Psychology 347 (13335): PERCEPTION

SUMMER TERM 2022 ONLINE:

July 18 – August 14, 2022

ZOOM CLASSES meet on Canvas, Mondays/Tuesdays/Wednesdays 9:15 – 11:35am; will be recorded and posted on Canvas

OFFICE HOURS ONLINE:
By appointment, ZOOM (**Bill & Jeff**)
By appointment, ZOOM (**TBD**)

Bill Griesar, Ph.D., **Instructor**; griesar@pdx.edu
Jeff Leake, M.F.A., **Instructor**; jleake@pdx.edu

TBD, **Undergraduate Teaching Assistant**;

Please use these email addresses, *NOT Canvas*

NO TEXTBOOK IS REQUIRED FOR PERCEPTION.

******PLEASE NOTE THAT ALL REQUIRED RESOURCES ARE AVAILABLE ONLINE.***

ADDITIONAL BOOK *(highly recommended):* Hallucinations, by Oliver Sacks

ART SUPPLIES (required): Sketchbook (standard 11" x 14" drawing, 80 pound weight paper, with at least 24 sheets), colored pencils (basic set, 12 assorted colors), Assorted graphite sticks, Pink pearl eraser, pipe cleaners (though these can be replaced with any found objects). *See Canvas course website for more details on what you'll need.*

GOAL OF THE COURSE: Perception involves the routing, identification, and interpretation of energy and information in our environment, both external and internal. Typically, it begins with detection of stimuli by sensory neurons, and the relay of this information to specific neural networks in the brain.

In this class we will investigate the mechanisms that underlie sensory detection of specific categories of stimuli (e.g., in visual, auditory, olfactory, gustatory, somatosensory (including touch, proprioception, nociception), and vestibular realms) and the CNS networks involved in perceptual discrimination, interpretation, and complex cognitive responses. We'll also look at how these critical, adaptive networks develop, and how they are influenced by drugs and, ultimately, decay…

We'll also explore how artists have approached, understood and integrated aspects of sensory detection and perception into often extraordinary works that compel, move, inspire, and affect our understanding of ourselves and our world. We'll visit online museums to view art with an eye towards the neural mechanisms involved in perception, and we'll create objects designed to help reflect on and understand the concepts we'll discuss.

GRADES: Grades are based on a point scale: 90 points and above = A; 80 – 89 points = B; 70 – 79 points = C; 60 – 69 points = D; 59 points or below = F. ***An A or B is ABOVE AVERAGE, a C is AVERAGE, and a D is BELOW AVERAGE.*** You can earn points (a maximum of **104**) in the following ways…

********* DEADLINES ARE IMPORTANT: Late work receives half credit.**

QUIZZES (40 points)
Quiz One: Psychophysics, neurons, and synapses (10 points)
Quiz Two: Gustation and olfaction (10 points)
Quiz Three: Somatosensation and vision (10 points)
Quiz Four: Auditory and vestibular systems (10 points)

ART PROJECTS (40 points)
Art Project 1: Neuron model building (10 points)
Art Project 2: Neuron metaphor drawing (10 points)
Art Project 3: Tactile Drawings (10 points)
Art Project 4: Sensory neuron model (10 points)

DISCUSSION FORUMS (24 points)

Students are required to post their own responses to questions in our four weekly discussion forums, which cover topics we'll be learning about in Zoom class meetings, online video lectures and other resources and links on d2l.

Each post must be at least 100 words (~300 max). POSTS ARE DUE ON THURSDAYS (by 11:50pm). NOTE: ONE forum post can be missed without penalty ☺

ACADEMIC HONESTY: Any evidence of cheating or plagiarism will lead to serious academic consequences, including possible failure of the course and/or dismissal from school. Plagiarism is also a violation of the PSU Code of Student Conduct. For more information see: http://www.pdx.edu/dos/psu-student-code-conduct

STUDENTS WITH DISABILITIES: Welcome to the course! If you are a student with a documented disability and registered with the Disability Resource Center (DRC), please contact the instructor to facilitate arranging academic accommodations. If you have a disability and have not yet registered with the DRC, please contact the DRC.

INCOMPLETES: Incompletes are rarely given, and are based on criteria described in the university catalog. Incompletes are not appropriate when less than ¾'s of the course work has been scored. No incomplete will be assigned without a written formal agreement and timeline related to course completion.

COVID-19: *Portland State has been working diligently 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.*

CHALLENGES: ***Look over the course requirements in our syllabus, and on d2l. If you are unclear about what's expected for an assignment, or assessment, please let me know.*** Life DEFINITELY has ups and downs, and everyone struggles sometimes with 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! But be aware that I am obligated to treat all students fairly, and that means each of you should ask questions, think ahead and plan for when assignments are due. *Everyone is subject to the same course expectations.*

THE CLASSES

WEEK ONE (7/18 – 7/22):

Introduction, Sensory Detection & Synapses

** DISCUSSION POST DUE BY THURSDAY

* ART PROJECT 1: Neuron model (pipe cleaners - or any found objects)

** ART PROJECT 1 DUE BY SUNDAY

*** ***QUIZ ONE:*** History, psychophysics, neurons and synapses

- AVAILABLE 7/21 – 7/24

MONDAY

Introductions, syllabus; history of perception; philosophical considerations; synesthesia, psychophysics, measuring threshold, signal detection theory

TUESDAY

Neurons carry information-rich electrical messages and communicate with each other by releasing chemical messengers (neurotransmitters). Brain cells, membranes, protein machines, forces, resting potential**,** action potential, synapses

WEDNESDAY

How do neurons carry information in the form of electric current, and communicate chemically across synapses to form neural networks for sensation and perception?

