



UNIVERSITY OF
TORONTO
SCARBOROUGH

THE UNIVERSITY OF TORONTO SCARBOROUGH
Department of Psychology

PSYC51: The Cognitive Neuroscience of Vision, Fall 2015

1.0 CALENDAR DESCRIPTION

This course will provide an in-depth examination of research in the field of visual cognitive neuroscience. Topics will include the visual perception of object features (shape, colour, texture), the perception of high-level categories (objects, faces, bodies, scenes), visual attention, and comparisons between the human and monkey visual systems.

2.0 COURSE INFORMATION

Prerequisite: PSYB51H3 or PSYB57H3 or PSYB65H3

Exclusion: PSY380H

Class meeting time: Tuesdays between 3 pm and 5 pm, Room SW 143

Textbook: Farah, M.J. (2000). *The Cognitive Neuroscience of Vision*. Blackwell Publishing: Malden, MA, USA.

3.0 INSTRUCTOR AND TEACHING ASSISTANT CONTACT INFORMATION

Instructor:

Professor Jonathan Cant [email: jonathan.cant@utoronto.ca (please put PSYC51 in the subject line of any emails); office hours: Thursdays between 2 – 4 pm (SW 411)]

Teaching assistants:

Matthew Lowe (matthew.lowe@mail.utoronto.ca)

Sol Sun (sol.sun@mail.utoronto.ca)

TA Office hours: will be held in SW411A, time TBA.

4.0 ONLINE COURSE RESOURCES

Blackboard: <https://portal.utoronto.ca/webapps/portal/frameset.jsp>

Blackboard will be used as the main online resource for this course. All important course-related information (e.g. announcements, syllabus, class schedule, assignment information, message boards, and grades) will be available via Black Board.

5.0 DETAILED COURSE DESCRIPTION

The purpose of this course is to introduce you to a number of fundamental concepts in the study of the cognitive neuroscience of vision. You will learn about the history of research in each topic area, and will also learn about the current understanding of how each concept is represented in the brain. We will be focusing on research conducted using a number of different experimental methods [e.g., behavioural psychophysics, human neuropsychology, monkey electrophysiology, transcranial magnetic stimulation (TMS), and brain imaging techniques such as functional magnetic resonance imaging (fMRI), electroencephalography (EEG), magnetoencephalography (MEG), and positron emission tomography (PET)]. The topics covered, and the associated readings, are listed in the chart below.

As a student in this course, you can expect to develop and improve upon the following types of skills, all of which are important for future academic or work-related endeavors: critical reasoning, problem solving, public speaking, and effective scholarly writing. Moreover, you will have developed knowledge in current topics of interest in visual cognition, perception, and memory, and will be able to relate this knowledge to the broader question of how information is represented in the human brain.

Class Schedule and Readings:

| Date | Topic | Reading |
|------------------|---|--|
| September 8 | Course introduction; early visual system (retina → LGN) | Chapter 1 (pages 1 – 12) |
| September 15 | Primary visual cortex Low- to mid-level vision | Chapter 1 (pages 12 – 28) Chapter 2 |
| September 22 | Shape and object processing | Chapters 3 & 4 |
| September 29 | Face processing | Chapter 5 |
| October 6 | Mid-term exam | |
| October 13 | READING WEEK, NO CLASS | |
| October 20 | Scene and body processing | |
| October 27 | Word processing; 1 ST analysis/thought paper due | Chapter 6 |
| November 3 | Visual attention | Chapter 7 |
| November 10 | Hemispatial neglect | Chapter 8 |
| November 17 | Visual awareness | Chapter 10 |
| November 24 | Group presentations | |
| December 1 | Group Presentations; 2 nd analysis/thought paper due | |
| To be determined | Final Exam | |

6.0 EVALUATION

Mid-term exam: 25%

Analysis/Thought papers: 30%

Group presentation: 20%

Final exam: 25%

Mid-term exam (25%)

The mid-term examination will cover material from the first four lectures, and will include material from both the lectures and the assigned readings. Since some of the material presented in class will not be covered in the readings (and vice versa), it is important to both attend class and to read the required chapters. There will be a number of multiple choice questions to answer, and you will have to write one essay, the topic of which you will choose from four different essay questions (one question provided per lecture topic).

