

Syllabus for PSYC 225 – Fall, 2018

Sensation and Perception

2:30-3:20 MWF, 115 Howell Hall

Instructor: Prof. Mark Hollins, 102 Davie Hall

Office Hours: 1:00-2:00 Monday and 2:00-3:00 Thursday

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1. Goals of course

Welcome to the study of sensation and perception. The three main goals of this course are:

1. to give you an in-depth understanding of the human senses. You will develop an appreciation of the remarkably lawful and beneficial ways in which sensory systems give rise to perceptual experience.
2. to provide you with a basic knowledge of sensory impairments, of diseases and vulnerabilities of sensory systems, and of the limitations and inaccuracies of sensory judgments.
3. to help you increase your ability to think and write scientifically, through practice in comparing theories, examining graphs, and evaluating evidence.

2. Course Requirements

The course requires that students: (1) attend class consistently (although officially excused absences will be honored) and participate in class discussion and other activities; (2) complete the writing assignments on time; (3) keep up with the assigned readings from the textbook, as listed in this syllabus; and (4) take the exams.

The textbook is: E. Bruce Goldstein & James R. Brockmole, (2017). *Sensation and Perception, Tenth Edition*. Published by Cengage Learning.

3. Time Commitment

The course will require 9 hours per week: 3 hours in class, and 6 hours of homework.

4. Tests and Final Exam

There will be three tests spread over the course of the semester. Students are required to take all three tests, but the lowest of the three grades will be dropped. Make-ups are not given: If you miss a test, whether the absence is excused or not, that is the test that will be dropped.

In addition, there will be a final exam at the end of the course. This is required, and the grade on it cannot be dropped. If a student misses the final, he/she will receive a grade of AB (“Absent from Final Exam”) in the course, and will have to work with the Dean’s Office to determine whether the absence was excused, in which case a make-up will be given at the beginning of the following semester. The final exam will be cumulative, but with an emphasis on recent material.

Tests and exams will be a mixture of multiple choice, fill in the blanks, and short answer questions.

4. Papers

There are four writing assignments over the course of the semester. Each paper should be double-spaced with 1-inch margins and size 12 font, and be at least 2.5 pages in length. Turn each assignment in as a pdf file, using the Assignment link in Sakai.

Papers will be graded on a 5-point scale, as follows:

- 5 – Unusually thoughtful and well-reasoned paper
- 4 – Good paper, addresses the question in a sensible, straightforward way
- 3 – Shows effort, but too short, wanders off topic, or uses too many quotes
- 2 – Weak paper, doesn’t make sense
- 1 – Just barely better than nothing

Papers are subject to late penalties (1 point per day; papers more than two days late are not accepted). You will be reminded of papers in class a week before they are due.

The papers are as follows:

- a. Explain which of your five senses (vision, hearing, touch, taste, and smell) you think is the keenest, compared to other people. For example, if you think your sense of smell is especially well developed, write about that. Explain why you think so, giving examples. **Due date: September 5.**

- b. Music has always been an important part of human life, but scientists don't understand how or why it affects us so strongly. What do you think? Exactly what is music? What types of music do you enjoy, and how do they make you feel? **Due date: September 28.**
- c. People often develop vision problems and hearing problems as they get older. Give examples of some of these problems. What are some things you can do—starting now—to keep your visual and auditory systems in top condition? **Due date: October 22.**
- d. Explain in general terms what you have learned from this course and how it has changed your understanding of perception and its role in our lives. **Due date: December 3.**

5. Basis for Assessment

The course grade will be based on the following components:

Written Assignments (4 x 5% = 20%)
 Tests (2 x 25% = 50%)
 Final Exam (30%)

The grading scale for course grades is:

93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
60-66	D
0-59	F

6. Poll Everywhere

Poll Everywhere questions will occasionally be asked in class, for purposes of discussion. To be eligible to participate, you need to register. Here's how:

1. Go to poll.unc.edu
2. Click **Student Account Registration**
3. Enter your **Onyen** and **password**
4. Follow the instructions on the screen to sign up for a Poll Everywhere account.
5. Your Poll Everywhere account will be created

7. Honor Code

As in all courses at Carolina, the Honor Code is in effect in this course. Use of notes, cell phones, etc., during tests and exams is not allowed. Any work you turn in should be entirely your own. As you plan your papers, you are welcome to discuss them with me or with others, but you should write them entirely on your own. Any material (text or ideas) taken from other sources should be properly recognized through reference citations or direct quotations.

If you are like me, when you read a book or an article you usually make notes for your own later use. Later, you might want to include some of these notes in a paper. It is therefore important that the notes be in your own words. Otherwise, some quotes from an article might inadvertently make their way into one of your papers without attribution—an unintentional violation of the Honor Code.

