ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (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 their culture, history, and traditions from one generation to the next on this site.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value
Behavioral Neuroscience 2	PSYC 371	3 credits

PREREQUISITES

PSYC 370

COREQUISITES

None

CONTACTS

Course Instructor(s)	Contact Details	Office Location	Office Hours
Jason Snyder	jasonsnyder@psych.ubc.ca --put "371" in the subject line to escape spam filters (especially yahoo users) --no email for course content questions (Piazza) --anonymous feedback: https://forms.gle/oWXyzyjCttpVjz8N7	Not a question of where, but when.	--Q&A will primarily occur asynchronously on Piazza. --live Q&A will occur in class as time permits --if additional live Q&A is needed, reach out on Piazza and we will schedule something

COURSE INSTRUCTOR BIOGRAPHICAL STATEMENT

I cringe at the idea of reusing my biographical statement from 370. I could rewrite it entirely. But then what about the 2 or 3 people that did not take 370? Will they have any idea who the real Jason Snyder is? Would the real Jason Snyder please stand up? Funny you should ask because I am already standing up (I use a standing desk). OK let's get serious. Actually, no, forget it let's move on.

OTHER INSTRUCTIONAL STAFF

Teaching Assistant: Alyssa Ash, alyssa.ash@alumni.ubc.ca

COURSE STRUCTURE

This course will be conducted entirely online because there is a pandemic and there are no courses in person yadda yadda yadda you already know this YOU LIVE THIS. The course will be similar to PSYC 370 except the content will be TOTALLY DIFFERENT. But the format will be largely familiar, and I will have the same hairstyle, fashion sense etc. There will be a few tweaks so don't gloss over the rest of this syllabus.

Lectures will be "traditional" and will be live and in the digital flesh. Lecture slides will be provided on Canvas in advance and classes will be recorded so that you can review them later if needed. **Live lectures will be on Zoom Tuesdays and Thursdays from 9:30am to 10:50am:** here is an internet hyperlink to the zoom lectures: https://ubc.zoom.us/j/69107283794?pwd=TmI1bHlFQnl0bVgzY0Jzb1RlTVFadz09**.** Within the lectures we will also have group discussion/exercise sessions where we review concepts together and perform various exercises that reinforce what we have learned. I encourage your attendance at live lectures so you can ask questions in real time, and benefit from discussions and exercises. We will use Piazza for online asynchronous discussion and Q&A; this will be where all course content questions should go, so that student peers can help answer questions and so that all can benefit from the questions that are asked [piazza.com/ubc.ca/winterterm22021/psyc3710022020w/home]. You will be evaluated with 4 tests (no assignments, by popular request). I really liked the way 370 turned out. Despite the online format (or perhaps partly because of it?) I think/hope we did a decent job of learning together about some interesting but also complex topics. Piazza discussions, polls and online tools may have helped me connect with you (and you with your peers) to make this a good learning environment. I hope we can do the same with 371 (this isn't a trivial aspiration because this is the first time I have taught this course!).

SCHEDULE OF TOPICS

	Section 1 – Motor systems & behavior selection
Jan. 12	Lecture 1: Warmup, planning (aka *what do you want to learn about?*)
Jan. 14	Lecture 2: Vestibular & Gustatory systems
Jan. 19	Lecture 3: Prefrontal cortex
Jan. 21	Lecture 4: Premotor cortex
Jan. 26	Lecture 5: Frontostriatal circuits
Jan. 28	Lecture 6: Reflexes, Cerebellum
Feb. 2	**Test 1**
	Section 2 – Low level control
Feb. 4	Lecture 7: Control of muscles and glands
Feb. 9	Lecture 8: Homeostasis and autonomic nervous system
Feb. 11	Lecture 9: Autonomic nervous system, stress and behavior
Feb. 15-19	**!!! Reading Week !!!**
Feb. 23	Lecture 10: Amygdala and fear behavior
Feb. 25	Lecture 11: Brain states: rhythms, attention
March 2	Lecture 12: Brain states: arousal, sleep
March 4	**Test 2**
	Section 3 – Brain and behavior across the lifespan
March 9	Lecture 13: Neural development & aging
March 11	Lecture 14: Experience-dependent plasticity in adulthood
March 16	Lecture 15: Repairing the damaged brain
March 18	Lecture 16: Adult neurogenesis – history and cellular properties
March 23	Lecture 17: Adult neurogenesis – circuit and behavioral functions
March 25	**Test 3**

