SYLLABUS: Advanced Neurophysiological Psychology

Psychology 410, Winter 2016; Room TBA

Course meets M/W/F, January 4 – March 16, 10:15 – 11:20am

Instructor: Bill Griesar, Ph.D. griesar@pdx.edu

Teaching Assistant:

Teaching Assistant:

Teaching Assistant:

Graduate Teaching Assistant:

Office hours: On review days and by arrangement (and *any time* by e-mail!)

Books:

1. *Phantoms in the Brain,* by V.S. Ramachandran (REQUIRED)
2. *Portraits of the Mind,* by Carl Schoonover (NOT required)

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 discussion and presentation of current topics in neuroscience research, a visit to the Oregon National Primate Research Center, and exposure to graduate students involved in 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 review of key topics in physiological psychology, including neurons, synapses, neural networks, gross anatomy, the neocortex, some specific cognitive networks, and various 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 delivery in class.

We will then concentrate on two research topics: **Topic One**, and **Topic Two**. Behavioral neuroscience graduate students will choose one review article for each topic, and research and prepare introductory presentations on these topics for delivery as class lectures. Grad students will lead seminars to discuss current research on the topic, and will also develop assessments for undergraduates (quizzes, short assignments), and grade these assessments.

PSU undergraduate students will read the review article/chapter chosen by the graduate students, and write summaries of additional articles they post, and be prepared to discuss article aims, methods, findings and conclusions in class. *Further instructions will come from the graduate students later in the course.*

Grades: Grades are based on a point system: 90 points or higher = A, 80 – 89 points = B, 70 - 79 = C, and 60 - 69 = D. Available course points (which will total 110) are accumulated in the following ways:

1. ***Basic brain review exam*** *(15):* From material covered in 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 be discussed *24 hours before class.* You will receive points for these question(s) and for class participation each day. LATE POSTS RECEIVE NO CREDIT.
3. ***Ramachandran presentations*** *(20):* Students will form six groups, and each group will orally present a series of chapters from the book (15 points per student).
4. ***Ramachandran exam*** *(15):* From material covered in the Ramachandran book.
5. ***Graduate topic assignment One*** *(10):* PLEASE CHECK THE COURSE d2l WEBSITE FOR MORE INSTRUCTION ON REQUIRED ASSIGNMENTS AS THE TERM PROGRESSES…
6. ***Graduate topic assignment Two*** *(10):* PLEASE CHECK THE COURSE d2l WEBSITE FOR MORE INSTRUCTION ON REQUIRED ASSIGNMENTS AS THE TERM PROGRESSES…
7. ***Grad Topic One exam*** *(10):* From material covered in lectures and discussion.
8. ***Grad Topic Two exam*** *(10):* From material covered in lectures and discussion.

ASSIGNMENT	POINTS	DUE DATE(S)
Basic brain review exam	15	January 22
Rama. questions/participation	10	Jan 25 – Feb 10
Rama. chapter presentation	20	Jan 25 – Feb 10
Ramachandran exam	15	Feb 12
Topic One Assignment (Topic)	10	See d2l for details*
Topic One exam	10	See d2l for details*
Topic Two Assignment (Topic)	10	See d2l for details*
Topic Two exam	10	See d2l for details*
	+ 10 points extra credit (for being you ☺)	
TOTAL COURSE POINTS	**110**	*** Grad students will assign**

CLASSES:

PSU students only

Basic brain review

1. **Introduction** (1/4): introductions, course information, syllabus, how to use on-line databases, library resources at PSU and elsewhere
    - *READ "Cellular Foundations of Neuropharmacology," by Floyd Bloom et al*
2. **The Neuron, and the Synapse** (1/6): neuron (and glial) structure/function, electrical properties of neurons, resting potential and action potentials, role of myelin; chemical transmission, neurotransmitters, network architecture
3. **Gross Anatomy** (1/8): anatomical terminology, basic structures, cortex versus subcortical nuclei, central role of the thalamus, brainstem, limbic system
    - *READ "A Brief History of Human Brain Mapping," by Marcus Raichle*
3. **Techniques** (1/11): anatomical, electrophysiological, imaging, genetic…
    - *READ "The columnar organization of the neocortex," by V. B. Mountcastle*
4. **The Cortex** (1/13): basic structure and function (lobes, sulci, gyri), sensory vs. association, Brodmann areas, motor/somatosensory gyri, language areas, etc.
    - *READ "The brain's default network," by R.L. Buckner, et al*
5. **Network example** (1/15): Distributed networks underlie complex cognition

- ** **NO CLASS ON MONDAY, JANUARY 18th**

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

6. **Review and brain examination; brain exam prep** (1/20)
7. **Basic brain review EXAM** (1/22)

PSU students only

Phantoms in the Brain

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

(Use overheads, handouts, and draw on related research articles from PubMed…)

8. **Chapters 1, 2** (1/25): student presentations and discussion
9. **Chapters 3, 4** (1/27): student presentations and discussion
10. **Chapters 5, 6** (1/29): student presentations and discussion
11. **Chapters 7, 8** (2/1): student presentations and discussion
12. **Chapter 9, 10** (2/3): student presentations and discussion
13. **Chapters 11, 12** (2/5): student presentations and discussion
14. ** **PRIMATE CENTER TOUR!** (2/8): 10:00am – 12:30pm @ ONPRC
15. **Additional overflow presentations** (2/10)
16. **Ramachandran EXAM** (2/12)

OHSU and PSU students

MOTIVATION AND DECISION MAKING

ERICA HANSON, OHSU GRADUATE STUDENT; hansone@ohsu.edu

NOTE: The following class dates and assignments may change, depending on what our graduate teaching participant prepares. Please check the D2L course website for explicit instructions on assignments, etc.

17. **Topic One** (2/15): ***Graduate student presentation:***
18. **Topic One** (2/17): ***Graduate student presentation:***
19. **Topic One** (2/19): latest research articles and discussion
    - *NOTE: OHSU graduate student(s) will lead discussion…*

20. **Topic One** (2/22): latest research articles and discussion
21. **Topic One** (2/24): latest research articles and discussion
22. **TOPIC ONE EXAM** (2/26): prepared/assessed by grad student

OHSU and PSU students

ALCOHOL AND THE BRAIN

DAICIA ALLEN, OHSU GRAD STUDENT; allendai@ohsu.edu

NOTE: The following class dates and assignments may change, depending on what our graduate teaching participant prepares. Please check the D2L course website for explicit instructions on assignments, etc.

23. **Topic Two** (2/29): ***Graduate student presentation:***
24. **Topic Two** (3/2): ***Graduate student presentation:***
25. **Topic Two** (3/4): latest research articles and discussion
26. **Topic Two** (3/7): latest research articles and discussion
27. **Topic Two** (3/9): latest research articles and discussion
28. **TOPIC TWO EXAM** (3/11): prepared/assessed by grad student

29. **GRADUATE STUDENT INFORMATION PANEL** (3/16): Final exam week. Undergraduates, please bring (and post) questions about graduate school, research opportunities, application procedures, grants, etc...!

    *** ***WEDNESDAY, MARCH 16, 2015, 10:15 – 12:05pm*** ***

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)…