

**Attention!**

This is a ***representative*** syllabus.  
The syllabus for the course when you enroll may be  
***different.***

Use the syllabus provided by ***your*** instructor for the most up-to-date information. Please refer to your instructor for more information for the specific requirements for a given semester.

Feel free to contact the Psychology Advising Office for any questions regarding psychology courses either by email ([psychadvising@osu.edu](mailto:psychadvising@osu.edu)) or phone (614.292.5750).  
Thank you!

# **Honors Behavioral Neuroscience**

## **PSYCHOLOGY 3313H**

Credit: 3 units; Class # 19775

### **I. COURSE SUMMARY**

This honors course explores the relationship between the brain and behavior. In order to truly understand our thoughts and behavior, it is necessary to understand the brain. The primary course objective is to introduce terminology and concepts that will allow you to begin to understand how behavior and cognitive function could arise from interactions between groups of neurons. My hope is that in this course you will not only become familiar with the "nuts and bolts" of how the brain works, but also become fascinated by its complexity and elegance, and its awesome ability to bring into existence all of your thoughts, memories, dreams, and hopes.

The course is divided into three major sections. The first section is organized around the general structure and function of the nervous system. In this section, we will begin by exploring the anatomical organization of the nervous system at both the cellular and systems level, followed by a discussion of the physiology (electrical and chemical) of neural communication within and between neurons. We will round out these beginnings by considering neuroendocrine systems, synaptic pharmacology of psychoactive drugs, and the genetics and development of the nervous system. The second section of the course will explore sensory and motor systems, with an in depth investigation of the visual system from retinal processes to complex perception. The third section will examine several domains of behavioral and cognitive functions and dysfunctions, from biological rhythms and sleep, to stress and emotions, to learning and memory, to neurological and psychological disorders.

### **II. LEARNING OBJECTIVES**

Upon successful completion of this course, students should be able to:

- understand the role of subcortical brain regions, including the basal ganglia, thalamus, hypothalamus, brainstem nuclei, cerebellum and spinal cord in overall brain function.
- describe the functional organization of the cerebral cortex.
- describe how and where information flows through the cerebral cortex.
- understand how individual neurons receive and send information.
- provide specific details about the role of the peripheral nervous system in providing afferent data to the brain as well as carrying out efferent commands to muscles and organs.
- explain the process of synaptic transmission.
- describe similarities and differences between the six major neurotransmitters, and how drugs interact with these transmitter systems.
- identify methods of investigation used to study the brain.

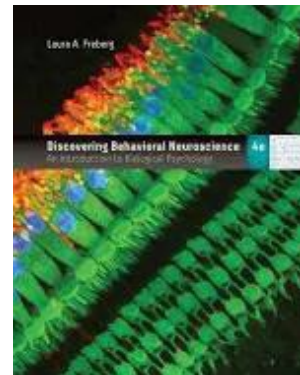
- describe how visual images are processed by the eye and be able to trace the pathways by which visual images are processed in the brain.
- describe how sounds are processed in the ear and be able to trace the pathways by which sounds are processed in the brain.
- trace the various pathways that are involved with movement and understand how each motor-related brain structure adds something different to the final output.
- recognize the various stages of the sleep cycle and identify the neural basis for each.
- know how different emotions engage different parts of the brain and how these brain structures contribute to various cognitive functions.
- differentiate among the different types of learning and memory and understand the brain mechanisms responsible.
- know the various neurological disorders and the brain mechanisms thought to be responsible for the symptoms as well as the latest approaches to treatment.
- identify the brain pathology underlying different psychological disorders.

In addition, by participating in discussions and presenting to the group, students will be able to:

- think critically about theories that relate a brain structure or process with a mental or behavioral function.
- apply neuroscience concepts, theories and research findings to issues in everyday life.
- form reasoned positions about major issues related to the neuroscience
- know how to read and understand peer-reviewed neuroscientific research articles and compare that information with textbooks and popular writing.

## II. RESOURCES

**Textbook:** The recommended course textbook is *Discovering Behavioral Neuroscience 4th ed.* by Laura Freberg, Cengage Learning, 2018. This is a very readable text that provides all of the basic information that you will need for this course. A copy of the course textbook will be on reserve at main library. This is a recommended, not required textbook. You can use previous edition of the textbook, or use another behavioral neuroscience textbook, or web resources to gain context for the information presented on the course PowerPoint slides.



**Websites:** The course website can be found at [www.carmen.osu.edu](http://www.carmen.osu.edu). This site is where all course materials and information are made available. Most important are the lecture files. Each lecture will be available as a video file and will have an accompanying PowerPoint file. You will need to access these lecture videos on a regular basis during each week of the semester. In addition to the course provided materials, there are many websites that provide useful information about behavioral neuroscience, including an open source textbook (<http://neuroscience.uth.tmc.edu/>) and I encourage you to use these sites to gain further information. Additional links to external content are provided in the modules.

**Assistance:** I am available and interested in talking with you about the course, the course material, and strategies to improve your learning. I'm usually available after class, can answer questions by e-mail ([givens.7@osu.edu](mailto:givens.7@osu.edu)) or phone (292-0385), and will gladly set up an appointment at a time that is mutually acceptable for more lengthy discussions.

