!
Class #3 Tu Apr. 11	How do neurons behave at rest? What are the electrical properties of channels?	Neuroscientist Journal #2 Due!
Class #4 Th Apr. 13	What are the electrical properties of channels? How do we study their function?	Neuroscientist Journal #3 Due!
Class #5 Tu Apr. 18	What are the electrical properties of channels? How do we study their function?	Neuroscientist Journal #4 Due!
Class #6 Th Apr. 20	Midterm 1 (up to and including lecture 4)	
Class #7 Tu Apr. 25	What are the biochemical properties of channels? How do we study their function?	Neuroscientist Journal #5 Due!
Class #8 Th Apr. 27	What are action potentials? How do channels function in how they work?	Neuroscientist Journal #6 Due!
Class #9 Tu May 2	What are action potentials? How do channels function in how they work?	Neuroscientist Journal #7 Due!
Class #10 Th May 4	What are synapses? What are neurotransmitters, and how are they released?	Neuroscientist Journal #8 Due!
Class #11 Tu May 9	How do neurotransmitters cause effects in the receiving cell?	Neuroscientist Journal #9 Due!
Class #12 Th May 11	Midterm 2 (up to and including lecture 9)	
Class #13 Tu May 16	How do neurotransmitters cause effects in the receiving cell?	Neuroscientist Journal #10 Due!
Class #14 Th May 18	What signaling occurs inside a neuron after receiving a signal?	Neuroscientist Journal #11 Due!
Class #15 Tu May 23	What is learning and memory? Where does learning and memory occur in the brain?	Neuroscientist Journal #12 Due!
Class #16 Th May 25	Midterm 3 (up to and including lecture 14)	
Class #17 Tu May 30	What are the synaptic mechanisms of learning and memory?	Neuroscientist Journal #13 Due!
Class #18 Th Jun. 1	What are the synaptic mechanisms of learning and memory?	Neuroscientist Journal #14 Due!
Class #19 Tu Jun. 6	How are new synapses formed?	Neuroscientist Journal #5 Due!

Class #20 Th Jun. 8	What are the synaptic mechanisms involved in drug addiction?	Neuroscientist Journal #16 Due!
M Jun. 12	Final Exam (all lectures)	
Sa Jun. 17	Final Reflection due at 11:59pm	