

SYLLABUS: Psychology 452 (Hybrid)

Advanced Neurophysiological Psychology



This is an advanced course, and prior exposure to neuroscience is required. Prerequisites in Psychology include any of the following: PSY 451 (Introduction to Neurophysiological Psychology), PSY 347 (Perception), PSY 450 (Psychopharmacology)

WINTER TERM 2024 (1/8 – 3/22); Online ZOOM class Mondays, 12:45 – 1:45pm; IN PERSON class (Lincoln Hall 247) Wednesday 12:45 – 1:45pm; Weekly TA-led ZOOM review sessions Fridays 12:45 – 1:45pm. NOTE: ZOOM sessions are recorded; in person classes are audio recorded.

Instructor: Bill Griesar, Ph.D. (he/him), griesar@pdx.edu

Guest Instructor: Noah Milman, OHSU, milman@ohsu.edu

Guest Instructor: Mason Andrus, OHSU, andrusm@ohsu.edu

Undergraduate Teaching Assistant: Kadi Rae Smith, kadirae@pdx.edu

Undergraduate Teaching Assistant: Annabella Showerman, annabell@pdx.edu

Graduate Teaching Assistant: Maureen Lowell, malowell@pdx.edu

Instructor Student Hours: ZOOM, by appointment

Book: *The Story of the Brain in 10 ½ Cells*, by Richard Wingate (REQUIRED)

Course Objectives: The primary objectives of this course are:

- (1) To teach you to gather, evaluate and present scientific information; and
- (2) **For PSU undergraduates:** to offer you a better understanding of the nervous system through reading, discussion and presentation of current topics in neuroscience research, interdisciplinary art projects, a visit to the Oregon National Primate Research Center (ONPRC), and direct exposure to graduate students pursuing original research
- (3) **For OHSU graduate students:** to provide you with the opportunity to organize and present current topics in neuroscience research, and gain experience teaching and assessing undergraduate students

The course begins with a DEEP REVIEW of key topics in physiological psychology, including neurons, glia, synapses, neural networks, gross anatomy, neocortex, some specific cognitive networks, and various staining, imaging and other techniques.

We then focus on a book by celebrated neuroscientist and BrainFacts.org Editor Dr. Richard Wingate (*"The Story of the Brain in 10 ½ Cells"*), and explore (and draw!) the neurons and glia that make us who we are. Undergraduate students will research and prepare presentations on individual chapters for online delivery.

We will then concentrate on a current research topic, which this term is: TBD.

Our visiting neuroscience graduate students will choose review articles, and research and prepare introductory presentations for delivery as class lectures. Our graduate students will lead seminars to discuss ongoing research on the topic, and will develop assessments (quizzes, short assignments, art projects) and (with supervision) help score these assessments.

PSU undergraduate students will read the review article/ chapters chosen by each graduate student. *Further instructions will come from our graduate participants later in the term. PLEASE CHECK our online Canvas course site for updates.*

This winter we have the unique opportunity to virtually visit the Oregon National Primate Research Center, and meet with research scientists!

Student Learning Outcomes: The primary outcomes of this course are:

- (1) **DISCIPLINARY AND PROFESSIONAL EXPERTISE:** To reliably and effectively acquire knowledge of current neuroscience research, including relevant neural and genetic mechanisms, distributed networks, and techniques.
- (2) **COMMUNICATION:** To interact with graduate students, fellow undergraduates, teaching assistants and your instructor in a respectful, empathetic and constructive manner, and to communicate effectively through classroom activities and assignments.
- (3) **CREATIVE AND CRITICAL THINKING:** To explore publicly funded research in area neuroscience labs, and effectively organize material and gain experience presenting and discussing complex brain and behavior related topics through oral presentations, online videos and art.
- (4) **ENGAGEMENT:** To discover community resources for further pursuit of neuroscience in a variety of educational and research contexts, by working with federally funded graduate students from area labs and visiting the OHSU Oregon National Primate Research Center.

Grades: Grades are based on a percentage system: 90% or higher = A, 80 – 89% = B, 70 - 79 = C, and 60 - 69 = D. An A or B is an ABOVE AVERAGE grade, a C is AVERAGE, and a D is BELOW AVERAGE. You earn points by completing assignments and assessments. Available course points (which total 105) are accumulated in the following ways:

1. ***Basic brain review exam (20):*** From research articles and lectures.
2. ***Story of the Brain questions and participation (10):*** You should post (on Canvas) *at least one* question about the book chapters, along with researched answers, to the relevant discussion forum no later than *24 hours before class*. You will receive points for these question(s) and for class participation each day.
3. ***Story of the Brain presentations (20):*** Students will create a 3 - 5 minute video presentation on a brain cell from the book, and a related current research article. Your video presentation should cover the structure of this cell, its functional significance, and the specific technique (or techniques) used to explore its significance in your article. Submit a link to your video presentation.
4. ***Story of the Brain art project (15):*** Create an original image of your cell using media of your choice (e.g., drawing, painting, sculpture, pipe cleaners, paper or writing). Submitted art must be entirely created by you (10 points).