Finally, while it's not a violation of the Honor Code to quote extensively from another source, it's not a good idea. Hannah, Mac and I are interested in *your* writing, so put everything, with the possible exception of an occasional key phrase, in your own words. This will show us that you really understand the concepts you are writing about.

8. Schedule of Classes

Wednesday 8/22: Introduction

Basic information about the course will be given, and we will go over the syllabus. The perceptual process will be discussed. [Begin reading Chapter 1 in the textbook.](#)

Friday 8/24: The Eye

We will talk about the main structures within the eye, and their functions; two clinical conditions, glaucoma and cataract, will be explained. [Finish reading Chapter 1.](#)

Monday 8/27: The Retinal Image

The optics of the eye, and refractive errors such as myopia and hyperopia, will be explained. [Start reading Chapter 2 \(pp. 20-27\).](#)

Wednesday 8/29: Rods and Cones

You will learn that there are two types of visual receptor cells, rods and cones. The world looks different with these two types of receptors. [Continue reading Chapter 2 \(pp. 27-33\).](#)

Friday 8/31: Visual Pigment

Our vision is totally dependent on the ability of certain molecules to absorb light. [Finish reading Chapter 2.](#)

Monday 9/3: LABOR DAY HOLIDAY—Take a break!

Wednesday 9/5: Sensory Processing in the Retina; Paper #1 Due

We will talk about the action potential, a special ability of neurons that makes perception possible. [Write Paper #1, which is due by 11:55 PM. Turn it in electronically using the Assignment link in Sakai.](#)

Friday 9/7: Receptive Fields of Retinal Cells

You will learn what a receptive field is. This is one of the key concepts in sensory physiology. Learn how it explains some perceptual phenomena. [Skip the first part of Chapter 3, but read pages 55-62 \(starting at “Processing from Retina to Visual Cortex and Beyond”\).](#)

Monday 9/10: From Retina to Cortex

As visual signals travel from the retina to the striate cortex, they cross a synapse in the lateral geniculate nucleus, then proceed to the striate cortex. We will learn about the receptive fields of LGN and striate-cortex neurons. [Finish reading Chapter 3.](#)

Wednesday 9/12: Feature Detectors—Building Blocks of Perception

Many neurons in the cortex respond only to specific “features” in their receptive field. These feature detectors can be studied psychophysically as well as physiologically. [Think about everything you have learned, and make a list of questions you want to ask at the Review.](#)

Friday 9/14: Review

We will revisit key concepts. Start studying early for Monday’s exam. Go over your notes and compare them with the textbook. If you would like, make up one or two exam questions and email them to me the day before this review. I will share some of these with the class.

Monday 9/17: Test 1

No need for blue books or notebook paper. Just bring a pen (blue or black ink). You will write all your answers on the test paper.

Wednesday 9/19: Organization of Striate Cortex

The organization of visual cortex is awesome. Different types of cells are arranged in systematic ways within a detailed electronic map. [Begin reading Chapter 4 \(pp. 73-79\).](#)

Friday 9/21: Beyond the Striate Cortex

The striate cortex is just the first of many areas of cortex that respond to visual stimulation. Each area has a job to do. [Finish reading Chapter 4.](#)

Monday 9/24: The Awesome Challenge of Perceiving Objects

Perception of objects and scenes seems effortless, but it is a major computational challenge. [Start reading Chapter 5 \(pp. 93-102\).](#)

Wednesday 9/26: Laws of Perceptual Organization

A century ago, Gestalt psychologists discovered how the visual system begins the process of making sense out of what we see, by combining small visual features into larger units. [Continue reading Chapter 5 \(pp. 102-112\)](#)

Friday 9/28: Stages of Perceptual Organization; Paper #2 Due

Our perceptual world is constructed in stages. [Take a break from reading. Instead, write Paper #2, which is due by 11:55 PM. Turn it in electronically using the Assignment link in Sakai.](#)

Monday 10/1: Visual Perception in Infants

Infants can't see very well at birth, but experiments show that their vision develops quickly during the first year of life, and more slowly for years after that. [Finish reading Chapter 5.](#)

Wednesday 10/3: What Happens When We Attend to Something?

Attention enhances perception, while distraction interferes with it. [Begin reading Chapter 6 \(pp. 125-135\).](#)

Friday 10/5: Attention as Glue

Attention binds visual features—such as the color and shape of an object—together. [Finish reading Chapter 6, but skip the section on “Attention and Perceptual Completion” \(pp. 144-146\).](#)

Monday 10/8: Eye Movements

Eye movements enable us to look at what we are paying attention to—and serve other functions. You will learn about the three different types of eye movements and how they evolved. [Take a break from reading. Instead, go back over your notes and prepare for the Review.](#)

Wednesday 10/10: Review

We will review key ideas, to jump-start your studying. Go over your notes and compare them with the textbook.

