



**Department of Psychology  
Psychology 469 (L01) – Vision  
Winter 2009**

**Class Time:** Mon/Wed/Fri 1:00 to 1:50 P.M.

**Classroom:** Admin253

**Course Instructor:** Dr. Donald Kline

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**Office Hours:** Mon & Wed 11:00 to 12:00 P.M. & by appointment

**Laboratory Instructor:** Mr. Dane Burns

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**Office Hours:** Wed. 2:00 – 3:00 P.M., Thurs. 3:00-4:00 P.M., & by appointment

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**I. Required Readings**

a.) Schwartz, S.H. (2004). Visual Perception: A Clinical Orientation (3<sup>rd</sup> 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**). Copies of the Supplementary Readings can be purchased from PSYCHS (The Association of Undergraduate Psychology Students) in Admin 170.

**II. Course Overview**

To interact effectively with the world around us, we need timely and accurate sensory information. The sighted observer can extract important environmental information from changing patterns of electromagnetic (e.m.) energy guided by the eye’s refractive optic media onto the retina. Transduced into “light” and then transformed into neurally-coded information 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. In **Module 1 (Light & Optics: Foundation for Vision)**, we’ll examine how the eye begins the transformation of 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. **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.

### III. Guiding Principles for the Course

#### What Can You Expect of the 469 Course and the Instructor?

I will do my utmost to make this course on vision a rewarding experience for you. This includes working to meet your expectations when you selected this course from among the many others available to you, and by implementing the course in accord with the following 7 principles:

1. "The universe is full of magical things patiently waiting for our wits to grow sharper." (Eden Philpotts). There are more magical things about vision than there is time available to consider them. I will do my best to bring them to you through accurate, organized lecture and lab experiences presented in an engaging and timely manner.
2. "Intellect without goodwill is apt to go astray, goodwill without intellect is apt to be impotent". (Aldous Huxley) Recognizing that neither intellect nor goodwill is alone sufficient to assure success in most human endeavours, we will pursue the ideals of both.
3. "Chance favours the prepared mind". (Louis Pasteur). "If you do not expect the unexpected, you will not find it." (Heraclitus) To optimize your "preparation" for understanding vision, as well as the application of that knowledge to visual problems and issues in the years ahead, we will emphasize deeper understanding of fewer topics rather than a passing familiarity with more.
4. "Experience is the child of Thought, and Thought is the child of Action". (Benjamin Disraeli, *Vivian Grey*). Because you are more likely to understand and recall material that helps you to understand and explain phenomena in daily life, this course will adhere to a practical experiential theme. Indices of the success of this effort will include the degree to which you become able to explain visual phenomena to others, or to offer viable hypotheses to explain visual events that you notice in your own life.
5. "Human felicity is produced not so much by great pieces of good fortune that seldom happen, as by little advantages that occur every day." (Benjamin Franklin - *Autobiography*). The acquisition of knowledge and in turn, the power that goes with it is the inevitable result of such a steadily applied commitment. Each day, each class, should yield a new contribution to your "cerebral capital investment", and ultimately to your "felicity".
6. "Ah, but a man's reach should exceed his grasp, or what's a heaven for?" (Robert Browning - *Andrea del Sarto*). Demanding learning goals are set for this course with the recognition that high achievement is well served by high ideals.
7. "That's not fair Franklin" (Paulette Bourgeois: Said to Franklin the turtle by his friends in *Franklin is Bossy*). I will work to make the exams and assignments fair and meaningful, to fix any grading mistakes, to be open to your concerns, and to fix problems that you bring to my attention. Not being psychic, I must depend on your help to identify problems and/or their "fixes".

#### What is Expected of 469 Students?

Successful learning in any course is a dialectical process, dependent on the effort, energy and organization of both instructor and student. Here are some things that you can do to enhance your success in the course:

1. Read this course outline and all assignment materials carefully. It will help everyone in the class if our time is not spent on questions already answered by these documents.

