

Sensation and Perception (PSY 4150, CRN 44525)

Fall 2012, August 20 – December 14

Prof. Robert Carlson

Class Information

Class Days: Tuesdays & Thursdays

Class Time: 1:00 – 2:15

Class Location: McDonald 206

Contact Information

Office: McDonald 222

Phone: 652-7893

E-mail: rcarlson@dixie.edu

Contacting the Instructor

The most effective way to contact me is by e-mail. I enjoy talking with students face-to-face, but I may not be in my office as much as in past semesters because of new responsibilities (i.e., meetings). You are welcome to drop by and see if I am there and have time to meet with you (just knock if my door is closed), but if you want to be sure I will be there to talk with you, please feel free to contact me via e-mail to make an appointment.

Course Information:

Textbook: Goldstein, *Sensation & Perception*, 8th Edition

Office Hours: Mon., 2:20-3:50; Tue., 10:20-11:50

Outside Reading:

Baluch, F. & Itti, L. (2011). Mechanisms of top-down attention. *Trends in Neuroscience*, 34(4), 210-224. Only read through to the first paragraph on p. 218

fMRI Explanation (originally copied from the Shriver Center at the University of Massachusetts).

Optics Handout (originally prepared by Jack Yellott; modified by Prof. Carlson).

Ramachandran, V.S. & Blakeslee, S. (1998). *Phantoms in the Brain*, Chapter 2: "Knowing Where to Scratch", 21-38. Quill: NY.

Syllabus Disclaimer

Please note that the specifics of this Course Syllabus can be changed at any time, and you will be responsible for abiding by any such changes. These changes, if any, will be **announced in class**. If you know in advance that you will miss a class, or if an emergency arises, it is your responsibility to inform the instructor as soon as possible regarding this absence so that any necessary alternative arrangements can be made.

Course Description

The goal of this course is to learn about the complicated processes by which we acquire information about our environment, and to learn about the tools and methods scientists use to acquire this knowledge. Perception of visual, auditory and other sensory information has a great influence on how we interact with our environment, yet perception is often not a simple mapping between an external stimulus and our internal representations of that object. Instead, human perceptual systems are designed to modify and interpret sensory information before you are even aware of what the information is. Although there has been much progress in the study of perception over the last few decades, scientists still have a lot to learn about human perception. Our ultimate goal will be to learn enough about the current body of knowledge to make educated speculations regarding the directions perceptual research will take, especially as this will apply to practical applications.

The Classroom

This is a small class, so **everyone's attendance and participation** will contribute greatly toward a good learning experience. As this is a senior-level course, you are expected to **come to class prepared** by having read the appropriate reading assignment. I want you to feel free to ask

questions and offer your insights into the subject matter we will be discussing each class period. If you find one topic particularly interesting, let me know so we can make sure and have a thorough discussion of that topic.

Grading

Grading will be based on the following criteria: midterm exams (50%), a final exam (25%), weekly quizzes (10%), brief summaries of articles (10%) and other assignments (5%).

Midterms: There will be three midterm exams. The two exams on which you score the highest will each be worth 20% of your final grade; your lowest exam score will be worth 10% of your final grade. Each exam will consist of true-false statements, multiple choice questions, diagrams or fill-in-the-blank statements, and, perhaps, essay questions. Midterm exams will be administered during class time, and are generally considered to be quite challenging, thoroughly testing your memory for facts and your ability to apply those facts. It is very important that you keep up with your studying throughout the exam period; last-minute cramming will generally not be successful.

Final: The final exam will be administered during Finals Week and will require the integration of material learned throughout the semester (i.e., it is cumulative). The format for this exam is similar to the midterm exams, but longer (typically double the length). It is worth 25% of your final grade.

Quizzes: Quizzes will cover the reading assignment for a given class period and will usually be administered during the first 5 minutes of class time, but this can change. Quizzes will be given frequently, so that there will usually be either an in-class assignment or a quiz every class period. If you miss class or arrive at class after the quiz was collected, you will **not** be given an opportunity to take that quiz at a later time. No after-the-fact make-up quizzes will be offered. However, if a known conflict with a class arises, a student can arrange to take the quiz in advance. The lowest two quizzes will not count toward the final quiz average (i.e., they will be dropped).

Article Summaries: A series of articles will be assigned, and students will be expected to prepare short (2 pages maximum) summaries of these articles. Each summary is due one week after it is assigned (the assigned date is listed on the Course Outline), with penalties of 20% per day it is late (no exceptions to this rule). Each article assignment will be written using complete sentences, demonstrating accurate use of formal scientific terminology. Include in each summary relevant background information and a general description of the main points of the article, as it relates to this course. The primary point of this assignment is to assess whether or not you can identify the main points of each article and describe those points concisely (i.e., within 2 pages). Each summary must be written **independently**. Only 4 of the 6 assigned summaries will contribute toward this portion of your grade (i.e., the lowest two article summary grades will be dropped). Also, you may submit a **rewrite of one** article summary for a chance to improve your score on that summary (due Dec. 1; **no late rewrites accepted**). However, only article summaries that were submitted on time are eligible to be rewritten.

