

Acknowledgment

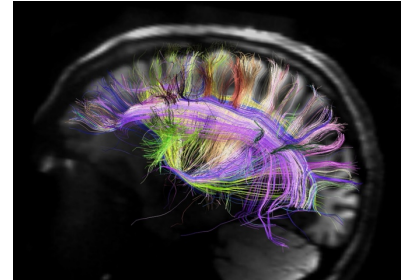
UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the x^wməθk^wəyəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on in their culture, history, and traditions from one generation to the next on this site.

PSYCHOLOGY 365

Cognitive Neuroscience

3 credits

Pre-requisites: One of PSYC 270 or COGS 200.



University of British Columbia, Vancouver

Jan-April, 2021

T-Th 3:30-5:00

Instructor: Dr. Rebecca Todd
E-mail: becket.todd@psych.ubc.ca

TA: Brandon Forys
E-mail: brandon.forys@ubc.ca

TA: Maria (Joey) Manaligod
E-mail: mmanaligod@psych.ubc.ca

Peer Tutor: Amy Lu
E-mail: amyjylu@mail.ubc.ca

Peer Tutor: Parisa Safarzadeh
E-mail: parisaks@student.ubc.ca

I. About your instructor and teaching assistants

Dr. Rebecca (Beck) Todd (she/her) is a faculty member in the Cognitive Science area of Psychology. She received her Ph.D. in Psychology and Neuroscience from University of Toronto. Her interests focus on the influence of emotion on attention and memory, and why our attention is tuned to things in the environment because of our own unique history and priorities. She also studies brain processes that contribute to these "biases" in attention and memory, as well as how they develop across the lifespan.

Brandon Forys is a first-year MA student in the Cognitive Science area of Psychology under the supervision of Dr. Rebecca Todd and Dr. Alan Kingstone. His research focuses on characterizing the brain circuits that underpin actions we take to avoid unpleasant situations or approach pleasant ones, and

developing computational models of cognitive processes that influence our use of physical effort to complete tasks. Separately, he also investigates factors influencing corticosterone regulation in the brains of rodents (with Dr. Kiran Soma) and has developed a set of tools for analyzing the behaviour and brain activity of mice using AI (with Dr. Tim Murphy) .

Maria (Joey) Manaligod is a first-year PhD student in cognitive psychology. Her research focuses on how preferences for everyday objects shift through experience and how they influence the way we attend to them later on. On the side, she is also interested in women's health, particularly how stress influences cognitive performance at various phases of the menstrual cycle.

Amy Lu is a fourth-year undergraduate student in Cognitive Systems (Brain & Cognition). She has a vast world of interests but is particularly interested in understanding the ways we think and communicate our emotions and thoughts to one another, as well as how cognition develops through maturation. Aside from nerding out on psychology, she is also an avid lover of art, animals and sustainability alike. Feel free to reach out to chat any time!

Parisa Safarzadeh is a recent UBC graduate, with a BSc in Behavioural Neuroscience. She is currently volunteering as an Speech-Language Pathologist assistant for children with Autism Spectrum Disorder and working as an audiology research assistant at the Middle Ear Lab at UBC. She is interested in the perceptual consequences of hidden hearing loss and its effects on cognition, mainly in working memory and attention. In her free time, she loves biking around the city, singing/songwriting, and eating a little too much sushi.

Course description and goals. The two-fold goal of this course is to introduce you to questions that drive research in cognitive neuroscience and the methods we have to answer them, while engaging you in active and critical discussion of current research and controversies in the field. That is, the goal is to give you a taste of classic studies and late-breaking news in the neuroscience of human cognition, while giving you the skills to make your own decisions about what information means and what to do about it in the world of FAKE NEWS! Topics include the cognitive neuroscience of perception, attention, learning, memory, and decision-making. After successful completion of this course, you will have a better understanding of what we know and don't know about the mysterious workings of the human mind and brain — and a glimpse of what the future may hold.

II. **Course Materials**

Classes

Lectures. Pre-recorded lectures will be posted on Canvas by the scheduled class time and will remain available for the duration of the course.

Scheduled class times. One hour of the scheduled class time on Tuesday (3:30-4:30pm) will be for optional group Q & A and discussion. Zoom links will be posted on Canvas. Thursdays from 3-4:30 pm will be reserved for scheduled one on one "office hours" meetings with Prof. Todd.

Readings

Required Textbook. Richard Passingham (2016). *Cognitive Neuroscience: A Very Short Introduction*. Oxford University Press. Available at the Bookstore. Also available as an ebook. ISBN: 9780198786221. The inexpensive and very readable book will provide a general overview and some background for the experimental studies we will read and discuss in class.

