

**Course name:** Sensation and Perception (301)

**Classroom:** [ARC 206, Busch Campus](#) (Notice the room change)

**Hours:** Monday, Wednesday, 6:00 -10:00 PM

**Instructor:** Xiaoli He

**Office:** Room 162, Busch Psychology building

**Office Hours:** By appointment

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**Textbook:** Sensation and Perception, 4rd edition. Wolfe JM, Kluender KR, Levi DM et al. (2015). Sinauer Associates.

Available in either (1) print form, or (2) electronic form. You may use either the printed book or the eTextbook for this course, as long as it is the fourth edition.

**Companion Book Website:** <http://sites.sinauer.com/wolfe4e/index.html>

Contains very useful activities, demos, and essays.

*Additional readings and handouts* will be made available as PDFs on Sakai (under "Resources").

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## COURSE OVERVIEW

The world as we perceive it is not "given" to our brains, but must be constructed, based on the pattern of physical stimulation impinging on the sense organs. This course will introduce the study of sensation and perception, from the point of view *psychophysical* and *neurobiological* approaches.

Some of the questions we will address are: What does it mean for an organism (or even a

robot or computer system) to "perceive" its environment? What kinds of problems must the brain solve in order to make perception possible? How can we scientifically measure someone's perception? What is the link between the way things appear to us perceptually and brain activity? How does the brain construct the percept of 3D shapes, colors, motions, sounds, bodily sensations, etc.?

Learning goals include: (1) To develop scientific and critical reasoning skills; (2) To learn how the sense organs and nervous system generate your perception of the world; (3) To learn about psychophysical and biological methods that are used to scientifically measure perception; (4) To appreciate the complexities of the connection between the mind, the brain, and the world.

The course is divided into three parts (tentative date):

- **Unit I** (Jun. 1 - Jun. 8): Introduction to the problem of perception; Light and eyes; Early processing of visual information
- **Unit II** (Jun. 13 - Jun. 20): Attention; Object perception and recognition; Color perception
- **Unit III** (Jun. 22 - Jun. 29): Space (depth) perception; Motion perception; Sound and hearing

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## GRADES

Grades will be based on 2 exams (Mid-term exam and Final exam), one oral presentation and attendance:

Mid-term exam ( <b>June 15</b> ):	30 %
Final exam ( <b>July 6</b> ):	40 %
Oral presentation ( <b>July 4</b> ):	20 %
Attendance:	10 %

Oral presentation: each student should choose one topic from the given topics, and give a 10-15 minutes presentation on July 4. I will give more details later on.

The Final exam will contain 10 questions from materials prior the mid-term exam.

**Grading scale:** Students can earn a maximum of 100 points during the course of the semester. Letter grades will be assigned only at the end of the semester, and will be based on the following fixed scale:

86-100 points	A	These cut-points will apply to everyone. No adjustments can be made for individual students.
81-85	B+	
71-80	B	
66-70	C+	
61-65	C	
51-60	D	
50 or less	F	

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## COURSE REQUIREMENTS

### Attending lectures (10%) :

Attending lectures is a the most important part of the course. The assigned readings from the text will overlap only partially with the corresponding lectures. Some topics covered in the lecture may be given only scant attention in the text. Conversely, some issues discussed at length in the text will only be mentioned briefly in the lectures. The text and lectures are meant to complement each other. The exams will generally emphasize the material from the lectures. However the text is critical in solidifying your understanding of the material.

### Missed classes:

You are responsible for the material covered in any class you miss. If you have to miss a class, or even a portion of a class, it is important to find out what was covered by borrowing notes from another student. Then, to get additional explanation, or to ask questions, come to office hours.

### Exam Policies:

1. Students are required to take all exams. No make-up exams will be given except in the case of a documented illness. This will require a note from your doctor and dean.

Make-up exams will be given at the end of the semester, during the week of the finals. All other exam absences will result in a score of 0 for that exam.

2. Once you begin work on an exam, it will count. No exam scores can be dropped. So, if you are ill, do not take the exam; please see your doctor.

#### **Oral Presentation:**

Given a topic, give a 10-15 minutes presentation to the whole class. More details will be given later on.

#### **Hand-posted signs:**

Do not trust any signs or notices posted outside the classroom announcing exam postponements, class cancellations, or anything else. All official announcements will be made on this Sakai page. If there are any doubts, always check with the Psychology departmental office first.

