

PSYC/NEUR478

Behavioural Neuroscience

Fall 2019

<b>Instructor:</b>	Dr. Michael Antle	<b>Lecture Location:</b>	AD51/53
<b>Phone:</b>	403-220-2574	<b>Lecture</b>	MWF 12-12:50
		<b>Days/Time:</b>	
<b>Email:</b>	<a href="mailto:antlem@ucalgary.ca">antlem@ucalgary.ca</a>	<b>Lab Location:</b>	AD047/51
<b>Office:</b>	A018	<b>Lab Time:</b>	W,F 13:00-15:50
<b>Office Hours:</b>	By appointment, or anytime my door is open	<b>TAs:</b>	Naila Jamani <a href="mailto:naila.jamani@ucalgary.ca">naila.jamani@ucalgary.ca</a> Rafal Ameen <a href="mailto:rwameen@ucalgary.ca">rwameen@ucalgary.ca</a>

## 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 the 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. This work is approved by the Life and Environmental Sciences Animal Care Committee and adheres to the guidelines laid down by the Canadian Council of 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 professor 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 – Experimental Design and Quantitative Methods for Psychology or PSYC 300 and 301 – Research Design and Data Analysis in Psychology I and II  
Psyc 375 – Brain and Behaviour

**Required Text:     None**

## Recommended Text:

1. The Behaviour of the Laboratory Rat: a handbook with tests. Edited by Ian Q. Whishaw and Bryan Kolb, Oxford University Press, 2005
  - a. <http://www.oxfordscholarship.com.ezproxy.lib.ucalgary.ca/oso/public/content/neuroscienc/e/9780195162851/toc.html>
  - b. The online license for this book limits simultaneous access, so you may be blocked if a classmate is accessing it at the same time. The license does allow downloading and printing chapters, so plan ahead. This book will only be used for the laboratory component of the course.
2. Neuroscience, 2<sup>nd</sup> edition, Edited by Dale Purves, George J Augustine, David Fitzpatrick, Lawrence C Katz, Anthony-Samuel LaMantia, James O McNamara, and S Mark Williams, Sinauer Associates, 2001
  - a. <http://www.ncbi.nlm.nih.gov/books/NBK10799/>
  - b. This is a freely available version of the textbook, however, by agreement with the publisher, this book is accessible by the search feature only, and cannot be browsed.

## Assessment Methods

### Exams (50%)

Exam	date	material	weighting
Midterm Exam#1	September 27 <sup>th</sup>	Lectures 1-9	15%
Midterm Exam#2	October 23 <sup>rd</sup>	Lectures 10-18	15%
Final Exam	Exam Period	Lectures 19-28	20%

Exams will be short answer and cover lecture and reading material up to the exam date. While **the midterms and final exam are not cumulative, about 25% of the final exam will cover thematic issues that span the full course.** 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 (10%)

Student presentations (November 25<sup>th</sup> to December 6<sup>th</sup>, sign up outside Dr. Antle's office) 10%

- 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 without approved documentation.

### Brief Lab Assignments (10%)

There are four 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. 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 Sept 18,20 | 2.5% |
| 2. Motor behavior      | due in lab Oct 9,11   | 2.5% |
| 3. Maternal Behaviour  | due in lab Oct16,18   | 2.5% |
| 4. Circadian Behaviour | due in lab Nov6,8     | 2.5% |

### Full Lab Reports (30%)

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. Pup development     | due in lab Oct 23,25 | 10% |
| 2. Stroke              | due in lab Nov20,22  | 10% |
| 3. Learning and Memory | due to TA Dec11,13   | 10% |

A physical copy of each assignment should be handed in at the beginning of the corresponding lab section. The final assignment can be submitted to your TA or to the box outside the psychology department main office before 4:30pm on the due date.

**Students must achieve a passing grade on both the class and lab components to pass this course.**

## Extra Research Participation Course Credit is Not Offered for 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., 89.50% will be rounded up to 90% = A, but 89.49% will be rounded down to 89% = A-).