2. Keep your life and career goals in mind as you decide how to spend your time. Appointments made with yourself to learn are among the most important that you will ever make or keep. Remember, you are the foremost beneficiary of the knowledge and skills that you acquire.
3. Be prepared. Your completion of the assigned readings, Labs and Tutorials as scheduled, along with active participation in class and lab discussions will enhance your experience, skill, and enjoyment, and almost certainly, your grade for the course.
4. Respect yourself; respect others. Consistent with this, it is expected that you will attend class regularly, arrive to class on time, and conduct yourself honourably on all exams and assignments.
5. Recognize that visual science is a vast and active research area. There is not sufficient class time to discuss all the topics that appear in the readings, nor are all in-class topics covered in the readings. The two sources of information are complementary, but not usually redundant. A topic that is presented only in the text or only in class is NOT of lesser importance than any other (i.e., it as likely to be on the exam as any other topic).
6. “The thing is to become a master and in your old age to acquire the courage to do what children did when they knew nothing.” (Henry Miller) There’s an irony in betraying that you don’t know something by asking questions; it means that you will soon know more. Make your investment in education pay off by having the courage to ask all the questions that occur to you.
7. Tell me about your concerns and problems. I can respond best if you bring them to my attention right away.

#### **IV. Evaluation, Examinations and Grading**

Students must achieve a passing grade on both the class and lab components to pass this course.

**A. Course Components.** The Lecture and Lab components of the course count toward your final grade in proportion to their respective time demands. Specifically, the lecture component will count for 66% of your final grade, the lab component for 34%. In the lecture part of the course, there will be 4 exams: 3 Term exams (one each for Modules 1, 2 and 3), plus a Final exam at the conclusion of Module 4. The grade for the lecture component will be calculated based on your 2 *best* scores from the 3 Term exams, *plus* your score on the partly cumulative Final. The grade for the lab component is based on participating in 4 workshops, participating in 5 in-class lab projects, and your best 5 scores on the 6 assigned lab project reports. A schedule of the labs and the specific assignments for each is provided in a separate supplementary outline specific to your lab section (i.e., B01 or B02); it is vital that you review the one appropriate to your lab section.

**B. Exam Format.** All exams will be composed of short-answer questions. The correct response can 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. A complete and correct answer to any question is worth 2 points, and is graded to the nearest .5 points (i.e., 0, 0.5, 1.0, 1.5 or 2.0 points). The first *two-thirds* (approximately) of the questions on each exam will be taken directly from the assigned reading material; the final *one-third* will be based directly on material presented in-class (i.e., on lectures and demonstrations) or from assigned Web tutorials. Of course, some questions can be answered from either source. Thus, it is essential to attend class regularly, and if a class is missed, to get access to a classmate’s notes for that class. The dates of the lecture topics, reading assignments, and exams are presented in the *Lecture/Exam Schedule* (Section X). To familiarize you with the exam format and grading scheme, a sample set of short answer exam questions with an answer key is provided in your course reading pack and on the course Blackboard site.

**C. Term Exams (20% x 2 = 40%).** On each Term Exam, you will answer 16 short-answer questions from a set of 21 (14 taken from assigned reading, 7 from lecture). So that your opportunity to earn a good course grade is not jeopardized by a single poor exam score, the lowest of your 3 Term Exam scores will be dropped (i.e., the 2 best Term Exam scores are counted toward the final score total). Thus, you can have one "bad" Term exam, or even miss a Term Exam without penalty, although you'll probably do better in the course if you do neither. This system also eliminates the need to take a make-up for a single missed exam. (Because they are likely to differ in difficulty from the regular term Exam, Make-ups are often unfair, either to the student, or to the rest of the class.) However, since *one* Term Exam can be missed *without a formal excuse*, if you miss 2 or more exams, a note from your attending physician or Dean's office must be submitted to the course instructor indicating a legitimate basis for *all missed exam(s)*! **Note:** *Since a later illness could cause you to miss one or more subsequent exams, if you miss any Term exams due to an illness, you should secure a physician's note immediately indicating the reason for the missed exam.*

