PSY 3WW3 - Measuring the Mind
BSB-145 (Burke Science Building)

**Instructor:**
Patrick J. Bennett
Office: Room 412, Psychology Building
Phone: (905) 525-9140 ext. 23012
email: bennett@mcmaster.ca
Office hour: Thursdays, 3-4 P.M.

**Teaching Assistant:**
Carl Gaspar

Grading:
Term Test (due February 14) 30%
Term Paper (due April 4) 30%
Final Exam 40%

**Take-Home Term Test & Final Exam:** There will be one take-home term test and a final exam worth 30% and 40% of the final grade, respectively. The term test can be picked up from my office during the scheduled class time on February 11 and is due (in my office) by the end of scheduled class time on February 14. The test will cover all readings and lectures up through February 7. The format may include multiple choice, short-answer, and essay questions. The test will be designed so that two hours should be sufficient to complete the test. **There is no make-up test.** If you miss the term test, then the weight associated with the paper (see below) and final exam will be increased to 45% and 55%, respectively. A two-hour final exam will held during the final examination period. The exam will cover all readings and lectures from the entire term, although material presented after the term test will be emphasized. The format may include multiple choice, short-answer, and essay questions.

**Term Paper:** A short term paper (maximum length = 12 pages) is required. It is worth 30% of your final grade. The paper is to be typewritten (double-spaced). Stylistic conventions of the American Psychological Association (APA) must be observed. Additional guidelines are provided on another page of this handout. When grading the papers, attention will be given to the organization and clarity of expression, appropriateness of the chosen topic, the depth and breadth of analysis, and the coherence of the discussion. Papers are due at the beginning of the final class on April 4. A penalty of one full letter grade will be assessed for each day that the paper is late. For example, the highest possible grade for a paper handed in on April 5 is B+, the highest possible grade for a paper handed in on April 6 is C+, and so on.

**Textbook:** There is no textbook in this course. Readings will be distributed electronically via the web. Details of how papers can be downloaded will be given in class.
Course Outline: (N.B. Changes to reading assignments may be announced in class)

Week 1 (Jan 7,9,10) - Quantum fluctuations in human vision I - Sensitivity
Jan 7: general introduction;
Jan 9: Hecht, Shafer, & Pirenne experiment; results & implications
Jan 10: Analyses of HSP psychometric functions; noiseless threshold model; highlight "ideal" nature of photon collection and non-ideal nature of threshold; predictions for psychometric functions; what happens if we add noise?

Week 2 (Jan. 14, 16, 17) - Quantum fluctuations in human vision II - Adaptation
Jan 14: effect of background on thresholds; photoreceptor bleaching?
Jan 16: dark light (psychophysical & physiological estimates)
Jan 17: how does internal noise change with the background? equivalent input noise technique

Week 3 (Jan. 21, 23, 24) - Is there a visual threshold?
Jan 21: Psychometric Function; why is it smooth? why have False Alarms? correction for guessing
Jan 23: High-threshold theory & ROC curves
Jan 24: Signal Detection Theory; calculating d’ and criterion; predicted and observed ROC’s in a variety of tasks;

Week 4 (Jan. 28, 30, 31) - Visual awareness: Relating detection & identification
Jan. 28. subliminal perception; detection vs. identification; SDT experiments
Jan. 30: SDT explanation of blindsight?
Jan 31: physiological bases of blindsight

Week 5 (Feb. 4, 6, 7) - Visual awareness: What vs. Where pathways
Feb. 4: origins of what vs. where theory; Mishkin;
Feb. 6: Goodale's reinterpretation of Mishkin's theory
Feb. 7: Franz' critique of Goodale's experiments
Week 6 - **TAKE-HOME TEST**
(Feb. 11) Pick up take-home term test in my office (4:30 - 5:20 p.m.)
(Feb. 13) No Class
(Feb. 14) Hand in take-home term test to me in my office (4:30 - 5:20 p.m.)

Week 7 (Feb. 18, 20, 21) - **MID-TERM RECESS; NO CLASS**

Week 8 (Feb. 25, 27, 28) - **The efficiency of perceptual decisions - I**
Feb. 25: The ideal observer as a modeling tool; Application: detection of symmetry
Feb. 27 & 28: Application: development of contrast sensitivity & colour vision

Week 9 (March 4, 6, 7) - **The efficiency of perceptual decisions - II**
March 4: Noisy template model of pattern vision
March 6: aging & contrast sensitivity
March 7: face & letter recognition

Week 10 (March 11, 13, 14) - **The efficiency of perceptual decisions - III**
March 11: faces & letters: spatial frequency tuning & selective spatial sampling
March 13: visual completion of partly-occluded objects
March 14: stimulus uncertainty & cueing effects

Week 11 (March 18, 20, 21) - **Visual search**

March 18: Visual Search: low-level vs. high-level factors
March 20-21: Signal Detection Models of Visual Search

**Week 12** (March 25, 27, 28) - *Perceptual learning*


March 25: Stimulus & task specificity
March 27: Roles of feedback, attention, & sleep
March 28: What changes with learning?

**Week 13** (April 1, 3, 4) - *OPEN*

The last 3 classes are left open in case we fall behind schedule.

April 4: TERM PAPERS ARE DUE AT THE END OF CLASS
Term Papers

Description of the assignment: You are to write an essay that i) summarizes and critically evaluates research on a particular topic in visual perception; and ii) outlines the stimulus, methods, and design of a proposed experiment on that topic. The paper is to be typewritten (double-spaced), must refer to at least three published research articles that do not appear on the class reading list, and must not exceed 12 pages in length. Stylistic conventions of the American Psychological Association must be observed. Papers are due at the beginning of the final class.

You should approach this assignment as though you were trying to convince a member of the Psychology department to supervise your fourth-year thesis: the paper should introduce the topic of interest, summarize the relevant research, and then outline what you want to do. For the purposes of this assignment, assume that the person reading your paper is familiar with the general area of visual perception, but is not familiar with the details of your particular topic. For example, if you wanted to propose an experiment examining the effect of aging on contrast sensitivity, you could assume that the reader understands the general significance of a contrast sensitivity function, standard psychophysical procedures, what a sine wave grating is, etc. Write your paper in a style and tone that is appropriate for that kind of reader. Thus, your research review should describe important or unusual aspects of methodology, the subject population, the experimental findings and the authors’ interpretations of their findings. Your research proposal should include a clear statement of the hypotheses being examined in your proposed experiment, how it relates to the experiments discussed in your review, a description of the independent and dependent variables, and an outline of your predictions.

Grading

Your papers will be rated on three 5-point scales -- writing, content, and originality -- which are described below. Each paper will be rated by two independent observers. The scores on each scale will be averaged and then summed to produce your final grade.

Writing: spelling, grammar, coherence, organization, APA format, etc.

Content: details of the reviewed studies; is sufficient information given for the reader to understand what was done in those studies? in the proposed experiment(s)? does the proposed study make sense? is it well designed? does it address the experimental question?

Originality: critical evaluation of the reviewed studies; novel or unusual aspects of method, stimuli, and design of proposed experiment. A critical evaluation should address, but need not be limited to, some or all of the following issues: i) potential problems with methodology, analyses and interpretations; ii) judgments about the relative merit of different studies (which findings are more likely to be true and why); iii) how various findings relate to, or differ from, each other; iv) possible explanations of conflicting results; v) alternative explanations that were not considered by the authors.