

PSYC/NEUR478		Behavioural Neuroscience		Fall 2022
<b>Instructor:</b>	Michael Antle	<b>Lecture Room:</b>	AD51/53	
<b>Phone:</b>	403-220-2574	<b>Days/Time:</b>	MWF: 12-12:50	
<b>Email:</b>	antlem@ucalgary.ca	<b>Lab Room:</b>	AD047/51	
<b>Office:</b>	AD018	<b>Days/Time:</b>	W,F 13:00-15:50	
<b>Office Hours:</b>	By Appointment	<b>TAs:</b>	Selena Fu Matt Dawson	<a href="mailto:selena.fu2@ucalgary.ca">selena.fu2@ucalgary.ca</a> <a href="mailto:matthew.dawson@ucalgary.ca">matthew.dawson@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 may result in disciplinary action that could include 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 <https://live-arts.ucalgary.ca/psychology/about#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	1,2,4	C,C,C
Assess the organization and complexity of rodent behaviour.	Lab reports, written assignments, presentation, exams	1,5,4	A,A,A
Implement multiple behavioural tests using a variety of behavioural apparatuses.	Lab reports, written assignments, presentation	3,4,6,7	C,C,C,C
Relate behaviours to localized regions of the brain.	Lab reports, written assignments, exams	1,3,4	A,A,A
Perform hands-on experiments with rodents.	Lab reports, written assignments	3,4,6,7	C,C,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 in a diverse world, 7 = apply psychological knowledge and skills, 8 = Demonstrate multicultural competence and awareness of issues related to equity, diversity,\* and inclusion. Level of PLO achievement facilitated by this course: I = introductory, C = competency, A = advanced.

## 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.

## Course Format

This is an in-person class held on campus.

## Prerequisites

Psyc 312 or Psyc 300 and 301 – Principles of Psychology  
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/neuroscience/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	Sept 28 <sup>th</sup>	Lectures 1-8	15%
Midterm Exam#2	Oct 26 <sup>th</sup>	Lectures 9-17	15%
Final Exam	Exam Period	Lectures 18-End	20%

#### Midterm and Final Exams

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, a small part of the final exam will cover thematic issues that span the full course.** Short answer questions will be graded such that part-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. Additionally, clear and effective answers will be focused and succinct. Answers that include extraneous or tangential information will not receive full marks. **No books, notes, computers, calculators, smart devices or cellular phones will be allowed during exams.**

#### Class Assignment (10%)

Student presentations (November 28<sup>th</sup> to Dec 7<sup>th</sup>, sign up outside Dr. Antle's office)

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.
- The proposal should apply the student's knowledge from the course in designing a behavioural neuroscience project using animals.
- If you've worked in a research lab, your topic area must be different from the topic area in which you've worked previously; we want you to learn something new.
- Due to time constraints, missed presentations cannot be made up in-person and will receive a 0% unless arrangements are made with the instructor. Student who meet the criteria detailed in

the “Absence From A Test/Exam/Assignment” section below can discuss make-up options with the instructor.

### **Brief Lab Assignments (15%)**

There are five 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 submitted to the D2L dropbox. Late assignments will be penalized 10% per day, including weekends. Due dates and weights are listed below:

Short Assignment	Due Date	Weight
1. Animal Handling	Sept 21,23	3%
2. Maternal Behaviour	Oct 12,14	3%
3. Adult Behaviour	Nov 10*, 12*	3%
4. Play / Robbing and Dodging	Nov 16,18	3%
5. Circadian	Nov 23,25	3%

\* Because of the Remembrance Day Holiday on Friday Nov 11<sup>th</sup>, assignments that week will be due the day after your normal lab day (i.e., Thursday the 10<sup>th</sup> for the Wednesday group, Saturday the 12<sup>th</sup> for the Friday group)

### **Full Lab Reports (25%)**

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 [https://www.jneurosci.org/content/information-authors#preparing\\_a\\_manuscript](https://www.jneurosci.org/content/information-authors#preparing_a_manuscript). See D2L for more specific guidelines. Assessment emphasizes what you write, not adherence to a particular publication style. Without instructor approval, late assignments will be penalized 10% per day, including weekends. Students may be asked for documentation <https://www.ucalgary.ca/pubs/calendar/current/m-1.html>

The due dates and weighting for the lab reports are as follows:

- |                        |              |     |
|------------------------|--------------|-----|
| 1. Pup development     | due Nov 2, 4 | 10% |
| 2. Learning and Memory | due Dec 10   | 15% |

Assignments will be submitted to the D2L dropbox.

