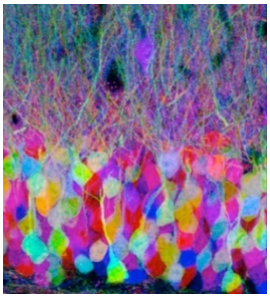
BIPN 140: Cellular Neurobiology

UC San Diego – Spring 2021



"[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 prerequisite is 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.

You may be anxious taking an online course, but **we will do our best to support you**. Research has shown that in online courses generally, more students disengage and leave the course, and the students who remain tend not to perform as well. However, research also shows that **courses where students feel connected to the course, materials, and instructors** suffer less from these effects.[1] In addition, we know from research on in-person classes that **courses with lots of low-stakes opportunities to explore ideas and get feedback** are generally better for student learning.[2]

Therefore, in addition to **pre-recorded lectures,** we will provide many opportunities for you to think about biology in low-stakes ways. These include **pre-lecture journal assignments** and **post-lecture problem set questions.** There will also be **post-lecture comprehension quizzes** that you can take up to 3 times to give you feedback on whether you understood the basic ideas of the lectures. These assignments will all be **mandatory** to help everyone stay on track every week.

We will also give you many opportunities to **connect with the teaching team and your fellow students.** These include **office hours** by both the professor and the IAs and **live discussion sections.** If you cannot make those, there will be a **discussion board on Campuswire** (www.campuswire.com) where you can ask questions about the material, technology, or anything else relevant to the course 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 comprehension 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] Protopsaltis and Baum. 2019. Does online education live up to its promise? A look at the evidence and implications for federal policy. https://mason.gmu.edu/~sprotops/OnlineEd.pdf

[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

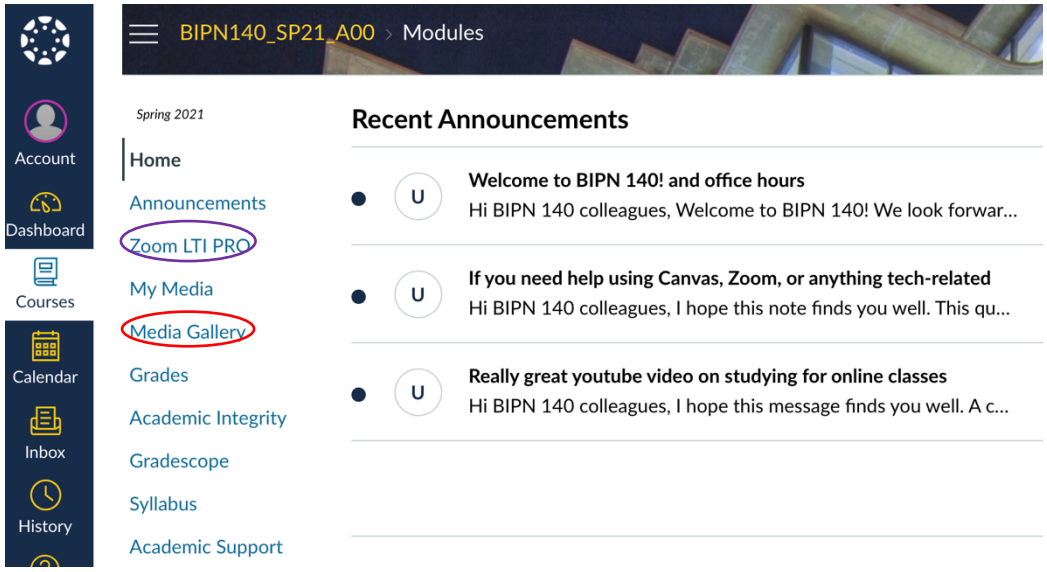
How a typical week may look: connecting with neurobiology every day

Day	Watch	Do
Monday		Do pre-lecture journal for Tuesday's lecture.
Tuesday	Tuesday's lecture	Attend office hours and ask a question via chat. Go to discussion section and practice with colleagues.
Wednesday		Do pre-lecture journal for Thursday's lecture.
Thursday	Thursday's lecture	Ask about a confusion on the class discussion board.
Friday		Complete weekly quiz. Get one question wrong, so immediately re-take it for full credit.

