

# Psychology of Perception

Psychology 4165–100

Spring 2004 Semester

Monday, Wednesday, & Friday, 10:00–10:50  
Muenzinger D-156

Lewis O. Harvey, Jr. – Instructor  
Benjamin L. Jacobson – Assistant



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### Syllabus Topics and Reading Assignments

12 Jan	Introduction to the Course		15 Mar	Action and Motion	(SB 9)
14 Jan	Psychophysics	(SB 1)	17 Mar	<b>Second Examination</b>	
16 Jan	Psychophysics	(SB Appendix)	19 Mar	Special Topic: Attention	
19 Jan	<b>Martin Luther King Day</b>		22 Mar	<b>Spring Break</b>	
21 Jan	Psychophysics •1	(SB Appendix)	24 Mar	<b>Spring Break</b>	
23 Jan	The Human Eye	(SB 2)	26 Mar	<b>Spring Break</b>	
26 Jan	The Human Eye	(SB 2)	29 Mar	Auditory System	(SB 10)
28 Jan	The Human Eye	(SB 2)	31 Mar	Auditory System	(SB 10)
30 Jan	The Eye & Seeing	(SB 3)	2 Apr	Auditory System	(SB 10)
2 Feb	The Eye & Seeing	(SB 3)	5 Apr	Hearing •3	(SB 11)
4 Feb	The Eye & Seeing	(SB 3)	7 Apr	Hearing	(SB 11)
6 Feb	Central Pathways	(SB 4)	9 Apr	Hearing	(SB 11)
9 Feb	Central Pathways	(SB 4)	12 Apr	Music Perception	(SB 11)
11 Feb	Central Pathways	(SB 4)	14 Apr	Speech Perception •4	(SB 11)
13 Feb	Spatial Vision	(SB 5)	16 Apr	Somatosensory	(SB 12)
16 Feb	Spatial Vision	(SB 5)	19 Apr	Somatosensory	(SB 12)
18 Feb	Spatial Vision	(SB 5)	21 Apr	Taste & Smell	(SB 13)
20 Feb	<b>First Examination</b>		23 Apr	Taste & Smell	(SB 13)
23 Feb	Object Perception	(SB 6)	26 Apr	Taste & Smell	(SB 13)
25 Feb	Object Perception	(SB 6)	28 Apr	Taste & Smell	(SB 13)
27 Feb	Color Perception	(SB 7)	30 Apr	Recapitulation	
1 Mar	Color Perception •2	(SB 7)	<b>5 May</b>	<b>Wednesday Morning</b>	
3 Mar	Color Perception	(SB 7)		<b>Final Examination</b>	
5 Mar	3-D Perception	(SB 8)		<b>10:30–13:00</b>	
8 Mar	3-D Perception	(SB 8)	<b>7 May</b>	<b>Commencement</b>	
10 Mar	3-D Perception	(SB 8)			
12 Mar	Action and Motion	(SB 9)			

#### Required Textbooks for the Course

Sekuler, R. W., & Blake, R. (2002). *Perception* (4th ed.). New York: McGraw-Hill.

Martin, D. W. (2004). *Doing Psychology Experiments* (6th ed.). Pacific Grove, California: Brooks/Cole Publishing.

**Note:** The numbers in parentheses above refer to chapters in the Sekuler & Blake (SB) and the Martin (M) texts.

Please read the indicated chapter before the class meeting.