**D. Final Exam (Partly Cumulative: 26%).** With the opportunity to drop your lowest Term Exam score from Modules 1 to 3, it is still important that all four-course modules be covered. Thus, the Final Exam will be "partly cumulative". It will consist of 29 short-answer questions, of which 22 must be answered. Part 1 will consist of 8 questions taken from the material assigned in Modules 1 to 3, of which you will be asked to answer 6. On Part 2 of the Final, you will answer 16 questions from a set of 21 that are based on the material in Module 4. The first 2/3 of the Part 2 Module 4 questions (i.e., 14) will be from the assigned readings, and final 1/3 (i.e., 8) will be on Module 4 lecture material. **Note:** *Given that the Final is partly cumulative, it is imperative that you complete all the assigned readings and attend the classes in all 4 Modules!*

**E. Lab Component (34%).** Your score for the lab component will be based on participation in 4 workshops, each worth 1.0 % (4 x 1.0 = 4.0%), participation as Observer and Experimenter in 5 in-class lab projects (5 x 1 = 5.0%), and your best 5 written lab assignments from the 6 assigned (5 x 5 = 25%). See the *469 Lab Outline* for your lab section as well as the *General Guidelines for 469 Lab Assignments* and the *Evaluation Criteria for 469 Lab Assignments*, for information regarding the preparation and evaluation criteria for your lab assignments. Lab assignments can be submitted to the TA directly or via the Main Psych Office. **Note:** e-mail submissions will **NOT** be accepted. *Except for an officially excused absence (e.g., certified illness), to be fair to the other students, you are NOT eligible to submit a written assignment for any of the 5 in-class lab projects if you did not participate in the in-class testing and data gathering.*

## V. Assignment of Grades

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

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58
A	90-95%	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 may be lowered (but NOT raised) from these levels for any given exam. Final course grades will be assigned based on the means of the cutoffs that were assigned to the individual exams.

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, final percentage grades will be rounded up or down to the nearest whole percentage (i.e., 89.5% will be rounded up to 90%; 89.4% will be rounded down to 89%, etc.).

## VI. Psyc 469 Learning Tools

**A. Lecture Notes on Blackboard.** The notes for each lecture are available for review and printing on the course Blackboard site at the URL below. You might find that it saves you a lot of time and effort to print them off in advance and bring them to class. That way, you can add whatever comments you need to make them clear and more useful for you. Because copyright issues preclude “Web publishing” of many of the scores of graphics and figures used in the course, please recognize that the Web notes contain only the text material from the lectures. Since these graphics are essential to understanding many of the issues discussed in class, it is critical that you attend all scheduled classes.

<http://blackboard.ucalgary.ca/>

Announcements, Course Notes, Course Outlines (Lecture & Lab), and other information regarding such items as exam scores and grades are also available on Blackboard.

To access the Blackboard system, you must have an IT computing account with a University e-mail address. If you don't already have a University account, you can get one as follows:

- Go to [www.ucalgary.ca](http://www.ucalgary.ca)
- Click on **IT** link on top menu
- Choose appropriate link under the “**Services For**” link
- Under Tools, click on **E-mail**
- Click on **E-mail accounts**
- Click on **Accounts** link to proceed to accounts page
- Click on **How to Get an IT Computing Account**

**B. Vision Tutorials on the Web.** To facilitate your mastery of the course material, a number of Web-based tutorials have been developed by Vision & Aging Lab (VAL) staff and students. The tutorials presently available are listed in Section **XI** of this document. *In some cases, the completion of a lecture topic via tutorial may substitute for a lecture on the same topic and will provide the basis for the questions on that topic that appear on the exam.* The topic(s) to which this approach applies will be announced in advance in-class. The tutorials can be accessed via the VAL home page at the following URL.

