

SYLLABUS: PSY U668
Seminar in Sensation and Perception
Spring Semester 2007

Instructor: Dr. Yury Petrov
 Office room: 115 Lake Hall
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Class hours: Mon, 11.45 am - 2.30 pm
 Class place: 243 Ryder Hall (SH)

Content: This class is intended to develop skills necessary to read, understand, and present research papers in psychology. The class covers the most influential articles from the vision science literature that dominated research in visual perception in the last few decades. The articles reflect different experimental approaches (primate neurophysiology, human brain imaging, psychophysics) as well as the main theoretical frameworks.

Required text: Original research articles (see below).

Recommended text: Steven Yantis (2001). *Visual Perception: Essential Readings*. Philadelphia, PA: Psychology Press.

Prerequisite: PSY U452 Introduction to Sensation and Perception

Course format: presentation and discussion of research articles in vision science.

Percent of final grade

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| • Class activity (presentations and discussions) | 40% |
| • Homework (control questions) | 30% |
| • Term paper | 30% |

Schedule:

#	Date	Content	Articles
1	Jan 08	Early visual processing	Hubel, D. H., Wiesel, T. N. (1968). <i>Receptive field and functional architecture of monkey striate cortex</i> . J Physiol, 195: 215-243. Blakemore, C. and Campbell, F. W. (1969). <i>On the existence of neurons in the human visual system selectively sensitive to the orientation and size of retinal images</i> . J Physiol, 203(1): 237–260.
2	22	Color	Hurvich, L., & Jameson, D. (1957). <i>An opponent-process theory of color vision</i> . Psych Review, 64, 384-404. DeValois RL, Abramov I, Jacobs GH. (1966). <i>Analysis of response patterns of LGN cells</i> . J Opt Soc Am A 56(7): 966– 77.
3	29	Depth	Barlow HB, Blakemore C, Pettigrew JD. (1967). <i>The neural mechanism of binocular depth discrimination</i> . J Physiol, 193(2): 327-42. Ohzawa, I., DeAngelis, G. C., & Freeman, R. D. (1990). <i>Stereoscopic Depth Discrimination in the Visual Cortex: Neurons Ideally Suited as Disparity Detectors</i> . Science, 249(4972):

			1037-1041. Marr, D., & Poggio, T. (1976). <i>Cooperative computation of stereo disparity</i> . <i>Science</i> , 194(4262): 283-287.
4	Feb 05	Motion	Adelson, E. H., & Movshon, J. A. (1982). <i>Phenomenal coherence of moving visual patterns</i> . <i>Nature</i> , 300, 523-525. Adelson E. H. & Bergen, J. (1985). <i>Spatio-temporal energy models for the perception of motion</i> . <i>J Opt Soc Am A</i> , 2, 284-299. Simoncelli, E. P. and Heeger, D. J. (1998). <i>A model of neuronal responses in visual area MT</i> . <i>Vision Research</i> , 38(5): 743-761.
5	12	Two cortical pathways	Haxby, J. V. et al. (1991). <i>Dissociation of object and spatial visual processing pathways in human extrastriate cortex</i> . <i>PNAS</i> , 88, 1621-1625. Malach, R. et al. (1995). <i>Object-related activity revealed by functional magnetic resonance imaging in human occipital cortex</i> . <i>PNAS</i> , 92: 8135-8139. Kanwisher, N., McDermott, J., Chun, M.M. (1997). <i>The fusiform face area: A module in human extrastriate cortex specialized for face perception</i> . <i>J Neuroscience</i> , 17 (11), pp. 4302-4311.
6	26	Object representation	Marr, D., & Nishihara, H. K. (1978). <i>Representation and recognition of the spatial organization of three-dimensional shapes</i> . <i>Proceedings of the Royal Society of London</i> , 200, 269-294. Shepard, R. N., & Metzler, J. (1971). <i>Mental rotation of three-dimensional objects</i> . <i>Science</i> , 171(3972): 701-703.
7	Mar 12	Object recognition	Biederman, I. (1987). <i>Recognition-by-components: A theory of human image understanding</i> . <i>Psych Rev</i> , 94, 115-147.
8	19	Attention	Treisman, A. M., & Gelade, G. (1980). <i>A feature integration theory of attention</i> . <i>Cognitive Psychology</i> , 12, 97-136. Moran, J., & Desimone, R. (1985). <i>Selective attention gates visual processing in the extrastriate cortex</i> . <i>Science</i> , 229(4715): 782-784. Treue, S. and Maunsell, J. H. R. (1996). <i>Attentional modulation of visual motion processing in cortical areas MT and MST</i> . <i>Nature</i> , 382: 539-541.
9	Apr 02	Attention	Wolfe, J.M., Cave, K.R., Franzel, S.L. (1989). <i>Guided search: an alternative to the feature integration model for visual search</i> . <i>J Exp Psych: Human Perception and Performance</i> , 15(3): 419-433. Corbetta, M. et al. (1991). <i>Selective and divided attention during visual discriminations of shape, color, and speed: Functional anatomy by positron emission tomography</i> . <i>Journal of Neuroscience</i> , 11(8): 2383-2402.
10	09	Visual awareness	Weiskrantz, L., Warrington, E. K., Sanders, M. D., & Marshall, J. (1974). <i>Visual capacity in the hemianopic field following a restricted occipital ablation</i> . <i>Brain</i> , 97, 709-728. Tong, F., Nakayama, K., Vaughan, J. T., and Kanwisher, N. (1998). <i>Binocular rivalry and visual awareness in human extrastriate cortex</i> . <i>Neuron</i> , 21, 753-759. He, S., Cavanaugh, P. and Intriligator, J. (1996). <i>Attentional resolution and the locus of visual awareness</i> . <i>Nature</i> , 383, 334-337.
	23	Term paper due	

Class Policies:

(1) In general, no makeup exams or assignments will be given. A missed deadline will be given a grade of 0, unless a valid excuse is given to the instructor prior to it. Valid excuses include sickness with a doctor's excuse, family emergencies, etc., but you must receive permission to miss a test prior to missing it. If it is due to an extreme emergency, it must be documented later. If the midterm exam is missed and a valid excuse is provided, the final exam will count 75% of the final grade.

(2) An "Incomplete" will be given only for valid reasons: family emergencies, serious illness, etc. In general, I will not give incompletes.

(3) Cheating will not be tolerated. The minimum punishment would be failure on the test.

(4) Please arrive for class on time; late entrants to the classroom can be very disruptive.

Notes:

Please come see me during office hours. This is your chance to get detailed answers to any questions you may have, clear up any confusions, and let me know more about you and your interests. Do not waste your opportunities: come talk to me.

Perception, like many other advanced topics in Psychology, requires a little background knowledge from other disciplines. Background requirements for this course are minimal. However, if you feel confused and suspect your difficulty is due to a lack of background (in neurophysiology or in basic math, for instance), I can help. Do not be discouraged: come see me for extra help. You can learn anything.