



PSYC/NEUR 478

Behavioural Neuroscience

Winter 2018

<b>Instructor:</b>	Dr. Simon Spanswick	<b>Lecture Location:</b>	AD 051
<b>Phone:</b>	403-220-4948	<b>Lecture Days/Time:</b>	MWF 10:00-10:50
<b>Email:</b>	<a href="mailto:scspansw@ucalgary.ca">scspansw@ucalgary.ca</a>	<b>Lab 01:</b>	W 13:00-15:45
<b>Office:</b>	A032	<b>Lab 02:</b>	F 13:00-15:45
<b>Office Hours:</b>	Email me to arrange a convenient time	<b>TA:</b>	TBA

### Course Description

The principle function of the nervous system is to produce behaviour. Thus, the goal of most behavioural work with laboratory animals in neuroscience is to understand how the nervous system produces behaviour and how experience changes the functioning of the nervous system. Understanding brain-behaviour relationships also offers a way to find treatments for dysfunctions of behaviour.

This course has multiple objectives that include, but are not limited to, the following;

- 1) Introduce students to the field of behavioural neuroscience.
- 2) Describe the organization and complexity of rodent behaviour.
- 3) Familiarize students with multiple behavioural apparatus and behavioural tests.
- 4) Relate behaviours to localized regions of the brain.
- 5) Provide students with hands on experiential learning opportunities with rodents.

Most students do find that taking the course is a worthwhile experience but there is no doubt that it requires real work. The course is considered as, and taught as, a senior-level course.

The laboratory component of this course involves the compassionate use of animals (rats). Most students find this hands-on learning experience valuable and exciting. The work is approved by the Life and Environmental Sciences Animal Care Committee and adheres to the guidelines laid down by the Canadian Council on Animal Care. **Intentional abuse and mistreatment of animals will not be tolerated.** Such abuse constitutes Academic Misconduct, and will result in a failing grade in the course. Students who are uncomfortable or nervous about handling animals should discuss their concerns with the instructor or TA.

### Course Learning Outcomes

The Department of Psychology is committed to student knowledge and skill development. The table below lists the key learning outcomes for this course, the program-learning outcomes they facilitate (see [psyc.ucalgary.ca/undergraduate/program-learning-outcomes](http://psyc.ucalgary.ca/undergraduate/program-learning-outcomes)), and the expected level of achievement.

Course Learning Outcomes	Assessment Methods	PLO(s)	Level(s)
Compare the history and philosophy of behavioural neuroscience.	Short answer exams	1,2	C
Assess the organization and complexity of rodent behaviour.	Lab reports, written assignments, presentation, exams	1,4,5	A
Implement multiple behavioural tests using a variety of behavioural apparatuses.	Lab reports, written assignments, presentation	3,4,6,7	C
Relate behaviours to localized regions of the brain.	Lab reports, written assignments, exams	1,3,4	A
Perform hands-on experiments with rodents.	Lab reports, written assignments	3,4,6,7	C

Notes. PLOs = Program-Learning Outcomes: 1 = demonstrate knowledge of psychological sciences, 2 = think critically and solve problems, 3 = conduct research and analyze data, 4 = communicate effectively, 5 = demonstrate information literacy, 6 = understand and implement ethical principles, 7 = apply psychological knowledge and skills. Level of PLO achievement facilitated by this course: I = introductory, C = competency, A = advanced.

### Prerequisites

Psyc 312 – Principles of Psychology

Psyc 375 – Brain and Behaviour

### Recommended Text

The Behaviour of the Laboratory Rat: A handbook with tests. Edited by Ian Q. Whishaw and Bryan Kolb, Oxford University Press, 2005. Available for free online using the link below:

<http://www.oxfordscholarship.com.ezproxy.lib.ucalgary.ca/oso/public/content/neuroscience/9780195162851/toc.html>

### Assessment Methods

#### Exams

Midterm #1 (Lectures 1-9; January 29 <sup>th</sup> ):	15%
Midterm #2 (Lectures 10-20; March 5 <sup>th</sup> ):	15%
Final Exam (Lectures 21-35; TBA)	20%

Exams will be short answer and cover lecture and reading material up to the exam date. The midterms and final exam will not be cumulative. Short answer questions will be graded such that half marks will be given if it is clear you know the general answer but have omitted specific details. Full marks will be given to those that include specifics, and employ the correct terminology and concepts. No books, notes, computers, calculators, or cellular phones will be allowed during exams.

#### Class Assignment

Student presentations (Apr 2 <sup>nd</sup> – Apr 13 <sup>th</sup> )	10%
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A short (7-8) minute presentation describing a behavioural neuroscience experiment selected and designed by the student. The presentation should be in a proposal format. Due to time constraints missed presentations cannot be made up and will receive a zero.

