UNIVERSITY OF CALGARY

Department of Psychology
Psychology 621.02 (L01) Advanced Topics Sensation & Perception: Vision
Winter 2010 – Course Outline

Class Time: Tu/Th 2:00 -3:15	**Classroom:** A237H
Course Instructor: Dr. Donald Kline	**Phone:** 220-4969
Office: Admin. 237	**Email**: donkline@ucalgary.ca
Course Blackboard Site:	**http://blackboard.ucalgary.ca/**
Office Hours: Tu/Th 1:00-2:00 P.M. & by appointment	

I. Course Overview and Learning Goals

To interact effectively with the world around us, we need timely and accurate sensory information. The sighted observer can extract important environmental information from the changing patterns of electromagnetic (e.m.) energy that are guided to the retina by the eye's optic media. First transduced into "light" and then transformed into neural code by the retina, this information is transmitted to the brain by the optic nerve. The processing of this information in the brain is the basis for our perception of objects and events.

The visual system and its functions will be explored in 4 course modules. **Module 1 (Light & Optics: Foundation for Vision)** will examine how the eye transforms light into useful visual information. In **Module 2 (Brain & Basic Visual Functions)**, we'll study the visual brain and the basic functions that it serves including acuity, brightness, colour vision, and depth perception. **Module 3 (Seeing in a Changing World)** will explore the ability of vision to track stimulus change (i.e., motion and flicker), how the visual system develops in early life and how it changes during adulthood. Finally, **Module 4 (Vision in Everyday Life)** will consider a range of visual phenomena of relevance to daily life, including how nature has designed the visual systems of different animals to fit the environments in which they live, human visual disorders and their treatment, how visual dysfunction might have affected the work of famous artists, recovery from blindness, visual agnosias, and lastly, how characteristics, knowledge and strategies of individual observers shape their reports and perceptions.

II. Required Readings

a.) Schwartz, S.H. (2004). Visual Perception: A Clinical Orientation (3rd Ed.). New York: McGraw Hill. (Abbreviated "**S"** in Lecture/Exam Schedule: p. 7-8)

b.) Supplementary Reading Material (**Section X**) scheduled as per the Lecture/Exam Schedule (**Section IX**). Master copy set available from instructor.

IV. Evaluation, Examinations and Grading

A. Course Components. Course grades will be based on performance on the exams that conclude each of the 4 course modules:

1. Module 1 Exam	25% of Grade
2. Module 2 Exam	25% of Grade
3. Module 3 Exam	25% of Grade
4. Module 4 Exam	25% of Grade

B. Exams. Each module exam will be composed of 18 short-answer questions. A complete and correct answer to any question is worth 2 points, graded to the nearest .5 points (i.e., 0, 0.5, 1.0, 1.5 or 2.0 points). A fully correct (i.e., 2-point) response could consist of a couple of lines or sentences, a listing of a number of points or issues, and/or an appropriately labeled diagram or graph. The first two-thirds of the questions (12) on each exam will be taken from the assigned reading material; the final one-third (6) will be based on material presented in-class. The date of each topic and reading assignment, lecture topic and exam is presented in the *Class/Exam Schedule* (Section **VII**).

V. Assignment of Grades

Grades will be assigned on a distribution that is not more restrictive than the one below:

A+	95-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-94%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

If warranted by class performance and exam difficulty, grade cutoffs can be lowered from these levels for any given exam.

As stated in the University Calendar, it is at the instructor's discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades. To determine final letter grades in this course, final percentage grades will be rounded up or down to the nearest whole percentage (e.g., 89.5% will be rounded up to 90% = A but 89.4% will be rounded down to 89% = A-).