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

Course website: UCSD **Canvas** site for BIPN 140, Spring 2021 (go to https://coursefinder.ucsd.edu/)
Where are the lectures? Go to the "**Media Gallery**" link on the side.
Where are office hours? Go to the "**Zoom LTI Pro**" link on the side and click on the tab "**Upcoming Meetings**." On there, you can see the office hours for Prof. Owens and for all the IAs.

Where are discussion sections? Go to the "**Zoom LTI Pro**" link on the side and click on the tab "**Upcoming Meetings**." On there, you can see the discussion section times for all the IAs. **You may attend any discussion section. Sections start Week 1.**



Where is the discussion board? This term we will be using CampusWire for class discussion. We encourage you to post your questions there instead of emailing the teaching team, so that we can attend to your questions more quickly. You will receive an invitation email from www.campuswire.com .

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
A01	Tu	9-9:50am	Michael Colwin
A02	Tu	10-10:50am	Eric de la Parra Saldana
A03	W	12-12:50pm	Thomas Shoff
A04	W	1-1:50pm	Avani Mylvara

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

Name	Role	Email	Office hours
Melinda T. Owens	**Assistant Teaching Professor Neurobiology**	**mtowens@ucsd.edu Text: 415-290-9953**	**Tu 12:30-2pm, Th 12-1pm**
Thomas Shoff	4th yr Physiology & Neuroscience / Pharmacological Chemistry major	tshoff@ucsd.edu	M 4-4:50pm
Michael Colwin	4th yr Neurobiology major	mcolwin@ucsd.edu	W 1-1:50pm
Eric de la Parra Saldana	4th yr Neurobiology major	edelapar@ucsd.edu	Th 6-6:50pm
Avani Mylvara	3rd yr Neurobiology major	avmylvar@ucsd.edu	F 12:30-1:20pm

Required and Optional Materials

Required materials: **- Canvas, Zoom** (To get your free PRO account, go to: https://ucsd.zoom.us/)
- *Neuroscience* by Purves et al. (4th, 5th, or 6th editions)

Lecture slides and all extra required course readings will be posted on the class website.

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, as much as possible in an online format, 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. You will also have the opportunity to practice scientific writing skills through numerous writing assignments.

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.

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	**190**	**18%**
More About You 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**	**9%**
Section participation credit (9 @ 10 points)	90	
Exams	**750**	**71%**
Highest scoring exam	250	
Next highest scoring exam	250	
Next highest scoring exam	250	
Professionalism	**20**	**2%**
TOTAL	**1050**	**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

With all these assignments, the course may seem like a lot of work, 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.

Lectures

To give you flexibility in your schedule, lectures will be **asynchronous.** We will record and post lectures early in the week that they are supposed to be watched.

During lectures, I will pose questions to you in the form of **video quizzes. Video quizzes are not graded;** they are purely to help you engage with the lecture material. Trying to answer the question before you hear the answer will help you check your own knowledge and better remember the material. That is true even if- actually *especially* if- you realize you do not know the answer.

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, we will give 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 online. 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 on Zoom each 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. You are encouraged to show your name and your video, if possible, to facilitate collaboration and taking attendance. In section, you will work with others in breakout rooms and shared Google Docs to collaboratively explain and understand the problem set. Because section is about engagement and collaboration, participation credit will only be rewarded if you participate verbally or through writing with your breakout room group.

- **Complete an alternate written assignment:** If you cannot attend any section, you can request and 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 synchronous participation 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 during the term and 1 during Finals week. The exam during Finals week will be in the same format and treated equivalently as all the other exams. Your lowest exam grade of the 4 exams will be dropped. If you miss one of the exams, that will be the exam dropped.

All exams are cumulative (except the first exam) 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.

For each exam, you will be given 25hrs to complete it. Exams will be released at 11am the day before they are due and have a deadline of 12n the day they are due. The dates for the exams are given on the Course Schedule at the end of this syllabus. **If you need to have alternate timing, 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.

