Psychology 347 (13335): PERCEPTION

FALL TERM 2019:

September 30 – December 13, 2019

Class meets in Cramer Hall, Room 401, MWF, 10:15 – 11:20am

OFFICE HOURS:
Mondays, 11:30am – 12:30pm (**Bill**); Cramer 309
Wednesdays, 11:30am – 12:30pm (**Jeff**); Cramer 367

Bill Griesar, Ph.D., **Instructor**; griesar@pdx.edu
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Please use these email addresses, *NOT d2l*

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TEXTBOOK (recommended): Sensation & Perception, 2nd Edition, Wolfe et al.
No text is required. We list an old edition, because the material is similar, and it costs a lot less. Newer editions are also acceptable; read chapters that correspond to the topics.
****PLEASE READ THROUGH ALL UPDATED MATERIAL ON OUR d2l website…***

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, one pound block of air dry clay (e.g., from Das), Assorted pipe cleaners. *See d2l course website for more details on what you'll need.*

NOTE: *You will need $2.50 to participate in the Portland Art Museum tour, and $2.50 for a tablet that will temporarily mess with your taste buds!* ***(DUE FRIDAY, October 4!)***

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 the Portland Art Museum 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 105, which includes 5 points of extra credit) in the following ways…

****** DEADLINES ARE IMPORTANT: LATE WORK RECEIVES HALF CREDIT. ******

QUIZZES (60 points)
Your top THREE quiz scores count towards your final grade
Quiz One: Psychophysics, neurons, and synapses (20 points)
Quiz Two: Gustation, olfaction, and somatosensation (20 points)
Quiz Three: Visual system (20 points)
Quiz Four: Auditory and vestibular systems (20 points)

ART PROJECTS (35 points)

Your top TWO art project scores (from Projects 3 – 5) count towards your final grade.

****SUBMIT ALL PROJECTS TO JEFF IN CLASS; LATE SUBMISSIONS EARN HALF CREDIT**

Art Project 1: Neuron model building (5 points) *REQUIRED*
Art Project 2: Neuron metaphor drawing (7.5 points) *REQUIRED*
Art Project 3: Blind touch sculpture (5 points)
Art Project 4: Mirror drawing (5 points)
Art Project 5: Blurred drawing (5 points)
Art Project 6: Sensory neuron model (7.5 points) *REQUIRED*

FINAL ART PROJECT (10 points)

Final Art Project: Final poster with gestalt collage (10 points)

The final poster consists of two parts. Part One: prepare four collages or drawings that are examples of gestalt grouping principles followed by a written explanation of how those principles are working. Part Two: prepare a formal analysis of a well known work of art, identifying the principles you chose for your collages or drawings within the image and clearly stating where and how those are operating within that work of art. The gestalt collages, famous artwork, and written descriptions for both will be fixed to an 18"x24" (minimum size) poster and presented in class during the time slot for our final exam.

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

NOTE: 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.

EXCUSES: Life has ups and downs, and everyone struggles sometimes with family, work, and other personal concerns and commitments. However, unless there is a serious, unexpected, sudden, documented and significant emergency, ***please do not petition for special treatment regarding deadlines for projects, quizzes, or exams.*** We are required to treat all students fairly, and that means each of you must think ahead and plan for when assignments are due. ***Everyone is subject to the same course expectations…***

THE CLASSES

WEEK ONE (9/30 – 10/4)

**** MONEY: Art Museum Tour ($2.50) & taste tablet ($2.50) due Friday, 10/4!**
INTRODUCTIONS: syllabus, basic concepts, history of perception, philosophical considerations, psychophysics, measuring the threshold, signal detection theory, neuroesthetics. *What is real? How do we know what's out there (or in here :)?*
READ (optional): Text, Chapter 1 (Introduction)

WEEK TWO (10/7 – 10/11)

SENSORY DETECTION: Neurons carry information-rich electrical messages, and communicate with each other by releasing chemical messengers (neurotransmitters). *What sort of sensory detection machinery do you have? How is detected information transferred to neural networks for further processing and response?*
READ (optional): Text, Chapter 1 (Introduction)

WEEK THREE (10/14 – 10/18)

*** **QUIZ ONE FRIDAY:*** History, psychophysics, neurons and synapses
NEUROESTHETICS
* ART PROJECT 1 Monday: Neuron model (bring pipe cleaners)
* ART PROJECT 2 Wednesday: Neuron metaphor (bring drawing supplies)

WEEK FOUR (10/21 – 10/25)

** **ART PROJECT 1 DUE WEDNESDAY (LATE = half credit)***
CHEMICAL SENSES (Gustation and Olfaction); taste and smell versus flavor; differences with other senses (ipsilateral projection and limbic/paralimbic targets); taste receptor cells, taste buds and papillae; basic tastes; labeled line vs. pattern coding; a few receptor mechanisms; gustatory pathways; flavor is so much more than taste; olfactory neurons, glomeruli, bulb, and CNS projection targets; vomeronasal organ and the Flehmen response
READ (optional): Text, Chapters 13 (Olfaction), 14 (Taste)

WEEK FIVE (10/28 – 11/1)

** **ART PROJECT 2 DUE WEDNESDAY (LATE = half credit)***

*** Miracle berry demonstration (bring extra food!) MONDAY**

* ART PROJECT 3 Friday: Blind touch sculpture (bring clay); Gestalt lecture 1

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

READ (optional): Text, Chapter 12 (Touch)

WEEK SIX (11/4 – 11/8)