Other readings. These include peer-reviewed experimental papers which will be posted on Canvas. Papers are also available through the UBC library. There will also be videos, media articles, and blog posts occasionally assigned.

Readings are meant to provide background (textbook) as well as details (papers) of scientific studies to be covered in each class, and will be due before class. The lectures will not simply recapitulate the readings, but will build on, expand and clarify material in the readings as well as *provide additional information*. Therefore, it's important to make sure you do the readings before the relevant lecture so that you have the necessary background for the lecture material. The lectures will highlight the information from the papers that you will need for the exams, so that you can study what's important. Most weeks you will be required to read ONE empirical paper a week. Papers listed in parentheses are optional, and are sources of material that will be in the lecture. **FOR OPTIONAL PAPERS YOU WILL ONLY BE EXAMINED ON MATERIAL THAT IS IN THE LECTURE.**

III. Course webpage

<https://canvas.ubc.ca/> (location for important announcements, readings, lecture notes, discussion, and grades)

IV. Course requirements

The assignments in this course are designed to foster an understanding of cutting-edge research in cognitive neuroscience that is informed by background knowledge of how thinking has developed in each research area. Readings, lectures, and exams will be geared towards this goal.

Academic concessions

For course policies regarding in-term academic concessions, please refer to the relevant UBC calendar entry: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,329,0,0>.

Exams

Exams will cover all in-class (e.g., lecture and video) and reading material. Note that lectures add to and elaborate on reading materials, and will contain information that is not in the readings. As we go along there will be more to synthesize and you will have had more practice doing it. **For each exam there will be two sittings: One during class time and one at gpm PST for those who are in other time zones or have demands on them that make taking exams during class time challenging**. Course policy is that we do not give make-up exams. If you are excused from one of the midterms we will distribute that proportion of your grade across the other exams.

2 Midterms (35% for the exam you do better on and 20% for the exam you do worse on).

These will draw on both lectures and the readings. For superior performance; you must have a clear understanding of both. There are two midterms so that you can digest the material in smaller chunks, which should allow you to master it better. Having two midterms also gives you more practice for the final exam, and the chance to keep bringing up your game, as well as giving you some insurance if one of the exam days is just a bad day.

Final Examination (35% of total course grade). While there will be more emphasis on material not covered in the mid-terms, the final will be cumulative in that you will be expected to synthesize more recent material with material learned earlier in the course. **Please note: the date of the final will not be announced until mid-February and so I strongly advise you NOT to plan travel until you learn the dates of your final exams. You cannot take the final on a different date/time unless you have a documented medical illness.**

Participation (10% of total course grade). Participation grades will be based on successfully completing canvas quizzes. You must complete the quizzes for each module to get credit for them. Your score on the quiz will count toward your total participation grade. As they are meant to encourage you to pay attention and remember key concepts as we go along, you can take them as many times as necessary to get 100%. You have until the end of term to complete them for the participation grade, but the questions on them are designed to cover material that can show up in exams, and they will only help you with the midterms if you complete them beforehand.

Piazza for Discussions

This term we will be using Piazza for class discussion. The system is designed to provide fast and efficient help from classmates, the TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com. You will be able to sign up on the class Q&A forum by clicking the Piazza link in Canvas. You will need to create a new password. After that you can view Piazza by clicking the Canvas link.

Research participation (extra credit). You also have the opportunity to earn up to **three (3)** extra percentage points on your overall final grade by participating in studies regularly conducted by the Psychology Department and coordinated through the Human Subject Pool (HSP). For each hour of experimental participation you can earn one credit towards your final grade. You can sign up for studies by visiting <https://ubc-psych.sona-systems.com/>. If you prefer, you can earn these same extra credits by completing a library-writing project, in which you read and summarize a peer-reviewed research article. You can find out more about how you can earn extra credits at <https://psych.ubc.ca/hsp>. There you will find a detailed guide about how to participate in the HSP, how-to videos, and a list of frequently asked questions.

One percentage point is assigned to your final grade for each hour of participation and partial credits will be rounded down (i.e., 1.5 hours = 1% extra credit). Credits can be recorded and tracked via the subject credit website. These credits are added to your grade at the end of the course. If you do not correctly assign your credits to this course, you will NOT receive credit so please make sure you have done this correctly.

