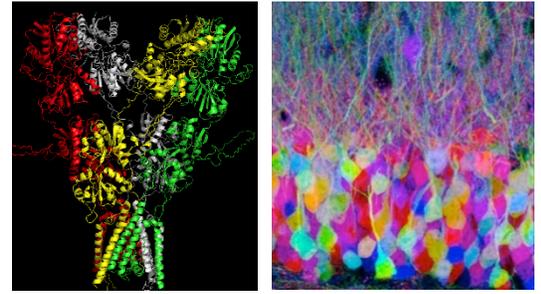


BIPN 140: Cellular Neurobiology

UC San Diego – Spring 2020

“[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.

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 **livecast office hours** by both the professor and the IAs and **livecast discussion sections**. If you cannot make those, there will be a **discussion board** 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		Go to discussion section and practice with colleagues. Do pre-lecture journal for Tuesday's lecture.
Tuesday	Tuesday's lecture	Attend office hours and ask a question via chat.
Wednesday		Do pre-lecture journal for Thursday's lecture.
Thursday	Thursday's lecture	Ask about a confusion on the class discussion board.
Friday		Complete post-lecture comprehension quiz. Get one question wrong, so immediately re-take it for full credit.
Weekend		Do problem set questions to prepare for Monday's section

The Basics: Where and When

Course website: UCSD **Canvas** site for BIPN 140, Spring 2020 (go to <https://coursefinder.ucsd.edu/>)

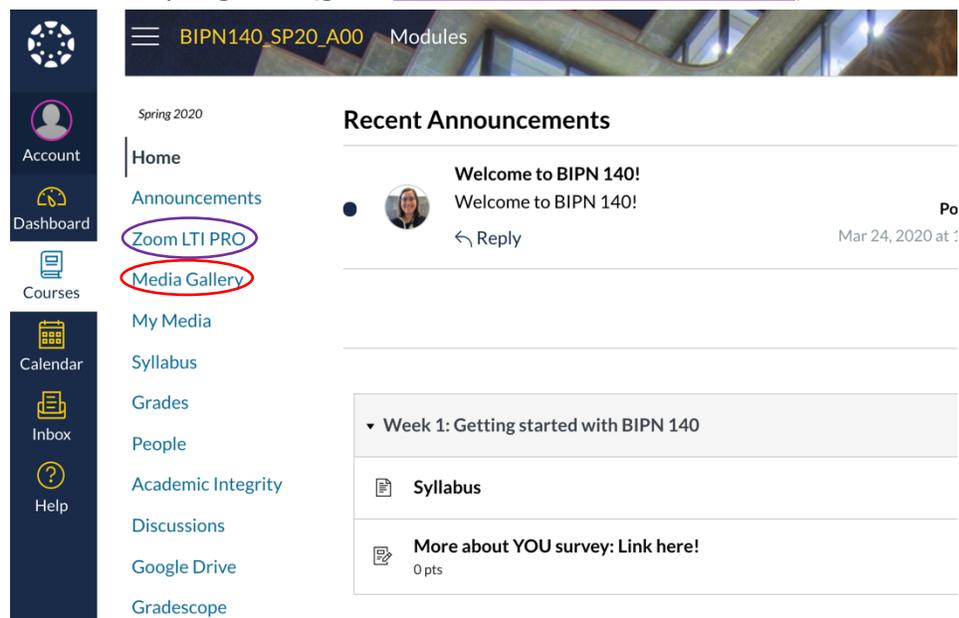
Where are the lectures? Go to the "**Media Gallery**" link on the side. Lectures will be ordered by Week, Day, and Topic.

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. When you enter office hours, **please turn on the chat** to ask questions.

When are office hours? For a list of the professor and IA office hours, please see below.

Where are the 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, but we encourage you to consistently attend the same one. Sections start Week 1.**

When are discussion sections? For a list of the professor and IA office hours, please see below.



Basic Contact Information for BIPN 140 Professor

Office hours and contact information: **You are encouraged to go to anyone's office hours.**

Name	Role	Email	Office hours
Melinda T. Owens	Assistant Teaching Professor Neurobiology	mtowens@ucsd.edu Text: 415-290-9953	TTh 3:30-4:50pm or by appointment
Sunnie Hong	IA, 4 th year, Human Biology major	swH008@ucsd.edu	W 3-4pm
Vikas Gubbala	IA, 3 rd year, Physio & Neuro major	vgubbala@ucsd.edu	F 12-1pm

Section times:

Section	Day	Time	IA
A01	M	3-3:50pm	Sunnie Hong
A02	M	4-4:50pm	Vikas Gubbala

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.