## Tentative Lecture Schedule

Date	Topic/Activity/Readings/Due Date	
F Sep 6	Introduction	<i>University Lectures begin.</i>
M Sep 9	History / Philosophy	
W Sep 11	History / Philosophy	
R Sep 12		<i>Last day to drop a class without a penalty</i>
F Sep 13	Motor systems	<i>Last day to add or swap a course</i>
M Sep 16	Motor systems	
W Sep 18	Motor systems	
F Sep 20	Motor systems	<i>Fee payment deadline for Fall Term full and half courses.</i>
M Sep 23	Motor systems	
W Sep 25	Motor systems	
F Sep 27	<b>Exam #1 (Lecture 1-9)</b>	
M Sep 30	Sex	
W Oct 2	Sex	
F Oct 4	Sex	
M Oct 7	Maternal Behaviour	
W Oct 9	Maternal Behaviour	
F Oct 11	Maternal Behaviour	
M Oct 14	<b>No lectures</b> <b>Thanksgiving Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries).</b>	
W Oct 16	Feeding	
F Oct 18	Drinking	
M Oct 21	Thermoregulation	
W Oct 23	<b>Exam #2 (Lectures 10-18)</b>	
F Oct 25	Circadian Rhythms	
M Oct 28	Circadian rhythms	
W Oct 30	Circadian rhythms	
F Nov 1	Sensation	
M Nov 4	Pain	
W Nov 6	Anxiety and Fear	
F Nov 8	Depression	
Nov 10-16	<b>Term Break - No Classes</b>	
M Nov 11	<b>Remembrance Day (Observed). University Closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.</b>	
M Nov 18	Learning	
W Nov 20	Learning	
F Nov 22	Learning	
M Nov 25	Student presentations	
W Nov 27	Student presentations & Course Evaluations	
F Nov 29	Student presentations	

M Dec 2	Student presentations	
W Dec 4	Student presentations	
F Dec 6	Student presentations	<i>Fall Term Lectures End. Last day to withdraw with permission from Fall Term half courses.</i>
Dec 9-19	Fall Final Exam Period	

### Tentative Lab Schedule

Some minimal extra laboratory time may be expected outside of the regular lab schedule

Week	Lab	Assignment due
Sept 11,13	1. Handling	
Sept 18,20	2. General Behaviour	Handling (short assignment)
Sept 25,27	3. Skilled Behaviour	
Oct 2,4	4. Maternal Behaviour and Pup Development #1	
Oct 9,11	5. Pup Development #2	Motor behaviour (short assignment)
Oct 16,18	6. Surgery Demonstrations	Maternal behaviour (short assignment)
Oct 23,25	7. Post stroke motor behaviour	Pup Motor Development (full Report)
Oct 30, Nov1	8. Circadian rhythms	
Nov 6, 8	9. Fear and Anxiety	Circadian (short assignment)
Nov 13, 15	<b>Reading Week – No Labs</b>	
Nov 20, 22	10. Spatial learning	Stroke (full Report)
Nov 27, 29	11. Object Recognition	
Dec 4, 6	12. Place preference/avoidance	
Dec 11,13		Learning (full Report)

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

A student who feels that a piece of graded term work (term paper, essay, test, etc.) has been unfairly graded, may have the work reappraised as follows. The student shall discuss the work with the instructor **within ten business days** of being notified about the mark or of the item's return to the class. If not satisfied, the student shall take the matter to the head of the department offering the course **within 2 business days of receiving the decision from the instructor**, who will arrange for a reappraisal of the work **within the next ten business days**. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected. Students in faculties without a departmental structure should take the matter to the dean, or designate, of the faculty offering the course. The result of that reappraisal will be given to the student in writing along with information about appealing the reappraisal.

*The reappraisal of graded term work may cause the grade to be raised, lowered or to remain the same. There is no limit to the number of pieces of graded work that a student may request be reappraised, however a single piece of work may only be reappraised once.*

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

In the reappraisal of a final grade, the only element that will be considered is the grading of the final assessment that makes up the final mark (e.g., final examination, final project, final paper). An exception may occur when the Instructor of Record evaluates a piece of graded term work at the end of the term; that grade may also be considered in a reappraisal of final grade.

A student seeking a reappraisal of a final grade should first attempt to review the final assessment with the department or faculty offering the course. After which, the student shall obtain a Reappraisal of Final Grade form from [ucalgary.ca/registrar](http://ucalgary.ca/registrar) (under Student Forms). The student must indicate exactly what error was made in marking the final assessment and/or in computing the final grade. The reappraisal will only be considered if the student provides a detailed rationale that outlines where and for what reason an error is suspected.

Students requesting a reappraisal of a final grade must submit their request by the following dates:

Fall Term – March 1

Winter Term – June 30

Spring Intersession – August 15

Summer Term – October 15

Supplemental Examinations: 30 calendar days from the date the examination was written

For information relating to Law, Veterinary Medicine and the Cumming School of Medicine (MD) courses, please refer to the faculty section.

The reappraisal form shall be submitted to Enrolment Services who will forward it to the department head or dean of the faculty offering the course. Reappraisals of final grades are dealt with by the head of the academic unit in consultation with members of academic staff. Normally, the department/faculty will respond to a reappraisal request within thirty calendar days of its initiation. After the reappraisal is completed, the department shall return the form to the Registrar's Office who shall inform the student in writing of the decision.

Students should be aware that the grade being reappraised may be raised, lowered or remain the same. A student may request a reappraisal of final for a maximum of two courses in one academic year (September 1 – August 31).

**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](https://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](https://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.

## 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)).

## 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/>).

### **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 [suyaca@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 **Thursday, September 12, 2019**. Last day add/swap a course is **Friday, September 13, 2019**. The last day to withdraw from this course is **Friday, December 6, 2019**.