### Brief Assignments

There are three brief (approx. 2 page) assignments for this course. Each assignment will involve a question regarding the lab in which they are assigned. Specific details will be posted on D2L prior to the lab they pertain to. Assignments will be due at the beginning of the following week's laboratory. Late assignments will be penalized 10% per day, including weekends. Due dates and weights are listed below:

- |   |       |
|---|-------|
| 1. Animal Handling (due in lab Jan 24, 26)    | 3.33% |
| 2. Maternal Behaviour (due in lab Feb 14, 16) | 3.33% |
| 3. Fear and Anxiety (due in lab Apr 4, 6)     | 3.33% |

### Lab Reports

There are three full-length lab reports for this course. Lab reports should be approximately 15 pages in length (double spaced), and will be based on prior laboratory and lecture material. Assignments should be prepared according to the style of the Journal of Neuroscience, details can be found at <http://www.jneurosci.org/content/preparing-manuscript#organization>. Late assignments will be penalized 10% per day, including weekends. The due dates and weighting for the lab reports are as follows:

- |   |     |
|---|-----|
| 1. Adult Behaviour (due in lab Feb 28, Mar 2) | 10% |
| 2. Stroke (due in lab Mar 21, 23)             | 10% |
| 3. Learning and Memory (due Apr 16)           | 10% |

A physical copy of the brief assignments/lab reports should be handed in at the beginning of the corresponding lab section. Students must achieve a passing grade on both the class and lab components to pass this course.

### **Department of Psychology Criteria for Letter Grades**

Psychology professors use the following criteria when assigning letter grades:

**A+ grade: *Exceptional Performance.*** An A+ grade indicates near perfect performance on multiple choice and short answer exams. For research papers/essays/course projects/presentations, an A+ grade is awarded for exceptional work deserving of special recognition and is therefore not a common grade.

**A, A- Range: *Excellent Performance.*** Superior understanding of course material. Written work is very strong in terms of critical and original thinking, content, organization, and the expression of ideas, and demonstrates student's thorough knowledge of subject matter.

**B Range: *Good Performance.*** Above average understanding of course material. Written work shows evidence of critical thinking and attention to organization and editing but could be improved in form and/or content.

**C Range: *Satisfactory Performance.*** Adequate understanding of course material. Knowledge of basic concepts and terminology is demonstrated. Written work is satisfactory and meets essential requirements but could be improved significantly in form and content. Note: All prerequisites for courses offered by the Faculty of Arts must be met with a minimum grade of C-.

D range: *Marginally meets standards.* Minimal understanding of subject matter. Written work is marginally acceptable and meets basic requirements but requires substantial improvements in form and content. Student has not mastered course material at a level sufficient for advancement into more senior courses in the same or related subjects.

F grade: *Course standards not met.* Inadequate understanding of subject matter. Written work does not meet basic requirements. Student has not demonstrated knowledge of course material at a level sufficient for course credit.

**Grading Scale**

A+	96-100%	B+	80-84%	C+	67-71%	D+	54-58%
A	90-95%	B	76-79%	C	63-66%	D	50-53%
A-	85-89%	B-	72-75%	C-	59-62%	F	0-49%

As stated in the University Calendar, it is at the instructor’s discretion to round off either upward or downward to determine a final grade when the average of term work and final examinations is between two letter grades. To determine final letter grades, final percentage grades will be rounded up or down to the nearest whole percentage (e.g., 89.5% will be rounded up to 90% = A but 89.4% will be rounded down to 89% = A-).

**Tentative Lecture Schedule**

Date	Topic/Activity/Readings
M Jan 08	Introduction to the course
W Jan 10	History/Philosophy
F Jan 12	History/Philosophy
M Jan 15	History/Philosophy
W Jan 17	General Behaviour (movement)
F Jan 19	<i>Last day to drop Winter Term half-courses.</i> General Behaviour (movement)
M Jan 22	<i>Last day to add or swap Winter Term half courses.</i> <i>Last day for change of registration from audit to credit or credit to audit.</i> General Behaviour (vision)
W Jan 24	General Behaviour (vision/forgaing)
F Jan 26	<i>Fee payment deadline for Winter Term fees.</i> Skilled Behaviour
M Jan 29	<b>Midterm #1 (Lectures 1-9)</b>
W Jan 31	Skilled Behaviour
F Feb 2	Sex
M Feb 5	Sex/Maternal Behaviour
W Feb 7	Maternal Behaviour/Development
F Feb 9	Development
M Feb 12	Circadian Rhythms
W Feb 14	Circadian Rhythms

