

Rev 0.8

Npsy 175: NEUROSCIENCE OF VISION (1999)

Instructor Robert Sekuler
e-MAIL vision@brandeis.edu

Volen Center, Room 242
Phone x.63277

COURSE AIMS: introduces vision research, including computational and physiological approaches to current theories and basic, unresolved issues.

REQUIRED TEXT: Brian A. Wandell, Foundations of vision (Sinauer Publishers, 1995)

RESERVE READING: Items below will be supplemented by other papers from current vision literature. These will be available both in traditional, printed form and as electronic-reserves.

E-RES URL:

EXERCISES: A series of five simple computational exercises will be required from each student. These will be done using Matlab and must be turned in to the instructor.

SEMINAR PRESENTATION: Each student will make a 20-minute presentation; topics include those listed at end of syllabus

RESEARCH PAPER: Each student will prepare a 15-20 page research paper based on the seminar presentation.

EXAMINATION: A 1.5 hour mid-term exam.

DISCUSSION & READING SCHEDULE

<u>DATES</u>	<u>TOPIC</u>	<u>CHAPTERS</u>
January 20	Framework	Teller (in Spillman & Werner)
January 27	Image formation & Photoreceptors	Wandell 2, 3
	DR Williams optics tutorial 1992	
	Cornsweet 2, 3, 4	
February 3	Wavelength encoding	Wandell 4
February 10	Retina	Wandell 5; Kolb 1994
February 17	Cortex	Wandell 6; McIntosh et al 1994; Schiller 1994; Geisler & Albrecht 1997
March 3	Exam; seminar topic	TBA
March 10	Pattern; image representation	Wandell 7 & 8
		Campbell & Robson 1968
		Geisler 1989
March 17	Color	Wandell 9
March 24	Motion & depth	Wandell 10; Zeki 1992; Watamaniuk 1993, 1995
		Blake 1993; Lu & Sperling 1995
March 31	Computational models	H. R. Wilson
April 14	Seminar presentations	
April 21	Visual development	Teller 1997 (IOVS)
April 28	Seminar presentations	
May 6	All papers are due	

Potential seminar topics include:

Brain damage's visual effects, including unilateral neglect

Blindsight, and vision without Area V1

Recognition of 3-D objects

Visual learning/plasticity

Surfaces, their visual representation and importance

Stereograms, including SIRDS, single-image random dot stereograms

A current controversy in color vision

A topic in motion perception

Normal aging and vision