5. *Graduate topic one assignment (7.5): PLEASE CHECK our online course site for more instruction on required assignments as the term progresses.*
6. *Grad Topic one "exam" (7.5): From material covered in lectures and discussion.*
7. *Graduate topic two assignment (7.5): PLEASE CHECK our online course site for more instruction on required assignments as the term progresses.*
8. *Grad Topic two "exam" (7.5): From material covered in lectures and discussion.*
9. *Teacher evaluations (5): For completing and submitting ALL graduate student teacher evaluations during finals week.*
10. *Graduate panel attendance (5): For attending grad panel during finals week.*

| <u>ASSIGNMENT</u> | <u>POINTS</u> | <u>DUE DATE(S)</u> |
|---|---------------|------------------------------------|
| Basic brain review exam <i>Exam available online for one week</i> | 20 | Jan 19 – Jan 28 |
| Wingate questions / participation <i>Posts are due 24 hours before each group presentation</i> | 10 | Jan 24 – Feb 14 |
| Wingate chapter presentation <i>Date depends on which brain cell you've chosen</i> | 20 | Jan 24 – Feb 14 |
| Brain cell art project | 15 | March 3 |
| Graduate assignment one | 7.5 | See Canvas for details* |
| Graduate assessment one | 7.5 | See Canvas for details* |
| Graduate assignment two | 7.5 | See Canvas for details* |
| Graduate assessment two | 7.5 | See Canvas for details* |
| Graduate teacher evaluations | 5 | |
| Graduate panel attendance | 5 | March 18 |
| TOTAL COURSE POINTS | 105 | * Grad students will assign |

*** DEADLINES ARE IMPORTANT: Late work earns half credit. It's difficult in a large class to track late assignments, so after one week late assignments will be zeroed out. No late assignments are accepted after Week Ten of term.**

CLASSES:

PSU students only

*Basic brain review***WEEK ONE (1/8 – 1/12): REVIEW of Neurons, Glia & Synapses**

Introductions, course information, syllabus and course expectations; neuron and glial structure & function, electrical properties of neurons, resting potential and action potentials, role of myelin; chemical transmission, neurotransmitters, network architecture

**** ZOOM CLASSES MONDAY & FRIDAY;******IN PERSON WEDNESDAY**

- READ *“Cellular Foundations of Neuropharmacology,”* by Floyd Bloom et al
- READ *“More Than Mortar: Glia as Architects of Nervous System Development and Disease,”* by Inês Lago-Baldaia et al
- READ through additional material posted on Canvas course website

WEEK TWO (1/15 – 1/19): REVIEW of Gross CNS/Techniques**** NO CLASS ON MONDAY, JANUARY 15th**

- **** Happy Martin Luther King Junior Day!**

**** IN PERSON CLASS WEDNESDAY; ZOOM CLASS FRIDAY**

Anatomical directional terms, planes of sections, meninges, lobes, sulci, gyri, fissures, diencephalon, brainstem, cerebellum; basic structure and function (lobes, sulci, gyri), sensory vs. association, Brodmann areas, motor / somatosensory gyri, language areas; distributed networks underlie complex cognition

- READ *“The columnar organization of the neocortex,”* by V. B. Mountcastle
- READ *“Evolution of the neocortex Biology,”* by Pasko Rakic
- READ *“The neocortical column,”* by Javier DeFelipe et al
- READ *“A Brief History of Human Brain Mapping,”* by Marcus Raichle
- READ *“The brain’s default network,”* by R.L. Buckner, et al
- READ additional articles on course Canvas website

ONLINE Basic brain review EXAM (1/19 – 1/28)**PSU students only*****The Story of the Brain in 10 ½ Cells***

Choose a cell (and thus a book chapter) to focus on for your project. Find one additional published, peer-reviewed research article about the cell you've chosen, and develop a 3 - 5 minute YouTube or Vimeo presentation on the cell, its structure, its functional significance, and the specific technique (or techniques) used by the authors to explore its significance. (*Use original slides, handouts*)