#### **Questions:**

If you have general questions, or need further clarification on a specific topic, please come to office hours. Alternatively, you can see me right after class. I will be available after each lecture to answer any questions you may have. I may not be able to respond to every email.

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## **HELPFUL HINTS FOR DOING WELL IN THIS COURSE**

### **1. Attend Class**

The most important requirement for doing well is to attend class regularly. If you miss a class -- or even a portion of a class -- be sure to borrow notes from another student and find out what was covered. This is crucial because subsequent material will build quickly on previously covered material.

### **2. Ask Questions**

Ask questions during lecture. Or ask questions right after the lecture. Or ask questions during office hours. If there is a point of confusion somewhere, it is important to get it cleared right away. Otherwise it may make it more difficult for you to understand subsequent material.

### 3. Review your notes and write summaries

Review your notes and make sure you understand the main points of each lecture. A good way to test your understanding is to write a short summary that highlights the main ideas.

### 4. Pay special attention to graphs and figures

Graphs summarize a great deal of important information. Make sure you understand what each graph is depicting, and why that information is relevant. (In particular, ask yourself: *What is the variable on the X-axis of the graph? What is the variable on the Y-axis? What does the shape of the graph tell us about the relationship between these variables? Finally, why is this information important for the study of perception?*)

Figures and perceptual demos (or "illusions") are especially important in the study of perception. When you encounter such a figure or illusion, always ask yourself: *What exactly does this illusion demonstrate? What does it tell us about how our perceptual systems work?*

### 5. Pace yourself

Pace your reading wisely for each chapter. Do not leave it for the last minute.

## Schedule (tentative)

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### UNIT 1

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Jun. 1	Relationship between the physical and perceptual world	Ch. 1
Jun. 1	The fundamental problem of perception	Hoffman chapter (available under Sakai "Resources")
Jun. 1	Approaches to the study of perception; Psychophysical methods	Ch. 1 (skip "Signal detection theory") + Companion Book website Ch. 1
Jun. 6	Biological approaches; Basics of neurons and neural processing	Ch. 1 + Companion Book website Ch. 1
Jun. 6	Light; Optics; The human eye	Ch. 2 + Companion Book website Ch. 2
Jun. 6	The Retina; Rods & Cones (the Duplex solution)	Ch. 2 + Companion Book website Ch. 2
Jun. 8	Ganglion cells; Lightness perception	Ch. 2 + Companion Book website Ch. 2
Jun. 8	Striate cortex / Area V1	Ch. 3 + Companion Book website Ch. 3

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Jun.8	Spatial vision; Contrast sensitivity function	Ch. 3 + Companion Book website Ch. 3
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## UNIT 2

Jun.13	Perceiving objects; Gestalt Laws of Perceptual Organization	Ch. 4 + Companion Book website Ch. 4
Jun.13	Figure and ground; Visual completion	Ch. 4 + Companion Book website Ch. 4
Jun.13	Object recognition; Face recognition	Ch. 4 + Oliver Sacks chapter (available under "Resources")
Jun.15	<b>Mid-term</b>	Ch. 7 + Companion Book website Ch. 7
	Attention; Visual search	
Jun.20	Attentional cueing; Scene perception	Ch. 7 + Companion Book website Ch. 7
Jun.20	Color Perception; Color mixing	Ch. 5 + Companion Book website Ch. 5
Jun.20	Trichromacy; Color opponency	Ch. 5 + Companion Book website Ch. 5

## UNIT 3

Jun.22	Space perception; Monocular cues	Ch. 6 + Companion Book website Ch. 6
Jun.22	Apparent size; Binocular vision	Ch. 6 + Companion Book website Ch. 6
Jun.22	Apparent motion; Biological motion	Ch. 8 + Companion Book website Ch. 8
Jun.27	Correspondence problem; Aperture Problem; Motion Integration	Ch. 8 + Companion Book website Ch. 8
Jun.27	Area MT; Motion adaptation; Optic flow	Ch. 8 + Companion Book website Ch. 8
Jun.29	Sound; The human ear	Ch. 9 + Companion Book website Ch. 9
Jun.29	Mechanisms of hearing; Sound localization	Ch. 9 + Companion Book website Ch. 9, Ch. 10
Jul. 4	<b>Oral presentation</b>	
Jul. 6	<b>Final Exam</b> Wednesday 6:00 PM (Our usual meeting room ARC 206)	