

SYLLABUS: Psychology 452

Advanced Neurophysiological Psychology

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

WINTER TERM 2022 (1/3 – 3/18); Online ZOOM classes M/W 12:45 – 1:45pm; Weekly TA-led review sessions on Fridays 12:45 – 1:45pm. NOTE: These ZOOM sessions will be recorded and posted for asynchronous delivery.

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

Teaching Assistant: Quinn Westlynd (he/him), celena2@pdx.edu

Instructor Student Hours: ZOOM, by appointment; Mondays 2 – 3:00pm

Book: *Phantoms in the Brain*, by V.S. Ramachandran (REQUIRED) (but cheap!)

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 neurologist V.S. Ramachandran (*“Phantoms in the Brain”*), and examine case studies of patients experiencing a host of neurological disorders, from phantom limb pain to anosognosia, temporal lobe epilepsy and hemispatial neglect. 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 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 collaborative 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 point system: 90 points or higher = A, 80 – 89 points = 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. Available course points (which will total 105) are accumulated in the following ways:

1. ***Basic brain review exam*** (20): From research articles and lectures.
2. ***Ramachandran questions and participation*** (10): You should post (on d2l) *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. ***Ramachandran presentations*** (20): Students will form five groups, and each group will collaborate to orally present a series of book chapters (10 points per student). Each student will prepare an online youtube video presentation and post the link on our course d2l website (10 points)
4. ***Ramachandran art project*** (15): Please pick one neurological disorder, and describe the symptoms, and what we currently understand about its underlying neurophysiological cause, or causes (5 Points). ALSO: Imagine that you have this disorder. Please submit (as a *.jpg or *.pdf) your own creative interpretation of that link between felt experience and the brain areas/networks known or suspected to be impacted by this disorder using media of your choice (e.g., drawing, painting, clay sculpture, pipe cleaners, paper or writing (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.

| ASSIGNMENT | POINTS | DUE DATE(S) |
|-------------------------------|---------------|--------------------|
| Basic brain review exam | 20 | Jan 17 – Jan 23 |
| Rama. questions/participation | 10 | Jan 19 – Feb 7 |
| Rama. chapter presentation | 20 | Jan 19 – Feb 7 |
| Ramachandran art project | 15 | Feb 23 |

| | | |
|------------------------------|------------|------------------------------------|
| Graduate assignment one | 7.5 | See d21 for details* |
| Graduate assessment one | 7.5 | See d21 for details* |
| Graduate assignment two | 7.5 | March 13 |
| Graduate assessment two | 7.5 | March 14 |
| Graduate teacher evaluations | 5 | |
| Graduate panel attendance | 5 | March 14 |
| TOTAL COURSE POINTS | 105 | * Grad students will assign |

CLASSES:

PSU students only

Basic brain review

WEEK ONE (1/3 – 1/7): 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

- *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 (1/10 – 1/14): REVIEW of Gross CNS/Techniques

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 (1/17 – 1/23)

PSU students only

Phantoms in the Brain

Students divided into six groups: Each group presents one set of chapters.

*(Use original slides, handouts, and draw on *current* peer-reviewed research articles)*

WEEK THREE (1/17 – 1/21): Phantoms in the Brain

**** NO ZOOM CLASS ON MONDAY, JANUARY 17th**

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



Chapters 1, 2 (1/19): Discussion

WEEK FOUR (1/24 – 1/28): Phantoms in the Brain

Chapters 3, 4 (1/24): ZOOM student presentations and discussion

Chapters 5, 6 (1/26): ZOOM student presentations and discussion

WEEK FIVE (1/31 – 4/4): Phantoms in the Brain

Chapters 7, 8 (1/31): ZOOM student presentations and discussion

Chapter 9, 10 (2/2): ZOOM student presentations and discussion

WEEK SIX (1/17 – 1/21): Phantoms in the Brain & PRIMATE CENTER TOUR

PRIMATE CENTER TOUR/RESEARCH DISCUSSION (2/7; 12:45 – 1:45pm)

Chapters 11, 12 (2/9): ZOOM student presentations and discussion

PSU and OHSU students

The neuroscience of pain

OHSU SENIOR RESEARCH ASSOCIATE YANGMIAO ZHANG (she/her)

MORE Details TBA in class

Please check the D2L course website for further instructions

WEEK SEVEN (2/14 – 2/18): PAIN

Topic One (2/14): Details TBD

Topic One (2/16): Details TBD

WEEK EIGHT (2/21 – 2/25): PAIN

Topic One (2/21): Details TBD

Topic One (2/23): Details TBD

TOPIC ONE ASSESSMENT ONLINE

******* RAMACHANDRAN PROJECT DUE ONLINE (2/23)**

PSU and OHSU students

The neuroscience of substance use disorders

OHSU GRADUATE STUDENT SOPHIA WEBER (she/her)

MORE Details TBA in class

Please check the D2L course website for further instructions

WEEK NINE (2/28 – 3/4): Substance Use Disorders

Topic Two (2/28): Details TBD

Topic Two (3/2): Details TBD

WEEK TEN (3/7 – 3/11): Substance Use Disorders

Topic Two (3/7): Details TBD

Topic Two (3/9): Details TBD

TOPIC TWO ASSESSMENT ONLINE

2. **GRADUATE STUDENT INFORMATION PANEL (3/14):** Final exam week. Undergraduates, please bring (and post) questions about graduate school, research opportunities, application procedures, grants, etc!