***** QUIZ TWO FRIDAY:*** Gustation, olfaction, somatosensation

**** ART PROJECT 3 DUE WEDNESDAY (LATE = half credit)***

* ART PROJECT 4 Friday: Mirror drawing (bring mirror drawing sheet/d2l)

INTRODUCTION TO THE VISUAL SYSTEM; Nature of the stimulus (narrow range of electromagnetic energy), anatomy of the eye (cornea, pupil, iris, lens, retina); presbyopia, myopia; retinal network physiology (photoreceptors, bipolar cells, ganglion cells, horizontal and amacrine cells); rods vs. cones (S, M, L), Isihara testing, intrinsically photosensitive ganglion cells and 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

READ (optional): Text, Chapter 2 (The First Steps in Vision: Seeing Stars); Chapters 3 (Spatial Vision); 4 (Perceiving and Recognizing Objects)

WEEK SEVEN (11/11 – 11/15)

* NO CLASS Monday: Happy Veteran's Day!

**** ART PROJECT 4 DUE WEDNESDAY (LATE = half credit)***

* ART PROJECT 5 Friday: Blurred drawing (drawing pad, graphite stick, eraser)

* Gestalt lecture 1 on Friday

More on the visual system; Optimal stimuli and receptive fields; columnar organization of the neocortex; functional organization of V1 (orientation specificity); P pathways and object recognition in ventral temporal lobe, visual agnosia, propopagnosia; M pathways and spatial mapping in parietal columns; neural network contributions to the figure/ground illusion

WEEK EIGHT (11/18 – 11/22)

***** QUIZ THREE FRIDAY:*** Visual system

*** MUSEUM TOUR WEDNESDAY (please meet at the Portland Art Museum)**

* Gestalt lecture 2 on Monday

THE AUDITORY SYSTEM; 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; mechanism of stimulus transduction; frequency coding (tonotopy)
READ (optional): Text, Chapter 9 (Hearing: Physiology and Psychoacoustics)

WEEK NINE (11/25 – 11/29)

* NO CLASS FRIDAY: Happy Thanksgiving!

**** ART PROJECT 5 DUE WEDNESDAY (LATE = half credit)***

More on the auditory system; and VESTIBULAR SYSTEM; Physical coding of frequency, amplitude and complexity in the cochlea; central pathways for audition; sound localization; physiology of vestibular organs (semicircular canals, otolith organs); vestibulo-ocular reflex; detection mechanisms for three vestibular "modalities" (angular motion/acceleration and semicircular canals, gravity/tilt and linear acceleration and the otolith organs); anatomy of vestibular organs (canals, vestibules, ampullae, cristae, hair cells; utricle/saccule and macula, otolithic membrane, otoconia); CNS pathways for vestibular perception
READ (optional): Text, Chapter 10 (Hearing in the environment)

WEEK TEN (12/2 – 12/6)

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

HALLUCINATIONS: Drug effects, and other sources of perceptual distortion
Charles Bonnet Syndrome; Musical Ear Syndrome, sensory deprivation experiments…
READ (highly recommended): Oliver Sack's "Hallucinations"

FINAL PROJECT ON WEDNESDAY, DECEMBER 11th, 10:15am – 12:05pm

(Please note: The final project will not be moved for any reason)

**** ART PROJECT 6 DUE **SAME WEDNESDAY (12/11)*****

A REMINDER: Life has ups and downs, and everyone struggles sometimes with family, work, and other personal concerns and commitments. **However, unless there is a serious, unexpected, sudden, documented, significant emergency,** ***please do not petition for special treatment regarding deadlines for projects, quizzes, or exams.***

Once again, we are required to treat all students fairly, and consistently, and that means each one of you must 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 stressful time…*

Title IX: Title IX is a federal law that requires the university to appropriately respond to any concerns of sex/gender discrimination, sexual harassment or sexual violence.

To assure students receive support, faculty members are required to report any instances of sexual harassment, sexual violence and/or other forms of prohibited discrimination to PSU's Title IX Coordinator, Julie Caron.

If you would rather share information about these experiences with an employee who does not have these reporting responsibilities and can keep the information confidential, please contact one of the following campus resources (or visit this link):

Women's Resource Center (503-725-5672) or schedule on line at https://psuwrc.youcanbook.me

Center for Student Health and Counseling (SHAC): 1880 SW 6th Ave, (503) 725-2800

Student Legal Services: 1825 SW Broadway, (SMSU) M343, (503) 725-4556

PSU's Title IX Coordinator and Deputy Title IX Coordinators can meet with you to discuss how to address concerns that you may have regarding a Title IX matter or any other form of discrimination or discriminatory harassment. Please note that they cannot keep the information you provide to them confidential but will keep it private and only share it with limited people that have a need to know. You may contact the Title IX Coordinators as follows:

PSU's Title IX Coordinator: Julie Caron by calling 503-725-4410, via email at titleixcoordinator@pdx.edu or in person at Richard and Maureen Neuberger Center

Deputy Title IX Coordinator: Yesenia Gutierrez by calling 503-725-4413, via email at yesenia.gutierrez.gdi@pdx.edu or in person at RMNC, 1600 SW 4th Ave, Suite 830

Deputy Title IX Coordinator: Dana Walton-Macaulay by calling 503-725-5651, via email at dana26@pdx.edu or in person at Smith Memorial Union, Suite, 1825 SW Broadway, Suite 433

For more information about the applicable regulations please complete the required student module Creating a Safe Campus in your D2L.