F Feb 16	Circadian Rhythms
Feb 18-25	Reading Week. No lectures. University open (except Family Day).
M Feb 19	Alberta Family Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.
M Feb 26	Stroke/Lesion
W Feb 28	Stroke/Lesion
F Mar 2	Stroke/Lesion
M Mar 5	<b>Midterm #2 (Lectures 10-20)</b>
W Mar 7	Fear/Anxiety/Depression
F Mar 9	Fear/Anxiety/Depression
M Mar 12	Fear/Anxiety/Depression
W Mar 14	Learning and Memory (spatial learning)
F Mar 16	Learning and Memory (spatial learning)
M Mar 19	Learning and Memory (spatial learning)
W Mar 21	Learning and Memory (object recognition)
F Mar 23	Learning and Memory (object recognition)
M Mar 26	Learning and Memory (object recognition)
W Mar 28	Putting it all together...
F Mar 30	Good Friday. University Closed
M Apr 2	Student presentations
W Apr 4	Student presentations
F Apr 6	Student presentations
M Apr 9	Student presentations
W Apr 11	Student presentations
F Apr 13	<i>Winter Term Lectures End.</i> <i>Last day to withdraw from full courses and Winter Term half courses.</i> Student presentations
Apr 16-26	<b>Winter Term Final Examinations.</b>

### Tentative Lab Schedule

Week	Lab	Assignment due
Jan 8-12	No labs	
Jan 15-19	1. Animal Handling	
Jan 22-26	2. General behaviour	<b>Brief assignment #1</b>
Jan 29-Feb 2	3. Skilled behaviour	
Feb 5-9	4. Maternal behaviour	
Feb 12-16	5. Drinking	<b>Brief assignment #2</b>
Feb 18-25	Reading Week. No labs	
Feb 26-Mar 2	6. Surgery demonstration	<b>Lab report #1</b>
Mar 5-9	7. Post stroke motor behaviour	
Mar 12-16	8. Fear, anxiety, and depression	
Mar 19-23	9. Spatial learning	<b>Lab report #2</b>

Mar 26-30	Good Friday. No labs	
Apr 2-6	10. Object recognition	<b>Brief assignment #3</b>
Apr 16	Assignment dropped off at Psychology office by 4:30 pm.	<b>Lab report #3</b>

### **Reappraisal of Grades**

A student who feels that a piece of graded term work (e.g., term paper, essay, test) has been unfairly graded, may have the work re-graded as follows. The student shall discuss the work with the instructor within 15 days of being notified about the mark or of the item's return to the class; no reappraisal of term work is permitted after the 15 days. If not satisfied, the student shall immediately take the matter to the Head of the department offering the course, who will arrange for a reassessment of the work within the next 15 days. The reappraisal of term work may cause the grade to be raised, lowered, or to remain the same. If the student is not satisfied with the decision and wishes to appeal, the student shall address a letter of appeal to the Dean of the faculty offering the course within 15 days of the unfavourable decision. In the letter, the student must clearly and fully state the decision being appealed, the grounds for appeal, and the remedies being sought, along with any special circumstances that warrant an appeal of the reappraisal. The student should include as much written documentation as possible.

### **Plagiarism and Other Academic Misconduct**

Intellectual honesty is the cornerstone of the development and acquisition of knowledge and requires that the contribution of others be acknowledged. Consequently, plagiarism or cheating on any assignment is regarded as an extremely serious academic offense. Plagiarism involves submitting or presenting work in a course as if it were the student's own work done expressly for that particular course when, in fact, it is not. Students should examine sections of the University Calendar that present a Statement of Intellectual honesty and definitions and penalties associated with Plagiarism/Cheating/Other Academic Misconduct.

### **Academic Accommodations**

The student accommodation policy can be found at: [ucalgary.ca/access/accommodations/policy](http://ucalgary.ca/access/accommodations/policy). Students needing an Accommodation because of a Disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities [ucalgary.ca/policies/files/policies/student-accommodation-policy](http://ucalgary.ca/policies/files/policies/student-accommodation-policy). Students needing an Accommodation based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the instructor.

### **Absence From A Test/Exam**

Makeup tests/exams are **NOT** an option without an official University medical excuse (see the University Calendar). A completed Physician/Counselor Statement will be required to confirm absence from a test/exam for health reasons; the student will be required to pay any cost associated with this Statement. Students who miss a test/exam have up to 48 hours to contact the instructor and to schedule a makeup test/exam. Students who do not schedule a makeup test/exam with the instructor

within this 48-hour period forfeit the right to a makeup test/exam. At the instructor's discretion, a makeup test/exam may differ significantly (in form and/or content) from a regularly scheduled test/exam. Except in extenuating circumstances (documented by an official University medical excuse), a makeup test/exam must be written within 2 weeks of the missed test/exam during exam make-up hours provided by the department <http://psychology.ucalgary.ca/undergraduate/exam-and-course-information#mues>. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam [http://www.ucalgary.ca/registrar/exams/deferred\\_final](http://www.ucalgary.ca/registrar/exams/deferred_final). Under no circumstances will this be accommodated by the department.