Note about “Digital Inclusive” version of textbook: The textbook publisher is offering a “Digital Inclusive” version of the textbook. This means that everyone gets access to the e-book version of the textbook for free **only during the first two weeks of class. If you do not opt out, you will be charged for the e-book.** The decision is yours, but consider the following pros and cons:

Pros of Digital Inclusive Textbook	Cons of Digital Inclusive Textbook
Cheaper than a new textbook (\$67 vs. \$146)	May be more expensive than a used older edition
Accessible now, because it’s digital	Not accessible later- only available for 180 days
Don’t have to pay for it if you drop the course before the end of the 2 nd week of class	If you withdraw later and then retake the class, you have to pay for the book again.
Legal (unlike other pdf copies found from Googling the title of the book, which are likely pirated)	It’s also legal for them to charge you if you forget to opt out before April 11th, 2020.

If you do choose to use the Digital Inclusive textbook, it will be available on Canvas under the “Redshelf” link on the left.

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.

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 overall learning outcomes.

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.

Grading

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

<u>%</u>	<u>Grade</u>	<u>%</u>	<u>Grade</u>	<u>%</u>	<u>Grade</u>	<u>%</u>	<u>Grade</u>
>97	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	250	22%
More About You survey	10	
Pre-lecture Neuroscientist Journals (13 @ 10 points each)	130	
Post-lecture Comprehension Quizzes (9 @ 10 points each)	90	
Final Reflection	20	
Section Participation	80	7%
Section discussion set (8 @ 10 points)	80	
Exams	800	70%
Highest scoring midterm	200	
Next highest scoring midterm	200	
Final Exam	400	
Professionalism	20	2%
TOTAL	1150	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

We will be recording and posting lectures early in the week that they are supposed to be watched. That is so that we can use the lectures to respond to feedback that has been brought up over the course of the previous week.

During lectures, I will pose questions and wait before giving further feedback or answering them. **It will benefit your learning to try to answer these questions before you hear the answer**. Even if you do not know the answer, thinking about the question before hearing the answer will allow you to better recreate that thought process later.

Pre-lecture Neuroscientist Journals

To give you further practice, allow you to reflect on your learning, and prepare you for class, before most classes, there will be an assigned activity called a **Neuroscientist Journal posted on Canvas**. This activity may include a reading from online sources or primary literature, but it will always involve writing to a specific prompt. These Journals are not meant to be formal essays or finely polished documents for public view. Instead, they should reflect your own ideas and thought processes and should be as much for your own benefit as ours. As such, we expect that although you will be looking up information in other sources, **you will use your own words when writing these Journals**.

Grades will be awarded for **turning in these Journals on time and meeting the word count** by writing thoughtfully on topic, **not for correctness**. Journal prompts will be posted on Canvas several days before they are due. **They will be due NO LATER THAN 11:50pm the night before class**.

You can submit 85% of Neuroscientist Journals (13/15) and still receive full credit, as the lowest 2 Journal scores are dropped.

Post-lecture Comprehension Quizzes

At the end of every week, there will be a **post-lecture comprehension quiz posted on Canvas** that repeat material covered in the lectures. They are not meant to represent exam-level questions but rather go over basic material to make sure the lectures made sense to you.

Quizzes will be mostly multiple-choice. Although they will be graded, we will give feedback on incorrect answers and allow up to 3 attempts to get full credit. In addition, we will ask one or two open-ended questions that allow you to give feedback to us about your experiences in the course. Completion of at least 85% of quizzes (9/10) will give you full credit. Quizzes will be due every Friday night **no later than 11:50pm**.

Final Reflection

A final reflection on your experiences in this course is due at the end of the quarter on the **last weekday 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?"

Section

Weekly discussion sections are designed to **engage you in applying your knowledge and exercising your skills** in collaborative problem solving and data analysis. Therefore, **we highly encourage everyone to attend the same section on Zoom each week**.

Problem Sets

To exercise problem-solving skills on questions that are at the level of exam questions, part of your section attendance score will involve **completing problem sets on Canvas**.

Problem sets will be graded **solely on completion**, not correctness. However, it will benefit your learning to do your best on them. **Problem sets are due at 11:50pm Sunday night** to prepare for participation in section. They will typically be posted on Canvas several days before they are due. Completing at least 85% of the pre-section assignments (8/9) will award you full problem set scores.

