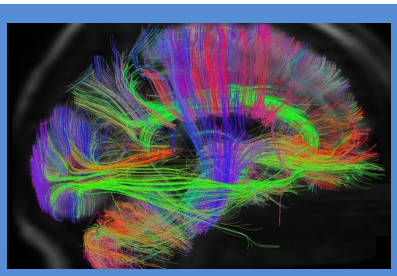
Neuroanatomy BIPN 160 & BGGN254, Winter 2024.

Instructor: Cory Root, Ph.D.
email: cmroot@ucsd.edu
Office Phone: 858-246-2241
Office Location: 3122A Pacific Hall
Office Hours: Wed & Fri 3-4pm



BIPN160 is taught concurrently with BGGN254. There are differences described below.

Course scope:
The goal of the course is to give students a fundamental understanding of the anatomy of the human brain and peripheral nervous system as it relates to neural circuits, behavior, perception and cognition. There will be an emphasis on how discovery happens, and thus, we will also examine clinical cases and research from other animals. The course will include historical approaches and findings as well as modern techniques and questions. Students will be able to anatomically identify key areas in the human brain involved in specifics functions, and understand the evidence that implies the function of key brain areas.

Learning objectives:
1. Identify anatomy and recall function of key brain areas and peripheral nerves.
2. Identify key experiments that allow us to assign functions to brain areas.
3. Implement techniques and tools to dissect neuroanatomy and function.
4. Construct knowledge from evidence

Engaged learning strategy
This course will use a flipped learning model. You will be expected to watch prerecorded lectures before class and come to class ready to participate. During class we will engage in problem solving activities and discussion of the material. Lectures and slides will be available on Canvas at least one week before each class. The class discussion will be podcasted, although it probably won't be useful as lectures are pre-recorded. Attendance is required and part of the grade. This is a new format for this course and your feedback will be important. We will have check-in surveys where you can tell me what is and isn't working well.

Instructional Assistants:	**email:**
Eeshi Uppalapati	euppalapati@ucsd.edu
Ming Tak Ngan	mngan@ucsd.edu
Rohini Gadde	rkgadde@ucsd.edu

Class Meeting Days: T & Th
Class Meeting Hours: 3:30-4:50pm
Class Location: Ledden Auditorium

Study section: Th 11:00-11:50 am (Zoom)
No sections the first week, or the week of an exam.

Electronic communication:
If you email Dr. Root, please put BIPN160 as the subject. Logistical emails can be sent to Dr. Root, but please do not email questions about course content – those emails may be ignored. Instead, please ask questions during office hours, study sessions, during/after class or on Canvas discussion boards. There will be discussion boards each week of class. Asking and answering questions there may be useful to others in the class.

Course scope and outline:

W1: 1/9 L1: Introduction, Neurons and Glia, basic anatomy
1/11 L2: Techniques to study neuroanatomy and function

W2 1/16 L3: Development of the spinal cord and brain
1/18 L4: Spinal cord, periphery and cranial nerves

W3 1/23 L5: Brainstem, Thalamus
1/24 Review session for first exam at 4pm. This is optional
1/25 **Exam 1**

W4 1/30 L6: Sensory cortex overview and somatosensory system
2/1 L7: Auditory systems

2/2 Deadline to drop class without a W

W5 2/6 L8: Visual system
2/8 L9: Chemosensory systems

W6 2/11 Review session for second exam at 1pm. This is optional
2/13 **Exam 2**
2/15 L10: Hedonics: Ventral striatum, amygdala, and others:

2/16 Deadline to drop class with a W and not an F

W7 2/20 L11: Hypothalamus: Homeostasis and drives
2/22 L12: Brain areas for sleep and arousal

W8 2/25 Review session for third exam at 1pm. This is optional
2/27 **Exam 3**
2/29 L13: Movement control: basal ganglion, and motor cortex

W9 3/5 L14: Cerebellum
3/7 L15: Hippocampus: Learning and memory

W10 3/12 L16: Frontal cortices and higher order functions
3/14 L17: Ventricles and Blood supply

FW *3/ 16 Review session for final exam at 1pm. This is optional*
3/19 Final Exam, 3-6pm.

Learning Materials

This class is not designed from a textbook and one is not required. Course material is mostly taken from the following sources. The first two will be in reserve at the library.

