

Cognitive Neuroscience of Decision Making

PSYC57H3

Instructor: Cendri Hutcherson
Office: SW565
Phone: 416-287-7447
Email: c.hutcherson@utoronto.ca
Office hours: M 4-6pm

TAs: Dean Carcone
dean.carcone@mail
Tyler Roberts
robertstyler192@gmail.com
Daniel Wilson
danielj.wilson@mail
Office hours: by appointment

Course Description

How did you decide to take this course? Why is it so hard to resist ice cream and chips? How do you steer true to your moral compass? Decision-making involves identifying and evaluating options in order to enact an appropriate response. It lies at the heart of most human behaviors, yet is in many ways still poorly understood. Over the last few decades, a unique synthesis of observations from neuroscience, psychology, and economics has revolutionized our understanding of both simple and complex choice and generated remarkable insights. This class covers some of the major neural and computational models of decision-making that have emerged from this work, and will explore implications of these models for when and why people choose wisely (or don't!).

Textbook

Glimcher, P. & Fehr, E. (2014) Neuroeconomics: Decision Making and the Brain, 2nd Edition.

Note: if purchasing this book, make sure to buy the 2nd edition (blue cover). The field is changing fast enough that the 1st edition is already out of date!

Grading

Midterm Exam (Feb. 16)	35%
Final Exam (Date TBD)	35%
Homework assignments (4)	24% (6% per homework)
Class participation	6%

Description of grade components:

1. Midterm exam: The midterm will consist of multiple-choice and short answer questions covering the lectures and readings from Topics 1-5, and will take place in class on Feb. 16.
2. Final exam: Like the midterm, the final will consist of multiple choice and short answer questions covering lecture material and readings for Topics 6-10. The date is set by the UTSC registrar, will take place sometime from April 5-22, and will be announced as soon as it is set.
3. Homework assignments: This course aims to introduce you to some of the major neural, mathematical and computational models in decision neuroscience, as well as to help you develop basic facility in the use of statistical software and computer programming. In the service of these twin goals, you will be asked to complete four homework assignments during the semester. Some of these assignments will involve performing statistical analysis on both your own and others' decision making behavior, and writing computer programs to implement key aspects of computational models.

Don't panic if you don't feel particularly math- or computer-savvy!!

Homework assignments will walk you step-by-step through an exploration of the brain and of the computational models, building from simpler concepts and tasks to more complex ones. In addition, the TAs are here to help you if and when you need guidance to complete the homework. Assignments (which are due by Sundays at midnight) will be posted on Blackboard 10 days before they are due, and will typically require you to submit both written responses as well as, in some cases, snippets of statistical or computer-programming code that you have written. Late submissions will receive a 10% penalty for every 24-hour period beyond the deadline, unless appropriate documentation of an emergency situation is received (see the departmental policy on missed term work for further details).

4. Class participation: Although this is a lecture-style class, a major goal of the class is to engage you in substantive interaction with me, the TAs, and other students in the class. This interaction will form the basis of your participation grade. Participation can take a number of forms, and will be graded on a simple point system with 8 total points possible. Each documented instance of participation is worth 1 point, and include the following:
 - Asking or responding to questions in class - 1 pt/class
 - Responding using the iClicker - 1 pt/class
 - Attending office hour sessions - 1 pt/session

Discussion board- 1 pt/substantive post (can be a question, comment, or response to another student's post)

Departmental Policy - Missed Term Work due to Medical Illness or Emergency:

All students citing a documented reason for missed term work (this includes homework assignments and midterm exams) must bring their documentation to the Undergraduate Course Coordinator, Ainsley Lawson, **within three (3) business days** of the term test / assignment due date. All documentation must be accompanied by the departmental [Request for Missed Term Work form](http://uoft.me/PSY-MTW) (<http://uoft.me/PSY-MTW>).

In the case of missed term work due to illness, only an **original copy** of the [official UTSC Verification of Illness Form](http://uoft.me/PSY-MED) (<http://uoft.me/PSY-MED>) will be accepted. Forms are to be completed in full, clearly indicating the start date, anticipated end date, and severity of illness. The physician's registration number and business stamp are required.

In the case of other emergency, a record of visitation to a hospital emergency room or copy of a death certificate may be considered.

Forms should be dropped off in SW427C between 9 AM - 4 PM, Monday through Friday. Upon receipt of the documentation, you will receive an email response from the Course Instructor / Course Coordinator within three business days. The Course Instructor reserves the right to decide what accommodations (if any) will be made for the missed work.

Note that this policy applies only to missed term work (assignments and midterms). Missed final exams are dealt with by the Registrar's Office (<http://www.utsc.utoronto.ca/registrar/missing-examination>).

Failure to adhere to any aspect of this policy may result in a denial of your request for accommodation.

Missed Exams

Midterm. If you are approved to miss the midterm, your final exam score will be reweighted to count for 70% of your course grade. For reasons of fairness, there will be no exceptions to this policy.

Final. If you must miss the final exam, then you should contact the Registrar's Office directly, as I am not authorized to make any changes to the final exam date and time.

Blackboard

The course's Blackboard website is the central location where you will find all important course information, including the syllabus, reading materials and information for homework assignments, handouts, announcements, and supplementary information. Blackboard is also where the course Discussion Board can be found (important both for your participation grade and for getting your questions answered). Lecture materials will be available on the Blackboard site prior to the start of class. To accommodate student discussion, lectures will sometimes deviate from the posted pre-lecture slides. In these cases, finalized lecture slides will be posted within 48 hours after class each week.