#### Office Hours

Name	Lewis O. Harvey, Jr.	Benjamin L. Jacobson
Office	MUEN D-251b	MUEN D-140d
Hours	11:00–12:00 Monday & 10:00–11:00 Tuesday & by appt.	14:00–15:00 Tuesday & Thursday & by appointment
Telephone	303-492-8882	
email	lharvey@psych.colorado.edu	jacobson@psych.colorado.edu
web	http://psych.colorado.edu/~lharvey/	

### Laboratory Schedule

Section L101: 11:00–13:50 Tuesday MUEN D-156 (Benjy Jacobson)  
Section L102: 11:00–13:50 Thursday MUEN D-156 (Benjy Jacobson)

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1. 20 & 22 January 2004 **Begin Lab 1: Weight Discrimination**  
(Martin Chapter 1, Chapter 12)

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  2. 27 & 29 January 2004 **Work on Lab 1**  
(Martin Chapter 13)

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  3. 3 & 5 February 2004 **Lab 1 Report Due (30 points)**  
**Begin Lab 2: Face Recognition**  
(Martin Chapter 12)

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  4. 10 & 12 February 2004 **Work on Lab 2**

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  5. 17 & 19 February 2004 **Work on Lab 2**

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  6. 24 & 26 February 2004 **Lab 2 Report Due (40 points)**  
**Begin Lab 3: Color Naming**

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  7. 2 & 4 March 2004 **Work on Lab 3**  
**Form Lab Groups for Lab 4.**

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  8. 9 & 11 March 2004 **Lab 3 due (50 points)**

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  9. 16 & 18 March 2004 **Work on Group Projects (Lab 4)**  
**First draft of group proposal due**  
(Cover page, Introduction, References)

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  10. 23 & 25 March 2004 **Spring Break**

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  11. 30 March & 1 April 2004 **Work on Lab 4**  
**Second draft of project due**  
(Cover page, Introduction, Methods, References)

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  12. 6 & 8 April 2004 **Work on Lab 4**

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  13. 13 & 15 April 2004 **Work on Lab 4**

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  14. 21 April 2004 (Wed, 14:00–17:00) **Poster Presentations in the UMC for the**  
**8<sup>th</sup> Annual Undergraduate Research Day**  
22 April 2004 (Thursday) **Group Project Presentations (20 points)**

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  15. 26 April 2004 (Monday) **Group Project Report due (80 points)**  
Each group turns in **one** paper with a Cover page,  
Introduction, Methods, Results and Reference  
section and each member of the group turns in their  
own discussion section. (80 points total: 40 points  
for group report, 20 points for individual discussion  
and 20 points for the group presentation).
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## Conditions Under Which The Course Operates

### **Lecture:**

There will be three exams: two midterms and one final examination. They are all required. No make-up examinations will be given. You will receive a grade of zero for each exam not taken. Part of the semester grade will be based on four homework assignments and on class participation.

### **Laboratory:**

The laboratory is not optional in Psychology 4165. There will be four assignments in laboratory. These assignments will be graded and the sum of the four grades will be your laboratory grade. All four laboratory assignments must be completed in order to receive a final grade for the course. If, at the end of the semester, you have not handed in one or more of your laboratory assignments you will receive a grade of IF. In order to have the IF removed you must complete your laboratory assignments. All lab assignments must be written and printed with a computer word processor and all graphs must be prepared with a graphics or spread sheet program.

### **Grading:**

Your final grade is computed from your exam scores, homework grades, participation grade, and the laboratory grade. The total possible points in the course is 800:

125	First Examination (20 February 2004)
125	Second Examination (17 March 2004)
250	Final Exam (5 May 2004)
80	Homework grade
20	Class participation
200	Laboratory Grade
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800	Total Possible Points

Your final letter grade in the course will be assigned in the following manner. First a "Reference Score" will be calculated by taking the mean of the top five percent of the class. Your grade will be determined by how well you have done in comparison to this reference score:

	A >96.6%,	A- >93.3% of the reference score	
B+	>90.0%,	B >86.6%,	B- >83.3% of the reference score
C+	>80.0%,	C >76.6%,	C- >73.3% of the reference score
D+	>70.0%,	D >66.6%,	D- >63.3% of the reference score
	F <63.3%		

It is therefore possible for the entire class to receive the grade of A. By the same token, it is also possible that very few people would receive an A.

## Comments About The Psychology Of Perception

### **Why Take This Course?**

There are three reasons to take this course: (1) To gain an understanding of the capabilities and limitations of our perceptual experiences; (2) to sharpen your ability to critically evaluate the results of experiments in light of theories of perception; and (3) to gain practical skills in the use of computers for designing experiments, for analyzing and graphing data, and for preparing written laboratory reports.

