

PSYCH 260/BBH 203
Spring 2023

Rick O. Gilmore, Ph.D.

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Overview



There is perhaps no more fascinating scientific frontier than the study of the brain and behavior. The goal of this course is to introduce you to the principal methods, theories, and findings of the scientific fields that seek to open this frontier. At the end of the term, you will know more about the following topics:

- how the nervous system is structured and how it functions;
- how the nervous system evolved and develops; and
- how the nervous system influences behavior, thought, action, and emotion.

Instructor

Rick O. Gilmore, Ph.D. Professor of Psychology rog1 AT-SIGN psu PERIOD edu

Schedule an appointment: <https://doodle.com/mm/rickgilmore/book-a-time>
Lab web site: <https://gilmore-lab.github.io>

Teaching Assistant

Megan Bradson mlb5897 AT-SIGN psu PERIOD edu

Meeting time & location

Tuesday and Thursday 3:05 PM - 4:20 PM ET Animal, Veterinary, and Biomedical Sciences Building 102

Resources

Textbook

Watson, N.V., & Breedlove, S.M. (2020). *The Mind's Machine*, 4th Ed. Oxford. PSU Bookstore link.

When a reading assignment refers to, for example, W&B 1:3-21 (see here), that means read Chapter 1, pages 3-21 from the Watson & Breedlove book.

Online

- Syllabus (this site): <https://psu-psychology.github.io/psych-260-2023-spring/>
- Course notes: <https://psu-psychology.github.io/psych-260-2023-spring-notes/>
- Canvas: <https://psu.instructure.com/courses/2244994>
 - Grades
 - Quizzes
 - Submit blogs posts, papers, and extra credit

Schedule

January 9-13

Tuesday, January 10

- Topics
 - Introduction to the course
 - A bit about systems
- Assignments
 - Read: W&B 1:3-21
- Materials
 - Slides: (1 of 2) and (2 of 2)

Thursday, January 12

- Topics
 - History of neuroscience
 - Levels of analysis
 - Neuroscience methods I
- Assignments
 - Scan: <https://faculty.washington.edu/chudler/hist.html>
 - Read: W&B 1:3-21; 2:29, 48-51; 3:75-79.
 - Watch: Beautiful 3-D Brain Scans Show Every Synapse
 - Optional:
 - * Grillner, Kozlov, Kotaleski (2005)
- Materials
 - History
 - Levels of analysis

- Methods
-

January 16-20

Tuesday, January 17

- Topics
 - Neuroscience methods II
- Assignments
 - Read: W&B 1:3-21; 2:29, 48-51; 3:75-79.
 - Watch: Magnetic Resonance Imaging Explained
 - Optional: https://en.wikibooks.org/wiki/Cognitive_Psychology_and_Cognitive_Neuroscience/Behavioural_and_Neuroscience_Methods
- Materials
 - Methods

Thursday, January 19

- Topics
 - Neuroanatomy I
 - Assignments
 - Read W&B 2:32-47
 - Materials
 - Methods
 - Neuroanatomy
-

January 23-27

Tuesday, January 24

- Topics

- Neuroanatomy II
- Assignments
 - Read W&B 2:32-47
- Materials
 - Neuroanatomy

Thursday, January 26

- Topics
 - Neuroanatomy III
 - **Quiz 1**, available on Canvas *after* class.
 - Assignments
 - Materials
 - Neuroanatomy
-

January 30 - February 3

Tuesday, January 31

- Topics
 - Cells of the nervous system
 - How nerve cells compute (Neurophysiology I)
- Assignments
 - Read W&B: 2:23-32
 - Read W&B: 3:55-59
- Materials
 - Slides

Thursday, February 2

- Topics
 - Neurophysiology II
- Assignments

- Read W&B: 3:55-70
 - Watch: Video about membrane potentials <https://www.youtube.com/embed/PtKAeihnbv0>
 - Materials
 - Slides
-

February 6-10

Tuesday, February 7

- Topics
 - Neurophysiology III
 - Exam 1 Review
- Assignments
 - Read W&B 3:70-75
- Materials
 - Slides
 - Exam 1 Study Guide