	Section 4 - What makes us human
March 30	Lecture 18: Comparative and evolutionary perspectives
April 1	Lecture 19: Sexual differentiation
April 6	Lecture 20: Language
April 8	Lecture 21: Disorders: Alzheimer's disease & dementia, schizophrenia
April 13	Lecture 22: Disorders: Depression and anxiety
April 18-29	**Exam Period - Test 4**

LEARNING OUTCOMES

This course assumes solid background in behavioral neuroscience, and builds directly upon PSYC 370. In that course, you learned about the basics of cellular neurobiology and how neurons interact in circuits to process sensory information and form memories. Here you will use that background to similarly learn about the neurobiological basis of the major types of behavior we experience on a regular basis. Here are specific learning outcomes and study topics, which are organized into 4 thematically-related sections:

1) **Motor systems and behavior selection**. You know how information enters the brain*, but how does it engage action? In the first section we will learn about frontal cortex and motor systems that regulate how goals are transformed into actions.
    a. Neurons in the frontal cortex and striatum learn about rewards and regulate the actions that attain them
    b. As in the sensory cortex, there is a hierarchical organization, where (anterior) circuits regulate high-level goals and (posterior) circuits regulate specific motor actions
    c. Motor function and action selection are disrupted in addiction and disorders such as Parkinson's disease
    d. Motor acts are ultimately executed by spinal circuitry
    e. The cerebellum fine tunes motor output
2) **Low level control**. Much of what we have learned has been high-level cognition. Here we will learn about how the brain also controls vital bodily functions in order to achieve homeostasis.
    a. The autonomic nervous system and hypothalamus detect the body's internal state and regulate vital bodily functions like temperature, cardiac output, respiration and appetite
    b. Higher brain regions such as the prefrontal cortex, hippocampus and amygdala regulate the response to stressors and threats
    c. Brain states related to attention, arousal and sleep are associated with distinct patterns of neural activity and serve distinct functions.
3) **Brain and behavior across the lifespan**. Once upon a time you were only a single cell. Now you are made up of 37 trillion cells, of which ~100 billion are neurons in your brain. The brain is incredibly complex and the wiring of its circuits are critical. How does this organization occur? How does the mature brain change with aging and experience?
    a. Intrinsic genetic programs guide the development and wiring of the nervous system
    b. Experience induces functionally-relevant plasticity in the developing and adult brain
    c. Plasticity promotes recovery from brain damage
    d. Neurogenesis occurs throughout adulthood in some brain regions and promotes functional plasticity

4) **What makes us human**. Humans are but one species with a CNS. Thus, our brains and our behaviors resemble those of many other creatures. But we are also unique in many respects! How does our knowledge of animal brains help us understand our own? How do we differ from one another? What problems (disorders) do we, as humans, face?
    a. Brains of different organisms have evolved to serve distinct behavioral functions
    b. Sex differences in brain organization and function relate to behavior
    c. The neurobiology of a human-specific behavior: language
    d. Many disorders are uniquely human, but can be modelled in animals

LEARNING ACTIVITIES

We will use a variety of different types of activities to learn the course content:

Lectures: We will of course have lectures! They will be 80 min in length and we will take a break halfway through (remind me in class if I forget!). Given the online format, I cannot keep an eye out for raised hands when lecturing. So if someone could again serve as an assistant and let me know, when I take a natural pause, that some questions have come up then I can answer them in class.

Breakout discussion: We will regularly break from traditional lecturing by forming small groups during class time where you will discuss content, perform exercises and solve problems with one another. The instructor and TA will hop around as best they can to try to provide some guidance in a more intimate fashion than can be achieved in the standard class format. After these breakout sessions, we will regroup as a full class and share what we have learned.

Piazza Asynchronous Discussion: Inevitably, questions will arise outside of class time and so we will use Piazza for asynchronous discussion just as we did in 370. All course content questions should be posted in Piazza and students are encouraged to provide answers, which will be moderated, endorsed or elaborated upon by the instructor and the TA. In order to post a question, one first has to explain their understanding of the problem (i.e. don't just say "I don't understand X can someone explain it to me?"). This helps us identify where the confusion lies. Also, many times we answer our own questions when we think carefully about a problem and try to articulate it. Piazza posts will be anonymous to the other students but not the instructor and TA. An extra 2% will be given to the top 5 participants. Here is the signup link for the class Piazza forum: https://piazza.com/ubc.ca/winterterm12020/psyc3700012020w.