Articles to Summarize:

Article 1: Hubel, D. H., and Wiesel, T. N. (1959). Receptive fields of single neurons in the cat's striate cortex. *Journal of Physiology*, 148, 574-591.

Article 2: Dagnelie, G. (2008). Psychophysical evaluation for visual prosthesis. *Annual Review of Biomedical Engineering*, 10, 339-368.

Article 3: O'Craven, K. M., Rosen, B. R., Kwong, K. K., Treisman, A., and Savoy, R. L. (1997). Voluntary attention modulates fMRI activation in human MT/MST. *Neuron*, 18, 591-598.

Article 4: Ingle, J. (1985). The goldfish as a retinex animal. *Science*, 227, 651-654.

Article 5: Graziano, M. S. A., Reiss, L. A. J., and Gross, C. G. (1999). A neuronal representation of the location of nearby sounds, *Nature*, 397, 428-430.

Article 6: Ruehle, B. S., Handwerker, H. O., Lennerz, J. K. M., Ringler, R., Forster, C. (2006). Brain activation during input from mechanosensitive versus polymodal C-nociceptors. *The Journal of Neuroscience*, 26, 5492-5499.

Other Assignments: There may be occasional in-class assignments (no advance notice will be given) or homework assignments. In-class assignments are likely to consist of an exercise called “predatory reading.” This will give you an opportunity to learn how to efficiently read and understand scientific research articles about perception. Details of this technique will be explained in class. Grading of these assignments will also be part of the learning process. If you are not present when an in-class assignment is given, there will be no means to make up the assignment. Other assignments might include homework exercises to put into practice the principles you are learning about in theory.

Make-up Exam Policy

Make-up exams are not allowed, except in the event of *extreme* and *unanticipated* circumstances. If there is a reasonable reason to believe that a situation will arise that might prevent your taking of an exam at the scheduled time (such as participation in an approved extra-curricular activity), it is your responsibility to contact the instructor *ahead of the scheduled exam time* to make separate accommodations. At least 2 days’ notice is customarily expected, and more time may be required in many cases to make adequate alternative arrangements. **Make-up quizzes are never allowed.** You may, however, take quizzes in advance if there is a good reason (leaving for Thanksgiving Break two days early is *not* a good reason) why you will miss a class.

Course Outline

<i>Date</i>	<i>Topic</i>	<i>Chapter(s):Pages</i>
Tue., Aug. 21	Introduction to the Course	1:1-12
Thu., Aug. 23	Neurophysiological techniques for studying perception	2:21-28; fMRI handout
Tue., Aug. 28	How neurons in the eye function	2:28-42
Thu., Aug. 30	Focusing images in the eye	Optics handout
Tue., Sept. 4	The Retina (cont’d.) and early perception	3:45-68
Thu., Sept. 6	Neural organization of early vision; A.S. 1 due	4:73-87
Tue., Sept. 11	Modularity of vision	4:87-95
Thu., Sept. 13	Object perception	5:99-113
Tue., Sept. 18	Beyond the object; A.S. 2 due	5:114-127
Thu., Sept. 20	Exam 1	Chapters 1-5, handouts
Tue., Sept. 25	Attentional theories	6:133-146
Thu., Sept. 27	Physiology of attention	6:146-150; Baluch & Itti
Tue., Oct. 2	Using perception for action; A.S. 3 due	7:155-172
Thu., Oct. 4	Motion perception	8:177-195
Tue., Oct. 9	Early color vision	9:201-213
Thu., Oct. 11	Fall Break (no class)	---
Tue., Oct. 16	Later color vision	9:213-224

Course Outline

<i>Date</i>	<i>Topic</i>	<i>Chapter(s):Pages</i>
Thu., Oct. 18	Depth perception; A.S. 4 due	10:229-243
Tue., Oct. 23	Size perception	10:243-254
Thu., Oct. 25	Exam 2	Chapters 6-10; handouts
Tue., Oct. 30	Basics of hearing	11:259-272
Thu., Nov. 1	Processing sound	11:272-287
Tue., Nov. 6	Localizing sound	12:291-307
Thu., Nov. 8	Speech perception; A.S. 5 due	13:311-325
Tue., Nov. 13	Career Day (no class)	---
Thu., Nov. 15	Cutaneous senses	14:329-343
Tue., Nov. 20	Pain and phantom sensations; A.S. 6 due	14:343; Ramachandran
Thu., Nov. 22	Thanksgiving Break (no class)	---
Tue., Nov. 27	Chemical senses	15:355-375
Thu., Nov. 29	Perceptual development; A.S. rewrite due	16:379-397
Tue., Dec. 4	Exam 3	Chapters 11-16; handout
Thu., Dec. 6	Review for Final Exam	---
Tue., Dec. 11	Final Exam, 12:30 – 2:30, In Class (McDonald 206)	---

Syllabus Appendix

This appendix is a required part of your syllabus. You are responsible for reading and understanding this part of the syllabus, just as you are required to read and understand the other portion of the syllabus.