Thursday, February 9

- Topics
 - **Exam 1**
 - In-person, 40 questions.
-

February 13-17

Tuesday, February 14

- Topics
 - Neurochemistry I
- Assignments

- Read W&B 4:83-92, 96-100
- Materials
 - Slides

Thursday, February 16

- Topics
 - Neurochemistry II
 - Assignments
 - Read W&B 4:83-92, 96-100
 - Watch <http://pittmedneuro.com/movies/transmission1.mp4>
 - Materials
 - Slides
-

February 20-24

Tuesday, February 21

- Topics
 - Hormones and the brain
 - **Blog post 1 (of 3) due.** | Assignment details |
 - **Quiz 2**, available on Canvas *after* class.
- Assignments
 - Read W&B 8:217-234
- Materials
 - Slides

Thursday, February 23

- Topics
 - Evolution of the human brain.
 - Review for Exam 2
- Assignments

- Read

- * Foster, C. (2017, January 19). If you were an elephant The Guardian. <http://www.theguardian.com/environment/2017/jan/19/if-you-were-an-elephant->
- * Neubauer, S., & Hublin, J.-J. (2012). The Evolution of Human Brain Development. *Evolutionary Biology*, 39(4), 568–586. <https://doi.org/10.1007/s11692-011-9156-1>

- Materials

- Slides
 - Exam 2 Study Guide
-

February 27 - March 3

Tuesday, February 28

- Topics
 - **Exam 2.**
 - In person, 40 questions.

Thursday, March 2

- Topics
 - Development of the human brain
 - Materials
 - Slides
-

March 6-10

NO CLASS

March 13-17

Tuesday, March 14

- Topic
 - Psychopathology I: Depression & Bipolar disorder
- Assignments
 - Read W&B 12:361-371
- Materials
 - Slides

Thursday, March 16

- Topics
 - Psychopathology II: Schizophrenia
 - Assignments
 - Read W&B 12:347-360.
 - Materials
 - Slides
-

March 20-24

Tuesday, March 21

- Topics
 - Emotion
 - Happiness & reward
 - **Quiz 3**, available on Canvas *after* class.
- Assignments
 - **Blog post #2 (of 3) due.** | Assignment details
- Materials
 - [Slides](<https://psu-psychology.github.io/psych-260-2023-spring-notes/emotion.html>)

Thursday, March 23

- Topics
 - Fear & stress
 - Assignments
 - Materials
 - Slides
-

March 27-31**Tuesday, March 28**

- Topics
 - Sensory systems
 - Somatosensation I
 - Review for Exam 3
- Assignments
 - Read W&B 5:119-150
 - Read W&B 11:337-347
- Materials
 - Slides
 - Exam Study Guide

Thursday, March 30

- Topics
 - **Exam 3**
 - In person, 40 questions.
-

April 3-7

Tuesday, April 4

- Topics
 - Somatosensation II
 - Action I
- Materials
 - Slides

Thursday, April 6

- Topics
 - Action II
 - Materials
 - Slides
-

April 10-14

Tuesday, April 11

- Topics
 - Vision I
- Assignments
 - Read W&B 7:183-201
- Materials
 - Slides
- **Papers or blog post #3 (of 3) due.** | Blog assignment details | Paper assignment details |

Thursday, April 13

- Topics
 - Vision II
 - Assignments
 - Read W&B 7:201-215.
 - Materials
 - Slides
-

April 17-21**Tuesday, April 18**

- Topics
 - Learning & memory
- Assignments
 - Read W&B 13:379-391.
- Materials
 - Slides

Thursday, April 20

- Topics
 - Learning & memory II
 - Assignments
 - Read W&B 13:392-401.
 - Materials
 - Slides
 - **Quiz 4**, available on Canvas.
-

April 24-28

Tuesday, April 25

- Topics
 - Speed of nervous system conduction lab
 - Slides

Thursday, April 27

- Topics
 - Review for Exam 4.
 - Frontiers & careers in neuroscience
 - The Cerebral Symphony
 - Materials
 - Exam 4 Study Guide
-