Professionalism can be demonstrated through individual (described here) and community efforts (described below). The individual component is to account for you personally demonstrating maturity and professionalism.

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:

- Developing deeper insight into course material, concepts, biology, and/or society in general
- Working collaboratively to improve in skill building and future opportunities
- Clarifying course material that facilitates deeper learning
- Learning conceptually and meaningfully why full credit was not awarded for an assignment
- Reporting errors or problems in class, on assignments, or other course material

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) or when it would be applied inequitably (such as just for you)
- 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!
- 10 points for **community professionalism**. This can be earned by completing course evaluations and related surveys. If 90% or more of all students complete all CAPEs and other course evaluation surveys in a mature and professional fashion (taking them seriously and providing timely and constructive feedback), 10 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 only to individual students.

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 for one day after the due date, and after that they will be given no credit. To help you keep on top of the schedule, Canvas has a feature called "**Syllabus**" on the left side that has links to all the due dates for assignments and quizzes in calendar form.

To mitigate the impact of this policy, in nearly all cases, you can drop one or two assignments without any impact on your score. For example, you can drop 2 Journals, 1 Weekly Quiz, 1 Section Credit, and 1 Exam. 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. The Office for Students with Disabilities will be open in Spring quarter, particularly by email.

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!

Lecture Recording

Discussion section meetings will be recorded on Zoom. You can find them on Canvas. (They will not be available at podcast.ucsd.edu because we will not be meeting together in a campus room.) Office hours will not be recorded because of privacy concerns.

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. **These will all be open in some form (mostly online) in Spring quarter.**

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.

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

*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

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 Mar. 30	Welcome! Who are we? What are neurons and glia?	
Class #2 Th Apr. 1	How do we represent neuronal function? How do neurons behave at rest?	**Neuroscientist Journal #1 Due!**
Class #3 Tu Apr. 6	How do neurons behave at rest? What are the electrical properties of channels?	**Neuroscientist Journal #2 Due!**
Class #4 Th Apr. 8	What are the electrical properties of channels? How do we study their function?	**Neuroscientist Journal #3 Due!**
Class #5 Tu Apr. 13	**Exam 1 (up to and including lecture 3)**	
Class #6 Th Apr. 15	What are the electrical properties of channels? How do we study their function?	**Neuroscientist Journal #4 Due!**
Class #7 Tu Apr. 20	What are the biochemical properties of channels? How do we study their function?	**Neuroscientist Journal #5 Due!**
Class #8 Th Apr. 22	What are action potentials? How do channels function in how they work?	**Neuroscientist Journal #6 Due!**
Class #9 Tu Apr. 27	What are action potentials? How do channels function in how they work?	**Neuroscientist Journal #7 Due!**
Class #10 Th Apr. 29	What are synapses? What are neurotransmitters, and how are they released?	**Neuroscientist Journal #8 Due!**
Class #11 Tu May 4	**Exam 2 (up to and including lecture 9)**	
Class #12 Th May 6	How do neurotransmitters cause effects in the receiving cell?	**Neuroscientist Journal #9 Due!**
Class #13 Tu May 11	How do neurotransmitters cause effects in the receiving cell?	**Neuroscientist Journal #10 Due!**
Class #14 Th May 13	What signaling occurs inside a neuron after receiving a signal?	**Neuroscientist Journal #11 Due!**
Class #15 Tu May 18	What is learning and memory? Where does learning and memory occur in the brain?	**Neuroscientist Journal #12 Due!**
Class #16 Th May 20	**Exam 3 (up to and including lecture 14)**	
Class #17 Tu May 25	What are the synaptic mechanisms of learning and memory?	**Neuroscientist Journal #13 Due!**
Class #18 Th May 27	What are the synaptic mechanisms of learning and memory?	**Neuroscientist Journal #14 Due!**
Class #19 Tu Jun. 1	How are new synapses formed?	**Neuroscientist Journal #5 Due!**

Class #20 Th Jun 3	What are the synaptic mechanisms involved in drug addiction?	**Neuroscientist Journal #16 Due!**
M Jun. 7	**Exam 4 (all lectures)**	
F Jun. 11	**Final Reflection due at 11:59pm**	