VISUAL NEUROSCIENCE

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PSYC 2240/NRSC 2217/VLST 2170

Spring 2024
Lecture: MWF 10.15-11.15a, Goddard Labs GLAB 101
Prerequisites: PSCY 1, BIBB 109, VLST 101, or COGS 001

Synopsis:
An introduction to the scientific study of vision, with an emphasis on the biological substrate and its relation to behavior. Topics will typically include physiological optics, transduction of light, visual thresholds, color vision, anatomy and physiology of the visual pathways, and the cognitive neuroscience of vision.

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Course Website (CANVAS):
The course has a dedicated CANVAS site. Lecture slides, homework assignments, and reading assignments/material will be posted there. Also, check the site frequently for posted announcements and Q & As on the discussion board. In general, this is the place to go first if you have any question or are in need of any information regarding the course.

No text book required (reading assignments will all be posted on CANVAS).

Requirements:

Midterm Exam 1	February 16
Midterm Exam 2	March 27
Midterm Exam 3	April 26
Final Exam (cumulative)	between May 6-14
Research participation	between Jan 18 - May 1

Policy on exams:
Each of the three midterms will be designed to be completed in 59 minutes. Midterm exams are performed in-person during regular class hours. The final exam is during finals week and is cumulative. All exams are closed book. Students with accommodations will take the exams at the Weingarten Center.

Policy on research participation:
The course covers many results that have been measured in psychophysical vision experiments. Thus students are encouraged to actively participate in such ongoing experiments on campus, and can earn extra credit for research participation via the subject participation pools during the semester. The full credit will be an 3% bonus in the students overall total score (see below). To earn the full credit students will have had a record of 3hrs or more of research participation by May 1st (sign up via https://upenn.sona-systems.com). If students are not able or willing to actively participate in research there will be alternative forms of educationally informative assignments to earn the grade credit. These alternatives are designed to take 3hrs or more to complete.

Computation of the final grade:
Your final grade will be computed as a weighted average of the average-score of the best two (out of the three) midterms (60%), and the score of the final exam (40%). Successful participation in research will bump up that score by 3% points (i.e. a total score of 0.87 will become 0.90).

Per default, there will be no makeup midterm exams as only the two best midterm scores count. In the unlikely case that a student has two or more qualified reasons of absence, only one, respectively none of the midterm scores count toward the final grade, and the grade weighing (above) is changed accordingly. Qualified reasons of absences are a) a medical problem that does not permit taking the exam (note from dean's office or doctor required), b) a family emergency that takes you out of town (note from parents required), or c) an out of town trip connected with a UPenn sponsored activity (e.g. team sports, note from coach/activity sponsor required.)

Tentative Topic List:
Design of the human eye.
Light, image formation, optics.
Clinical issues in visual neuroscience.
Visual adaptation.
Spatial resolution and the contrast sensitivity function.
Overview of retinal anatomy, phototransduction, absolute threshold.
Color vision and trichromacy.
Eye movements, depth perception and binocularity.
Motion perception.
Object recognition and face processing.
Visual cognition, visual attention, and visual memory.
Computational processes underlying visual perception and cognition.
Artificial neural network architectures for visual processing.