Friday 10/12: Test 2

Same format as Test 1. Get a good night's sleep and bring an extra pen.

Monday 10/15: Depth Perception and Monocular Depth Cues

We begin our study of depth perception by considering sources of depth information (“cues”) that we can see even with one eye closed. [Start reading Chapter 10 \(pp. 227-233\).](#)

Wednesday 10/17: Stereopsis

The most powerful of all depth cues—binocular disparity—gives rise to a type of depth perception called stereopsis. 3D movies make use of this depth cue. [Continue reading Chapter 10 \(pp. 233-243\).](#)

Friday 10/19: FALL BREAK

Monday 10/22: Size Constancy; Paper #3 due

Since both an object's size and its distance from us influence the size of the retinal image, depth cues help us determine the object's size. [Take a break from reading; use the time to write Paper #3, which is due by 11:55 PM. Turn it in electronically using the Assignment link in Sakai.](#)

Wednesday 10/24: Geometrical Illusions

We will examine the idea that unconscious inference contributes to some optical illusions. [Finish reading Chapter 10.](#)

Friday 10/26: The Sense of Touch

“Touch” is actually a whole family of sensory abilities, including the ability to perceive mechanical stimulation (such as pressure and vibration), thermal stimulation (warmth and cold), and pain. We will talk about the receptors in the skin that are responsible for these different types of sensitivity. [Begin reading Chapter 14 \(pp. 337-342\).](#)

Monday 10/29: Tactile Acuity and Texture Perception

Perceiving the surface texture of an object is a complex ability involving tactile acuity and vibration detection. The Hollins lab has played a role in understanding this aspect of perception. [Continue reading Chapter 14 \(pp. 342-351\).](#)

Wednesday 10/31: The Puzzle of Pain

Pain is not just unpleasant; it is puzzling. Sometimes it is useful, warning of danger or urging rest; but for victims of chronic pain, it serves no purpose. [Continue reading Chapter 14 \(pp. 351-355\).](#)

Friday 11/2: Cognition and Pain

Compared to other types of perception, pain is unusually susceptible to cognitive influences, such as the placebo effect. [Finish reading Chapter 14.](#)

Monday 11/5: Review

We will review key ideas, to jump-start your studying. Go over your notes and compare them with the textbook. [Think back over what you have learned since the last test, and make a note of any questions you have for the review.](#)

Wednesday 11/7: Test 3

Same format as earlier tests.

Friday 11/9: Introduction to Hearing

We'll talk about physical and perceptual dimensions of sound. [Begin reading Chapter 11 \(pp. 259-267\).](#)

Monday 11/12: Structure of the Ear

There are receptor cells for hearing (hair cells) just as there are for vision (rods and cones). And the ear, like the eye, contains a number of structures through which the stimulus must pass before it reaches the receptors. [Continue reading Chapter 11 \(pp. 268-276\).](#)

Wednesday 11/14: How the Inner Ear Works

The cochlea is an awesome little machine that pulls sounds apart into their components, which then stimulate different groups of receptors. [Finish reading Chapter 11.](#)

Friday 11/16: Hearing Loss

The types, causes, and symptoms of hearing loss will be described. We will also discuss cochlear implants. [Read only the first part of Chapter 12 \(pp. 289-298\).](#)

Monday 11/19: Auditory Localization

The auditory system uses several types of information in determining where a sound is coming from. [There's no reading assignment today. Instead, spend the time getting ready for Thanksgiving.](#)

Wednesday 11/21 & Friday 11/23: HAPPY THANKSGIVING!

Monday 11/26: Speech Perception

The acoustic signal for speech is complex; interpreting it is a challenging task for the auditory system. [Read only the first part of Chapter 13 \(pp. 317-324\).](#)

Wednesday 11/28: The Sense of Taste

Ancient philosophers believed that tiny pieces of objects reach our nervous system, causing perception. This actually is what happens in taste and smell—the “chemical senses.” [Begin reading Chapter 15 \(pp. 361-368\).](#)

Friday 11/30: The Sense of Smell

Smell and taste seem similar, but they encode chemical stimuli in very different ways. [Finish reading Chapter 15.](#)

Monday 12/3: Animal Senses that Humans Don't Have; Paper #4 Due

From infrared sense to magnetic sense, many animals have important sensory abilities that we lack. How did we lose out? There is no reading for this class; a summary will be posted on the website containing all the information you need from the lecture. [There is no reading assignment for today; use the extra time to write Paper #4, which is due by 11:55 PM. Turn it in electronically using the Assignment link in Sakai.](#)

Wednesday 12/5: Last class—Review and Final Thoughts

FINAL EXAM: Friday 12/7 at 4pm. It will be held in our regular classroom.