May 1-5

Tuesday, May 2

- **Exam 4, 10:10a-12:00p, Health & Human Development 254**

Evaluation

Elements

Component	Description	Points
Exams	There will be three (3) in-class examinations, plus a final held during the exam period that is partially cumulative. Each exam is worth 40 points. The top 3 of 4 exam scores will count toward your final grade. You may choose not to take the final.	120
Quizzes	There will be four (4) in-class quizzes. Each quiz is worth 10 points. The top 3 of 4 quiz scores will count toward your final grade.	30
Participation	There are a total of 15 points available by completing EITHER a paper or a set of 3 blog posts assignment. <i>Blog:</i> You are encouraged to create and maintain a neuroscience-related blog on PSU's blog server, http://sites.psu.edu . You may create up to 3 posts and earn 5 points/post, for a total of 15 possible points. Assignment <i>Paper:</i> You may write a 3-5 pp (double-spaced) news-style paper on a topic related to biological psychology. The paper is worth 15 points. Assignment	15
	TOTAL POINTS POSSIBLE	165
Extra Credit	There may be extra credit opportunities provided at random and unannounced times during the semester. Come to class in order to benefit from them.	

Grading Scheme

Points	Percent	Grade
165+	100+	A+
155-164	94-99	A
148-154	90-93	A-
143-147	87-89	B+
139-142	84-86	B
132-138	80-83	B-
127-131	77-79	C+
115-126	70-76	C
99-114	60-69	D
0-98	<59	F

Blog assignment

Format, due date

- Create a blog at <http://sites.psu.edu> or add pages to an existing blog; make at least three posts.
- Worth 15 points in total (5 points/post)
- Due dates/times
 - Post 1: **Tuesday, February 21, 2023, 5:00 pm**
 - Post 2: **Tuesday, March 21, 2023, 5:00 pm**
 - Post 3: **Tuesday, April 11, 2023 at 5:00 pm**
- Submit by sending email with link (URL) to the TA via Canvas, cc (carbon copy) the instructor.
- Please indicate in your email whether you wish to have the link to your blog added to the course web site.

Assignment

Create a blog at <http://sites.psu.edu> or add to an existing blog you have created.

Write at least three posts between now and **Tuesday, April 11, 2023 at 5:00 pm** that discuss different issues on any topic related to the biology of behavior. Your posts should be 1-3 paragraphs in length, or approximately 1-1.5 pp double-spaced.

You may choose to comment on articles from the popular or scientific press. You can find appropriate articles in general interest magazines such as Time,

The Economist, in a newspaper such as *The New York Times*, in general science publications such as *Scientific American*, *The American Scientist*, *Science News*, or *Discover*, or scientific journals such as *Science*, *Nature*, *Current Directions in Psychological Science*, etc. You may choose to discuss a topic we covered in class, perhaps how it might relate to you or to someone you know but you should incorporate the scientific literature.

Summarize and discuss the main points of the articles as follows:

1. Describe the main purposes and findings of the research reported on in the articles. Remember the strategy that good reporters use: Who did what to whom, when and how did they do it, and why?
2. Discuss what is known about the neural mechanisms underlying the behavior in question, what are the strengths and weaknesses of the approach to studying the biology of behavior undertaken by the investigators you are writing about, and how the current results expand or alter our knowledge about the topic.
3. Discuss why the new discovery or issue covered in the article is important and interesting, and what questions about the topic remain to be answered. In other words, why should a general audience care about this topic, and what do we still need to know?

If your non-textbook references are unavailable online, submit printed paper copies. NOTE: Remember to include proper APA in-text citations and also include full references for your sources at the end of each post.

THE TA OR I WILL BE HAPPY TO DISCUSS POSSIBLE ARTICLES AND TOPICS WITH YOU.

Be mindful of personal privacy. You should not reveal sensitive or personal information about yourself or another person in any way that could cause harm or embarrassment.

How to submit

Send an email to Dr. Gilmore and the TA. Include the URL (web link) to your blog in the message.

Sources

You may use your textbook or other reference materials as resources. When mentioning a finding that appears in your textbook or another source, please cite the source using the APA Publication Manual format — e.g. (Gilmore & Cohen, 2003). If you use sources other than your textbook, provide a full bibliographic reference at the end of your paper. Wherever possible, link to articles or figures in your post so that others can follow what you've found.