WEEK TWO (7/25 – 7/29):

Neuroesthetics, Gestalt & Chemical Senses

** DISCUSSION POST DUE BY THURSDAY

* ART PROJECT 2: Neuron metaphor (drawing supplies)

** ART PROJECT 2 DUE BY SUNDAY

*** ***QUIZ TWO:*** Gustation and olfaction

- AVAILABLE 7/28 – 7/31

MONDAY

NEUROESTHETICS (the biology of beauty and art)

TUESDAY

More on NEUROESTHETICS and GESTALT

WEDNESDAY

CHEMICAL SENSES: gustation and olfaction; taste/smell versus flavor; differences with other senses (ipsilateral projection, limbic/paralimbic targets); taste receptor cells, taste buds and papillae; basic tastes; labeled line vs. pattern coding; a few receptor mechanisms gustatory pathways); Olfaction (smell); flavor is so much more than taste; olfactory neurons, glomeruli, bulb, and CNS projection targets; vomeronasal organ and the Flehmen response

WEEK THREE (8/1 – 8/5):

Somatosensation & Vision

** DISCUSSION POST DUE BY THURSDAY

* ART PROJECT 3: Tactile Drawings

** ART PROJECT 3 DUE BY SUNDAY

*** ***QUIZ THREE:*** Somatosensation and vision

- AVAILABLE 8/4 – 8/7

MONDAY

SOMATOSENSATION: Mechanical senses (touch, proprioception) vs. protective senses (temperature, pain, itch, deep sensual touch); mechanoreceptor physiology & mechanisms (e.g., Meissner's, Pacinians, Ruffini's, Merkel's receptors, muscle spindle receptors, Golgi tendon organs); Dorsal column/trigeminal nerve for CNS delivery of mechanoreception; Anterolateral system for detection, delivery and mapping of emotionally salient stimuli; receptors/ receptor mechanisms (nociceptors, thermoreceptors, itch-sensitive neurons, deep touch receptors), pathways (spinothalamic, spinoreticular, spinomesencephalic); Hypothalamic detection/response, cortical networks for somatosensory integration (S1/S2 (parietal lobe), insula, anterior cingulate)

TUESDAY

VISION: Nature of the stimulus (narrow range of electromagnetic energy), eye anatomy (cornea, pupil, iris, lens, retina); presbyopia, myopia; retinal network physiology (e.g., photoreceptors, bipolar cells, ganglion cells, horizontal and amacrine cells); rods vs. cones (S, M, L), Ishihara testing

WEDNESDAY

VISION: Intrinsically photosensitive ganglion cells, circadian cycles; sensitivity vs. acuity, center/surround receptive fields, parvocellular vs. magnocellular pathways; central visual targets (LGN to V1, superior colliculi, hypothalamus, pre-tectal region); visual hemifields, nerves vs. tracts; Optimal stimuli, receptive fields; columnar organization of neocortex; functional organization of V1 (orientation specificity); P pathways & object recognition in ventral temporal lobe, visual agnosia, prosopagnosia; M pathways & spatial mapping in parietal lobe

WEEK FOUR (8/8 – 8/12):

Audition, Vestibular Function, Hallucinations & Museum Tour

** DISCUSSION POST DUE BY THURSDAY

* ART PROJECT 4: Afferent (sensory) neuron

** ART PROJECT 4 DUE BY SUNDAY

***** QUIZ FOUR:*** Auditory and vestibular systems

- AVAILABLE 8/11 – 8/14

MONDAY

AUDITION: Physical features of stimulus (frequency, amplitude, complexity) vs. perceptual experiences of sound (pitch, loudness, timbre); ear anatomy (outer, middle, inner; pinna, tympanic membrane, ossicles, oval window, cochlea); structure and function (e.g., pinna size vs. frequency/amplitude detection); acoustic reflex; Physiology of cochlea; inner/outer hair cells; stimulus transduction mechanism; frequency coding (tonotopy); physical coding of frequency, amplitude and complexity in the cochlea; central pathways for audition; sound localization

VESTIBULAR FUNCTION: Physiology of vestibular organs (semicircular canals, otolith organs); vestibulo-ocular reflex; detection for three vestibular "modalities" (angular motion/acceleration and semicircular canals, gravity/tilt and linear acceleration and otolith organs); anatomy of vestibular organs (canals, vestibules, ampullae, cristae, hair cells; utricle/saccule and macula, otolithic membrane, otoconia); CNS pathways for vestibular perception; Hallucinations, drug effects, and other sources of perceptual distortion; Charles Bonnet Syndrome; Musical Ear Syndrome, sensory deprivation

TUESDAY

*** VIRTUAL MUSEUM TOUR**

WEDNESDAY

NO ZOOM CLASS: ***But an outreach opportunity!*** If you are able, please bring your expertise and enthusiasm for neuroesthetics and the neuroscience of perception into our community. Real brains and art! Details posted on Canvas.

A REMINDER: We are obligated to treat all students fairly, and that means each of you should ask questions, think ahead and plan for when assignments are due. *Everyone is subject to the same course expectations*. Note that sometimes, for a myriad of reasons, life intervenes to create ongoing difficulties with class attendance, and meeting academic requirements. *In these cases, it's often best to withdraw from the course, and perhaps re-enroll at a less challenging time.*

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.

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.