

## Neuroscience 10: The Brain Made Simple – Neuroscience for the 21<sup>st</sup> Century

**Instructor:** Walt Babiec

**Course Times:** Tuesday (T), Thursday (R), 11 – 1:05 pm

**Course Room:** Haines Hall A18

**Office Hours:** TBA. Office hours will be held on Zoom to allow for people to participate from varying locations and to avoid space limitations. The Zoom link will be published on the course website.

**Course Description:** Neuroscience is distinguished from the overlapping fields of psychology and cognitive science by its focus on explaining the emergence of mental processes from the collective, self-organized action of the cellular constituents of the central (brain and spinal cord) and peripheral nervous system. For this reason, this course provides an overview of the central and peripheral nervous systems from the building blocks, i.e., neurons, glia and the connections between neurons (synapses) to the integrated whole. It also considers the behaviors that emerge from integrated neural activity and the pathological processes impacting those behaviors. Many neuroscience methods and neurological diseases are touched upon briefly during these discussions. A high school background in either biology or chemistry is sufficient for this course.

This course satisfies part of the university-wide General Education (GE) requirements, specifically, Foundations of Scientific Inquiry. This course may not be taken for credit by students with credit for course M101A (Molecular, Cell, and Developmental Biology, M175A, Physiological Science, M180A, or Psychology, M117A) or Physiological Science 111A or Psychology 115. P/NP or letter grading available.

### Course Overview

- This course is taught in 2 two-hour lectures per week (TR, 11 – 1:05 pm). Active participation is a must and will be expected. Please show up on time. Make sure you are well-fed and hydrated before you come.
- Currently, masks are required for all indoor settings on the UCLA campus. Therefore, you will be expected to wear a mask during class. I will be wearing one too. If UCLA policies change, we will adapt as necessary.
- There will be 2 exams.
  - Exams will be 75 minutes and consist of 15 multiple choice and four free-response questions.
  - You will be allowed one side of one 8.5" x. 11" piece of paper for notes to use during the exam. Notes may be written or typed but must be at least 10 pt in size. That is, no microfont! All other written or electronic notes are prohibited. Computers, cell phones, tablets, or other electronic devices are prohibited, unless you are told otherwise. Your one sheet of notes must have your name on it. You are required to submit those notes with your exam. Your exam will not be graded and counted as 0, if you do not hand in your notes. Your notes will be returned to you.
- There will be 4 graded homework assignments that are meant to help you work with and review the material discussed in lecture.
- Success in this course depends upon lecture attendance. Exams will be based entirely on lecture content. Cramming is highly discouraged.

**Course Website:** This course uses the Bruin Learn Learning Management System. The course site can be accessed by logging into Bruin Learn or at this link (where you will then be prompted to login): <https://bruinlearn.ucla.edu/courses/134865>. **Lecture notes, homework assignments, and the textbook will be posted on the course website, so make sure you can access this site as soon as possible! You will not receive announcements about the class, until you log in at least once.**

**BruinCast:** UCLA does not offer BruinCast services in the summer.

### Textbooks/Readings

- There is no mandatory textbook or course reader. The textbook provided on Bruin Learn is Open Access and meant to provide supportive readings that discuss topics we have discussed in class. If you find differences between what I say in lecture and what's in this book, first, bring it to my attention. Second, go with what I say as right, unless I correct myself. Things change and, as you'll find in this class, some groupings, explanations, etc. are up for interpretation, and, in those cases, I am trying to teach you what I feel is the best approach.

Lim, A (2021) *Open neuroscience initiative*. <https://www.austinlim.com/open-neuroscience-initiative>

- In addition, the following two books are where your homework assignments come from. They contain information that might be helpful to (1) reinforce material we discuss in lecture (2) provide another voice to explain things we discuss in lecture (3) provide some additional depth if there's a topic that particularly interests you. Medical students and neuroscience majors use these books, which isn't to say that they'll be over your head or said to impress you, but, rather, don't think the material is light-weight because it comes from a "coloring book." All that being said, these are not required either.

Kapit W, Macey RI, Meisami E (2000) *The physiology coloring book*. (2<sup>nd</sup> ed.) San Francisco: Addison Wesley Longman, Inc.

Diamond MC, Scheibel AB, Elson LM (1985) *The human brain coloring book*. New York: Collins Reference.

The layout of the nervous system has not changed since the publication of these books. However, there is plenty of new information, which sometimes changes interpretations or explanations. As with the textbook, if you find differences between what I say in lecture and what's in one of these books, first, bring it to my attention. Second, go with what I say as right, unless I correct myself. Things change and, as you'll find in this class, some groupings, explanations, etc. are up for interpretation, and, in those cases, I am trying to teach you what I feel is the best approach.

Finally, used copies of these books are fine, because I will not be asking you to turn in anything from them, but they are paperback, so make sure of the quality of the used version that you are getting. I'm sure you don't want something that's falling apart when you receive it.

- In some cases, additional supportive readings, meant to aid understanding or to supplement knowledge, may be announced and posted after particular lectures on Bruin Learn. Whether I make any additional postings will depend upon feedback and how I feel you are digesting the course material.

