

PSYC/NEUR 478

Behavioural Neuroscience

Winter 2020

<b>Instructor:</b>	Dr. Simon Spanswick	<b>Lecture Location:</b>	D2L
<b>Phone:</b>	403-220-4948	<b>Lecture Days/Time:</b>	MWF 9:00-9:50
<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>	AD032	<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	1,5	A
Implement multiple behavioural tests using a variety of behavioural apparatuses.	Lab reports, written assignments, presentation	3,6,7	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 or PSYC 300 and 301 – Research Methods and Data Analysis in Psychology I and II  
 Psyc 375 – Brain and Behaviour  
 Admission to the major or honours program

### 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>

Recommended readings will be provided prior to the lab they pertain to.

### Assessment Methods

#### Exams

Midterm #1 (Lectures 1-10; February 5 <sup>th</sup> ):	15%
Midterm #2 (Lectures 11-21; March 11 <sup>th</sup> ):	15%
Final Exam (Lectures 22-35; TBA; 2 hours)	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 (March 30 <sup>th</sup> – April 15 <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. Without approved documentation, due to time constraints missed presentations cannot be made up and will receive a zero. All presentations will be submitted via Dropbox prior to 9:00am on the day that you were scheduled to present. The presentation order will be uploaded to D2L to ensure clarity.

### 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 should be submitted via Dropbox on D2L by the beginning of your lab section. Without approved documentation, late assignments will be penalized 10% per day, including weekends. Due dates and weights are listed below:

- |   |       |
|---|-------|
| 1. Animal Handling (due in lab Jan 29, 31)    | 3.33% |
| 2. Maternal Behaviour (due in lab Feb 26, 28) | 3.33% |
| 3. Fear and Anxiety (due in lab Apr 8, 10)    | 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>. Without approved documentation, 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 Mar 4, 6) | 10% |
| 2. Stroke (due in lab Mar 25, 27)        | 10% |
| 3. Learning and Memory (due Apr 17)      | 10% |

Assignments should be submitted via Dropbox on D2L by the beginning of your 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/Due Date
M Jan 06	<i>Winter term begins (block week January 6-10)</i>
M Jan 13	Introduction to the course
W Jan 15	History/Philosophy
F Jan 17	History/Philosophy
M Jan 20	History/Philosophy
W Jan 22	General Behaviour (movement)
R Jan 23	<i>Last day to drop Winter Term half-courses.</i>
F Jan 24	<i>Last day to add or swap a course</i> General Behaviour (movement)
M Jan 27	General Behaviour (vision)
W Jan 29	General Behaviour (vision/foraging)
F Jan 31	<i>Fee payment deadline for Winter Term fees.</i> Skilled Behaviour
M Feb 3	Skilled Behaviour

W Feb 5	<b>Midterm #1 (Lectures 1-10)</b>
F Feb 7	Sex
M Feb 10	Sex
W Feb 12	Sex/Maternal Behaviour
F Feb 14	Maternal Behaviour
M Feb 17	Alberta Family Day
Feb 16-22	Term Break, No Classes (University if Open, Except on Alberta Family Day)
M Feb 24	Maternal Behaviour/Development
W Feb 26	Development
F Feb 28	Development
M Mar 2	Stroke
W Mar 4	Stroke/Lesion
F Mar 6	Lesion
M Mar 9	Fear/Anxiety
W Mar 11	<b>Midterm #2 (Lectures 11-21)</b>
F Mar 13	Fear/Anxiety
M Mar 16	Fear/Anxiety
W Mar 18	Learning and Memory (spatial learning)
F Mar 20	Learning and Memory (spatial learning)
M Mar 23	Learning and Memory (spatial learning)
W Mar 25	Learning and Memory (object recognition)
F Mar 27	Learning and Memory (object recognition)
M Mar 30	Student presentations
W Apr 1	Student presentations
F Apr 3	Student presentations
M Apr 6	Student presentations
W Apr 8	Student presentations
F Apr 10	Good Friday, No Classes
M Apr 13	<i>Non-Instructional Day, University Open</i>
W Apr 15	Last day of classes, last day to withdraw from winter courses Student presentations
Apr. 18-29	<b>Final Exam Period</b>
R Apr 30	End of Term