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

### **Policy of Assignment Extensions**

Without instructor approval, late assignments will be penalized 10% per day, including weekends.

That said, this course has a lot of assignments, with something due almost every week in one form or another. While we have endeavored to spread out the work in this course as much as possible, we know that you are also taking other courses, and in some cases the workloads in those classes may conflict with due dates in this course. With that in mind, the following accommodations will be provided to all students:

1. Look at all your due dates in all your courses. Write them on a calendar. If you feel, after having looked at all your due dates, that you would benefit from adjusting your due dates slightly in this course, then due dates on lab assignments can be adjusted by up to 72h if the request is submitted to the prof by September 28<sup>th</sup>.

2. All students are allowed an automatic one-time-only 24h extension on any lab assignment. Just email the prof before the deadline to indicate that you're using your one-time-only extension.
  - a. Students who do not use their one-time-only extension will receive 5 bonus points (out of 100) applied to their final lab report.

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

### **University of Calgary Academic Integrity Policy**

Academic integrity is the foundation of the development and acquisition of knowledge and is based on values of honesty, trust, responsibility, and respect. We expect members of our community to act with integrity.

Research integrity, ethics, and principles of conduct are key to academic integrity. Members of our campus community are required to abide by our institutional code of conduct and promote academic integrity in upholding the University of Calgary's reputation of excellence. It is your responsibility to ensure that you have read and are familiar with the student academic misconduct policy: <https://www.ucalgary.ca/policies/files/policies/student-academic-misconduct-policy.pdf>.

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

Psychology course instructors 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 (revise and add columns & rows as necessary)
W Sep 7	Course Introduction <i>University Lectures begin</i>
F Sep 9	1. History / Philosophy
M Sep 12	2. History / Philosophy
W Sep 14	3. Experimental approaches in behavioral neuroscience
R Sep 15	<i>Last day to drop a class without penalty</i>
F Sep 16	4. Motor systems
M Sep 19	5. Motor systems <i>Last day to add/swap a class</i>
W Sep 21	6. Motor systems
F Sep 23	7. Motor systems
M Sep 26	8. Motor systems <i>Fee payment deadline for Fall Term full and half courses</i>
W Sep 28	<b>Exam #1 (Lecture 1-8, Sept 9-26<sup>th</sup>)</b>
F Sept 30	<b>UNIVERSITY CLOSED National Day for Truth and Reconciliation</b>
M Oct 3	9. Sex
W Oct 5	10. Sex
F Oct 7	11. Sex
M Oct 10	<b>Thanksgiving Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.</b>
W Oct 12	12. Maternal Behaviour
F Oct 14	13. Maternal Behaviour
M Oct 17	14. Maternal Behaviour
W Oct 19	15. Feeding
F Oct 21	16. Drinking
M Oct 24	17. Thermoregulation
W Oct 26	<b>Exam #2 (Lectures 9-17, Oct 3<sup>rd</sup> – Oct 24<sup>th</sup>)</b>
F Oct 28	18. Circadian Rhythms
M Oct 31	19. Circadian rhythms
W Nov 2	20. Circadian rhythms
F Nov 4	21. Sensation
Nov 6-12	<b>Term Break No Classes</b>
F Nov 11	Remembrance Day (Observed). University Closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.
M Nov 14	22. Pain
W Nov 16	23. Anxiety and Fear <Recorded Lecture – Dr. Antle on NSERC Grant Review>

