

Neuroscience and Behavior Lab – Fall 2026

NSBH-21450 section 04
Tuesdays 2:00 – 5:00 pm
Jordan Hall of Science, Room 206

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COURSE DESCRIPTION

The Neuroscience and Behavior Laboratory will provide you with the opportunity to attempt and practice basic neuroscience skills that are essential for success in any scientific field. The labs are designed to introduce you to a wide range of neuroscience research techniques and critical ideas pertaining to conducting scientific inquiry in general. The course will be divided into four research categories: Neuroanatomy, Histology, Electrophysiology, and Behavior. The labs are designed to provide you with background information and give you an opportunity to apply this information, along with your own knowledge and curiosity, by designing simple experiments. You will conduct, analyze, and interpret the data for your experiment and in the end present your data in a scientific poster presentation.

ATMOSPHERE AND CHARACTER

We all come with different backgrounds, experiences, and skills – which is a good thing because this allows for different perspectives, ideas, and strengths. We each have something to offer and can learn from one another and a willingness to see things in different ways is an opportunity for growth. I encourage earnest learning, respect for one another, and willingness to listen to differing viewpoints. Humble curiosity is a great way to approach learning, not only for new course material, but about us and others as well. We can disagree – and that is great because it challenges us to think about things differently. However, we cannot be disrespectful. There is no need, it only hinders all of us, and it won't be tolerated in this class.

Added information to syllabus after IVT information highlighted in yellow:

COURSE LEARNING OBJECTIVES

Upon successful completion of this laboratory course, you will have a better understanding of the nervous system, both its anatomy and function. You will also learn key elements of experimental design and be provided opportunities to implement and present your own scientific studies. This will develop key scientific design, analysis, and communication skills that will allow you to critically evaluate, understand, and interpret scientific work in the field of Neuroscience.

In addition to the fundamental scientific skills, this laboratory course is set up for you to create your own experiments. With this, you will think about how you want to design your study, what data you will collect, how you convey your data, and how your findings relate to what is already known in science. This can be daunting because, much like science being done in any laboratory, it is our own experimentation and observations that lead to new findings, ones that have not been described before. Because of this, failure is inevitable . . .

I have no special talents. I am only passionately curious. ~ Albert Einstein

Success is not final, failure is not fatal: It is the courage to continue that counts. ~ Winston Churchill

But failure is not a bad thing. We can learn from our failure and grow. Many times, we grow more from failure than trying to be perfect in the first place.

Final quote: *The data are the data.* ~ Dr. Lane

You will hear me say this phrase repeatedly throughout the semester. When findings from the experiment you conduct go against what is known in the field. When the data are beautiful except for one subject/participant that has a strange measure. When your experimental and control groups have the exact same scores. **The data are the data.** And it means that something caused the data to come out that way. Sometimes that something is that you made a mistake – and that's ok. Try and figure out what that mistake was and learn from it. Sometimes it is because there is something you didn't think about when you were designing your study. Another opportunity to learn and grow. Sometimes it is because there is something new to be found that hasn't been reported yet – how exciting! This is science. This is learning. I hope you value your mistakes and try and understand them instead of being afraid to make them.

Resilience Club “Applications”

If you struggled with a laboratory assignment, you have the option to reflect on your difficulties and join the Resilience Club. Filling out an application for the club will provide you with 2.5 points extra credit that will be applied to the lab assignment described in the application. The “application” is a guided written reflection on any assignments that you found to be challenging, where you can think about what went wrong with the lab and consider different approaches for the lab. You can complete this application for any lab throughout the semester. You will find the form in the “Files” portion of CANVAS.

THE COURSE WEBSITE

The course syllabus, laboratory materials, assignments and announcements for this course can be found on the web-based CANVAS platform, which will be used as the primary means of communication for the course. If you are enrolled in the course, then SP26-NSBH-21450 should be automatically listed within your courses. If SP26-NSBH-21450 is not listed as an active course, check with the registrar to make sure you are officially enrolled.

COURSE MATERIALS

1. Required textbook: The Brain Atlas: A Visual Guide to the Human Central Nervous System. 4th edition, Woolsey, Hanaway, and Gado. ISBN: 978-1118438770. [The textbook can be purchased here.](#)

2. Personal Protective Equipment (PPE): You will be required to wear PPE of a lab coat, safety glasses, and gloves during. These will be provided to you on the first day of class for use throughout the semester.