***** MONDAY, MARCH 14, 2020, 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 will need to enroll in BEHN 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.**

ABOUT CHALLENGES: Look over the course requirements in our syllabus, and on d2l. **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](#).**

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 and discuss 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.

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](#).

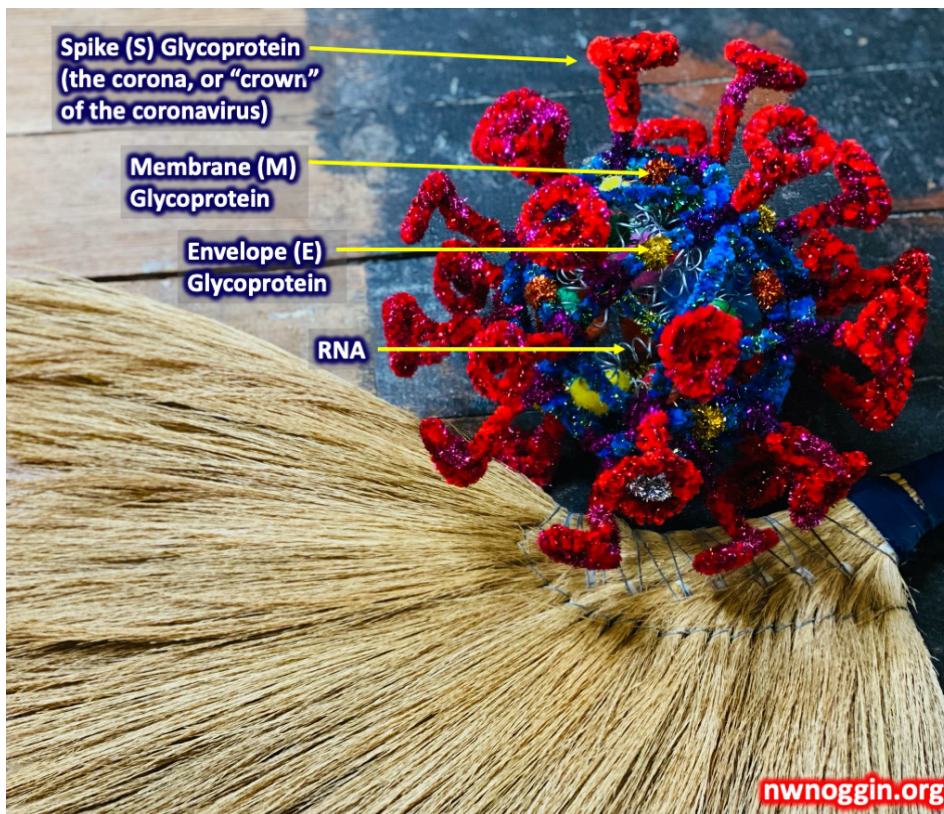
Please be aware that all PSU faculty members and instructors **are required to report** information of an incident that may constitute prohibited discrimination, including sexual harassment and sexual and relationship violence. This means that if you tell me about a situation of sexual harassment or 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.

***COVID-19:** Portland State has been working to address the health, safety, and well-being of the entire PSU community during the COVID-19 pandemic. Every effort is being made to provide an accurate and efficient flow of communication to students, staff, and faculty. As questions and concerns arise, many campus resources are available. If you are ever unsure how to find a resource you need or want, explore the College of Liberal Arts and Sciences' website at pdx.edu/clas/covid-19-resources-for-students. Help is near. Reach out.*



Protect your community: Get vaccinated

Vaccines developed with public investment in scientific research now safely defend millions from the SARS-CoV2 coronavirus & COVID-19.

Recordings in Zoom classes

We will use technology for virtual meetings and recordings in this course.

Our use of such technology is governed by FERPA, the [Acceptable Use Policy](#) and PSU's [Student Code of Conduct](#). A record of all meetings and recordings is kept and stored by PSU, in accordance with the Acceptable Use Policy and FERPA. Your instructor will not share recordings of your class activities outside of course participants, which include your fellow students, TAs/GAs/Mentors, and any guest faculty or community based learning partners that we may engage with.

You may not share recordings outside of this course.

Doing so may result in disciplinary action.