Important Dates for Dixie State College Students, Fall 2012:

- Monday, August 20, 2012: Semester classes begin
- Thursday, August 23, 2012: Last day to wait list
- Friday, August 24, 2012: Last day to add classes without instructor signature
- Monday, August 27, 2012: Drop/audit fee begins (\$10 per class)
- Monday, September 3, 2012: Labor Day (no classes)
- Tuesday, September 4, 2012: Financial charge of \$50 late registration/payment fee
- Monday, September 10, 2012: Last day for refund of tuition and fees
- Monday, September 10, 2012: Pell Grant Census
- Monday, September 10, 2012: Last day to drop without receiving a “W” grade
- Tuesday, September 11, 2012: Students dropped from classes for non-payment
- Friday, September 14, 2012: Last day to add/audit classes
- Monday, October 1, 2012: Graduation application deadline for Fall 2012
- Thursday-Friday, October 11-12, 2012: Fall Semester Break (no classes)
- Monday, October 15, 2012: Last day to drop/audit classes
- Thursday, November 1, 2012: Graduation application deadline for Spring 2013

Friday, November 9, 2012: Last day for complete withdrawal
Monday, November 12, 2012: Registration open for Seniors (90+ credits)
Tuesday, November 13, 2012: Career day (most classes are cancelled)
Tuesday, November 13, 2012: Registration open for Juniors (60+ credits)
Wednesday, November 14, 2012: Registration open for Sophomores (30+ credits)
Thursday, November 15, 2012: Open registration
November 21-23, 2012: Thanksgiving Holiday (no classes)
Friday, December 7, 2012: Last day of classes
December 10-14, 2012: Final Exams scheduled

Student Services: Dixie State College (DSC) provides a variety of services to assist students in managing their academic progress while attending DSC. Among these services are:

Tutoring Center: See the Web site at <http://dsc.dixie.edu/tutoring/index.htm> for information regarding tutoring services available at DSC. Unfortunately, no tutoring services are available for Psychology courses, except for Statistical Methods (some semesters).

Testing Center: See their Web site at <http://new.dixie.edu/testing/> for information about how the testing center operates, including hours of operation. The Testing Center is located in the North Plaza (make sure you know how to find it). You will take all your midterm exams through the Testing Center in this course. You should know that there are a limited number of computers in the Testing Center and rules for how and when you can take exams. **If, for any reason (including waiting for a computer), an exam is not completed before the time it is due you will receive a grade of 0 for that exam.**

Writing Center: See their Web site at http://new.dixie.edu/english/dsc_writing_center.php to learn about the Writing Center services. The Writing Center is located on the 4th floor of the new Holland Centennial Commons.

Disability Services: Students with medical, psychological, learning or other disabilities desiring reasonable academic adjustment, accommodations, or auxiliary aids to be successful in this class will need to contact the DISABILITY RESOURCE CENTER Coordinator (Baako Wahabu) for eligibility determination. Proper documentation of impairment is required in order to receive services or accommodations. The DRC is located next door to the Testing Center. Visit or call 652-7516 to schedule appointment to discuss the process. DRC Coordinator determines eligibility for and authorizes the provision of services.

Computer Labs: DSC provides a variety of computer labs for students to use. Please see the Information Technology website at <http://www.dixie.edu/reg/info-technology.html> for information regarding these services. If you do not have access to your own computer, these computer facilities will be very helpful so you can access course materials that are made available only through Blackboard Vista, and so you can access your Dmail account.

Computer Printers: In addition to established computer labs, there are computer stations located at various locations throughout campus where students can print

documents and access other computer functions. These computer stations require users to stand up, so they are best used for brief computer functions, but they can be very handy. One is located on the 2nd Floor of the McDonald building.

Library: The DSC Library is located in the new Holland Centennial Commons. Their website, which lists hours of operation and has links to electronic resources and the course catalog, is at <http://library.dixie.edu/>.

Health and Wellness Center: The Health and Wellness Center is located slightly off campus—34 N. 600 E., just north of the cemetery on 600 East. The center has professional medical facilities, including four on-site mental health counselors. They can provide some care on site and can offer referrals for other medical or psychological problems. Students are charged \$10 for a visit, which includes lab work.

Dmail: “Important class and college information will be sent to your Dmail account. This information includes your DSC bill, financial and/or scholarship notices, notification of dropped classes, reminders of important dates and events, and other information critical to your success in this class and at DSC. All DSC students are automatically assigned a Dmail account. If you don’t know your username and password, go to www.dixie.edu and select ‘Dmail,’ for complete instructions. You will be held responsible for information sent to your Dmail, so please check it often.”

Academic Integrity: Cheating of any kind is not tolerated. **You may not give information about quiz or exam questions to other students.** Students must take all quizzes and exams independently (without the help of others, except for appropriate disability services). For further information regarding student responsibilities related to academic integrity, please refer to Section 5.33.5 of the DSC policy, which can be viewed at <http://www.dixie.edu/humanres/policy/sec5/533.html>. Other portions of this policy are also relevant, especially as they relate to fostering a learning environment that does not discriminate and is conducive to learning.

Attendance Policy: I expect you to attend class because I know it will help you in learning the material and obtaining a good grade, but I will not enforce this expectation other than requiring attendance at least once during the first week of school.