WEEK THREE (1/22 – 1/26): The Story of the Brain**** ZOOM CLASS MONDAY, ZOOM CLASS FRIDAY;******IN PERSON CLASS WEDNESDAY****Basic Brain Review (1/22):** ZOOM follow up questions on topics and review**GROUP ONE - Cell 1 (1/24):** Introduction to the Richard Wingate book; IN PERSON presentations / discussion**GROUP TWO - Cells 2, 3 (1/26):** ZOOM student presentations / discussion**WEEK FOUR (1/29 – 2/2): The Story of the Brain****** NO CLASS MONDAY, ZOOM CLASS FRIDAY;******NO CLASS WEDNESDAY****GROUP THREE - Cells 4, 5 (2/2):** ZOOM presentations / discussion**WEEK FIVE (2/5 – 2/9): The Story of the Brain****** ZOOM CLASS MONDAY, ZOOM REVIEW FRIDAY;******IN PERSON CLASS WEDNESDAY****GROUP FOUR - Cells 6, 7 (2/5):** ZOOM student presentations / discussion**GROUP FIVE - Cells 8, 9 (2/7):** IN PERSON presentations / discussion

WEEK SIX (2/12 – 2/16): The Story of the Brain & PRIMATE CENTER TOUR

**** ZOOM CLASS MONDAY, ZOOM REVIEW FRIDAY;**

****IN PERSON PRIMATE CENTER TOUR WEDNESDAY**

GROUP SIX - Cells 10, 10.5 (2/12): IN PERSON presentations / discussion

PRIMATE CENTER TOUR/RESEARCH DISCUSSION

(WEDNESDAY 2/14; 12:30 – 3:00pm)

PSU and OHSU students

Research Topic One:

Plasticity on multiple scales in sleep and development

Noah Milman, OHSU graduate student participant

MORE Details TBA in class

Please check the Canvas course website for further instructions

WEEK SEVEN (2/19 – 2/23): RESEARCH TOPIC

**** ZOOM CLASS MONDAY, ZOOM CLASS FRIDAY;**

****IN PERSON CLASS WEDNESDAY**

Topic One (2/19): ZOOM; Details TBD

Topic One (2/21): IN PERSON; Details TBD

Topic One (2/23): ZOOM; Details TBD

WEEK EIGHT (2/26 – 3/1): RESEARCH TOPIC

**** ZOOM CLASS MONDAY, ZOOM CLASS FRIDAY;**

****IN PERSON CLASS WEDNESDAY**

Topic One (2/26): ZOOM; Details TBD

Topic One (2/28): IN PERSON; Details TBD

Topic One (3/1): ZOOM; Details TBD

RESEARCH TOPIC ASSESSMENT ONLINE

******* WINGATE CELL ART PROJECT DUE ONLINE (3/3)**

Research Topic Two:

Stress, substance use disorder, learning and memory

Mason Andrus, OHSU graduate student participant

MORE Details TBA in class

Please check the Canvas course website for further instructions

WEEK NINE (3/4 – 3/8): RESEARCH TOPIC

**** ZOOM CLASS MONDAY, ZOOM CLASS FRIDAY;**

****IN PERSON CLASS WEDNESDAY**

Topic One (3/4): ZOOM; Details TBD

Topic One (3/6): IN PERSON; Details TBD

Topic One (3/8): ZOOM; Details TBD

WEEK TEN (3/11 – 3/15): RESEARCH TOPIC

**** ZOOM CLASS MONDAY, ZOOM CLASS FRIDAY;**

****IN PERSON CLASS WEDNESDAY**

Topic Two (3/11): ZOOM; Details TBD

Topic Two (3/13): IN PERSON; Details TBD

Topic One (3/15): ZOOM; Details TBD

RESEARCH TOPIC ASSESSMENT ONLINE

GRADUATE STUDENT INFORMATION PANEL (3/18): Final exam

week. Undergraduates, please bring (and post) questions about graduate school, research opportunities, application procedures, grants, etc!

***** ZOOM MONDAY, MARCH 18, 2024, 12:30 – 2:20pm *****

For OHSU students: To participate, you must have successfully completed your qualifying exam, and have explicit approval of your dissertation advisor in Behavioral Neuroscience. If selected, you enroll in BEST 650 (Teaching Practicum).

A NOTE ABOUT STUDY GUIDES AND EXAM PREPARATION: Please be aware that while study guides are *often* prepared and/or updated by course TAs, these are *never* meant to be comprehensive or used as your sole material for study.

***** Please review your own notes, any course slides, online links, and in particular the readings required for the course before taking any assessment this term.***

Access and Inclusion for Students with Disabilities

Welcome to the course! PSU values diversity and inclusion; we are committed to fostering mutual respect and full participation for all students. My goal is to create a learning environment that is equitable, useable, inclusive, and welcoming. If any aspects of instruction or course design result in barriers to your inclusion or learning, please notify me. The Disability Resource Center (DRC) provides reasonable accommodations for students who encounter barriers in the learning environment.