As an alternative to participating in studies, you may choose to complete library writing projects, in which you read and summarize a research article; each article summary counts as one hour of research participation. You must select a research article (not a letter to the editor, commentary, or review paper) published between 2000-present in the journal *Psychological Science*. Each summary should be about 500 words and should include the purpose, method and results of the study. Library assignments are due on the last day of classes (Friday April 5 for the upcoming term). If you choose the library option, you should submit their assignment on TurnItIn. Please contact Prof. Todd for the class ID for "Psychology HSP (Winter 2020)", password "research". A full description of the library assignment is available on page 4 of "Info for Participants" document.

In addition, you can earn one of your 3 extra percentage points (HSP or library) points by attending the UBC Neuroscience Undergraduate Research Conference 2021. That is, you could earn 2 credits via HSP and 1 via the conference. This will take place on **Thursday January 28th 2021 via Zoom**. It's a great opportunity to learn more about the neuroscience related research being conducted by fellow UBC undergraduates. In addition to oral and poster presentations from students, there will be 6 workshops on topics like Artificial Intelligence, Careers in Neuroscience, and Life after Undergrad. Please see the website <https://ubcneuroscienceclub.wixsite.com/uncweb/> to register for free. Attendance will be taken

during the conference, to notify Dr. Todd who attended. If you have any questions regarding the conference please e-mail ubcneuroscienceclub@gmail.com.

V. Course grading

Your final grade consists of the items described in Section IV. Performance for each of the items above will be put into a calculator that outputs your final course percentage earned. As mentioned in Section IV, any extra credit earned will be added to this final score.

You are earning a degree at a highly reputable post-secondary institution. Therefore, criteria for success are high. The Faculty of Arts offers the following guidelines that broadly characterize the kind of work that is generally associated with the main grade ranges.

A RANGE: *Exceptional Performance.* Strong evidence of original thinking; good organization in written work; capacity to analyze (i.e., break ideas down) and to synthesize (i.e., bring different ideas together in a coherent way); superior grasp of subject matter with sound critical evaluations; evidence of extensive knowledge base.

B RANGE: *Competent Performance.* Evidence of grasp of subject matter; some evidence of critical capacity and analytic ability; reasonable understanding of relevant issues; evidence of familiarity with the literature.

D-C RANGE: *Adequate Performance.* Understanding of the subject matter; ability to develop solutions to simple problems in the material; acceptable but uninspired work; not seriously faulty but lacking style and vigor.

F RANGE: *Inadequate Performance.* Little or no evidence of understanding of the subject matter; weakness in critical and analytical skills; limited or irrelevant use of the literature.

VI. University policies

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access, including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on [the UBC Senate website](#).

VII. Course policies

Readings

The readings will be current experimental papers featuring cutting edge studies in cognitive neuroscience, supplemented by short chapters from the Passingham textbook. Note these papers are demanding! I will walk you through how to read these papers and point you to what material is important to know for exams and quizzes and what methodological details are unnecessary for our understanding of the papers.

E-mail policy

Please direct any questions where the answers will be of interest to other class members to Piazza! For other matters, in most cases, e-mails will be answered within 48 hours of receipt (not including weekends). If you send the instructor or teaching assistants an email, the email subject should include the course and nature of the inquiry. Please send questions about grading/assessment to the TAs and about the course content to Prof. Todd. Please note that last-minute emails about test questions may very well not be answered the day before an exam so please plan accordingly.

You are strongly encouraged to use Piazza and to join discussions during the scheduled course time.

Syllabus changes

There may be minor changes to the syllabus during the term. You will be notified of these changes ASAP and no changes will be instituted that dramatically affect your ability to properly prepare for an examination.

Office hours

Thursday's class time will be used for one on one appointments. You can use one on one office hours as well as attending group discussion sessions during Tuesday's class time if you have questions or concerns about any of the material that you wish to discuss live/"in-person." You may also make office hour appointments to ask about graduate school, research or other related questions. If we cannot answer your question(s) about topics beyond the course, we'll direct you to someone who can.

You will need to contact TAs for sessions provided to review your exams if you so choose. If you have any outstanding questions you can fill out a request form and talk to Dr. Todd. Any grading disputes other than calculation errors for the midterms must be handled with Dr. Todd within three weeks of when the scores were released.

"Classroom" conduct

Our virtual classroom is a place where you should always feel safe and respected. It is also a place that is conducive to learning and intellectual curiosity. Any behaviors compromising this environment will not be tolerated and the student(s) and/or individual(s) will be asked to leave.