#### Tentative Lab Schedule

Week	Lab	Assignment due
Jan 13-17	No labs	
Jan 20-24	1. Animal Handling	
Jan 27-31	2. General behaviour	<b>Brief assignment #1</b>
Feb 3-7	3. Skilled behaviour	
Feb 10-14	4. Maternal behaviour	

Feb 16-22	Reading Week. No Labs	
Feb 24-28	5. Development	<b>Brief assignment #2</b>
Mar 2-6	6. Surgery demonstration	<b>Lab report #1</b>
Mar 9-13	7. Post stroke motor behaviour	
Mar 16-20	8. Fear and anxiety (archival data)	
Mar 23-27	9. Spatial learning (archival data)	<b>Lab report #2</b>
Mar 30- Apr 3	10. Object recognition (archival data)	
Apr 6-10	Assignment submitted via Dropbox prior to your lab section.	<b>Brief assignment #3</b>
Apr 17	Assignment submitted via Dropbox	<b>Lab report #3</b>

## Extra Research Participation Course Credit is Not Offered for this Course.

### Seating During Exams

Instructors and exam invigilators are free to ask students to move seats before an exam begins or even during an exam. Students must comply with this request and refusal to do so may warrant a charge of academic misconduct.

### Absence From A Test/Exam

Makeup tests/exams are **NOT** an option without the approval of the instructor. A student may be asked to provide supporting documentation for an exemption/special request for a make-up exam <https://www.ucalgary.ca/pubs/calendar/current/n-1.html>. Students who miss a test/exam have up to 48 hours to contact the instructor to ask for a makeup test/exam. It's the instructor's discretion if they will allow a make-up 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. **Once approved by the instructor 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** <https://www.ucalgary.ca/registrar/exams/deferred-exams>.

### 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** <https://www.ucalgary.ca/registrar/exams/deferred-exams>. **Students with an exceptional extenuating circumstance (e.g., a family emergency) should contact the Department of Psychology** ([psyugrd@ucalgary.ca](mailto:psyugrd@ucalgary.ca)).

**Reappraisal of Graded Term Work** <http://www.ucalgary.ca/pubs/calendar/current/i-2.html>

**Reappraisal of Final Grade** <http://www.ucalgary.ca/pubs/calendar/current/i-3.html>

### **Academic Accommodations**

Students seeking an accommodation based on disability or medical concerns should contact Student Accessibility Services; SAS will process the request and issue letters of accommodation to instructors. For additional information on support services and accommodations for students with disabilities, visit [www.ucalgary.ca/access/](http://www.ucalgary.ca/access/). Students who require an accommodation in relation to their coursework based on a protected ground other than disability should communicate this need in writing to their Instructor. The full policy on Student Accommodations is available at <http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf>.

### **Academic Misconduct**

For information on academic misconduct and its consequences, please see the University of Calgary Calendar at <http://www.ucalgary.ca/pubs/calendar/current/k.html>

### **Instructor Intellectual Property**

Course materials created by professor(s) (including course outlines, presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the professor(s). These materials may NOT be reproduced, redistributed or copied without the explicit consent of the professor. The posting of course materials to third party websites such as note-sharing sites without permission is prohibited. Sharing of extracts of these course materials with other students enrolled in the course at the same time may be allowed under fair dealing.

### **Copyright Legislation**

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright ([www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf](http://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf)) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

### **Freedom OF Information and Protection of Privacy**

Student information will be collected in accordance with typical (or usual) classroom practice. Students' assignments will be accessible only by the authorized course faculty. Private information related to the individual student is treated with the utmost regard by the faculty at the University of Calgary

### **Student Support and Resources**

<https://www.ucalgary.ca/registrar/registration/course-outlines>

### **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.

### **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)

### **Important Dates**

The last day to drop this course with no "W" notation and **still receive a tuition fee refund** is **January 23, 2020**. Last day for registration/change of registration is **January 24, 2020**. The last day to withdraw from this course is **April 15, 2020**.