Psychology of Perception

Psychology 4165, Section 100

Spring 2003 Semester
Monday, Wednesday, & Friday, 10:00–10:50
Muenzinger D-156

Lewis O. Harvey, Jr. – Instructor
Joe Biedenkapp– Assistant

Hermann von Helmholtz (1821–1894)

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Syllabus Topics and Reading Assignments

Date	Topic	Reading		Date	Topic	Reading
13 Jan	Introduction to the Course			17 Mar	Action and Motion	(SB 9)
15 Jan	Psychophysics	(SB 1)		19 Mar	**Second Examination**	
17 Jan	Psychophysics	(SB Appendix)		21 Mar	Special Topic: Attention	
20 Jan	**Martin Luther King Day**			24 Mar	**Spring Break**	
22 Jan	Psychophysics •1	(SB Appendix)		26 Mar	**Spring Break**	
24 Jan	The Human Eye	(SB 2)		28 Mar	**Spring Break**	
27 Jan	The Human Eye	(SB 2)		31 Mar	Auditory System	(SB 10)
29 Jan	The Human Eye	(SB 2)		2 Apr	Auditory System	(SB 10)
31 Jan	The Eye & Seeing	(SB 3)		4 Apr	Auditory System	(SB 10)
3 Feb	The Eye & Seeing	(SB 3)		7 Apr	Hearing •3	(SB 11)
5 Feb	The Eye & Seeing	(SB 3)		9 Apr	Hearing	(SB 11)
7 Feb	Central Pathways	(SB 4)		11 Apr	Hearing	(SB 11)
10 Feb	Central Pathways	(SB 4)		14 Apr	Music Perception	(SB 11)
12 Feb	Central Pathways	(SB 4)		16 Apr	Speech Perception •4	(SB 11)
14 Feb	Spatial Vision	(SB 5)		18 Apr	Somatosensory	(SB 12)
17 Feb	Spatial Vision	(SB 5)		21 Apr	Somatosensory	(SB 12)
19 Feb	Spatial Vision	(SB 5)		23 Apr	Taste & Smell	(SB 13)
21 Feb	**First Examination**			25 Apr	Taste & Smell	(SB 13)
24 Feb	Object Perception	(SB 6)		28 Apr	Taste & Smell	(SB 13)
26 Feb	Object Perception	(SB 6)		30 Apr	Taste & Smell	(SB 13)
28 Feb	Color Perception	(SB 7)		2 May	Recapitulation	
3 Mar	Color Perception •2	(SB 7)		**7 May**	**Wednesday Morning**	
5 Mar	Color Perception	(SB 7)			**Final Examination**	
7 Mar	3-D Perception	(SB 8)			**10:30–13:00**	
10 Mar	3-D Perception	(SB 8)		9 May	Commencement	
12 Mar	3-D Perception	(SB 8)				
14 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. (2000). *Doing Psychology Experiments* (5th 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.	Joe Biedenkapp
Office	MUEN D-251b	MUEN D-140d
Hours	9:30–11:00 Tuesday & Thursday	14:00–15:00 Tuesday & Thursday
	and by appointment	and by appointment
Telephone	303-492-8882	
email	lharvey@psych.colorado.edu	biedenka@psych.colorado.edu
web	http://psych.colorado.edu/~lharvey/	

Laboratory Schedule

| Section L101: | 11:00–13:50 Tuesday | MUEN D-156 (Joe Biedenkapp) |
| Section L102: | 11:00–13:50 Thursday | MUEN D-156 (Joe Biedenkapp) |

1. 21 & 23 January 2003

Begin Lab 1: **Weight Discrimination**
(Martin Chapter 1, Chapter 12)

2. 28 & 30 January 2003

Work on Lab 1
(Martin Chapter 13)

3. 4 & 6 February 2003

Lab 1 Report Due (30 points)
Begin Lab 2: **Face Recognition**
(Martin Chapter 12)

4. 11 & 13 February 2003

Work on Lab 2

5. 18 & 20 February 2003

Work on Lab 2

6. 25 & 27 February 2003

Lab 2 Report Due (40 points)
Begin Lab 3: **Color Naming**

7. 4 & 6 March 2003

Work on Lab 3
Form Lab Groups for Lab 4.

8. 11 & 13 March 2003

Lab 3 due (50 points)

9. 18 & 20 March 2003

Work on Group Projects (Lab 4)
First draft of group proposal due
(Cover page, Introduction, References)

10. 25 & 27 March 2003

Spring Break

11. 1 & 3 April 2003

Work on Lab 4
Second draft of project due
(Cover page, Introduction, Methods, References)

12. 8 & 10 April 2003

Work on Lab 4

13. 15 & 17 April 2003

Work on Lab 4

14. 22 April 2003 (Tuesday, 15:00–17:00)

Poster Presentations in the UMC for the annual
Psychology Dept. Undergraduate Research Day

24 April 2003 (Thursday)

Group Project Presentations (20 points)

15. 28 April 2003 (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).

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 (21 February 2003)
125  Second Examination (19 March 2003)
250  Final Exam (7 May 2003)
 80  Homework grade
 20  Class participation
200  Laboratory Grade
-----
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.

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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 (χ^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

$\chi^2 =$

January 13, 2003

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 ($y = a + b \cdot x$) 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.

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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 of the University of Colorado

A university's intellectual reputation depends on maintaining the highest standards of intellectual honesty. Commitment to those standards is a responsibility of every student and every faculty member at the University of Colorado.
Breaches of academic honesty include cheating, plagiarism, and the unauthorized possession of exams, papers, computer programs, or other class materials that have not been formally released by the instructor.

Cheating
Cheating is defined as using unauthorized materials or giving 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, 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 acknowledgment. Examples of plagiarism include: failing to use quotation marks when quoting from a source; failing to document distinctive ideas from a source; fabricating or inventing sources; and copying information from computer-based sources.

Unauthorized Possession or Disposition of Academic Materials
Unauthorized possession or disposition of academic materials may include: selling or purchasing examinations or other academic work; taking another student's academic work without permission; possessing examinations or other assignments not formally released by an instructor; and/or submitting the same paper for two different classes without specific authorization.

Sanctions
Breaches of academic honesty will result in disciplinary measures that may include: a failing grade for a particular assignment; a failing grade for a particular course; and/or suspension for various lengths of time or permanent expulsion from the university.

Procedures
Each college and school has developed procedures to enforce its statement or code of academic honesty. These generally contain a requirement that a student accused of academic dishonesty be notified of specific charges, that the student be given an opportunity to respond to the charges before an unbiased individual or committee, and that the student be notified in writing of the decision or recommendation made by the individual or committee reviewing the charges. If a student wishes to appeal a case, the student should request a listing of the procedures used by his or her school or college and follow the requirements therein.

Students are under the academic standards and codes of their primary college. This is the academic body that takes action on any violation of academic standards. The academic unit that taught the course in which an academic standards breach is alleged will cooperate with the appropriate college disciplinary committee.

Breaches of academic honesty are under the purview of each college and school pursuant to the *Laws of the Regents,* Article 4A6. For further information and for individual college and school policies, students should consult their dean's office.

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