

Vision and Psychophysics 1051-350

The final 'component' in many imaging systems is visual perception. The human visual system can also be considered as an imaging system itself; arguably the most complex system. From visual optics through high-level cortical processing such as the perception of depth and motion, an understanding of the characteristics and limitations of the visual system aids in designing and evaluating imaging systems. Unlike other elements of imaging systems, it is difficult or impossible to get objective measures of visual perception; psychophysics provides tools for measuring perceptual mechanisms. This course presents an overview of the organization and function of the human visual system and some of the psychophysical techniques used to study visual perception. (1051-204 or permission of instructor) Class 4, Credit 4 (S)

Class meeting times:

TR 10:00 – 11:50 76-1230

Faculty:

Jeff Pelz

76-3112

5-2783

Office hours by appointment

Objectives:

The goal of Vision and Psychophysics is to provide a detailed overview of the components making up the human visual system, and the tools used to make quantitative measurements of perceptual phenomenon (psychophysics). Components include physical elements (e.g., visual optics, photoreceptors) and neural processes such as retinal and cortical processing.

Schedule:

Week	Topics
1	The eye as an optical instrument
2	The retina as a detector
3	Psychophysics
4	Retinal image processing
5	The limits of spatial vision
6 & 7	Color perception
8	Temporal vision & motion perception
9	Depth perception
10	Review & presentations

Textbook:

Sensation and Perception, Jeremy M. Wolfe, Keith R. Kluender, Dennis M. Levi, Linda M. Bartoshuk, Rachel S. Herz, Roberta L. Klatzky, and Susan J. Lederman, 2006, Sinauer Associates, Inc.

Evaluation:

20% Exam 1
20% Exam 2
25% Final exam
20% Research paper
15% Homework/projects
(Exams are cumulative)

Class participation and significant improvement can be taken into account.

Homework:

All assignments are due at the beginning of class on the assigned date. Late assignments will not be accepted unless an extension has been granted before the due date.

Independent Term Paper/Project:

Students will select a topic for independent research. A formal written report is submitted in the eighth week of the quarter.

Students will select a topic in the area of Vision and Psychophysics to explore in depth. It would typically be a topic covered at some level in class, but you may select any relevant topic. You have wide latitude in selecting the topic of your research; topics spanning the range from physiology to high-level perception are acceptable. If you are unsure about a topic, discuss it with me early, but be warned that if it is related to vision I will probably OK it. Students are encouraged to use the web and the popular press to explore areas, but the research paper must be based on a minimum of three references from sources such as books, journal articles, and personal communications with content experts.

The paper should be 10-15 pages in length, be illustrated as appropriate, include full references, and be adequately proof-read for errors. Note that spell checking is not sufficient. Remember that all material including text, data, and images must be attributed (see the policy on Academic Honesty).

The proposed topic of the paper, along with a supporting paragraph, are due Week 4. A detailed outline is due Week 6. The final paper is due Week 9.

Final: Date TBA As scheduled.

Academic Honesty:

RIT's Educational Policies and Procedures Manual contains the following statement regarding academic dishonesty:

"The Rochester Institute of Technology does not condone any form of academic dishonesty. Any act of improperly representing another person's work as one's own is construed as an act of academic dishonesty. These acts include, but are not limited to, plagiarism in any form or use of information and materials not authorized by the instructor during the examination."

"If a faculty member judges a student to be guilty of some form of academic dishonesty, the student may be given a failing grade for that piece of work or for the course, depending upon the severity of the misconduct."

"If the student believes the action by the instructor to be incorrect or the penalty too severe, appeal may be made to the Academic Conduct Committee of the college in which the course is offered."

The distinction between cooperation and academic dishonesty is clear. Clearly crediting such collaboration on the work submitted is required, and will eliminate any possibility of "improperly representing another person's work as one's own." While consultation and cooperation among students and with support services on campus is encouraged, it is expected that all assignments are the work of an individual student. The billions of documents on the web are a tremendous resource for exploration, but create three problems for the student. The first is that the documents are often temporary, unlike a library resource, a piece of information on the web may be gone in days. Cache sites help in this regard, but do not solve the problem. The second problem is one of veracity; in general, there is no peer or editorial review, there is no reason to believe that information posted by individuals or groups is true or free of self-interest. The third problem is that the information is a tempting source of material to be plagiarized.