Analysis/Thought papers (30%)

You will be required to write two analysis/thought papers, each of which is worth 15% of your final grade. The purpose of these papers is to improve your ability to critically analyse scientific research published in a peer-reviewed journal, and to improve your scientific writing ability. The first paper will be based on a specific research article that focuses on face processing (due at the beginning of class on October 27), and the second paper will be based on a specific research article that focuses on visual awareness (due at the beginning of class on December 1). In each paper, you will both evaluate the content of the article, and will form your own opinion of the research presented in the article.

a) **Evaluating the content of the article:** this involves summarizing the rationale of the article, the specific hypotheses tested, the methods used, the results found, and the conclusions made by the authors. This summary should be no more than one page in length.

b) **Forming your own opinion of the article:** this involves critically analysing the data/arguments presented in the article, and evaluating whether or not the conclusions made are supported by the data or arguments. In other words, do you agree or disagree with the conclusions made in the article? If you liked the article, what aspects of it did you like? If you did not like the article, what aspects of it do you think could be improved? In this section, you will need to cite two additional research papers on the topic that support your critical analysis of the primary article.

c) **Formatting:** Each paper should be no longer than 1000 words in length (not including title and references), should be in 12-point font, should be double-spaced with 1 inch margins, and should include a reference list prepared according to APA format.

Note: papers are due in hard copy at the beginning of the specified class.

Group Presentation (20%)

You will be required to give one group presentation in class (using a combination of presentation techniques, such as PowerPoint slides and video files). Your presentation will focus on a specific visual illusion, and it is the job of your group to teach the class about your visual illusion. So, in your presentation, your group will need to: a) show the visual illusion to the class; b) provide a scientific explanation of the illusion based on our knowledge of the

visual system; and c) briefly review the methods, results, and findings of scientific articles that have studied the illusion (up to a maximum of three articles). At the beginning of the semester, you will be randomly assigned to a group, and your group will be randomly assigned a visual illusion to study. In addition to the in-class presentation, each member of the group will be required to submit a written report summarizing an original research article focusing on their visual illusion. This written report should be no longer than 500 words in length (not including title and references; 12 point font; 1 inch margins), and should briefly and concisely summarize the rationale, methods, results, and findings of the article. Each group member must submit a written report based on a unique research article (if two or more group members submit a report on the same article, all members will receive 0% on the written component of the group presentation), so it is your responsibility to ensure that your research article is different from the articles selected by all other group members. It is permissible to use the research article(s) that were included in the in-class group presentation, but only one group member can submit a written report for each article used. **The written report is due in hard copy at the beginning of class the day your group is scheduled to present.** This group presentation is worth 20% of your final grade (of which the written report is worth 5%), and should be no longer than 10 minutes in length. As a member of a group, you are responsible for not only working as hard as other members in your group, but also ensuring that all group members are contributing equally to the project.

Final Exam (25%)

The final examination will cover material from the last five lectures, and will include material from both the lectures and the assigned readings. The format of this examination is identical to the format of the mid-term examination.

Important Dates

- October 6:** Mid-term exam (covering material from lectures 1 – 4, and specified assigned readings)
- October 27:** Face processing analysis/thought paper due in hard copy at the beginning of class
- November 24:** First round of group presentations (written reports due in hard copy at the beginning of class)
- December 1:** Second round of group presentations (written reports due in hard copy at the beginning of class);
Visual Awareness analysis/thought paper due in hard copy at the beginning of class
- TBD:** Final exam (covering material from lectures 5 – 9, and specified assigned readings)

Policy on late assignments: late assignments will lose 10% for each day past the deadline that they are not submitted. Extensions will only be granted with proper documentation (i.e., documented family emergency, or UTSC medical certificate). Please note, according to UTSC policy, I am not permitted to extend the deadline for any assignment past the last day of classes for the semester (December 3).