Paper assignment

Format, due date

- **3-5 pages double-spaced**, worth 15 points
- Due **Tuesday, April 11, 2023 at 5:00 pm**.

Assignment

You are the psychology and neuroscience correspondent for an international news service. Your job is to scan the popular and scientific press for recent findings in psychology and neuroscience and to describe them to a general audience in a succinct and thoughtful way.

Choose two articles from the popular or scientific press on the same issue or recent finding of relevance to the biology of behavior. You may find appropriate articles in general interest magazines such as *Time*, *The Economist*, in a newspaper such as *The New York Times*, in general science publications such as *Scientific American*, *The American Scientist*, *Science News*, or *Discover*, or scientific journals such as *Science*, *Nature*, *Current Directions in Psychological Science*, etc. Summarize and discuss the main points of the articles as follows:

1. In an introductory paragraph or two, describe the main purposes and findings of the research reported on in the articles. Remember the strategy that good reporters use: Who did what to whom, when and how did they do it, and why?
2. In another paragraph or two, discuss what is known about the neural mechanisms underlying the behavior in question, what are the strengths and weaknesses of the approach to studying the biology of behavior undertaken by the investigators you are writing about, and how the current results expand or alter our knowledge about the topic.
3. In a concluding paragraph, discuss why the new discovery or issue covered in the article is important and interesting, and what questions about the topic remain to be answered. In other words, why should a general audience care about this topic, and what do we still need to know?
4. If your non-textbook references are unavailable online, submit printed paper copies.
5. Your paper should be about three to five pages in length, using double-spacing, margins no smaller than 1" and a 12 point typeface. This is approximately 500-1,000 words.
6. THE TA OR I WILL BE HAPPY TO DISCUSS POSSIBLE ARTICLES AND TOPICS WITH YOU.

How to submit

Send an email to Dr. Gilmore and the TA via Canvas. Attach your paper with the message.

Sources

You may use your textbook or other reference materials as additional resources. When mentioning a finding that appears in your textbook or another source, please cite the source using the APA Publication Manual format — e.g. (Gilmore & Cohen, 2003). If you use sources other than your textbook, provide a full bibliographic reference at the end of your paper.

Tips for success

- Always use page numbers.
- Make sure that your essay has introductory and concluding paragraphs.
- Save your paper with a file name in this format: PSYCH260.001_paper_Gilmore_R.docx, substituting your last name and first initial for mine.

Deadlines

Date	What's due/happening
Thu Jan 26	Quiz 1
Thu Feb 9	Exam 1
Tue Feb 21	Quiz 2; Blog post 1 due
Tue Feb 28	Exam 2
Tue Mar 21	Quiz 3
Tue Mar 21	Blog post 2 due
Thu March 30	Exam 3
Tue Apr 11	Short paper or Blog post 3 due
Thu Apr 20	Quiz 4
TBD	Exam 4

Policies

Academic Integrity

Students with questions about academic integrity should visit <http://www.la.psu.edu/current-students/undergraduate-students/education/academic-integrity>.

Penn State defines academic integrity as the pursuit of scholarly activity in an open, honest and responsible manner. All students should act with personal integrity, respect others dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts (Faculty Senate Policy 49-20). Sanctions for academic misconduct can include a grade of F for the course as well as other penalties.

Students are responsible for maintaining academic integrity. Violations include cheating on exams, talking to others during exams, looking at another student's test materials or answers during an exam, removing exams from the classroom without consent from the instructor, plagiarizing (do not copy from someone else!), and dishonesty in any aspect of course participation.

When you complete assignments, remember the **ABCs** to avoid plagiarism: **A**lways place copied information within quotation marks, include information about the quoted or paraphrased source in a **B**ibliography, and **C**ite the source in the body (in the text) of your paper immediately after the quoted or paraphrased information. When in doubt, cite in the text and include the source in a bibliography.

Late, missed or make-up assignments

Exams

Make-up exams may be permitted under unusual circumstances such as (a) an interview for graduate school or a job, (b) illness, (c) religious observance, (d)

the death of a family member, or (e) any other event recognized by the university as a valid excuse for absence from class.

