

*Psy 310, Sensory & Perceptual Processes, Spring 2017*

*Tuesday, Thursday: 3:00 - 4:15 PM*

*Bldg. LWSN, Rm. B151*

Last update: January 1, 2017.

Instructor: **Dr. Zygmunt Pizlo**, PRCE 194 (email: [zpizlo@purdue.edu](mailto:zpizlo@purdue.edu))

Office hour: Tu 1-2pm.

Teaching Assistant: Ruiting Shao, PRCE 172 (email: [shao72@purdue.edu](mailto:shao72@purdue.edu))

Office hours: Tu,Th 5-6pm.

Perceptual systems provide an observer with an accurate information about the environment. This information allows the observer to understand three-dimensional scenes (shapes of objects, sizes, distances, colors, weights) and effectively interact and communicate with others. Perception refers to making inferences based on sensory data. These inferences are usually veridical (they agree with the things “out there”). When they are not, we call the resulting percept an illusion. This course will review perceptual phenomena, will describe relevant experiments testing the underlying mechanisms, and will discuss the theories (explanations) of these mechanisms.

Grades are based on exam performance. The first two midterms count 25% each, and the final counts 50%. The second midterm is not cumulative, but the final is. For each exam, an average of two best scores is computed and every score is normalized to it. The grades are based on conventional cut-off points: 90% and higher – A, 80-89% - B, and so on. All exams are multiple choice. The exam questions will be based on the material presented in the class.

**Week 1:**

History of perception. Nativism vs. Empiricism. Perception as Inference.

**Week2:**

Psychophysical Methods. Signal Detection.

**Week3:**

Quiz

Reflection and refraction. Prisms and lenses. Fermat Principle.

**Week 4:**

The eye. Acuity. Dark adaptation.

Limits of basic visual function – Hecht, Shlaer & Pirenne's experiment.

**Week 5:**

*Review and Exam 1.*

***Exam 1: Feb 9.*****Week 6:**

Brain and seeing.

Corpus callosum. Split brain. Two visual pathways. Shape vs. space perception.

**Week 7:**

Color vision.

Newton's contributions: dispersion of sunlight; color mixture; color circle model.

Trichromatic theory: T. Young – blue, green, red channels. Yellow, white are complex percepts.

Opponent process theory – E. Hering: red/green, yellow/blue, bright/dark channels. Yellow is a simple percept.

Hurvich & Jameson's (1951) experiment. Measuring the strength of colors.  
Binocular fusion of pure green and pure red leads to the percept of gray, contradicting the trichromatic theory.

**Weeks 8-9:**

Perceptual organization.

Symmetry, groups of transformations, invariants.

Gestalt Psychology, figure-ground organization, simplicity principle.

**Week 10:**

*Review and Exam 2:*

***Exam 2: Mar 23.***

**Week 11:**

Perspective and orthographic projection.

Seeing a 3D world.

Binocular vision, depth perception, size constancy.

**Week 12:**

Action and perception of events.

Structure from motion.

**Week 13:**

Shape constancy.

**Week 14:**

Sound and hearing.

**Week 15:**

*Review.*