Perception and Psychophysics
Psych 3450, Lecture version
Fall 2008, CRN 41045

Instructor:	Professor Don Sinex
My office:	EDUC 422
My phone:	435-797-8921
My email:	don.sinex@usu.edu
Office hours:	Monday and Wednesday, after class until 1:30pm or other times by appointment
Time and place:	MWF, 11:30am-12:20pm, VSB130
Textbook:	"*Sensation and Perception*", 7th edition, by E. Bruce Goldstein, Thomson Wadsworth, Belmont CA, 2007, ISBN 0-534-55810-0

Overview:

This course deals with how you perceive - see, hear, taste, feel - objects in your environment. Perception is a complex, dynamic process that includes low-level "sensory" processing, as well as higher-level processing sometimes referred to as "cognitive" processing. The distinction between "sensation" and "perception" is an important one, as you might guess since the author of the textbook chose that as his title.

The first step in sensory processing is to detect the presence of a physical stimulus - a pattern of light, for vision, a pattern of sound waves for hearing, the presence of chemicals for taste and smell. You will learn something about the properties of these stimuli, and about anatomical structures like the eye or ear that have evolved to detect them. The outcome of sensory processing is a representation in the brain of important features of the physical stimulus - for example, the visual system must have a way of representing the spatial pattern of reflected light with different wavelengths and intensities.

"Perception" occurs when these patterns and properties lead to the experience of an object or event in the environment. What you perceive reflects the information in the stimulus, but it is also affected by additional "top-down" processes. You don't perceive a pattern of wavelengths or acoustic frequencies; you perceive your friend's face or a song that you like. The processing that lets you experience objects does not end at the eye or ear, but relies heavily on structures throughout the brain. We'll spend a lot of time discussing processing by structures in the nervous system.

That's perception; what's psychophysics? Psychophysics refers to the set of techniques used to study sensation and perception, as well as to the data obtained with psychophysical methods. We will learn about the techniques, since that is an important part of the scientific study of sensation and perception.

Reading assignments:

My lecture notes are available in HTML format, which can be viewed with any web browser. The files have extensive links that connect related topics, which is especially useful for pre-exam reviewing. The notes are available at the Psych3450 site on Blackboard. If you would like your own copy of the HTML notes on a CD, bring me a blank, writable CD with your name on it, and I will return it with the notes at the next class. Please read the notes, and any assigned material from the textbook **before** each class. That will make the lecture easier to follow, and will let you know if there's anything you want to ask a question about. I encourage you to ask questions, and I make it a point to take time for questions at the beginning of each class.

What I want you to learn and understand:

1. Methods of psychophysics: the "classical methods" and modern techniques based on "Signal Detection Theory".
2. How to describe the stimulus for the various sensory modalities - light for vision, acoustic signals for hearing, etc. The distinction between terminology that describes the stimulus and terminology that describes perception.

3. Fundamental facts about sensory processing for each modality. This includes the anatomy of the receptor structures and physiological processing throughout the brain.
4. Fundamental facts about perception, at the cognitive or behavioral level. This includes general concepts such as perceiving objects, the modification of sensory systems by evolutionary pressure, and the essential role of top-down processing. It also includes more specific information about each modality, such as color vision, distance (depth) perception, speech perception, spatial hearing, and pain perception.
5. That there are differences in the way humans and non-humans perceive the world, and that sensory systems have been strongly influenced by natural selection.

Exams, quizzes, and grading:

There will be four exams. Exam 1 covers introductory material and is worth 80 points. Exam 2 on the visual system and Exam 3 on hearing and speech are worth 100 points each. Exam 4, given during the final exam period, is worth 120 points: 80 points on touch, olfaction, and taste, and 40 points on important topics covered at any time during the semester. Exams may include any kind of question except long essays. Multiple choice and short-answer questions will be most common. Many questions require you to understand graphs or illustrations similar (maybe even identical) to those in the notes or the textbook. I also like to know whether you've learned the meanings of important words and phrases.

Makeup exams are possible, if you have a valid reason for missing the exam. Valid reasons include such things as illness, accidents, and family emergencies. Excuses that don't get much sympathy include such things as not knowing the schedule or forgetting. If you realize that you're going to miss an exam, let me know as soon as possible. Email or voice mail are good ways to let me know.

There will also be quizzes and homework assignments worth 10 points each. There will be at least 10 of these, to add up to 100 points. If it happens that we have more than 10 of these assignments, your points will be the sum of your 10 highest scores. Most of these assignments will be given via Blackboard, but I will reserve the right to give unannounced quizzes or homework assignments in class any time I think it would be useful. Quiz 1 will be available on Blackboard on the first day of class, and must be completed before the next class.

