

PSYCHOLOGY 365

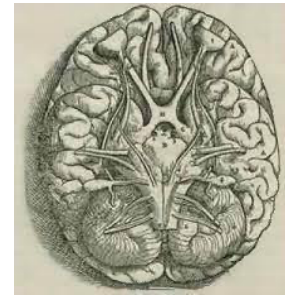
Cognitive Neuroscience

3 credits

Pre-reqs: One of PSYC 260, PSYC 270, COGS 200, NSCI 201

University of British Columbia, Vancouver

Jan-April, 2023 T-Th 3:30-5:00pm HEBB-100



Instructor: Dr. Rebecca Todd (she/her) becket.todd@psych.ubc.ca

TAs: Brandon Forys (he/his) brandon.forys@psych.ubc.ca
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*bear painting by former 365 Student Nicola Tindle

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 been a place of intergenerational learning for the Musqueam people from time immemorial.

Equity, Diversity and Inclusion

We will work to create a learning environment that welcomes, listens to, and respects students of all identities, inclusive of race, gender, sexuality, age, or ability. Unfortunately, like much of psychology and academia, research on cognitive neuroscience is historically built on a small subset of privileged voices. I review the set readings annually and lecture materials every year and am always interested in hearing suggestions for ways they can be made more diverse. Progress in this field will only be made by integrating a more diverse set of experiences, and I would be grateful to receive any input you may have.

I. 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.

Summary of Assessments

Midterm Exam 1 (Feb 7)	20% (if worst exam) or 35% (other)
Midterm Exam 2 (Mar 9)	20% (if worst exam) or 35% (other)
Midterm Exam 3 (Mar 30)	20% (if worst exam) or 35% (other)
Presentations (Apr 4-13)	7%
Participation (By Mar 28)	3%
Total	100%
Human Subject Pool participation	2%

II. COURSE MATERIALS

Classes

In-person class sessions. Classes will be in-person. There will be no live-streaming of classes. However, for a subset of classes the lecture material will consist of pre-recorded videos posted on Canvas and class time will be devoted to optional in-class discussion. Note that these optional sessions (indicated by asterisks in the class schedule at the end of this syllabus) will NOT count towards your participation grade.

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 and online at the UBC library for free! 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

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](#).

Exams

Exams will cover all lecture and reading material indicated in the syllabus. Note that lectures add to and elaborate on reading materials, and will contain information that is not in the readings. **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.**

3 Midterms (35% for the two exams you do better on and 20% for the exam you do worst on).

These will draw on both lectures and the readings. For superior performance; you must have a clear understanding of both. There are three midterms so that you can digest the material in smaller chunks, which should allow you to master it better. Having three midterms also gives you 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. Because there is no final, **the midterms will be cumulative. The focus will be on new material but some high level retention of material from earlier lectures/readings will also be required.**

Final Presentation (7% of total course grade). 5 minute group presentations. Each group will present a cognitive neuroscience paper of the presenters' choice (published since 2015), in the last 2 weeks of classes. These presentations can be either pre-recorded or live. This is where you deploy the paper-reading muscles you've been building over the term. Present the main questions, methods, results, and critique the conclusions in plain, accessible, and entertaining form. Creativity is encouraged. Beyond the required content, the format (podcast, comic strip, video) is up to you. You will form your own groups of 2-3 students. If you do not wish to present as part of a group, presenting solo is also an option. The 5-minute time limit will be strictly enforced.

Participation (3% of total course grade). Participation grades will be based on submitting **one discussion question (1%) and two multiple-choice exam questions** over the course of the term **(2%)**. Full points will be

given to submitting questions that have the potential to inspire extended class discussion, and some of them will be used to guide our optional class discussions. A bonus of writing a good exam question is that it may be used in one of the midterms!

Piazza for Discussions

We will be using Piazza for class discussion. The system is designed to provide fast and efficient help from classmates, the TAs, the peer tutors 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 or at this [link](#). 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 **two (2)** 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 [here](#). 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.

Library Assignment. 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. Library assignments are due on the last day of classes. A full description of the library assignment is available on page 4 of the "Info for Participants" document that can be found on the HSP website. This term, the class ID is 35938309, class name is HSP W2 2022-2023 and password is "Research".

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.

C-D 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. COVID/VIRUS SAFETY

Masks: For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. Masks that cover our noses and mouths are a primary tool to make it harder for COVID-19 and other airborne viruses to find a new host. Surgical masks and N95s are far more effective than cloth masks. To keep us all healthy, I request that you please wear a mask during our class meetings, for your own protection, and the safety and comfort of everyone else in the class.

If you're sick, it's important that you stay home – no matter what you think you may be sick with (e.g., cold, flu, other). If you think you might have COVID symptoms test yourself.