### **Travel During Exams**

Consistent with University regulations, students are expected to be available to write scheduled exams at any time during the official December and April examination periods. Requests to write a make-up exam because of conflicting travel plans (e.g., flight bookings) will NOT be considered by the department. Students are advised to wait until the final examination schedule is posted before making any travel arrangements. If a student cannot write their final exam on the date assigned by the Registrar's Office, they need to apply for a deferred exam [http://www.ucalgary.ca/registrar/exams/deferred\\_final](http://www.ucalgary.ca/registrar/exams/deferred_final). Students with an exceptional extenuating circumstance (e.g., a family emergency) should contact the Department of Psychology ([psyugrd@ucalgary.ca](mailto:psyugrd@ucalgary.ca)).

### **Freedom of Information and Protection of Privacy (FOIP) Act**

The FOIP legislation disallows the practice of having student's retrieve tests and assignments from a public place. Therefore, tests and assignments may be returned to students during class/lab, or during office hours, or will be made available only for viewing during exam review sessions scheduled by the Department. Tests and assignments will be shredded after one year. Instructors should take care to not link students' names with their grades, UCIDs, or other FOIP-sensitive information.

### **Acknowledgments and Respect for Diversity**

Our classrooms view diversity of identity as a strength and resource. Your experiences and different perspectives are encouraged and add to a rich learning environment that fosters critical thought through respectful discussion and inclusion. The Department of Psychology would also like to acknowledge the traditional territories of the people of the Treaty 7 region in southern Alberta. The City of Calgary is also home to Métis Nation of Alberta, Region III.

### **Wellness and Mental Health Resources**

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the excellent mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student

Centre, <https://www.ucalgary.ca/wellnesscentre/services/mental-health-services>) and the Campus Mental Health Strategy website (<http://www.ucalgary.ca/mentalhealth/>).

### **Course Credits for Research Participation (Max 2% of final grade)**

Students in most psychology courses are eligible to participate in Departmentally-approved research and earn credits toward their final grades. A maximum of two credits (2%) per course, including this course, may be applied to an individual's final grade. **To get 2%** added to the final grade in a full-year course, like this one, you have to acquire **a total of 4 bonus credits** towards the course. These credits may be acquired in the Fall and/or the Winter Session. The demand for timeslots may exceed the supply in a given term. Thus, students are not guaranteed that there will be enough studies available to them to meet their credit requirements. Students should seek studies early in the term and should frequently check for open timeslots. Students can create an account and participate in Departmentally-approved research studies at <http://ucalgary.sona-systems.com>. The last day to participate in studies and to assign or reassign earned credits to courses is **Apr 13<sup>th</sup>, 2018**.

### **Evacuation Assembly Point**

In case of an emergency evacuation during class, students must gather at the designated assembly point nearest to the classroom. The list of assembly points is found at <http://www.ucalgary.ca/emergencyplan/assemblypoints>  
Please check this website and note the nearest assembly point for this course.

### **Student Organizations**

Psychology students may wish to join the Psychology Undergraduate Students' Association (PSYCHS). They are located in Administration 130 and may be contacted at 403-220-5567.

**Student Union VP Academic:** Phone: 403-220-3911 [suypaca@ucalgary.ca](mailto:suypaca@ucalgary.ca)

**Student Union Faculty Rep.:** [arts1@su.ucalgary.ca](mailto:arts1@su.ucalgary.ca)

### **Student Ombudsman's Office**

The Office of the Student Ombudsmen provides independent, impartial and confidential support for students who require assistance and advice in addressing issues and concerns related to their academic careers. The office can be reached at 403-220-6420 or [ombuds@ucalgary.ca](mailto:ombuds@ucalgary.ca)  
(<http://www.ucalgary.ca/provost/students/ombuds>)

### **Safewalk**

The safewalk program provides volunteers to walk students safely to their destination anywhere on campus. This service is free and available 24 hrs/day, 365 days a year.  
Call 403-220-5333.

### **Important Dates**

The last day to drop this course with no "W" notation and **still receive a tuition fee refund** is **January 19, 2018**. Last day for registration/change of registration is **January 22, 2018**. The last day to withdraw from this course is **April 13, 2018**.