Exams and quizzes are open-notes and open-book. Of the two, the notes are more important. Most items on exams and quizzes come from the lecture notes. Some of the material in the notes and on the exams isn't in the book at all. Does that mean you can skip reading the textbook? I don't recommend that, but some students in previous years have made that choice. If you choose not to use the textbook, you do that at your own risk.

One point on an exam has the same value as one point on a quiz. Overall, there are 500 possible points. Cutoffs for letter grades will be at or below:

A: ≥450 B: ≥400 C: ≥350 D: ≥300 F: <299

"At or below" means that I may lower a cutoff based on the actual distribution of scores. In practice, I almost always lower them. I will never raise a cutoff. I may give plus grades for scores just below or minus grades for scores just above a cutoff.

You can check your total points at any time on Blackboard. You should check often, so that you can report any factual errors, which I will happily correct. You can also report differences of opinion, but I don't promise to as happy about that.

Cheating:

Cheating (which I know ***you*** would never do) will incur penalties up to and including a failing grade for the course.

Tentative schedule. Important: changes - delays, usually - are likely. This means that the dates given for exams are estimates. Exams may occur later than stated here.

	Monday	Wednesday	Friday
Week 1: *25-Aug-08 to 29-Aug-08*	Course Organization Topic A1: Introduction Ch 1, pp 1-12	Topic A2: Psychophysics Ch 1, pp 12-end	A2, continued
Week 2: *1-Sep-08 to 5-Sep-08*	*Labor Day, No class*	Topic A3: Signal detection theory (SDT) Appendix, pp 373-378	A3, continued
Week 3: *8-Sep-08 to 12-Sep-08*	Topic A4: Sensory physiology Ch 2, pp 21-28	Topic A5: Neural processing and perception Ch 3, pp 45-58	Topic A6: Review for Exam 1
Week 4: *15-Sep-08 to 19-Sep-08*	**Exam 1** **Chapters 1-3, Appendix**	Topic B1: Visual system Light and the retina Ch 2, pp 28-end	B1, continued
Week 5: *22-Sep-08 to 26-Sep-08*	Topic B2: Central visual processing Ch 3, pp 58-end	B2, continued	Topic B3: Processing streams Ch 4, pp 77-84
Week 6: *29-Sep-08 to 3-Oct-08*	Topic B4: Object perception Ch 5, pp 93-106	B4, continued	Topic B5: Color vision Ch 7, pp 141-159
Week 7: *6-Oct-08 to 10-Oct-08*	Topic B6: Distance Perception Ch 8, pp 167-179	Topic B7: Perception of size Ch 8, pp 179-end	Topic B8: Motion perception Ch 9, pp 195-208
Week 8: *13-Oct-08 to 17-Oct-08*	Topic B9: Review for Exam 2	**Exam 2** **Chapters 2-5, 7-9**	*Discuss Exam 2* *(Meet on Thursday, Friday is a holiday)*

	Monday	Wednesday	Friday
Week 9: *20-Oct-08 to 24-Oct-08*	Topic C1: Hearing, sound Ch 11, pp 233-241	C1, continued	Topic C2: Hearing - Anatomy and physiology Ch 11, pp 241-256
Week 10: *27-Oct-08 to 31-Oct-08*	C2, continued	Topic C3: Hearing, basic psychophysics	Topic C4: Sound localization Ch 12, pp 265-274
Week 11: *3-Nov-08 to 7-Nov-08*	Topic C5: Auditory Scene Analysis Ch 12, pp 274-278	C5, continued	Topic C6: Hearing loss Ch 11, pp 259-end
Week 12: *10-Nov-08 to 14-Nov-08*	Topic C7: Speech Perception Ch 13	Topic C8: Review for Exam 3	**Exam 3** **Chapters 11-13**
Week 13: *17-Nov-08 to 21-Nov-08*	Topic D1: Touch Ch 14, pp 303-318	D1, continued	Topic D2: Pain Perception Ch 14, pp 318-end
Week 14: *24-Nov-08 to 28-Nov-08*	Topic D3: Olfaction Ch 15, pp 327-338	Thanksgiving holiday no class	Thanksgiving holiday no class
Week 15: *1-Dec-08 to 5-Dec-08*	Topic D4: Taste Ch 15, pp 338-end	Topic D5: Development Ch 16	Topics D6 and D7: Review for Exam 4
Finals week: *12/10/2008, 9:30 am to 11:20 am*		**Exam 4** **Chapters 14-16 + major topics from other units**	