

PSYC/NEUR478

Behavioural Neuroscience

Fall 2020

Instructor:	Michael Antle	Lecture Location:	Online
Phone:	403-220-2574	Lecture	M: 12-12:50 (live lecture on zoom)
		Days/Time:	WF: asynchronous (Lecture posted to D2L)
Email:	antlem@ucalgary.ca	Lab Location:	AD047/51
Office:	AD018	Lab Time:	W,F 13:00-14:20 ; 14:30-15:50
Office	By appointment	TAs:	Patty Blakely patricia.blakely@ucalgary.ca
Hours:			Eric Eyolfson eric.eyolfson@ucalgary.ca

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 <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	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 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 course will use a hybrid format. Some lectures will be taught live via Zoom during each scheduled class as marked by asterisks in the course schedule below and will be recorded and posted to D2L after class. Other class materials will be posted to the course D2L page by the day/time of each scheduled class as per the course schedule.

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/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, 2nd 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

Take Home Questions (60%)

Exam	due date	material	weighting
Question Set #1	October 5 th	Material up to Sept 28	20%
Question Set #2	November 2 nd	Material from to Sept 30 to Oct 26	20%
Question Set #3	December 12 th	Material from Oct 28	20%

Questions on the take home assignments will be short answer and cover lecture and reading material up to the assignment date. While **the assignment questions are not cumulative, about 25% of the final assignment will cover thematic issues that span the full course.** Questions will be provided one week in advance of the due date.

Questions sets are open book. For this course, an open book exam means that the use of class notes and the textbook is permitted. The use of online resources is permitted. Students may not communicate with others about course material or the question sets either in person or electronically.

As the questions sets are take-home open book, answers will be graded not only for accuracy, but also for how clearly and effectively the question is answered. To earn full marks, answers need to be correct and accurate, need to include specifics, and will 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.

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 prior to beginning of the following week's laboratory. 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:

1. Animal Handling	due Sept 23,25	2.5%
2. Motor behavior	due Oct 14,16	2.5%
3. Maternal Behaviour	due Oct 21,23	2.5%
4. Circadian Behaviour	due Nov 18,20	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 https://www.jneurosci.org/content/information-authors#preparing_a_manuscript. 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 Oct 23, 25	5%
2. Stroke	due Nov 25, 27	10%
3. Learning and Memory	due Dec 18	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.

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	
W Sep 9*	Introduction * (live on Zoom)	University Lectures begin.
F Sep 11	History / Philosophy	
M Sep 14	History / Philosophy	
W Sep 16	Motor systems	
R Sep 17	Motor systems	Last day to drop a class without a penalty
F Sep 18	Motor systems	Last day to add or swap a course
M Sep 21*	Motor systems Q&A * (live on Zoom)	
W Sep 23	Motor systems	
F Sep 25	Motor systems	Fee payment deadline for Fall Term full and half courses.
M Sep 28*	Motor systems * (live on Zoom)	
W Sep 30	Sex	
F Oct 2	Sex	
M Oct 5	No Lecture - Take home exam due – Material up to Sept 28 covered	
W Oct 7	Sex	
F Oct 9	Maternal Behaviour	
M Oct 12	Thanksgiving Day, University closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.	
W Oct 14	Maternal Behaviour	
F Oct 16	Maternal behaviour	
M Oct 19*	Sex Maternal behaviour and Feeding Q&A * (live on Zoom)	
W Oct 21	Feeding	
F Oct 23	Drinking	
M Oct 26*	Thermoregulation * (live on Zoom)	
W Oct 28	Circadian Rhythms	
F Oct 30	Circadian rhythms	
M Nov 2	No Lecture - Take home exam due – Material from Sept 30 to Oct 26 covered	
W Nov 4	Circadian rhythms	
F Nov 6	Sensation	
Nov 8-14	Term Break No Classes	
W Nov 11	Remembrance Day (Observed). University Closed (except Taylor Family Digital Library, Law, Medical, Gallagher and Business Libraries). No lectures.	
M Nov 16*	Circadian rhythms Q&A * (live on Zoom)	
W Nov 18	Blood flow and Stroke	
F Nov 20	Meninges and headache	
M Nov 23*	Pain * (live on Zoom)	
W Nov 25	Anxiety and Fear	
F Nov 27	Depression	
M Nov 30*	Learning * (live on Zoom)	
W Dec 2	Learning	
F Dec 4	Learning	
M Dec 7*	Guest Lecture * (live on Zoom)	
W Dec 9*	Final Q&A session	Fall Term Lectures End. Last day to withdraw with permission from Fall Term half courses.
Dec 12-23	Fall Final Exam Period	

Tentative Lab Schedule

Week	Lab	Assignment due
Sept 16, 18	1. Handling	
Sept 23, 25	2. General Behaviour	Handling (short assignment)
Sept 30, Oct2	3. Skilled Behaviour	
Oct 7, 9	4. Maternal Behaviour and Pup Development #1	
Oct 14, 16	5. Pup Development #2	Motor behaviour (short assignment)
Oct 21, 23	6. Surgery Demonstrations	Maternal behaviour (short assignment)
Oct 28, 30	7. Post stroke motor behaviour	Pup Motor Development (full Report)
Nov 4, 6	8. Circadian rhythms	
Nov 11, 13	Reading Week – No Labs	
Nov 18, 20	9. Fear and Anxiety	Circadian (short assignment)
Nov 25, 27	10. Spatial learning	Stroke (full Report)
Dec 2, 4	11. Object Recognition / Place preference	
Dec 18		Learning (full Report)

Labs will be run **IN PERSON** on campus according to the following guidelines.

- University reentry protocols must be followed:
 - <https://ucalgary.ca/risk/sites/default/files/2020-05/UCalgary.COVID19.ReEntryProtocols.pdf>
- Students in each lab session (Wednesday or Friday) will be assigned to an early (13:00) or late (14:30) timeslot, allowing for ½ capacity attendance at each lab session
 - The early 13:00 group will enter into room AD51
 - The late 14:30 group will enter into AD53
- Enter the Administration Building from the north end (closest to the Social Sciences link and executive suit. Use the large stair well opposite the executive suite at the north end, and follow the corridors to your left at the bottom of those stairs.
- When you leave, please use the stairs and exits at the south end of the Administration building, closest to the Professional Faculties Building.
- Facemasks, gloves and lab coats will be required. Masks will be provided, although feel free to bring your own. Gloves will be provided.
- Maintain 2m separation when possible.
- 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 a lab 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

Makeup tests/exams are **NOT** an option without the approval of the instructor. 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 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/. 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) 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 17, 2020**. Last day add/swap a course is **Friday, September 18, 2020**. The last day to withdraw from this course is **Wednesday, December 9, 2020**.

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