If you must miss class on the day an exam is scheduled, you must do the following:

1. Contact the TA or the instructor by telephone, email, or in person in advance of the exam. Twenty-four hours notice is expected. If you do not contact the TA or instructor in advance, it is possible that you may not be able to schedule a make-up exam.
2. Arrange with the TA or instructor to take a make-up exam as soon as possible, but no later than one (1) week following the date of the scheduled exam. It is your responsibility, not the TA's or the instructor's to schedule an approved make-up exam in a timely way.

Quizzes

No make-up quizzes will be given except under unusual circumstances. You may ask for a copy of the quiz for studying purposes, however.

Accommodation for persons with disabilities

Penn State welcomes students with disabilities into the University's educational programs. Please refer to the information provided by Student Disability Resources (SDR) at <http://equity.psu.edu/student-disability-resources/> for information about the procedures required to obtain reasonable accommodations in this course. Students should discuss SDR-approved accommodations with their instructor as early in the semester as possible, even if they have taken another course with the instructor. Please note: students are not required to provide their instructor with information about the nature of their condition.

Penn State students are also welcome to contact other units for assistance with personal concerns that interfere with academic progress, including: Counseling and Psychological Services (CAPS; <http://studentaffairs.psu.edu/counseling/>), the Office of Student Affairs (<http://studentaffairs.psu.edu/>), Career Services (<http://studentaffairs.psu.edu/career/>), the Center for Women Students (<http://studentaffairs.psu.edu/womenscenter/>), the LGBTQA Student Resource Center (<http://studentaffairs.psu.edu/lgbtqa/>), the Office of Sexual Misconduct Prevention and Response (<http://titleix.psu.edu/>), Penn State Educational Equity (<http://equity.psu.edu/>), the Multicultural Resource Center (<http://equity.psu.edu/mrc/>), and University Health Services (<http://studentaffairs.psu.edu/health/>).

Nondiscrimination Statement

The Pennsylvania State University is committed to equal access to programs, facilities, admission and employment for all persons. It is the policy of the University to maintain an environment free of harassment and free of discrimination against any person because of age, race, color, ancestry, national origin, religion, creed, service in the uniformed services (as defined in state and federal law), veteran status, sex, sexual orientation, marital or family status, pregnancy, pregnancy-related conditions, physical or mental disability, gender, perceived gender, gender identity, genetic information or political ideas. Discriminatory conduct and harassment, as well as sexual misconduct and relationship violence, violates the dignity of individuals, impedes the realization of the University's educational mission, and will not be tolerated.

Direct all inquiries regarding the nondiscrimination policy to:

Dr. Kenneth Lehrman III Vice Provost for Affirmative Action
Affirmative Action Office The Pennsylvania State University 328 Boucke Building University Park,
PA 16802-5901 Email: kfl2@psu.edu Tel (814) 863-0471

Diversity Statement

This classroom is a place where you will be treated with respect. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

Penn State is committed to creating an educational environment which is free from intolerance directed toward individuals or groups and strives to create and maintain an environment that fosters respect for others as stated in Policy AD29 Statement on Intolerance.

Mandated Reporting Statement

Penn State's policies require me, as a faculty member, to share information about incidents of sex-based discrimination and harassment (discrimination, harassment, sexual harassment, sexual misconduct, dating violence, domestic violence, stalking, and retaliation) with Penn State's Title IX coordinator or deputy coordinators, regardless of whether the incidents are stated to me in person or shared by students as part of their coursework. For more information regarding the University's policies and procedures for responding to reports of sexual or gender-based harassment or misconduct, please visit <http://titleix.psu.edu>.

Additionally, I am required to make a report on any reasonable suspicion of child abuse in accordance with the Pennsylvania Child Protective Services Law.

COVID safety information (last updated 2021-08-12)

Please consult the Penn State Covid-19 Dashboard for updates on masking policies, instructional-mode changes, etc. <https://virusinfo.psu.edu/covid-19-dashboard/>.

This class will meet in-person unless there is a change in University policy.