Access and Diversity

UBC is committed to equal opportunity in education for all students including those with documented physical or learning disabilities. If you believe you fall in this category, please visit this website (<http://www.students.ubc.ca/access/disability-services/support-students/exam-accommodations/>) to take the necessary steps to ensure that you have every opportunity that you deserve to excel here at UBC.

Grade bumps

When computing final grades, the instructor carefully analyzes every single student to determine whether a grade bump is deserved. Bumps *may* be awarded for consistent performance at a major grade boundary or for marked improvement from the midterm to the final (i.e., 10%+). Bumps are not guaranteed and are **not** awarded for non-academic reasons (i.e., student is graduating and/or involved in sports or other extracurricular activities). **DO NOT send the instructor an email asking for a grade bump.**

Academic Misconduct

Cheating, plagiarism, and other forms of academic misconduct are very serious concerns of the University, and the Department of Psychology has taken steps to alleviate them. Relevant to this course, the Department has implemented software that can reliably detect cheating on multiple-choice exams by analyzing the patterns of students' responses. This will be used for every assessment we take in this course. For what how to avoid plagiarism on writing assignments see UBC guidelines for plagiarism: <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959>

In all cases of suspected academic misconduct, the parties involved will be pursued to the fullest extent dictated by the guidelines of the University. Strong evidence of cheating may result in a zero credit for the work in question. According to the University Act (section 61), the President of UBC has the right to impose harsher penalties including (but not limited to) a failing grade for the course, suspension from the University, cancellation of scholarships, or a notation added to a student's transcript.

Do note that during exams, the instructor and invigilators reserve the right to move students in their seating arrangement with no explanation provided.

VIII. Learning analytics

Learning analytics includes the collection and analysis of data about learners to improve teaching and learning. This course will be using the following learning technologies: Canvas & Piazza. Many of these tools capture data about your activity and provide information that can be used to improve the quality of teaching and learning. In this course, I plan to use analytics data to:

- View overall class progress
- Review statistics on course content being accessed to support improvements in the course
- Track participation in discussion forums

IX. Copyright

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the Course Instructor or licensed for use by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline.

Students are permitted to record lectures.

X. Links that you may find useful...

Helpful student information

UBC Academic Calendar

<http://www.calendar.ubc.ca/vancouver/academicyear.cfm>

UBC Access and Diversity

<http://www.students.ubc.ca/access/index.cfm>

Tips to help overcome test anxiety

http://www.swccd.edu/~asc/lrnlinks/test_anxiety.html

WELLNESS RESOURCES

Below you will find a list of resources you may want to utilize if you are struggling in any way to manage your responsibilities while in school or the stresses of life in general.

Campus Lightbox:

One website with links to ALL the mental health resources and more: <https://campuslightbox.com/> Start here!

The Kaleidoscope:

the-kaleidoscope.com

A confidential peer-run mental health support group for UBC students that takes place online at least once a week. You may attend the group if you are experiencing any kind of mental health related challenges, or if you're just feeling stressed about school in general. Registration is not required to attend the group. See the website for meeting times.

Counselling Services:

students.ubc.ca/livewell/services/counselling-services

Phone number: 604-822-3811

Counselling services offers a variety of resources to help you maintain your mental health while in school. You may see a counsellor on an individual basis, attend group counselling, or to document an illness if you should require academic concession.

SpeakEasy:

ams.ubc.ca/services/speakeasy/

Phone number: 604-822-9246

A student run service that offers confidential support for students experiencing crisis. Also a good resource for additional information and referrals within the UBC community.

Empower Me:

http://www.studentcare.ca/rte/en/UniversityofBritishColumbiaAMSGSS_EmpowerMe_EmpowerMe

A 24/7 website/telephone/app resource for mental health, productivity, nutrition, etc. that just emerged this past September. No issues are too big or small. Request support for depression, anxiety, grief, relationship problems, adjusting to life in a new country, addictions, mild substance abuse, educational conflict, disordered eating, and more.

SHARE:

<http://www.vivreshare.org/> Self Harm Anonymous Recovery and Education is a program designed to promote self care and educate about self harm. SHARE support groups meet biweekly; times and locations can be found on their website.

UBC Wellness Centre:

students.ubc.ca/livewell/services/wellness-centre

Phone number: 604-822-8450

Speak with other students about tips for managing stress, keeping healthy sleep and eating patterns, concerns about safe sex and more.

Access and Diversity:

students.ubc.ca/about/access

604-822-5844

Access and Diversity provides accommodations for students living with physical or mental disabilities.

Student Health Services:

students.ubc.ca/livewell/services/student-health-service

604-822-7011

Student health provides students with a variety of healthcare related services to help you maintain your health while studying. Access to doctors and registered nurses.