To access Blackboard, log on via <https://portal.utoronto.ca/> using your UTORid and password. I strongly recommend regularly checking the "Announcements" sections of the course website, since you are solely responsible for making sure that you stay up to date with course requirements. To facilitate this, please make sure that your Blackboard account is up to date so that your correct email address is listed. If you are registered for the course, you should see this class displayed automatically when you log on via the intranet.

Lectures

Lectures take place on Thursdays from 3-5pm in SW 128, and are designed to present major research areas, theories and experiments from the field of decision neuroscience. While there will be some overlap between lectures and the readings, there will not be a 1-to-1 correspondence. Some things may be covered in lecture but will not appear in the reading and vice-versa. I therefore recommend that you make every effort to attend class each week. Attendance and participation during lectures is also a good way to achieve full points for your course participation grade.

Please note: there will be no lectures on Feb. 16 (replaced by an in-class midterm) and Feb. 23 (reading week). In addition, because I will be away for a conference on Jan. 19, there will be no in-class lecture for that day.

Office Hours (SW565, Mondays 4-6pm)

Office hours are a great way for you to get answers to specific questions you may have, as well as a way for you to receive points for participation. They are also a good forum for hearing answers to questions that other students have and learning about things you may not have thought about. When you arrive for office hours, please come inside my office, even if other students are already present. That way I will know you are present, and you can hear the discussion with other students.

iClicker

I will occasionally be polling the class during lectures to add an element of interaction, as well as to provide a way for you to earn participation points. This participation will rely on the iClicker remote polling technology, for which you can use the iClicker device or the mobile phone app. You can register your iClicker at <http://www.iclicker.com/registration/Register.aspx>. Enter your first and last name, clicker id (the number above the bar code in the back of the device), and your UTORid (not your student number). iClickers can be purchased at the UTSC bookstore, bought used, or borrowed, as long as the device is registered under your own name and UTORid. Please note: not every class will include an iClicker component.

Academic Integrity

Academic integrity is a cornerstone of University of Toronto policy. It is critically important both to maintain a community that honours the values of honesty, trust, respect, fairness and responsibility and to protect you, the students. According to Section B of the University of Toronto's Code of Behaviour on Academic Matters which all students are expected to know and respect, it is an offence for students to 1) use someone else's ideas or words in their own work without acknowledging those ideas/words with a citation and quotation marks, i.e. to commit plagiarism; 2) include false, misleading or concocted citations in their work; 3) obtain or provide unauthorized assistance on any assignment; 4) submit their own work for credit in more than one course without the permission of the instructor; 5) falsify or alter any documentation required by the University, including doctor's notes; or 6) 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.

You may see advertisements for services offering grammar help, essay editing and proof-reading. Be very careful. If these services take a draft of your work and significantly change the content and/or language, you may be committing an academic offence (unauthorized assistance) under the *Code of Behaviour on Academic Matters*.

It is much better and safer to take your draft to the Writing Centre as early as you can. They will give you guidance you can trust. Students for whom English is not their first language should go to the English Language Development Centre.

If you decide to use these services in spite of this caution, you must keep a draft of your work and any notes you made before you got help and be prepared to give it to your instructor on request. Please respect these rules and the values they protect.

English Language Development Center

This class assumes a degree of fluency in English, for both writing and comprehension. All students are encouraged to take the Academic English Health Check at the start of the term, and to visit the English Language Development Center for support if needed. The ELDC supports all students in developing better Academic English and the critical thinking skills needed in academic communication. Make use of the personalized support in academic writing skills development and Café sessions to enhance your ability to do better in the various components of this course. Details and sign-up information: <http://www.utsc.utoronto.ca/eld/>

Extra Credit

I am committed to incorporating your feedback in order to make this class a challenging but fun and worthwhile experience for students. In service of this goal, I will be asking a short series of questions to evaluate the strengths and weaknesses of each week's lecture, readings, and homeworks (10 in all). Students who complete these weekly evaluations can earn up to a maximum of 3% extra credit, which will be added to their total grade at the end of the semester. The amount of extra credit will depend on the percentage of evaluations provided, marked simply as completed or not. Feedback will be anonymized before it is given to me, and I am keenly interested in improving the class, so you should feel free to give honest evaluations. Weekly feedback questions can be found under the "Extra Credit" section on Blackboard.

Course Schedule

DATE	TOPIC	READINGS	ASSIGNMENTS
Jan 5	Topic 1. Logistics; Introduction to Decision Making and the Brain	Ch. 1, Ch. 6 Optional review: Ch. 5	
Jan. 12	Topic 2: The value of things: Costs and benefits, risks and rewards	Ch. 13	
Jan. 19	NOTE: Class time canceled (away at conference)	Ch. 4 (see homework 1 for details)	Homework 1: Basics Due: Jan. 22
Jan. 26	Topic 3: Reward Learning I: Learning from the past	Ch. 15	
Feb. 2	Topic 4: Reward learning II: Predicting the future	Ch. 21	Homework 2: Reward learning Due: Feb. 5
Feb. 9	Topic 5: Taking action: turning evidence into a choice	Ch. 19	
Feb. 16	Midterm Exam (In class)		
Feb. 23	Reading Week	NO CLASS	
Mar. 2	Topic 6: Attention, context and expectancy effects	Ch. 24	Homework 3 Implementing choice Due: Mar. 5
Mar. 9	Topic 7: Intertemporal choice and self-control	Ch. 10	
Mar. 16	Topic 8: Social Decisions I: Altruism and Morality	Ch. 11	
Mar. 23	Topic 9: Social Decisions II: Strategy and interaction	Ch. 25, 26	Homework 4: Social choice, discounting Due: Mar. 26
Mar. 30	Topic 10: Pharmacology, addiction, and disorders of decision making	Ch. 14	