VI. Important Notices

A. Reappraisal of Grades

A student who feels that a piece of graded term work (e.g., term paper, essay, test) has been unfairly graded may have the work re-graded as follows. The student shall discuss the work

with the instructor within 15 days of being notified about the mark or of the item's return to the class. If not satisfied, the student shall immediately take the matter to the Head of the department offering the course, who will arrange for a reassessment of the work within the next 15 days. The reappraisal of term work may cause the grade to be raised, lowered, or to remain the same. If the student is not satisfied with the decision and wishes to appeal, the student shall address a letter of appeal to the Dean of the faculty offering the course within 15 days of the unfavourable decision. In the letter, the student must clearly and fully state the decision being appealed, the grounds for appeal, and the remedies being sought, along with any special circumstances that warrant an appeal of the reappraisal. The student should include as much written documentation as possible.

B. Plagiarism and Other Academic Misconduct

Intellectual honesty is the cornerstone of the development and acquisition of knowledge and requires that the contribution of others be acknowledged. Consequently, plagiarism or cheating on any assignment is regarded as an extremely serious academic offense. Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Students should examine sections of the University Calendar that present a Statement of Intellectual honesty and definitions and penalties associated with Plagiarism/Cheating/Other Academic Misconduct.

C. Academic Accommodation

It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 403-220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than 14 days after the start of this course.

D. Absence From A Test/Exam

Makeup tests/exams are NOT an option without an official University medical excuse (see the University Calendar). A completed Physician/Counselor Statement will be required to confirm absence from a test/exam for health reasons; the student will be required to pay any cost associated with this Statement. Students who miss a test/exam have 48 hours to contact the instructor and to schedule a makeup test/exam. Students who do not schedule a makeup test/exam with the instructor within this 48-hour period forfeit the right to a makeup test/exam. At the instructor's discretion, a makeup test/exam may differ significantly (in form and/or content) from a regularly scheduled test/exam. Except in extenuating circumstances (documented by an official University medical excuse), a makeup test/exam must be written within 2 weeks of the missed test/exam.

E. Evacuation Assembly Point

In case of an emergency evacuation during class, students must gather at the designated assembly point nearest to the classroom. The list of assembly points is found at http://www.ucalgary.ca/emergencyplan/assemblypoints

Please check this website and note the nearest assembly point for this course. The primary assembly point for the Education Block is the Social Science Food Court; the alternate assembly point is the ICT Food Court.

G. Important Dates:

The last day for registration/change of registration is **Jan 22nd, 2010**. The last day to withdraw from this course is **Apr 16th, 2010**.

VII. Class /Exam Schedule - Winter 2010

*A "**T#**" appearing after the page numbers in the Tutorial column below indicates a VAL Web-based Learning Tutorial with that number (see Section X for a list of Tutorials on the Web) with information relevant to that topic.*

Module 1 – Light & Optics: Foundation for Vision (Jan. 14 to Feb. 11)

Date:	Topic:	Have Read:	Tutorial
Jan. 12 (T)	1.) Introduction to Course 2.) Research in Vision	--- **S**: 1-2; 237-259	--- ---
Jan. 14 (R)	3.) The Construction of Light 4.) Optics	**S**: 19-23 **VAL Tutorials 1 & 2**	--- **T1, T2**
Jan. 19 (T)	4.) Optics ctd. 5.) Measure & Control Light	---- **S**: 61-79	---
Jan. 21 (R)	6) Colour of Light	**S**: 79-87	---
Jan. 26 (T)	7) Physiological Optics	**S**: 3-6;	**T2**
Jan. 28 (R)	8) Retinal Image	**W&S**: 40-51 **S**: 6-15; 25-35; 261-281	---
Feb. 2 (T)	***Exam 1**: Module 1 Reading & Lecture Material*		

Module 2: Art & Visual Dysfunction (February 11 to March 17)