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 multiple choice and short answer. Any material covered in or closely related to each lesson's learning objectives may be tested. **More information on the format of the exams will be available closer to the time of the first midterm.**

Midterms

There will be 3 midterms in this course. They will be take-home exams. Your lowest midterm grade will be dropped. If you do not hand in one of the midterms, that will be the midterm dropped.

Final Exam

Everyone must take the final exam. **If you need to miss the final exam due to a verifiable, unplanned emergency, you must notify us (by phone or e-mail) of the problem as soon as it is reasonable to do so.** We will discuss your best options given your circumstances.

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 any points for assignments, quizzes, exams, or anything else submitted late**. 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 Lecture Comprehension Quiz, 1 Problem Set, and 1 Midterm. 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	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Speak openly with one another while respecting diverse viewpoints and perspectives Provide sufficient space for others to voice their ideas 	<ul style="list-style-type: none"> Respect your perspectives even while we challenge you to think more deeply and critically Help facilitate respectful exchange of ideas
Fairness	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Create fair assignments and exams and grade them in a fair and timely manner Treat all students and collaborative teams equitably
Trustworthiness	<ul style="list-style-type: none"> Be open and transparent about what we are doing in class Not distribute course materials to others in an unauthorized fashion 	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> 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

Lectures and section meetings will be automatically 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 food³ 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.**

<i>Help and Resources</i>		
Academic Support	Psychology & Physical Safety*	Basic Needs
<p>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).</p> <p>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.</p>	<p>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.</p> <p>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.</p>	<p>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.</p> <p>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.</p>

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.

Ongoing assignments:

Assignment	Due Date	Starts
Problem set	Sunday night each week by 11:50pm	Week 2
Post-lecture Comprehension Quiz	Friday night each week by 11:50pm	Week 1

Weekly schedule:

Date	Guiding Questions	Neuroscientist Journals Due 11:50pm Night Before Class
Class #1 Tu Mar. 31	<i>No class; please familiarize yourself with the course structure, assignments, and syllabus</i>	
Class #2 Th Apr. 2	Welcome! Who are we? What makes a good scientific question? What are neurons and glia?	More About You! Survey due (Friday night); Reading: Syllabus
Class #3 Tu Apr. 7	How do we represent neuronal function? How do neurons behave at rest?	Neuroscientist Journal #1 Due!
Class #4 Th Apr. 9	How do neurons behave at rest?	Neuroscientist Journal #2 Due!
Class #5 Tu Apr. 14	How do the ion channels are important for neuronal function behave? How do we study their function?	Neuroscientist Journal #3 Due!
Class #6 Th Apr. 16	Midterm 1 (lectures 2-4)	
Class #7 Tu Apr. 21	What are action potentials? How do channels function in how they work?	Neuroscientist Journal #4 Due!
Class #8 Th Apr. 23	How do the biochemical structure of ion channels contribute to action potential function?	Neuroscientist Journal #5 Due!
Class #9 Tu Apr. 28	How do action potentials travel?	Neuroscientist Journal #6 Due!
Class #10 Th Apr. 30	What are synapses? What are neurotransmitters, and how are they released?	Neuroscientist Journal #7 Due!
Class #11 Tu May 5	Midterm 2 (lectures 5-9)	
Class #12 Th May 7	How do neurotransmitters cause effects in the receiving cell?	Neuroscientist Journal #8 Due!
Class #13 Tu May 12	How do neurotransmitters cause effects in the receiving cell?	Neuroscientist Journal #9 Due!
Class #14 Th May 14	What signaling occurs inside a neuron after receiving a signal?	Neuroscientist Journal #10 Due!
Class #15 Tu May 19	What is learning and memory? Where does learning and memory occur in the brain?	Neuroscientist Journal #11 Due!

Class #16 Th May 21	Midterm 3 (lectures 10-14)	
Class #17 Tu May 26	What are the synaptic mechanisms of learning and memory?	Neuroscientist Journal #12 Due!
Class #18 Th May 28	What are the synaptic mechanisms of learning and memory?	Neuroscientist Journal #13 Due!
Class #19 Tu Jun. 2	How are new synapses formed?	Neuroscientist Journal #14 Due!
Class #20 Th Jun 4	What are the synaptic mechanisms involved in drug addiction?	Neuroscientist Journal #15 Due!
M Jun. 8	Final Exam (all lectures)	
F Jun. 12	Final Reflection due at 11:59pm	