### III. Lecture and Reading Schedule

WEEK	DATES	TOPICS	CHAPTER
1	Aug 24 Aug 26	Introduction and History of Mind-Brain studies Research Methods	1 1
2	Aug 31 Sept 2	Central Nervous System Support systems and Peripheral Nervous System	2 2
3	Sept 7 Sept 9	Neurons and Glia Action Potentials	3 3
4	Sept 14 Sept 16	Synaptic Transmission Neurotransmitters, Drugs and Hormones	3 4
5	Sept 21 Sept 23	<b>Review</b> <b>Exam 1</b>	
6	Sept 28 Sept 30	Development Vision and Visual Perception	5 6
7	Oct 5 Oct 7	Auditory Processing and Other Sensory Systems <b>Presentations</b>	7
8	Oct 12 Oct 14	Movement No Class – Fall Break	8
9	Oct 19 Oct 21	Sleep and Dreaming Lateralization and Language	11 13
10	Oct 26 Oct 28	<b>Presentations/Review</b> <b>Exam 2</b>	
11	Nov 2 Nov 4	Learning Memory	12 12
12	Nov 9 Nov 11	<b>Presentations</b> No Class – Veterans Day	14
13	Nov 16 Nov 18	Emotion Reward/Stress	14 14
14	Nov 23 Nov 25	Neurological Disorders No Class – Thanksgiving	15
15	Nov 30 Dec 2	Schizophrenia and Affective Disorders Anxiety	16 16
16	Dec 7	<b>Presentations/Review</b>	
17	Dec 13 12:00 PM	<b>Final Exam</b>	

### IV. GRADING

There will be three exams in this course. Each exam will consist of 40 (2 point) multiple-choice questions, and two (10 point) short answer questions. The first two exams are sectional, only over the material covered since the last exam. The final also contains a sectional exam (~70%), but also has a portion (~30%) that is comprehensive over some of the material covered in the first exam. This early material is tested twice because it is considered to be critically important for your long term understanding of how the brain works. Each of the three tests is weighted

Letter Grade	Starting %	Points/330
A	93	307
A-	90	297
B+	87	287
B	83	274
B-	80	264
C+	77	254
C	73	241
C-	70	231
D+	67	221
D	60	198
E	0	<197

equally, worth 100 points each. There will be an assignment in which you will share (written and oral) a recent discovery in the field of behavioral neuroscience (5 pts) and another where you summarize concepts learned from a Neuron video (5 pts). In addition, there will be a written summary and presentation of a research article (10 pts each). The written summary will be done individually, and the presentation in groups of 2. The total number of points for the course is 330 points and grades will be calculated based on the percentage using the OSU standard scheme (on left)

All of the material that is tested on the exams comes from lecture, so it is in your best interest to attend all lectures. As a suggestion, you should make the acquaintance of others in the class, so that you can get class notes in the event that you miss a class.

## V. Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's [Code of Student Conduct](http://studentconduct.osu.edu) (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

**If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct.** If COAM determines that you have violated the university's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

[Committee on Academic Misconduct](http://go.osu.edu/coam) (go.osu.edu/coam)

[Ten Suggestions for Preserving Academic Integrity](http://go.osu.edu/ten-suggestions) (go.osu.edu/ten-suggestions)

[Eight Cardinal Rules of Academic Integrity](http://go.osu.edu/cardinal-rules) (go.osu.edu/cardinal-rules)

## VI. Statement on Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options on Ohio State's Title IX website ([titleix.osu.edu](http://titleix.osu.edu)) or by contacting the Ohio State Title IX Coordinator at [titleix@osu.edu](mailto:titleix@osu.edu). Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information, visit the OIE website ([equity.osu.edu](http://equity.osu.edu)) or email [equity@osu.edu](mailto:equity@osu.edu).

## VII. Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand mental health resources ([go.osu.edu/ccsondemand](http://go.osu.edu/ccsondemand)) are available. You can reach an on-call counselor when CCS is closed at 614- 292-5766. **24-hour emergency help** is available through the National Suicide Prevention Lifeline website ([suicidepreventionlifeline.org](http://suicidepreventionlifeline.org)) or by calling 1-800-273-8255(TALK). The Ohio State Wellness app ([go.osu.edu/wellnessapp](http://go.osu.edu/wellnessapp)) is also a great resource.

## VIII. COVID-19

**Safety and health requirements:** All teaching staff and students are required to comply with and stay up to date on all University safety and health guidance, which includes wearing a facemask and maintaining a safe physical distance at all times.

## IX. Accessibility Accommodations for Students with Disabilities

### Requesting Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with [Student Life Disability Services \(SLDS\)](#). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

### Disability Services Contact Information

- Phone: [614-292-3307](tel:614-292-3307)

- Website: [slds.osu.edu](https://slds.osu.edu)
- Email: [slds@osu.edu](mailto:slds@osu.edu)
- In person: [Baker Hall 098, 113 W. 12th Avenue](#)

#### Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

[CarmenCanvas accessibility](https://go.osu.edu/canvas-accessibility) ([go.osu.edu/canvas-accessibility](https://go.osu.edu/canvas-accessibility))

Streaming audio and video

[CarmenZoom accessibility](https://go.osu.edu/zoom-accessibility) ([go.osu.edu/zoom-accessibility](https://go.osu.edu/zoom-accessibility))

Collaborative course tools