1) Nolte's Human Brain: An introduction to its functional anatomy, by Vanderah & Gould.
2) Principles of Neurobiology, by Liqun Luo
3) The Brain: An introduction to functional Neuroanatomy, by Watson, Kirkcaldie and Paxinos.

Lecture attendance (applies to BIPN160 & BGGN254)

Active participation is important for your learning. Therefore, every day, we will engage in in-class activities and use iClickers. iClicker usage is how Attendance and participation will be measured for points. Attendance is required and will be monitored with clickers starting on the second class. There are a total of 16 lectures and you must attend 10 class discussions (review sessions don't count) to receive full credit for attendance. 3 points/class x 10 classes = 30 points total. You can miss up to 6 classes and get full credit, but full attendance will not generate extra credit.

iClickers. For your iClicker to correctly be associated with your name, **you must register your clicker** on iclicker.com. To do that, make an iClicker student account on https://student.iclicker.com/#/login (if you haven't already) and register your remote's ID on your iClicker student account.

We will clickers from the beginning but start counting iClicker participation for points on the Thursday of Week 1. Participation credit will require participating in at least 50% of clicker polls for each class. Everyone has different circumstances and life events. Therefore, to get full attendance points, you only need to attend and click in during 10/16 lectures (out of 16 total), which allows you to miss 3 weeks (6 class sessions) of class after the first class. If you feel sick, you are encouraged 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 me soon.

Podcasting: 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 captured by a videocast. *The podcast video may not contain much useful information since content is delivered by recorded videos.*

Readiness exercises/Lecture quizzes (applies to BIPN160 & BGGN254)

To prepare for class you must watch the recorded lecture. Each lecture will be accompanied by a short quiz that must be completed before the start of the corresponding class. These quizzes are meant to test basic understanding of the lecture rather than mimic exam questions. Each quiz is worth 5 points and will be graded for accuracy. You can use notes and will have up to three attempts to get the right answers before the due date (3:30pm of class day).

Problem sets (applies to BIPN160 & BGGN254)

Problem sets are part of your grade. There will be 7 problem sets, worth 10 points each. They will be graded for effort/completion and not accuracy. If you earnestly attempted to answer all questions you will get full credit. Points will be deducted for unanswered questions or answers that are not sincere attempts. Problem sets will be accepted late with the penalty of 1 point per day.

Exams (applies to BIPN160 only)

There will be three midterm exams worth 100 points and a comprehensive final worth 150 points. Your lowest exam grade will be dropped, not including the final. You may skip one midterm if you want to drop that exam. All students must take the final. Exams will be based off of lecture material and will contain a combination of multiple choice and short answer questions.

- One note sheet will be allowed during each exam. Note sheet must be standard 8.5 x 10.5 paper or smaller, **single-sided** and **handwritten** (not typed).

Study section
Section attendance is optional and begins the second week. There will be one section for the entire class that meets remotely. Lecture material will be reviewed, questions answered, and problem sets discussed.

Basis for Final Grade BIPN160

Course component	610 total points for course	Percentage of grade
Participation/attendance	30 total	5%
Lecture attendance	10 @ 3 points ea.	
Assignments	230 total	36%
Lecture quiz	16 @ 10 points ea.	
Problem sets	7 @ 10 points ea.	
Exams	350 points total	55%
Highest midterm	100 points	
Next highest midterm	100 points	
Final Exam	150 points	

The course may seem like a lot of work with all these assignments, but I believe that each of the course components is important for **supporting your learning** and structuring your studying. Also note that dividing up points earned from different tasks affords more opportunities to improve your overall grade. If it becomes apparent that this format is not working well, I reserve the right to alter the course structure to support you and your learning.

Tentative Grading Scale

94-100 A	87-89 B+	75-80 C+	55-62 D+	<40 F
90-93 A-	83-86 B	69-74 C	47-54 D	
	80-82 B-	63-68 C-	40-47 D-	

This grading scale will be used as a guide; however, grades may be curved to raise the average grade if necessary. The average grade target is a B or B+. Percentage will be rounded to two significant digits, so a 93.4 will be a 93. The grade of A+ will be reserved for the top ~5% of students who usually have at least a 100%.

Missed exams
You are expected to take the exams when they are scheduled during normal class time. Make-up exams will only be arranged in extreme situations and decided on a case-by-case basis. Alternatively, a missed exam may count as your dropped lowest exam grade.