[www.psych.ucalgary.ca/PACE/VA-Lab/](http://www.psych.ucalgary.ca/PACE/VA-Lab/)

**C. Information on the Vision and Aging Lab (VAL) on the Web.** Information on Vision and Aging Lab research activities and facilities, graduate training, personnel, publications and presentations is also available at the VAL Web site:

[www.psych.ucalgary.ca/PACE/VA-Lab/](http://www.psych.ucalgary.ca/PACE/VA-Lab/)

**D. Study Help on the Net.** Information on how to prepare for exams ("Test-Taking Advice: Especially for the Multiple-Choice Challenged") has been made available on the Web by Drs. Tim Rogers and Don Kline at the following address:

<http://psych.ucalgary.ca/undergraduate/student-support#tta>

Although this aid emphasizes preparation for multiple-choice exams, most of the information contained in it is relevant for all exam types, short-answer and essay included.

**E. Psychology Course Outlines on the Web:** A copy of all Psychology course outlines, including this one, is also available at the Psychology Course Notes location.

<http://psych.ucalgary.ca/courses>

## **VII. Eye Glass Collection for Vision Patients in the Third World**

The Vision & Aging Lab operates a collection center for the Canadian Lions Eyeglass Recycling Program that gathers pre-owned eyeglasses for distribution to those needing them in Third World communities. If you, your family or friends have any eyeglasses that are no longer needed, you can drop them off at the Vision & Aging Lab or give them to the Course or Lab Instructor. The donation of glasses no longer used could be of great help to someone else.

## **VIII. 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 graded unfairly, 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 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. Student Organizations**

Psychology students may wish to join the Psychology Undergraduate Students' Association (PSYCHS). They are located in Administration 170 and may be contacted at 220-5567.

**Student Union VP Academic:** Phone: 220-3911 [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca)  
**Student Union Faculty Rep.:** Phone: 220-3913 [socialscirep@su.ucalgary.ca](mailto:socialscirep@su.ucalgary.ca)

#### **F. Important Dates**

The last day to drop this course and still receive a fee refund is **January 23, 2009**. The last day to withdraw from this course is **April 17, 2009**.

### IX. Lecture/Exam Schedule – Winter 2009

A "T#" appearing in the Web Tutorial column below indicates that the Learning Tutorial with that number (see section XII - *Tutorials on the Web*) contains information relevant to the scheduled topic. See *Section XI* for abbreviations used in the "Have Read" columns below.

#### Module 1 – Light & Optics: Foundation for Vision (Jan. to Feb. 2)

By Date (Day)	Topic # / Topic:	Have Read	Web Tutorial(s)
<b>Jan. 12 (M)</b>	1) Introduction to Course 2) Research in Vision	<b>S:</b> 1-2; 237-259 <b>WCGF&amp;B:</b> all	----
<b>Jan. 14 (W)</b>	2) Research in Vision ctd.	----	----
<b>Jan. 16 (F)</b>	3) From Whence Light?	<b>S:</b> 19-23	----
<b>Jan. 19 (M)</b>	4) Ray Optics: Bending Light	<b>L, K &amp; C (T1)</b>	<b>T1; T2</b>
<b>Jan. 21 (W)</b>	5) Measuring & Controlling Light	<b>S:</b> 61-79	----
<b>Jan. 23 (F)</b>	6) Colour of Light	<b>S:</b> 79-87	----
<b>Jan. 26 (M)</b>	7) Physiological Optics	<b>S:</b> 3-6;	<b>T2</b>
<b>Jan. 28 (W)</b>	8) Retinal Image	<b>W&amp;S:</b> 40-51 <b>S:</b> 6-15; 25-35; 261-281	----
<b>Jan 30 (F)</b>	<b>Exam 1:</b> Module 1 Reading & Lecture/Demonstration Material		
<b>Feb. 2 (M)</b>	Return/Review Exam I; Begin Module 2		