If you have, or think you may have, a disability that may affect your work in this class and feel you need accommodations, contact the Disability Resource Center to schedule an appointment and initiate a conversation about reasonable accommodations.

The DRC is located in 116 Smith Memorial Student Union, 503-725 4150, drc@pdx.edu, <https://www.pdx.edu/drc>.

- If you already have accommodations, please contact me to make sure that I have received a faculty notification letter that covers your accommodations.
- Students who need accommodations for tests and quizzes are expected to schedule their tests to overlap with the time the class is taking the test.
- For information about emergency preparedness, please go to the [Fire and Life Safety webpage](https://www.pdx.edu/environmental-health-safety/fire-and-life-safety) (<https://www.pdx.edu/environmental-health-safety/fire-and-life-safety>) for information.

ABOUT CHALLENGES: Look over the course requirements in our syllabus, and on Canvas. **If you are unclear about what's expected, please let your instructor know.**

Life **DEFINITELY** has ups and downs, and everyone struggles sometimes with pandemics, fires, family, work, and other personal concerns and commitments. But not everyone has access to the same resources, or experiences the world in the same way.

If there is a serious, unexpected, documented and significant emergency, please get in touch! Be aware that instructors are obligated to treat all students fairly, and that means you should ask questions, think ahead and plan for when assignments are due.

Everyone is subject to the same course expectations.

However, if you encounter a serious ongoing situation that makes it difficult to meet academic requirements, **[there are resources available on campus to help](#)**. In some cases, it may be best to withdraw from a course and re-take it at a less stressful and difficult

time. If this resonates, please contact the [Center for Student Health and Counseling](#) (SHAC) and the [PSU Student Life CARE Team](#).

TITLE IX REPORTING OBLIGATIONS

Portland State is committed to providing an environment free of all forms of prohibited discrimination and sexual harassment (sexual assault, domestic and dating violence, gender or sex-based harassment and stalking). If you have experienced any form of sexual harassment, know that help and support are available. PSU has staff members trained to support survivors in navigating campus life, providing academic support and more. Information about PSU's support services on campus, including [confidential services](#) and [reporting options](#), can be found on PSU's [Sexual Misconduct Response website](#) or you may call a Confidential Advocate at 503.894.7982 or by scheduling [online](#). You may also report any incident of discrimination or discriminatory harassment, including sexual harassment, to the **Title IX Coordinator**, [Office of Equity and Compliance](#), or the [Office of the Dean of Student Life](#).

Please be aware that all PSU faculty members and instructors **are required to report** information of an incident that may constitute prohibited discrimination, including sexual harassment and sexual and relationship violence. This means that if you tell me about a situation of sexual harassment or discrimination, I have to share the information with the University's Title IX Coordinator or the Office of the Dean of Student Life. However, the information will be kept private and only those with a need to know will be provided with what you disclose.

Please complete the required student module [Understanding Sexual Misconduct and Resources](#) in Canvas, which provides information about PSU policy and resources. You may also report sexual and relationship violence to law enforcement on campus with [Campus Public Safety Office \(CPSO\)](#).

Or you may file an [anonymous report with Campus Public Safety Office](#) or a [Bias Incident report](#) with the [Bias Review Team \(BRT\)](#). PSU does not typically investigate the reports that are made through these two avenues. These reports help PSU understand what students and employees are experiencing on and around campus and provide support where needed.

The Center for Student Health & Counseling (SHAC)

Think SHAC First!

[The Center for Student Health & Counseling \(SHAC\)](#) provides high quality, accessible, [medical](#), [counseling](#), [dental](#), and [health promotion services](#) to all PSU

students taking 5+ credit hours, regardless of the type of insurance coverage. Office visits at SHAC are FREE!

Students taking 1+ credit hours can access [SHAC Dental Services](#). SHAC has an incredible staff of health care professionals who are dedicated to keeping you healthy so you can stay in the classroom and focus on learning. For a full list of services and more information visit pdx.edu/health-counseling.

Medical Excuse Notes: [The Center for Student Health and Counseling \(SHAC\)](#) does not provide medical excuse notes for absences from classes, labs, studios or exams, or for missed deadlines due to short-term illness, injury, or other clinical appointments. Visit the [SHAC Medical Excuse Policy](#) at pdx.edu/health-counseling/our-policies for more information.

Mental Health Emergencies: If you are having a mental health emergency and need to speak with someone immediately, come in to SHAC at ANY time during SHAC [hours of operation](#). After hours and weekends call the Multnomah County Crisis Line 503.988.4888 or use the 24/7 [mySSP mental health support resource](#) 866.743.7732.