

# Attention!

This is a *representative* syllabus.

The syllabus for the course when you enroll may be **different**.

Use the syllabus provided **by your instructor** for the most up-to-date information. Please refer to your instructor for more information for the specific requirements for a given quarter.

New

## New Syllabus for Psychology 606 High Level Vision

**Instructor:**

Prof. James Todd  
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**Location:**

**Time:** Tues, Thur 2:00 – 3:18 PM  
**Credits:** 3  
**Office hours:** Tues, Thur 3:30 – 4:30

**Course description**

This course will examine the perceptual processes by which humans and other animals are able to obtain knowledge about the three-dimensional environment. The material covered will include ecological optics, the representation of three-dimensional form, and the perceptual analysis of various aspects of image structure, including texture, shading motion and binocular disparity.

**Evaluation**

For the undergraduate version of this course, evaluation will consist of three exams, each worth 1/3 of your final grade. These exams will contain essay and short answer questions, and will cover material from both the readings and lectures. For the graduate version of the course, evaluation will consist of three exams, each worth 1/4 of your final grade, and a 10-15 page term paper that covers some topic in high level vision in greater depth than the material discussed in class or in the assigned readings.

**Course web site**

Powerpoint files and all readings can be downloaded for each lecture on Carmen. **Warning:** Some of these power-point files are quite large so you should not try to open them on line.

**Academic Misconduct**

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term academic misconduct includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct.

**Students with Disabilities**

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the Instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

NEW

Topic and required readings

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**Lectures 1 & 2) Projective Geometry and Ecological Optics**

Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin. pp. 16-44.

**Lectures 3&4) The Perceptual Representation of 3D Shape**

Todd, J. T. (2004) The perception of 3D shape. *Trends in Cognitive Science*, 8, 115-121.

Willats, J. (1997). *Art and representation : new principles in the analysis of pictures*. Princeton, N.J.: Princeton University Press. pp. 93-146.

**Lecture 5 & 6) Object and Face Recognition**

Biederman, I. (1995). Visual object recognition. In S. Kosslyn & D. N. Osherson, D. N. (Eds.). *An invitation to cognitive science*. (2nd ed.). Cambridge, Mass.: MIT Press. pp 121-165.

**Lecture 7-8) The Analysis of Image Contours and Shape from Texture**

Gibson, J. J. (1950). *The perception of the visual world*. Boston: Houghton Mifflin. Pp 59-116.

**Lecture 9) Lightness Perception**

Adelson, E.H. (2000) Lightness Perception and Lightness Illusions. In *The New Cognitive Neurosciences*, 2nd ed., M. Gazzaniga, ed. Cambridge, MA: MIT Press, pp. 339-351.

**Lecture 10) Shape from Shading**

Koenderink J.J., Van Doorn A.J. : Shape and shading. In: *The visual neurosciences*, L.M. Chalupa, J.S. Werner (eds.), MIT Press, Cambridge, 1090-1105.

**First Exam**

**Lecture 11 & 12) Shape from Binocular Disparity**

Hershenson, M. (1999). *Visual space perception : a primer*. Cambridge, Mass.: MIT Press. pp. 9-73

**Lecture 13 & 14) Shape from Motion**

Todd, J. T. (1995) The visual perception of three-dimensional structure from motion. In W. Epstein, & S. J. Rogers, S. J. (Eds.) *Perception of space and motion*. San Diego: Academic Press. pp. 202-227.

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**Lecture 15 & 16)                    Shape from Multiple Sources of Information**

Landy, M. S., Maloney, L. T., Johnston, E. B., & Young, M. J. (1995). Measurement and modeling of depth cue combination: In defense of weak fusion. *Vision Research*, 35, 389-412.

**Lecture 17 & 18)                    The Analysis of Natural Scenes**

Geisler, W.S. (2008) Visual perception and the statistical properties of natural scenes. *Annual Review of Psychology*, 59, 10.1-10.26.

**Second Exam**

**Lecture 19 & 20)                    Neural Mechanisms of High Level Vision**

Orban, G.A. (2008) Higher Order visual processing in macaque extrastriate cortex. *Physiological Review*, 88, 59-89

Georgieva, S., Peeters, R., Kolster, H., Todd, J. T & Orban, G. A. (2009) The processing of 3D shape from disparity in the human brain. *Journal of Neuroscience*, 29, 727-742.

**Lecture 21 & 22)                    The Geometry of Visual Space**

Todd, J. T., Oomes, A. H. J., Koenderink, J. J. & Kappers, A. M. L. (2001) On the affine structure of perceptual space. *Psychological Science*, 12, 191-196.

Koenderink, J. J., van Doorn, A. J., Kappers, A. M. L. & Todd, J. T. (2002) Pappus in optical space. *Perception & Psychophysics*, 64, 380-391.

**Lectures 23-24)                    Perceptual Control of Action**

Warren, W. H. (1995) Self-motion: Visual perception and visual control. In W. Epstein, & S. J. Rogers, S. J. (Eds.) *Perception of space and motion*. San Diego: Academic Press. pp. 263-326.

Bruce, V., Green, P. R., & Georgeson, M. A. (1996). *Visual perception : physiology, psychology, and ecology*. (3rd ed.). Hove, East Sussex, UK: Psychology Press. pp. 267-285.

**Lectures 25-26)                    Event Perception**

Bruce, V., Green, P. R., & Georgeson, M. A. (1996). *Visual perception : physiology, psychology, and ecology*. (3rd ed.). Hove, East Sussex, UK: Psychology Press. pp. 323-364.

Todd, J. T., Mark, L. S., Shaw, R. E., & Pittenger, J. B. (1980). The perception of human growth. *Scientific American*, 242, 132-144.

**Final Exam**