#### Module 2: Brain & Basic Visual Functions (Feb. 2 to March 6)

By Date (Day)	Topic# / Topic:	Have Read	Web Tutorials
<b>Feb. 2 (M)</b>	<i>Review Exam 1</i> 1) Visual Pathways	---- <b>S:</b> 16-19; 283-295	----
<b>Feb. 4 (W)</b>	1) Visual Pathways ctd.	----	----
<b>Feb. 6 (F)</b>	2) Brain: The Organ of Sight	<b>S:</b> 297-314;315-328	----
<b>Feb. 9 (M)</b>	3) Brightness, Lightness & Darkness	<b>S:</b> 35-60	----
<b>Feb. 11 (W)</b>	4) Colour Vision	<b>S:</b> 89-126	<b>T3, T4</b>
<b>Feb. 13 (F)</b>	5) Colour Vision Tests & Deficiencies	<b>S:</b> 127-163	<b>T3, T4</b>
<b>Feb. 15-22</b>	<i>No classes: Reading Week Feb. 15-22</i>		
<b>Feb. 23 (M)</b>	6) Contrast Sensitivity	<b>S:</b> 165-189	<b>T5</b>
<b>Feb. 25 (W)</b>	7) Acuity & Hyperacuity	<b>S:</b> 189-193	<b>T6</b>
<b>Feb. 27 (F)</b>	8) Monocular Depth Perception	<b>S:</b> 225-230	----
<b>Mar. 2 (M)</b>	9) Binocular Depth Perception	<b>S:</b> 230-236	----
<b>Mar. 4 (W)</b>	<b>Exam 2:</b> Module 2 Reading & Lecture/Demonstration Material		
<b>Mar. 6 (F)</b>	Return & Review Exam 2		



**Module 3: Seeing in a Changing World (March 6 to March 23)**

Date:	Topic:	Have Read	Web Tutorials
<b>Mar. 6 (F)</b>	<i>Review Exam 2</i> <i>Mid-Course Evaluations</i>	----	----
<b>Mar. 9 (M)</b>	1) Temporal Resolution	<b>S:</b> 195-213	----
<b>Mar. 11 (W)</b>	2) Motion Perception	<b>S:</b> 215-223	----
<b>Mar. 13 (F)</b>	3) Self-Guidance	<b>B&amp;G:</b> 287-311	----
<b>Mar. 16 (M)</b>	4) Visual Development	<b>S:</b> 347-372	<b>T6</b>
<b>Mar. 18 (W)</b>	5) Visual Aging: The Visual Future	<b>S:</b> 372-379 <b>FS:</b> 229-254	<b>T7</b>
<b>Mar. 20 (F)</b>	<b>Exam 3:</b> Module 3 Reading & Lecture/Demonstration Material		
<b>Mar. 23 (M)</b>	Return/Review Exam 3; Begin Module 4		

**Module 4: Vision in Everyday Life (March 23 to April 17)**

Date:	Topic:	Have Read:	Web Tutorial(s)
<b>Mar. 23 (M)</b>	<i>Review Exam 3</i> 1) Vision: Nature's Solutions	----	----
<b>Mar. 25 (W)</b>	1) Vision: Nature's Solutions ctd.	----	----
<b>Mar. 27 (F)</b>	2) Optical Disorders	<b>Gold:</b> 545-554	<b>T8</b> <b>T2</b>
<b>Mar. 30 (M)</b>	3) Treatment of Optical Disorders	<b>Eye Surgery Videos</b>	<b>T7</b>
<b>April 1 (W)</b>	4) Retinal/Neural Disorders	<b>Gold:</b> 554-564	----
<b>April 3 (F)</b>	5) Vision & Art	----	<b>T8</b>
<b>April 6 (M)</b>	6) Art & the Disordered Eye	<b>Marm:</b> 132-146 <b>Rav:</b> 168-180	<b>T8</b>
<b>April 8 (W)</b>	7) Recovery from Blindness	<b>Wan:</b> 387-390	----
<b>April 10 (F)</b>	<i>No class: Good Friday</i>	----	----
<b>April 13 (M)</b>	8) Visual Agnosias	----	<b>T9</b>
<b>April 15 (W)</b>	9) Knowledge Effects in Vision	<b>Wan:</b> 390-402 <b>Schif:</b> 187-192	<b>T9</b>
<b>April 17 (F)</b>	9) Last Class W09: Review	----	----
<b>TBA *</b>	<b>Final Exam</b> - Modules 1 - 4 Reading & Lecture/Demonstration Material [* Registrar-scheduled during Final Exam period April 20-30.]		