Optional thought questions rather than group assignments: The majority of 370 students (52/65) did not want to have assignments this term, and I appreciate the reasons why. At the same time, working through the material in another format helps you master it. For this reason, I am planning on posting assignment-like thought questions that you can work on as you see fit, in your own time, with others or individually, with feedback on Piazza etc. Something to get the mental gears working!

Other: As always, I am open to new ideas. Perhaps something about another course worked really well and you would like to see it here too? You can always make a suggestion either via email or by using the anonymous Google form: https://forms.gle/oWXyzyjCttpVjz8N7

LEARNING MATERIALS

We will use Canvas as our online learning management system. Selected readings will be provided (for free) from the following 2 textbooks: 1) Kandel, E.R. et al. (2012), Principles of Neural Science, 5th Edition. 2) Striedter, GF (2016) Neurobiology: A Functional Approach. ***The textbook readings are not mandatory but they are highly recommended***; they complement and expand upon the class material. Other notes and learning materials will be compiled and provided as lecture slides and associated content (eg videos). ***All of the material covered in lectures, and present in the lecture slides, is testable.***

ASSESSMENTS OF LEARNING

Tests: There will be 4 closed-book tests, spaced approximately equally throughout the term. Each test will be worth 25% of the final grade. Tests will consist of multiple choice questions, short answer questions as well as brief questions such as fill in the blank, one or multi-word answers. Tests will be written in Canvas and will be invigilated using Zoom. *If you are ill or otherwise cannot write a test let us know (beforehand or within 24 hours) and we will schedule an alternate date. If you cannot write at the scheduled time due to time zone differences let us know in advance so we can schedule an alternate time. We cannot go back and adjust grades for tests after they have been written (eg if you were unwell) because this is not fair to other students.* The TA will set aside time to review tests with you after you get your grades.

Bonus participation marks: an extra 2% for the 5 people who contribute to the richest discussion and learning environment on Piazza (participate frequently, provide good questions, insightful observations, useful answers and the like).

Regrading: In cases where there is regrading of a question or exam, the entire question or exam will be regraded and the new grade will replace the old grade.

Grading Policies: The Psychology Department mandates a certain class average and standard deviation and so scaling may be required; grades are not final until they appear on your transcript.

A NOTE ON CHEATING

The transition to online learning removes some wonderful aspects of teaching (the ability to connect in person and enjoy time together) but will hopefully open doors to some better learning approaches (asynchronous discussion, in class polls that can provide helpful feedback, etc). It has also caused instructors to feel a lot of anxiety about how to be confident that students' performance reflects their true understanding. If we cannot see you how do we know you are answering honestly and not looking at notes? Did a student really master the material or did they obtain a screenshot of a previous year's assignment? Personally, I assume most students are honest and most of my experiences have been really positive. When you look around the (virtual) classroom at your peers, do agree? Do you like your classmates? Would you hurt them physically? Probably not. Would you hurt them emotionally or want them to suffer academically? Probably not! But this is what happens when someone cheats; it affects everyone else because you are all being ranked with respect to one another. This is to say nothing of the fact that the personal consequences of cheating / lying / misconduct can be tremendous, and difficult to live down if you are ever caught. So, with that said, let's make this a collaborative, supportive and fair learning environment!

DEPARTMENT OF PSYCHOLOGY POSITION ON 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. In the first place, the Department has implemented software that can reliably detect cheating on multiple-choice exams by analyzing the patterns of students' responses. In addition, the Department subscribes to TurnItIn – a service designed to detect and deter plagiarism. All materials (term papers, lab reports, etc.) that students submit for grading will be scanned and compared to over 4.5 billion pages of content located on the Internet or in TurnItIn's own proprietary databases. The results of these comparisons are compiled into customized "Originality Reports" containing several sensitive measures of plagiarism; instructors receive copies of these reports for every student in their class. 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 or plagiarism 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. All graded work in this course, unless otherwise specified, is to be original work done independently by individuals. If you have any questions as to whether or not what you are doing is even a borderline case of academic misconduct, please consult your instructor. For details on pertinent University policies and procedures, please see Chapter 5 in the UBC Calendar (http://students.ubc.ca/calendar) and read the University's Policy 69 (available at http:/www.universitycounsel.ubc.ca/policies/policy69.html).

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.**

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