ATTENDANCE

Lab attendance is **mandatory**. The scope of the materials needed for assignments and because you will be working in pairs/groups for the lab assignments, your failure to attend a given laboratory will not only negatively impact you, but also members of your group.

If you are unable to attend, you MUST contact the instructor, via email, as soon as you know you will be absent from the lab. If your absence is excused, you must work with your instructor to determine a time to make up your missed laboratory work, preferably as soon as possible to

access lab materials. For absences to be excused you must provide appropriate documentation (see <https://dulac.nd.edu/academic/> for required documentation). With excused absences, you are still responsible to make up any work missed in the lab.

THERE WILL BE NO MAKEUP LABS FOR UNEXCUSED ABSENCES and students will not be eligible to earn associated points for missed labs. If you have one unexcused absence over a two-week unit (i.e. you are in lab for one of the weeks but not the other), your score will be reduced by 50%.

GRADING

Grades will be comprised of:

- Completion of Safety Review Worksheet (10 points)
- Nine in-class lab assignments that are due at 5:00 pm on the lab day (worth 20 points each).
- A brain anatomy lab practical quiz (worth 40 points).
- A scientific poster presenting the experimental elements of your final lab (worth 50 points).

Total points available: 280 points:

Grade	Percentage	Points	Grade	Percentage	Points
A	93 - 100%	260-280	C +	77 – 79 %	215-223
A -	90 - 92%	252-259	C	73 – 76 %	204-214
B +	87 – 89%	243-251	C -	70 – 72 %	196-203
B	83 – 86 %	232-242	D	60 – 69%	168-195
B-	80 – 82%	224-231	F	0 – 59 %	0 – 167

LAB MATERIALS AND ASSIGNMENTS

1. Background information. For each lab module, background information, manuals, and lab instructions will be provided to assist you in completing labs effectively. The background information should be read completely **before coming to lab** to ensure you understand the methodology, expectations, and assignments for each lab.

2. Lab assignments. There will be a laboratory assignment associated with each weekly lab (20 pts each). The assignments are the culmination of that week's key information and materials that are critical for understanding the specific information being taught. The assignments are to be completed in lab and are due by 5:00 pm on the assigned day. They can be submitted electronically via CANVAS or to the lab TAs on paper. Only one submission is required – either paper or electronic. Late assignments: **3 points will be deducted** each day the assignment is late.

3. Lab Practical. After the brain anatomy labs, there will be a practical where sections of human and sheep brain tissue will be labeled with pins. Students will be expected to identify labeled brain structures and describe the function and connections of each brain region (40 points).

4. Neuroplasticity Lab poster and presentation. The culmination of all the work in the lab will conclude with a poster presentation on Tuesday December 2nd. Each lab group will create and present a scientific poster to the class (50 pts).

COURSE SCHEDULE

Lab assignments are **due on the day they are assigned by 5:00 pm.**

	Date	Lab Topic	In class assignments
	8/25	No labs first week of class	
A N A T O M Y	9/1	Safety Review Syllabus Review Human Brain Tissue	Laboratory Safety Worksheet (10 pts)
	9/8	Sheep brain dissections -> comparison to human brain tissue	Dissection Lab Assignment (20 pts)
	9/15	Functional Systems of the Human Brain	Brain Function Lab Assignment (20 points)
	9/22	Brain Anatomy Practical	Practical (40 pts)
H I S T O L O G Y	9/29	FIJI - Image J Lab	FIJI Lab Assignment (20 pts)
	10/6	Experimental Design and Statistical Analysis	Statistical Analysis/SPSS Lab Assignment (20 pts)
	10/13	Microscopy Lab	Microscopy Lab Assignment (20 pts)
	10/20	Fall break – no lab	
E P H Y S	10/27	Meta-Neuron – Neuron Simulator Lab	Metaneuron Lab Assignment (20 pts)
	11/3	Earthworm Electrophysiology Lab	Earthworm Lab Assignment (20 pts)
B E H A V I O R	11/10	Neuroplasticity Lab	Behavior Lab Assignment 1 (20 points)
	11/17	Neuroplasticity Lab Part 2	Behavior Lab Assignment 2 (20 points)
	11/4	Thanksgiving Break – no Lab	
	12/1	Laboratory poster presentations	Posters should be submitted before the start of class

	12/8	No Lab – last week of class	
	12/14	Finals Week – no final exam	