## Grading

Percentages of the course grade are apportioned as follows. **You must take each of the exams to pass the class.** My goal is for all of you to pass. So take all the tests! There are no quotas per letter grade, so don't feel like A's are reserved for someone else!

Nominally, 90 and above will get you somewhere in the A range, 80 and above somewhere in the B range, 70 and above somewhere in the C range. Any adjustments to grade ranges will be in the students' favor. So, if you have a 95 average, there's no way you'll get less than an A, even if you have the worst average in the class, which is not likely but would be nice.

- Exam 1: 40% (Tuesday, 7/5 in class)
- Exam 2: 40% (Thursday, 7/28 in class)
- Homework 1\*: 5% (Due: Tuesday, 6/28 in class)
- Homework 2\*: 5% (Due: Tuesday, 7/5 in class)
- Homework 3\*: 5% (Due: Tuesday, 7/19 in class)
- Homework 4\*: 5% (Due: Thursday, 7/28 in class)

\*All homework is due by the end of class on the date indicated above. No exceptions will be made for late homework. Instead, the average of your exam grades will be substituted for that homework grade.

**Gradebook on MyUCLA for Official Grades:** Official grades will be kept on MyUCLA, not Bruin Learn. As assignments and exams are graded, grades will be posted in Gradebook on MyUCLA.

**Make-up/Early Exams/Emergencies:** There are no early exams. There are no make-up exams unless there is an emergency. Any emergencies should be reported immediately and will be evaluated carefully. A make-up exam is not guaranteed.

**Regrading:** Student's will be able to review (but not keep) a copy of their graded exams. There will be no regrading other than for unambiguous grading errors.

**Extra Credit:** Extra credit work will not be assigned. No extra credit work will be accepted to make up for grades.

**Accommodations for Learning Disabilities:** Students needing academic accommodations based on a disability should contact the Center for Accessible Education (CAE) at (310)825-1501 or in person at Murphy Hall A255. When possible, students should contact the CAE within the first two weeks of the term as reasonable notice is needed to coordinate accommodations. For more information visit [www.cae.ucla.edu](http://www.cae.ucla.edu).

**Respect and Dignity:** The classroom belongs to everyone. Please be respectful of this community. Fostering trust and security allows us to focus on the real work of learning. Use common sense to guide appropriate behavior. Please turn your cell phones off, and avoid distracting activity.

**Academic Honesty:** Cheating on an exam or class assignment will result in a score of 0 for that exam/assignment and notification of the Office of the Dean of Students or the UCLA Summer School Office for further disciplinary action. **Collaboration on exams or assignments is cheating.** You are expected to complete all exams and assignments on your own. **Use of CourseHero, Chegg, or other study sites to help complete exams or assignments is considered cheating.**

**Plagiarism is cheating!** Any indication that you have copied work from a fellow student or copied published works without proper attribution will result in a 0 for that assignment for the student(s) involved and notification of the Dean's Office or Summer School Office. Copying text directly from an article, the web, or a lecture transcript, without proper attribution **DOES** constitute plagiarism.

It's estimated that as many as 75% of students at some point engage in academically dishonest conduct while at university. **Be the 1-in-4 who do not!**

**You are not allowed to post or redistribute - for free, for sale, or in return for services - class materials, including, but not limited to, exams, assignments, lecture slides, lecture recordings, lecture transcripts, or the syllabus, including to study sites like CourseHero and Chegg.** All rights to these materials are reserved to the instructor of this course, UCLA, or third parties, such as textbook publishers, through terms of fair use. Therefore, you **MAY NOT** disseminate any of these materials directly or through 3<sup>rd</sup> parties. If you do so, you may be referred to the Office of the Dean of Students or UCLA Summer School Office for further disciplinary action.

#### **Recommendations**

Due to programmatic constraints, I will not be able to accept any requests for letters of recommendation.

Preliminary Outline of Dates and Topics (Subject to Change)

Week	Date	Topic	Readings (Lim)
1		Introduction to Neuroscience / Overview of brain and nervous system anatomy	Ch. 1 Sections 2.1-2.2 (Ch. 2)
		Cellular Organization of the Nervous System	Ch. 3
2		Synaptic Communication Between Neurons I ( <b>Homework 1 due</b> )	Ch. 4
		Synaptic Communications Between Neurons II	Ch. 5
3		<b>Exam 1</b> (Covering lectures on 6/21, 6/23, 6/28, 6/30) ( <b>Homework 2 due</b> )	
		Motor Systems I (Control of Skeletal & Smooth Muscles, & Glands)	Section 10.4 (Ch. 10)
4		Motor Systems II (Planning & Control of Movements)	pp.10-5, 10-6 (Ch. 10)
		Motor Systems III (Brain Structures Providing Specialized Support for Movement)	Section 10.2 (Ch. 10)
5		Sensory Systems I (Sensation v Perception/Touch) ( <b>Homework 3 due</b> )	Box on 7-2 (Ch. 7), Section 8.3 (Ch. 8)
		Sensory Systems II (Vision)	Ch. 7
6		Sensory Systems III (Hearing)	Section 8.1 (Ch. 8)
		<b>Exam 2</b> (Covering lectures on 7/7, 7/12, 7/14, 7/19, 7/21, 7/26) ( <b>Homework 4 due</b> )	