Date:	Topic:	Have Read:	Tutorial
Feb. 4 (R)	Review Exam 1 1) Visual Pathways	---- **S**: 16-19; 283-295	---
Feb. 9 (T)	2) The Visual Brain 3) Brightness, Lightness & Darkness	**S**: 297-314; 315-328 **CAGW:** 1-9; **MW: 695-703** **S**: 35-60	---
Feb. 11 (R)	3) Brightness, Lightness & Darkness 4) Colour Vision	---- **S**: 89-126	---
Feb. 13-21	***Reading Week – No Classes***		
Feb. 23 (T)	5) Colour Tests & Deficiencies 6) Contrast Sensitivity	**S**: 127-163 **S**: 165-189	**T3, T4** **T3, T4**
Feb. 25 (R)	6) Contrast Sensitivity 7) Acuity & Hyperacuity	---- **S**: 189-193	**T5** **T6**
Mar. 2 (T)	8) Depth Perception	**S**: 225-236	---
Mar. 4 (R)	***Exam 2**: Module 2 Reading & In-Class Material*		

Module 3 – Vision in a Changing World (XXX to YYY)

Date:	Topic:	Have Read:	Tutorial
Mar. 9 (T)	*Review Exam 2* 1) Temporal Resolution	--- **S**: 195-213	--- ---
Mar. 11 (R)	2) Motion Perception 3) Self-Guidance	**S**: 215-223 **B&G**: 287-311	--- **T1, T2**
Mar. 16 (T)	3) Self-Guidance ctd. 4) Visual Development	---- **S:** 347-372	---
Mar. 18 (R)	5) Visual Aging	**S:** 372-379 **FS:** 229-254 **SWPL**: 384-390 **LWPZM**: 812-815	---
Mar. 23 (T)	**Exam 3:** Module 3 Reading & Lecture/Demonstration Material		

Module 4 – Vision in Daily Life (XXX to YYY)

Date:	Topic:	Have Read:	Tutorial
Mar. 25 (R)	*Review Exam 3* 1) Vision: Nature's Solutions	---	--- ---
Mar. 30 (T)	2) Optical Disorders & Their Treatment	**Gold**: 545-554 **Surgery Videos**	**T2, T7**
April 1 (R)	4) Retinal/Neural Disorders 5) Vision & Art	**Gold**: 554-564 **Marm**: 132-146	--- **T7**
April 6 (T)	5) Vision & Art ctd. 6) Art & the Disordered Eye	--- **Rav**: 168-180	---
April 8 (R)	7) Recovery from Blindness 8) Visual Agnosias	--- **Sacks:** 8-22	 **T8**
April 13 (T)	8) Visual Agnosias	---	---
April 15 (R)	9) Knowledge Effects in Vision	**Wan**: 390-402 **Schif**: 187-192	**T8**
TBA	**Exam 4: Module 4 Reading & Lecture Material** ***(Final Exam Period April 19-29)***		

VIII. Supplementary Readings - Winter 2010

Module I

1.) Winer, G.A., Cottrell, J.E., Gregg, V., Fournier, J.S., & Bica, L.A. (2002). Fundamentally misunderstanding visual perception. *American Psychologist*, *57*(6/7), 417-424. (= **WCGF&B** in Section IX lecture schedule)
2.) Lynk, L., & Kline, D. & Cooney, V. (2001). Refraction of light. Department of Psychology, University of Calgary, Calgary, AB. ***NOTE:*** A Web-based programmed learning tutorial on the VAL Web site. (i.e., **T1** in Section XI of this outline). (= **L,K&C** in lecture schedule)
3.) Bergerman, L. Kline, D., Lynk, L. & De Maria, M. (2002). Ophthalmic (Corrective) Lenses**.** Department of Psychology, University of Calgary, Calgary, AB. ***NOTE:*** A Web-based programmed learning tutorial on the VAL Web site. (i.e., **T1** in Section XI of this outline). (= **BKLM** in lecture schedule)
4.) Wade, N. J. & Swanston, M. (1991). Light and the eye. In *Visual Perception: An Introduction* (pp. 40-51). London and New York: Routledge (= **W&S** in lecture schedule)

Module 2

1.) Chen, L., Artal, P., Gutierrez, D., & Williams, D. R. (2007). Neural compensation for the best aberration correction. *Journal of Vision, 7*(10), 1-9. (= **CAGW** in lecture schedule)
2.) Mendelson, J. R., & Wells, E. F. (2002). Age-related changes in the visual cortex. *Vision Research, 42*(6), 695-703. (= **MW** in lecture schedule)