Do not come to class if you are sick, have COVID symptoms, have recently tested positive for COVID, or are required to quarantine. This precaution will help reduce risk and keep everyone safer. In this class, the marking scheme is such that no part of the participation grade requires your in-person presence.

If you are sick on a midterm exam day don't come in. Let us know you were sick and we will redistribute your grade between the other midterm and final, as per policy. You do NOT need a medical note. **If you are sick on a final exam day**, do not attend the exam. You must apply for deferred standing (an academic concession) through [Arts](#) or [Science](#) Advising no later than 48 hours after the missed final exam/assignment. Students who are granted deferred standing write the final exam/assignment at a later date.

If I (the instructor) am sick I will not come to class. I will make an announcement on Canvas and post a recorded video of the lecture(s) for the days I am unable to lecture in person.

VII. UNIVERSITY POLICIES

ACADEMIC INTEGRITY

Academic honesty is essential to the continued functioning of the University of British Columbia as an institution of higher learning and research. All UBC students are expected to behave as honest and responsible members of an academic community. Breach of those expectations or failure to follow the appropriate policies, principles, rules, and guidelines of the University with respect to academic honesty may result in disciplinary action.

We will adhere to the UBC Respectful Environment policy <https://hr.ubc.ca/sites/default/files/wp-content/blogs.dir/14/files/UBC-Statement-on-Respectful-Environment-2014.pdf>.

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](#).

VIII. 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 live 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

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 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](#) 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.

IX. 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

X. 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.

XI. USEFUL LINKS

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/lrnglinks/test_anxiety.html

WELLNESS RESOURCES

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

Crisis Services: If you or someone you know are in an emergency, please contact 911, Crisis Centre BC 1 800 784 2433, or Crisis Services Canada 1 833 456 4566. More information here:

<https://students.ubc.ca/health/accessing-crisis-support-services>.

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

For 24/7 mental health support as covered by UBC:

<https://students.ubc.ca/health/ubc-student-assistance-program-sap>

<https://here2talk.ca/main>

For other UBC Health & Mental Health resources:

<https://students.ubc.ca/health>

<https://students.ubc.ca/health/counselling-services>

For the Centre for Accessibility:

<https://students.ubc.ca/about-student-services/centre-for-accessibility>

For a neutral third party (Ombudsperson): <https://ombudsoffice.ubc.ca/>

Psychology 365 2022: CLASS 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>
			*lecture material in videos. Class attendance is optional.	(readings in parentheses are optional)
1	10-Jan	T	Introduction/Syllabus Module	Syllabus
2	12-Jan	Th	Cognitive Neuroscience: The Good, the Bad, and the Ugly	Passingham Chap 1; How to Read a Scientific Paper for Non-Scientists
3	17-Jan	T	*Neuroanatomy Optional class discussion	Neuroanatomy module
4	19-Jan	Th	Cognitive Neuroscience methods	Poldrack & Farah, 2015
5	24-Jan	T	fMRI: Workhorse of Cog Neuro	
6	26-Jan	Th	*Recognizing objects Part 1 Optional class discussion	Passingham Chap 2; How AI helps us understand human vision; Videos
7	31-Jan	T	Recognizing Objects Part 2	Neural networks made easy; How to Read a Scientific Paper
8	2-Feb	Th	What is special about faces?	Harada et al., 2020; Cracking face code
9	7-Feb	T	Midterm 1	
10	9-Feb	Th	*Classifying Objects Optional discussion	Videos. (Connolly et al., 2012)
11	14-Feb	T	Predicting Perception	Egner, Monti & Summerfield, 2009
12	16-Feb	Th	*Selecting Attention Optional class discussion	Passingham Chapter 3. Videos
	20-24 Feb		NO CLASS – Reading Week	
13	28-Feb	T	Sustaining attention	Rosenberg et al., 2016
14	2-Mar	Th	Emotion, Motivation, and Attention* Optional guest lecture	Videos
15	7-Mar	T	Review	
16	9-Mar	Th	Midterm 2	
17	14-Mar	T	Reward and attention (& learning)	Anderson et al., 2016; 2 Dopamine blogs
18	16-Mar	Th	*The Hippocampus: From space travel to time travel Optional discussion	Passingham Chapter 4; Videos
19	21-Mar	T	Episodic memory*	How to See a Memory
20	23-Mar	Th	Rehearsing and retrieving memories	Bird et al., 2015
21	28-Mar	T	Review	
22	30-Mar	Th	Midterm 3	

23	4-Apr	T	Neurophenomenology
24	6-Apr	Th	Presentations
25	11-Apr	T	Presentations
26	13 Apr	Th	Presentations