Grading objections and regrades
If you have an objection to **a particular exam question**, you have 24 hours from the end of the exam to raise your concerns. Objections to exam questions must be made by email, with a written argument of why that question was unfair. A decision will then be made whether to exclude that question for the entire class.

If you have objections to the grading of a question on **your** exam, you can discuss with Dr. Root during office hours or by email. In either case, you must provide an explanation for why you think you deserve more points. **Regrades will only be available within a week after you receive the graded exam.** Note that a regrade may result in a gain or loss of points. Graded exams will be scanned before being returned. If you are caught altering your answer to an exam

question for a regrade, you will be given a zero on the entire exam and reported for academic dishonesty.

Strategies to do well in this course

Below is a list of tips collected from top students in past years. These are things that worked well from them. *But note that the format of the course has changed a bit.*

1) Use active study approaches to engage with the material. Take notes during lectures, create summaries/outlines, flashcard and self-quizzing. Try Anki or Quizlet for digital flashcards.
2) Attend lectures, discussion sections and review sessions
3) Keep up with the material as you go (there is a lot).
4) Previewing lecture slides helps with note taking during the lecture.
5) Do/review all practice problems available (questions in lectures, problem sets, practice exams and study guide)
6) Learn anatomical descriptors, techniques and experimental language.
7) Understand the experiments in terms of why, how and what they say.

BGGN254

The course is taught concurrently as an undergraduate and graduate course. Students enrolled in BGGN254 are expected to attend lectures and complete assignments as above. BGGN254 students will not take the BIPN160 exam. Instead, you will have three take home exams that will require you to read a paper and answer questions. You are welcome to use your notes. Each exam will count toward your final grade (lowest **not** dropped). You will take the BIPN160 final exam as a take home, open note exam. Points for BGGN254 are as follows.

Course component	710 total points for course	Percentage of grade
Participation/attendance	30 total	4%
Lecture attendance	10 @ 3 points ea.	
Assignments	230 total	31%
Lecture quiz	16 @ 10 points ea.	
Problem sets	7 @ 10 points ea.	
Exams	450 points total	61%
Exam 1	100 points	
Exam 2	100 points	
Exam 3	100 points	
Final Exam	150 points	

Tentative Grading Scale BGGN254

92-100 A	85-87 B+	72-87 C+	52-60 D+	<40 F
88-91 A-	82-84 B	67-71 C	45-51 D	
	78-81 B-	61-66 C-	40-44 D-	

This scale may be curved to raise the average grade if necessary.

Violations of Academic Integrity: Violations include, but are not limited to:

- Cheating: Intentionally using or attempting to use unauthorized materials, information, notes, study aids, or other devices in during exams.
- Fabrication and Falsification: Intentional and unauthorized alteration or invention of any information or citation in an academic exercise. Falsification is a matter of inventing or counterfeiting information for use in any academic exercise.
- Plagiarism: Intentionally or knowingly presenting the work of another as one's own (i.e., without proper acknowledgment of the source).
- Abuse of Academic Materials: Intentionally or knowingly destroying, stealing, or making inaccessible library or other academic resource materials.

- Complicity in Academic Dishonesty: Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty.

Use of artificial intelligence (AI)
ChatGPT and other artificial intelligence such as Bard and Bing Chat are online services that can answer questions in human-like ways. These tools can help you in many tasks. However, they **have serious downsides**. As they merely string words together without employing logic, they may not give the correct answers to questions that require logical analysis, and are often factually incorrect. They also do not necessarily understand the content of this course or how you will be evaluated. However, you may use ChatGPT and other AI tools as one way to study or understand a topic. **Be cautious of incorrect information that might confuse you**.

BIPN160 does not have written essays, but BGGN254 does. BGGN254 students are welcome to use AI technology to help in writing your exams. If you do, please indicate that you did and write a brief discussion of your experience (1 paragraph). For example: How much did you have to edit? How accurate do you think it was? What did it get right/wrong? Do you think it is a useful tool for writing? **I do not recommend using AI**, as it will cheat you out of an important learning exercise and could produce a lower quality writing. In my limited experience with students using AI to write about research papers, AI usually does a poor job by adding extraneous and inaccurate information (points will be deducted for inaccuracies and extraneous information). Lastly, remember that whatever you do, you are ultimately responsible for the work you turn in and, more importantly, for the learning that does or does not take place.