Penn State University requires everyone to wear a face mask in all university buildings, including classrooms, regardless of vaccination status. **ALL STUDENTS MUST** wear a mask appropriately (i.e., covering both your mouth and nose) while you are indoors on campus. This is to protect your health and safety as well as the health and safety of your classmates, instructor, and the university community. Anyone attending class without a mask will be asked to put one on or leave. Instructors may end class if anyone present refuses to appropriately wear a mask for the duration of class. Students who refuse to wear masks appropriately may face disciplinary action for Code of Conduct violations. If you feel you cannot wear a mask during class, please speak with your adviser immediately about your options for altering your schedule.

Zoom

At some point in the semester, I may decide to use Zoom to allow students who are unable to attend class in person to participate.

While you are on Zoom, keep in mind that this is a classroom environment and others should be treated with respect. Please keep your microphone muted unless you want to ask a question or interact with someone. If your microphone is not muted, the entire class will be able to hear what is going on in your environment. As an instructor, I personally like to see people's faces. As a participant, I am more involved when I have my camera on. I realize, however, that there are many reasons why you might not want to turn on your camera such as poor internet connection, joining via phone, or other privacy concerns. It is your choice as to whether you would like to have the camera on or not.

Principles & Values

Penn State Principles

The Pennsylvania State University is a community dedicated to personal and academic excellence. The Penn State Principles were developed to embody the values that we hope our students, faculty, staff, administration, and alumni possess. At the same time, the University is strongly committed to freedom of expression. Consequently, these Principles do not constitute University policy and are not intended to interfere in any way with an individual's academic or personal freedoms. We hope, however, that individuals will voluntarily endorse these common principles, thereby contributing to the traditions and scholarly heritage left by those who preceded them, and will thus leave Penn State a better place for those who follow.

I will respect the dignity of all individuals within the Penn State community. The University is committed to creating and maintaining an educational environment that respects the right of all individuals to participate fully in the community. Actions motivated by hate, prejudice, or intolerance violate this principle. I will not engage in any behaviors that compromise or demean the dignity of individuals or groups, including intimidation, stalking, harassment, discrimination, taunting, ridiculing, insulting, or acts of violence. I will demonstrate respect for others by striving to learn from differences between people, ideas, and opinions and by avoiding behaviors that inhibit the ability of other community members to feel safe or welcome as they pursue their academic goals.

I will practice academic integrity. Academic integrity is a basic guiding principle for all academic activity at Penn State University, allowing the pursuit of scholarly activity in an open, honest, and responsible manner. In accordance with the University Code of Conduct, I will practice integrity in regard to all academic assignments. I will not engage in or tolerate acts of falsification, misrepresentation or deception because such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

I will demonstrate social and personal responsibility. The University

is a community that promotes learning; any behaviors that are inconsistent with that goal are unacceptable. Irresponsible behaviors, including alcohol or drug abuse and the use of violence against people or property, undermine the educational climate by threatening the physical and mental health of members of the community. I will exercise personal responsibility for my actions and I will make sure that my actions do not interfere with the academic and social environment of the University. I will maintain a high standard of behavior by adhering to the Code of Conduct and respecting the rights of others.

I will be responsible for my own academic progress and agree to comply with all University policies. The University allows students to identify and achieve their academic goals by providing the information needed to plan the chosen program of study and the necessary educational opportunities, but students assume final responsibility for course scheduling, program planning, and the successful completion of graduation requirements. I will be responsible for seeking the academic and career information needed to meet my educational goals by becoming knowledgeable about the relevant policies, procedures, and rules of the University and academic program, by consulting and meeting with my adviser, and by successfully completing all of the requirements for graduation.

Penn State Values

Integrity: We act with integrity and honesty in accordance with the highest academic, professional, and ethical standards.

Respect: We respect and honor the dignity of each person, embrace civil discourse, and foster a diverse and inclusive community.

Responsibility: We act responsibly, and we are accountable for our decisions, actions, and their consequences.

Discovery: We seek and create new knowledge and understanding, and foster creativity and innovation, for the benefit of our communities, society, and the environment.

Excellence: We strive for excellence in all our endeavors as individuals, an institution, and a leader in higher education.

Community: We work together for the betterment of our University, the communities we serve, and the world.