Policy on missed examinations: students are expected to write both examinations. If an exam is missed, it will only be excused with proper documentation (i.e., documented family emergency, or UTSC medical certificate). There will be no make-up date for the

mid-term examination. If a student fails to write the mid-term examination and provides proper documentation, the final examination will be re-weighted to 50% of their final grade. If a student fails to write the final examination, they may petition the Registrar's office for permission to write a deferred exam, but note that the Registrar's office only grants these petitions under conditions of illness or extreme emergency at the time of the examination (see http://www.utsc.utoronto.ca/~registrar/current_students/deferred_exams for more details). Thus, you must ensure that you have proper documentation to support your petition (e.g., documented family emergency, or UTSC medical certificate). Students who fail to provide proper documentation for missing either the mid-term or final exam will receive a mark of 0% on that exam.

7.0 ADDITIONAL INFORMATION

Help With Writing

If you would like help with academic writing, the following resources are available to you:

- The Centre for Teaching and Learning (AC312) Writing Centre offers students one-to-one appointments and supplementary materials to help improve upon their writing skills.

<http://ctl.utsc.utoronto.ca/home/>

<http://ctl.utsc.utoronto.ca/twc/>

- The English Language Development Centre offers support and specialized writing programs for students who do not speak English as their primary language.

<http://ctl.utsc.utoronto.ca/eld/>

- Advice on academic writing

<http://www.writing.utoronto.ca/advice>

Academic Integrity

Academic integrity is taken very seriously at UTSC, as it is important to maintain our community which honours the values of honesty, trust, respect, fairness, and the responsibility to protect students within this community, and the value of the degree towards which they are all working towards.

Students are directed to read the appropriate policy, specifically, the University of Toronto's *Code of Behaviour on Academic Matters*, which can be found at the following website:

<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>

According to Section B of the *Code*, it is an offence for students:

- To use someone else's ideas or words in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, i.e. to commit plagiarism.
- To include false, misleading or concocted citations in their work.
- To obtain unauthorized assistance on any assignment.
- To provide unauthorized assistance to another student. This includes showing another student completed work.
- To submit their own work for credit in more than one course without the permission of the instructor

- To falsify or alter any documentation required by the University. This includes, but is not limited to, doctor's notes.
- To use or possess an unauthorized aid in any test or exam.

There are other offences covered under the *Code*, but these are by far the most common. Please respect these rules and the values which they protect.

Written assignments may be subject to submission for textual similarity review using the commercial plagiarism detection software under license to the University (<http://www.turnitin.com>). All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system.

AccessAbility Services

If you are a student with a disability (e.g. physical, learning), you are encouraged to contact AccessAbility Services (S302, 416-287-7560) to arrange accommodation for the course. After you have provided the appropriate documentation, staff in AccessAbility Services assess your needs and determine appropriate and reasonable accommodations, and I liaise with them where appropriate. All information that AccessAbility Services collects from students about their disabilities is kept in strict confidence as prescribed by law.

<http://www.utsc.utoronto.ca/ability>

Literature Searches

Students can use the following resources when conducting literature searches to find relevant articles for their presentation and final essay:

The UTSC Library (AC235)

<http://www.library.utoronto.ca/utsc/>

PubMed

<http://www.ncbi.nlm.nih.gov/pubmed>

PsychINFO

<http://www.apa.org/pubs/databases/psycinfo/index.aspx>

Google Scholar

<http://scholar.google.ca/>

For Your Health

The Health and Wellness Centre (SL270, 416-287-7065) provides diagnostic, treatment and referral services for all illnesses ranging from the medical to psychological to health promotion. The professional staff of physicians, nurses and counselors provides personal advice and assistance with family issues, eating disorders, depression, stress, drug and alcohol abuse, relationship issues, a positive space for gender/sexuality issues, and more.

<http://www.utsc.utoronto.ca/wellness>