## X. Supplementary Reading & Web Material - Winter 2009

### 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. (Abbreviated **WCGF&B** in Section IX lecture schedule)
- 2.) Lynk, L., & Kline, D. (2001). Refraction of light. Department of Psychology, University of Calgary, Calgary, AB. **NOTE:** This reading is also available as a Web-based programmed learning tutorial by Lynk, Kline & Cooney on the VAL Web site. (i.e., **T1** in Section XI of this outline). (Abbreviated **L, K & C** in lecture schedule)
- 3.) Wade, N. J. & Swanston, M. (1991). Light and the eye. In *Visual Perception: An Introduction* (pp. 40-51). London and New York: Routledge (Abbreviated **W&S** in lecture schedule)

### Module 2

N/A

### 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. (Abbreviated **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. (Abbreviated **FS** in lecture schedule)

### Module 4

- 1.) Goldstein, E. B. (2002). Clinical aspects of vision and hearing. In *Sensation & Perception* (6<sup>th</sup> Ed., pp. 545-564). Pacific Grove, CA: Brooks Cole. (Abbreviated **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. (Abbreviated **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. (Abbreviated **Rav** in lecture schedule)
- 4.) Wandell, B.A. (1995). Seeing. In *Foundations of Vision* (pp. 387-402). Sunderland, MA: Sinauer. (Abbreviated **Wan** in lecture schedule)
- 5.) Schiffman, H. R. (1996). Perceptual set. In *Sensation & Perception: An Integrated Approach* (4th ed., pp. 187-192). New York: John Wiley & Sons. (Abbreviated **Schif** in lecture schedule)

## XI. Vision Tutorials on the Web

Students and staff in the Vision & Aging Lab have created several computer-based tutorials to facilitate your learning of selected vision topics. These tutorials (listed below) are highly recommended. The tutorials can be accessed on the VAL home page:

[www.psych.ucalgary.ca/PACE/VA-Lab/](http://www.psych.ucalgary.ca/PACE/VA-Lab/)

Tutorial	Author(s)	Associated Reading/ Lecture Topic(s)	Course Module(s)
<b>T1 Refraction of Light</b>	Lynk, Kline & Cooney	<i>Ray Optics: Bending Light</i>	1
<b>T2 Ophthalmic (Corrective) Lenses</b>	Bergerman, Kline, Lynk & De Maria	<i>Ray Optics; Physiological Optics</i>	1; 4
<b>T3 Bases of Colour Vision</b>	Wagner & Kline	<i>Colour Vision; Colour Vision Testing &amp; Deficiencies</i>	2
<b>T4 Colour Perception in Everyday Life</b>	Kokotailo & Kline	<i>Colour Vision Colour Vision Testing &amp; Deficiencies</i>	2
<b>T5 Visual Size: Calculating a Visual Angle</b>	Kline, Lynk & Cooney	<i>Contrast Sensitivity Acuity &amp; Hyper acuity</i>	2
<b>T6 Visual Development</b>	Salamanca & Kline	<i>Visual Development</i>	3
<b>T7 Visual Aging</b>	Hilton & Kline	<i>Visual Aging</i>	3
<b>T8 Art, Vision &amp; the Disordered Eye</b>	Coldham, Cooney & Kline	<i>Vision &amp; Art</i>	4
<b>T9 Visual Agnosias</b>	Rai & Kline	<i>Visual Agnosias</i>	4