Module 3

1.) Bruce, V., Green, P. R., & Georgeson, M.A. (1996). Visual guidance of human action. In *Visual Perception: Physiology, Psychology and Ecology* (3rd ed., pp. 287-311). Hove, UK: Psychology Press. (= **B,G&G** in lecture schedule)
2.) Schieber, F. (2006). Vision and aging. In J. E. Birren & K. W. Schaie (Eds.), *Handbook of the Psychology of Aging* (6th ed., pp. 129-154). Amsterdam: Elsevier Academic Press. (= **FS** in lecture schedule)
3.) Schmolesky, M. T., Wang, Y., Pu, M., & Leventhal, A. G. (2000). Degradation of stimulus selectivity of visual cortical cells in senescent rhesus monkeys. *Nature Neuroscience, 3*(4), 384-390. (=**SWPL** in lecture schedule)
4.) Leventhal, A. G., Wang, Y., Pu, M., Zhou, Y., & Ma, Y. (2003). GABA and its agonists improved visual cortical function in senescent monkeys. *Science, 300* (5620), 812-815. (= **LWPZM** in lecture schedule)

Module 4

1.) Goldstein, E. B. (2002). Clinical aspects of vision and hearing. In *Sensation & Perception* (6th Ed., pp. 545-564). Pacific Grove, CA: Brooks Cole. (A=**Gold** in lecture schedule)
2.) Marmor. M.F. (1997). Perspective on perspective. In M.F. Marmor & J.G. Ravin (Eds.), *The Eye of the Artist* (pp. 132-146), St. Louis: Mosby. (= **Marm** in lecture schedule)

3.) Ravin, J.G. (1997). Artistic vision in old age: Claude Monet. Perspective on perspective. In M.F. Marmor & J.G. Ravin (Eds.), *The Eye of the Artist* (pp.168-180), St. Louis: Mosby. (= **Rav** in lecture schedule)

4.) Sacks, O. (1998). The man who mistook his wife for a hat. In *The Man Who Mistook His Wife for a Hat* (pp. 8-22). New York: Touchstone. (= **Sacks** in lecture schedule)

5.) Wandell, B.A. (1995). Seeing. In *Foundations of Vision* (pp. 387-402). Sunderland, MA: Sinauer. (= **Wan** in lecture schedule)

6.) Schiffman, H. R. (1996). Perceptual set. In *Sensation & Perception: An Integrated Approach* (4th ed., pp. 187-192). New York: John Wiley & Sons. (= **Schif** in lecture schedule)

IX. Vision Tutorials on the Web

Several computer-based tutorials to facilitate your learning of selected vision topics can be accessed on the VAL home page. These are listed in the Table below):

www.psych.ucalgary.ca/ PACE/ VA-Lab/

Tutorial	Author(s)	Associated Reading/ Lecture Topic(s)	Course Module(s)
T1 Refraction of Light	Lynk, Kline & Cooney	*Ray Optics: Bending Light*	1
T2 Ophthalmic (Corrective) Lenses	Bergerman, Kline, Lynk & De Maria	*Ray Optics;* *Physiological Optics*	1; 4
T3 Bases of Colour Vision	Wagner & Kline	*Colour Vision;* *Colour Vision Testing & Deficiencies*	2
T4 Colour Perception in Everyday Life	Kokotailo & Kline	*Colour Vision* *Colour Vision Testing & Deficiencies*	2
T5 Visual Size: Calculating a Visual Angle	Kline, Lynk & Cooney	*Contrast Sensitivity* *Acuity & Hyper acuity*	2 2
T6 Visual Development	Salamanca & Kline	*Visual Development*	3
T7 Art, Vision & the Disordered Eye	Coldham, Cooney & Kline	*Vision & Art*	4
T8 Visual Agnosias	Rai & Kline	*Visual Agnosias*	4