Mood Disorders Clinic UBC:

ubc-mooddisorders.vch.ca/

A psychiatric program designed specifically to treat individuals living with depression or bipolar disorder.

Live Well, Learn Well:

students.ubc.ca/livewelllearnwell

The Live Well, Learn Well initiative is a resource hub that provides students with information to help improve physical and mental wellbeing.

Mental Health Awareness Club:

ubcmhac.sites.olt.ubc.ca/

A club that offers opportunities to speak about mental health with others and strives to promote mental health awareness throughout the UBC community.

Pacific Spirit Addiction Services:

3rd Floor, 2110 West 43rd Ave Vancouver B.C. V6M 2E1

Phone number: 604-267-3970

A free and confidential service for youth and young adults up to the age of 24. Services include counselling, access to an addiction physician - including usage of a methadone maintenance program - and a drug education series.

AMS Food Bank:

ams.ubc.ca/services/food-bank/

If you are in a financial emergency AMS food bank can provide you with a food hamper. You are able to use the service up to 6 times each term.

UBC Psychology Clinic:

clinic.psych.ubc.ca

Professional psychological services provided to the community, including assessment & treatment for children, adults & families by clinical psychology trainees.

BC Crisis Center:

crisiscentre.bc.ca

Phone number: 604-872-3311. Non-profit, volunteer-driven organization that provides emotional support to youth, adults, and seniors in crisis in BC. Crisis line available 24/7.

Distress Line:

Phone number: 1-800-Suicide (784-2433)

If you are in distress or are worried about someone in distress who may hurt themselves, call 1-800-SUICIDE 24 hours a day to connect to a BC crisis line, without a wait or busy signal.

XI. Censored topics

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities. Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses. For further information and support, please visit: <http://academic.ubc.ca/support-resources/freedom-expression>

Psychology 365 2021: CLASS and reading schedule

May be subject to minor revisions with advance notice from the instructor.

<u>Lecture</u>	<u>Date</u>	<u>Day</u>	<u>Topic</u>	<u>Assignment</u> (readings in parentheses are optional)
1	12-Jan	T	Introduction/Syllabus Module	Syllabus
2	14-Jan	Th	Cognitive Neuroscience: The Good, the Bad, and the Ugly	Passingham Chap 1; How to Read a Scientific Paper for Non-Scientists
3	19-Jan	T	Neuroanatomy Part 1	Neuroanatomy module Part 1
4	21-Jan	Th	Neuroanatomy Part 2	Neuroanatomy module Part 2
5	26-Jan	T	Cognitive Neuroscience methods	Poldrack & Farah, 2015
6	28-Jan	Th	fMRI: Workhorse of Cog Neuro	
7	2-Feb	T	Recognizing objects Part 1	Passingham Chap 2; Brain facts: How AI helps us understand human vision
8	4-Feb	Th	Recognizing Objects Part 2	Neural networks made easy
9	9-Feb	T	Classifying Objects	How to Read a Scientific Paper (Connolly et al., 2012;
10	11-Feb	Th	What is special about faces?	Harada et al., 2020; Cracking face code
15-19 Feb			NO CLASS – Reading Week	
11	23-Feb	T	Midterm 1 (Classes 5-10)	
12	25-Feb	Th	Predicting perception	Egner, Monti & Summerfield, 2009
13	2-Mar	T	Selecting Attention	Passingham Chapter 3
14	4-Mar	Th	Sustaining attention	Rosenberg et al., 2016
15	9-Mar	T	Emotion, motivation and attention	(Panksepp, Affective Neuroscience, Chap 3 up to AFTERTHOUGHT p. 56); Brain Facts: Why you get zoom fatigue
16	11-Mar	Th	Reward and attention (& learning)	Anderson et al., 2016; 2 Dopamine blogs
17	16-Mar	T	Reward & attention continued	
18	18-Mar	Th	The Hippocampus: From space travel to time travel	Passingham Chapter 4
19	23-Mar	T	Midterm 2 (Classes 12 -17)	
20	25-Mar	Th	Episodic memory	How to See a Memory (Bonnizzi & McGuire, 2012)
21	30-Mar	T	Rehearsing and retrieving memories	Bird et al., 2015 (Richter et al., 2016)
22	1-Apr	Th	Rehearsing and retrieving memories continued	
23	6-Apr	T	Making decisions	Passingham Chap 6
24	8-April	Th	Decision making and psychopathy	Mitchell et al., 2002
25	13-April	T	Catch up and review	