PSYC 111 PERCEPTION (Fall 2018)
Location & Time   Levin Auditorium; T,TH 9:00-10:30am
Instructor   Johannes Burge, Assistant Professor, Dept. of Psychology
Office: Goddard 426, 3710 Hamilton Walk
Office hours: Tuesday 10:30am-11:30am and by appointment (see below)
e-mail: jburge@sas.upenn.edu

Teaching Assistants
Name: Jiang Mao
Office: Goddard 4th Floor Open Space
Sections: Thursdays, 2:00-3:00pm   (Location: Goddard Lab 102)
                     Mondays,   4:00-5:00pm   (Location: Williams 27)
Office hours: Friday,   3:00-4:00pm   (Location: Goddard 409)
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Name: Alice Xia
Office: Goddard 4th Floor, Richards 4th Floor Open Space
Sections: Fridays,   2:00-3:00pm   (Location: Goddard Lab 100)
                     Mondays,   5:00-6:00pm   (Location: Williams 27)
Office hours: Mondays,   3:00-4:00pm   (Location: Goddard 420 open space)
e-mail: lingqiz@sas.upenn.edu

Readings
Textbook: "Sensation & Perception", Goldstein 10th edition (9th edition also ok)
Textbook website: "Sensation & Perception" website:
                     http://www.cengage.com/c/sensation-and-perception-10e-goldstein
Miscellaneous: https://canvas.upenn.edu/courses/
Discussion board: http://piazza.com/upenn/

Exams   Midterms: 10/1; 11/5   Each midterm = 25% of grade
                     Final: 12/13; 9:00-11:00am   Final exam   = 40% of grade
                                                     Participation = 10% of grade
Deadlines   Drop deadline: 10/7
                     Withdrawal deadline: 11/4

Office hours
Students are strongly encouraged to come to office hours. Take advantage of the individual attention that is available to you. There is no better way to learn! Please note that office hours that are scheduled by appointment must be confirmed via email the day before the appointment. If a confirmation email is not sent, the appointment will be considered canceled.

Prerequisites
No prerequisites are required, except curiosity about perception. For some course topics, basic familiarity with algebra, geometry, trigonometry, and statistics will be expected. If you did well on the SAT math section, you have sufficient math background for this course. For students who want to brush up, web and print review materials will be provided. Office hours will also be held by the TA(s) specifically devoted to math review during the first two weeks of the course. Students who are out of practice are *strongly* encouraged to take advantage of these resources. It will be hard to get an 'A' in the course unless you comfortable with the basics of the mathematics.

Homework problems
Homework problems will be distributed regularly throughout the term. Homework will be collected each week and, along with section participation, will count towards your participation grade. But homework will not be graded. Homework solutions will be posted approximately 1 week after each homework set is assigned. The homework sets will test your command of the concepts & give you practice with the types of problems that will appear on exams. If you want to do well in the class, do the homework.

Academic Integrity
You are responsible for knowing UPenn's Code of Academic Integrity. Any suspected instances of academic dishonesty will be investigated and penalized appropriately as dictated by university guidelines. If you have questions or concerns, please contact the professors or the TAs. To review
http://www.upenn.edu/academicintegrity/ai_codeofacademicintegrity.html

Sections
Section participation, together with homework problems, will constitute 10% of your grade. Difficult material from the week's lectures will be reviewed, homework will be explained, and questions will be answered.

Grades
The course will be graded on a curve. Last term, ~30% of students received an A, ~50% of students received a B, and ~20% of students received a C. However, it is not set in stone that grades will be distributed as they were last term. If the class is performing very well as a group, the overall distribution of grades will shift higher. If you, as an individual, score 1.5 standard deviations below the mean on any exam, you are expected to meet with the professor to figure out a plan for how to improve your performance. If you score 1.75 standard deviations below the mean on the first midterm, you should strongly consider dropping the class.

Exams and grade disputes
Exams are designed to be hard, to gauge your command of the material, and to test your ability to think. Exams are not designed to trick you. If you think an exam question was incorrectly scored or was ambiguously worded, email the TAs. The TAs and professor will consider the issue and make a decision. The request must be made within 1 week of the return of your exam.

Objectives
This course will provide a thorough introduction to the scientific study of perception. Perception is the objective but fallible representation of behaviorally relevant properties of the environment based on information gathered by the senses. The perceptual systems of perceiving animals have been honed by evolution over millions of years to perform perceptual tasks that improve behavioral outcomes and further reproductive success. The ease with which humans and other animals accurately perceive the world around us belies the extraordinarily powerful computations that make such representations possible. The modern study of sensation and perception draws on a wide variety of disciplines including physics, chemistry, biology, neuroscience, statistics, mathematics, computer science, and psychology. This course will focus on insights about how certain sensed physical quantities are converted into representations of objects (e.g. what that is), object properties (e.g. how big that is), object relations (e.g. how far this is from that), and events (e.g. how fast that moves). Understanding the processes underlying perception is one of the great scientific challenges of our age.

For each sensory-perceptual system (e.g. vision, audition, touch) that we study, we will discuss: i) the properties of the environment that the system represents, ii) the physical stimulus that its sensors transduce (light, sound waves, force), iii) the computations that the various stages of processing carry out, and iv) the remarkable accuracy and precision of the resulting percepts. We will study techniques for modeling the underlying physical, biological, and psychological processes that lead to perception. We will study methods that have been devised for measuring perceptual performance. We will use the rare, often entertaining, and sometimes spectacular failures of perception (i.e. illusions) as tools for understanding particular perceptual phenomena. And we will train you to think about problems in perception science like a perception scientist. The course will focus primarily on vision, reflecting the fact that vision is the best understood perceptual system. We will also spend significant time on how information is combined between the senses. In all areas, we will make an effort to discuss ongoing research in the field. Be ready for a rigorous introduction to a fascinating field of study.

List of Topics

The Problem of Perception	Motion Perception
Light	Eye movements
Visual system	Sound waves
Optics	Auditory System
Animal eyes and optical tradeoffs	Psychoacoustics
Psychophysical methods	Auditory cue combination
Retina & retinal receptive fields	Localization
Visual Cortex	Visual-Auditory cue combination:
Spatial Vision	Ventriloquist & McGurk Effects
Mid-level Vision	Touch system
Bayes' Rule & Signal detection theory	Visual-tactile cue combination
Gestalt Laws	Visual and haptic 'capture'
Depth Cue Processing	Vestibular System
Depth Perception & Cue Combination	Visual-Vestibular cue combination:
Motion Processing	Somatogravic Illusion