F Nov 18	24. Depression
M Nov 21	25. Learning
W Nov 23	26. Learning
F Nov 25	27. Learning
M Nov 28	Student presentations
W Nov 30	Student presentations
F Dec 2	Student presentations
M Dec 5	Student presentations
W Dec 7	Student presentations <i>Fall Term Lectures End. Last day to withdraw with permission from Fall Term half courses.</i>
Dec 10-21	<b>Fall Final Exam Period (Lectures 18-27, Oct 28<sup>th</sup> – Nov 25<sup>th</sup> + general course themes)</b>

### Tentative Lab Schedule

Week	Lab	Assignment due
Sep 14, 16	1. Handling	
Sep 21, 23	2. General behavior	Handling (short assignment)
Sep 28, 30	--- No Labs ---	Midterm Exam #1
Oct 5, 7	3. Maternal Behaviour and Pup Development #1	
Oct 12, 14	4. Pup Development #2	Maternal behaviour (short assignment)
Oct 19, 21	5. Skilled Behavior	
Oct 26, 28	6. Play and robbing/dodging	Midterm Exam #2
Nov 2, 4	7. Circadian rhythms	Pup Motor Development (full Report)
Nov 9, 11	--- No Labs ---	Adult behaviour (short assignment)
Nov 16, 18	9. Fear and Anxiety	Play / Robbing-Dodging (short assignment)
Nov 23, 25	10. Spatial learning	Circadian (short assignment)
Nov 30, Dec 2	11. Object Recognition / Place preference	
Dec 10		Learning (full Report)

**Labs will be run IN PERSON on campus. In person attendance is expected.**

- Regular in person attendance is expected.
- Occasional attendance outside regular scheduled lab times may be needed (e.g., to assess pup development on non-lab days). When this happens,
- University COVIDSafe Campus protocols must be followed:
  - <https://www.ucalgary.ca/risk/emergency-management/covid-19-response/covidsafe-campus>
- Since you are working with live animals, **proper PPE must be worn at all times** both for your own health and the health and safety of the animals. N.B., this is not a COVID-19 protocol but rather an animal health protocol. Facemasks, gloves and lab coats will be required. Facemasks must be properly worn for the full duration of the lab and KN95 or similar masks are highly recommended, particularly for student with potential allergies. Gloves will be provided. A limited number of Lab coats are available to sign-out for the semester; please bring your own if you have one.

- Do not attend lab if you are feeling unwell, or have any of the following symptoms:
  - cough, fever, shortness of breath, runny nose or sore throat, or any of the other symptoms identified by Alberta Health Services (<https://www.alberta.ca/covid-19-testing-in-alberta.aspx>)
  - Missing one or two labs for these reasons will not affect your grade or performance in the course.
  - Please let the TA know if you will be missing the lab

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

Makeup tests/exams/assignment are **NOT** an option without the approval of the instructor. Students who miss a test/exam/assignment have up to 48 hours to contact the instructor to ask for a makeup test/exam/assignment. It's the instructor's discretion if they will allow a make-up test/exam/assignment. Students who do not schedule a makeup test/exam/assignment with the instructor within this 48-hour period forfeit the right to a makeup test/exam/assignment. At the instructor's discretion, a makeup test/exam/assignment may differ significantly (in form and/or content) from a regularly scheduled test/exam. Once approved by the instructor a makeup test/exam/assignment must be written within 2 weeks of the missed test/exam/assignment on a day/time scheduled by the instructor. 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).

**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 <https://www.ucalgary.ca/legal-services/university-policies-procedures/accommodation-students-disabilities-procedure>.

### **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 (<https://www.ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy> ) 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>

### **Important Dates**

The last day to drop this course with no "W" notation and **still receive a tuition fee refund is Thursday, September 15, 2022**. Last day add/swap a course is **Friday, September 16, 2022**. The last day to withdraw from this course is **Wednesday, December 7, 2022**

<https://www.ucalgary.ca/pubs/calendar/current/academic-schedule.html#fall2017>