The study of perception is the oldest part of modern psychology. It developed from trying to answer two questions posed by philosophers: “How do we know what we know?” and “Why do things appear the way they appear?” Since most of what we know about the outside world comes to us through our sensory systems, our sensory capabilities were the first to be studied extensively. Perceptions are derived from neural and psychological mechanisms that operate on sensory information. We will study the seven main themes, taken from Table 1.1 of the Sekuler and Blake textbook, and learn how they apply to each of the senses:

1. **Sensory transduction and neural coding:** Sense organs transform physical energy into bioelectrical signals; perceptual qualities are coded in patterns of neural activity.
2. **Differences among species and among individuals:** Nonhuman animals possess sensory capabilities beyond the realm of human perceptual experience. Perceptual responses may differ from one individual human to another, or from one group of humans to another.
3. **Clinical insights and disordered perception:** Perceptual responses can be disordered by changes in sense organs, by neurological disease or by brain injury.
4. **Top-Down influences and attention:** A perceiver’s intentions and knowledge can influence perception, as can the context in which objects and events occur.
5. **Illusions and errors:** Perception sometimes provides misleading (but useful) descriptions of objects or events in the environment.
6. **Research methods and demonstrations:** Understanding perception requires sophisticated research methods. Demonstrations and exercises provided in the book amplify some of these research findings.
7. **Plasticity:** Experience and practice can modify perception

### **Prerequisites:**

A broad understanding of the basic concepts from a general psychology course is assumed. You will be using methods of inferential statistics, such as those taught in Psychology 3101, to evaluate the results of your experiments. A facile ability with these methods in particular and with mathematical concepts through algebra and trigonometry are required. A familiarity with calculus is helpful but is not necessary. Please work through the eight questions on the next two pages. If you find these questions very difficult and you don’t even know how to find out how to answer them, you probably are not ready to take this course. You will need to make a considerable commitment of time. For each credit hour you should expect to spend 3 hours of class-related activities (studying, research, writing) per week. Since the class is a four-credit course expect to spend 12 additional hours per week outside the class and laboratory.

### Skills Needed for Psychology of Perception

**Question 1:**

Rearrange the following linear equation to solve for  $b$ :  $Y = a + b \cdot X$

$$b =$$

**Question 2:**

Solve the following equation for  $X$ :  $Y = \log X$

$$X =$$

**Question 3:**

Compute the arithmetic mean and the standard deviation of this sample of numbers:  
10.0, 9.0, 12.0, 11.0, 8.5, 13.0, 8.0, 10.0, 7.0, and 11.5:

$$\mu =$$

$$\sigma =$$

**Question 4:**

In an experiment you observe the number of times six different kinds of events occur ( $n = 6$ ). A theoretical model makes predictions about how often these events *should* occur. These data are presented in the table below. Compute the chi-square ( $\chi^2$ ) statistic to test if the observed data are significantly different from the predicted data. You may assume  $n-1$  degrees of freedom.

	E1	E2	E3	E4	E5	E6
Observed Data	174.0	172.0	104.0	92.0	41.0	8.0
Predicted Data	175.5	167.8	106.5	90.4	44.3	6.5

$$\chi^2 =$$

**Question 5:**

In an experiment with two levels of an independent variable you observe the following values of the dependent variable for 10 subjects (five were tested under level 1 and five under level 2). Compute the mean of each column and calculate a t-test (or ANOVA if you wish) to test the hypothesis that there is a significant difference between the means:

Level 1		Level 2	
Subject	Dependent	Subject	Dependent
1	8.0	6	10.0
2	9.0	7	9.5
3	7.5	8	11.0
4	7.0	9	9.0
5	8.5	10	10.5
Mean		Mean	

$t(df) =$

$p =$

**Question 6:**

Convert the probability 0.76 to a z-score based on the unit, normal Gaussian distribution. What is the probability that a single sample drawn from a population having a Gaussian distribution with a mean of 0.0 and a standard deviation of 1.0 will have a value of 1.96 or greater?

**Question 7:**

Using least-squares linear regression, compute the slope ( $b$ ) and y-intercept ( $a$ ) of the straight line () that best fits the following set of data:

$x$	1.0	3.0	5.0	7.0	9.0
$y$	4.1	9.9	16.1	22.0	27.9

$a =$

$b =$

$R^2 =$

**Question 8:**

Plot the data in Question 7 on a graph using linear axes. The x-axis should have a range of 0.0 to 10.0 and the y-axis should range from 0.0 to 30.



## **AGREEMENTS FOR PARTICIPATING IN THE COURSE**

The purpose of these agreements is to create a condition that allows all people in the class to get maximum value from the course.

### **AGREEMENTS**

- 1 You agree to be responsible for these agreements.
- 2 You agree to be on time to class and to your laboratory meetings.
- 3 You agree to complete the assigned reading and homework on time.
- 4 You agree to complete your laboratory assignments on time.
- 5 You agree to attend all class and laboratory meetings unless an emergency comes up.
- 6 You agree to understand the material.
- 7 You agree to ask questions when you don't understand the material.
- 8 You agree to communicate any complaints and criticisms you may have only to someone who can do something about the situation and you agree not to complain or to criticize to someone who cannot do something about the situation.
- 9 You agree to get value out of your participation in the course.

If you attend the next class meeting, you are accepting responsibility for the above agreements.

## **Academic Integrity Policy**

A university's intellectual reputation depends on maintaining the highest standards of intellectual honesty. Commitment to those standards is a responsibility of every student, faculty, and staff member on the University of Colorado at Boulder campus.

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### **Honor Code**

A student-run Honor Code was instituted on the Boulder Campus in 2002. The intent of the Honor Code is to establish a community of trust where students do not plagiarize, cheat, or obtain unauthorized academic materials. An honor code council collaborates with the colleges and schools in addressing allegations and instances of academic dishonesty and in assisting to educate all members of the university community on academic integrity issues.

Breaches of academic honesty include cheating, plagiarism, and the unauthorized possession of examinations, papers, computer programs, as well as other class materials specifically released by the faculty.

A student accused of academic dishonesty will either accept the accusation made by a faculty member or request a hearing before a student panel, who will make a decision on the accusation of academic dishonesty. In addition to academic sanctions imposed by the faculty, students found guilty of academic dishonesty also face consequences from the honor code council ranging from attending a mandatory class in ethics to expulsion from the campus. More information about CU-Boulder's Honor Code may be found at [www.colorado.edu/academics/honorcode/Home.html](http://www.colorado.edu/academics/honorcode/Home.html).

The following terms are clarified for the benefit of all members of the university community.

### **Cheating**

Cheating is defined as using unauthorized materials or receiving unauthorized assistance during an examination or other academic exercise. Examples of cheating include: copying the work of another student during an examination or other academic exercise (includes computer programming), or permitting another student to copy one's work; taking an examination for another student or allowing another student to take one's examination; possessing unauthorized notes, study sheets, examinations, or other materials during an examination or other academic exercise; collaborating with another student during an academic exercise without the instructor's consent; and/or falsifying examination results.

### **Plagiarism**

Plagiarism is defined as the use of another's ideas or words without appropriate acknowledgment. Examples of plagiarism include: failing to use quotation marks when directly quoting from a source; failing to document distinctive ideas from a source; fabricating or inventing sources; and copying information from computer-based sources, i.e., the Internet.

### **Unauthorized Possession or Disposition of Academic Materials**

Unauthorized possession or disposition of academic materials may include: selling or purchasing examinations, papers, reports or other academic work; taking another student's academic work without permission; possessing examinations, papers, reports, or other assignments not released by an instructor; and/or submitting the same paper for multiple classes without advance instructor authorization and approval.

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