



UNIVERSITY OF
CALGARY

**Psychology 476A+B (L01) – Physiological Psychology
Fall 2009 + Winter 2010**

Instructor:	Dr. Mike Antle	Lecture Location:	Admin 51/53
Phone:	403-220-2574	Lecture Days/Time:	MWF 10:00 – 10:50
Email:	antlem@ucalgary.ca	Lab Location:	Admin 47/51
Office:	Admin 018	Lab Day/Time:	W or F 13:00 – 16:00
Office Hours:	Drop-in or By appointment	(E-Mail to schedule an appointment)	
Lab Instructor:	Brook Rakai	Office:	Admin 9
		Email:	bdrakai@ucalgary.ca
Office hrs:	Drop-in or By appointment	(E-Mail to schedule an appointment)	

Course Description and Goals

This is a senior course in physiological psychology whose key philosophical theme is that behaviour and mind reflect neural activity. According to this view, the brain underlies not only relatively simple behaviours such as walking and smiling, but also elaborate affective and cognitive events such as feeling, thinking, and composing a poem. As a corollary, the emotional and cognitive problems that characterize neurotic and psychotic illness must result from disturbances of the brain. The brain is made up of individual units - the neurons and glial cells. Thus, the task of physiological psychology is to determine the relationship between behaviour and brain activity. Students will learn about these concepts through lecture material and **hands-on experiments with live, behaving animals**.

This course is organized into four main sections.

- Anatomy and Molecular Biology
- Neurophysiology
- Plasticity (Development and Learning)
- Homeostasis

Students completing this course have found it one of the most rewarding experiences of their academic careers. It forms an unparalleled foundation for future studies in Neuroscience and Medicine. That being said, the workload will likely be much heavier than most students have experienced thus far. Students who are unable to dedicate the time and effort required for this course are advised to pursue an alternative course.

Prerequisites

Psyc 375 – Brain and Behaviour, and

Psyc 312 – Experimental Design & Quantitative Methods for Psychology (or consent of the Department)

Laboratories:

Labs begin **the first week of classes (September 8th and 10th)** and will be held in Admin 047/051. The recommended lab manual is indicated below. Lab coats and rubber gloves are also recommended. Students are responsible for providing their own dissecting kits and they should bring them to the laboratory sessions. The first two or three labs will be devoted to neuroanatomy. The remaining labs will be devoted to behavioural analysis and **neurosurgery** in preparation for second term projects. All students should be prepared to **work with live,**

behaving animals, following the guidelines recommended by the Canadian Council on Animal Care.

Required Text

- Kandel, Schwartz, and Jessel. (4th Ed.). Principles of Neural Science, Academic Press, 2000.
- Vanderwolf and Cooley (2nd Ed.) The Sheep Brain: A Photographic Series, A.J. Kirby Co., 2002

Additional laboratory readings will be made available as needed.

Evaluation:

All exams are short answer format. See lecture outline below for chapters covered on each exam.

Fall:	Neuroanatomy quiz	5%	Monday, Sept 28 th	in A47/51
	First exam	10%	Wednesday Oct 14 th	in class
	*Behavioural Test Project	5%	Oct 21 st or 23 rd	in lab
	Second exam	10%	Monday Nov 16 th	in class
	*Stroke Lab Report	5%	Nov 18 th or 20 th	in lab
	*Scent Marking Lab Report	5%	Dec 8 th	“green” box outside A275
	Third exam	10%	Scheduled by registrar	
Winter:	*Written Proposal	1%	Jan 14 th or 16 th	in lab
	Fourth exam	10%	Early to mid Feb, 2009	in class
	*Proposal presentation	5%	Feb 25 th or 27 th	in lab
	Fifth exam	10%	Mid to late Mar, 2009	in class
	*Final Presentation	5%	Apr 1 st or 3 rd	in lab
	*Final Project Report	9%	Apr 16 th	“green” box outside A275
	Final exam	10%	Scheduled by registrar	

* - Due date depends on lab section, assignments due on the day of the week when your lab is held.

Descriptions of Lab Assignments:

1. Neuroanatomy Quiz: Students will learn the neuroanatomy of the sheep brain in lab and on their own time. The quiz will consist of a written portion based on the lab text as well as a timed portion identifying brain structures in real sheep brains.
2. Behavioural Tests: Students will run rats through about 5 different behavioural tests. The assignment requires a small write up about each test. The write up will consist of:
 - Brief description of the test including the purpose of the test (i.e. what is it measuring?).
 - Brief summary of real studies that have used the test. You will need to provide a **minimum** of 2 references for each test.
 - Design a simple experiment that would effectively use the test.
3. Stroke Lab: A full lab write-up of the experiment in the style of the Journal of Neuroscience (<http://www.jneurosci.org/misc/itoa.shtml>).
4. Flank-Marking Lab: A full lab write-up of the experiment in the style of the Journal of Neuroscience.
5. Individual Project: Students will work alone or in pairs on a project of their own design (subject to resource and Animal Ethics constraints). Students can work under the TA's supervision, or possibly in a Behavioural Neuroscience professor's lab. Evaluation will consist of the following:
 - a. A proposal presentation:

- In 10 minutes, present the background necessary to understand the question, as well as the proposed methodology.
- b. A presentation on the completed project:
 - In 10 minutes, present a brief background to set up the research question, present the methodology and results, and then place your findings in the context of the wider research area.
- c. A brief written proposal, describing the research question and methods.
- d. A full lab write-up of the experiment in the style of the Journal of Neuroscience.

Students must achieve a passing grade on both the class and lab components to pass this course. All laboratory projects must be completed, or students **will receive a zero for the full laboratory component of the course**. Penalty for late submission of reports and exams is 10% for each day, including weekends and holidays. No excuses apart from a medical certificate will be accepted. E-Mailed assignments will only be accepted with prior approval of the TA.

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

See last page. Winter lecture schedule will be provided in January.

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. 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 Accommodation

It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 220-8237. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation. You are also required to discuss your needs with your instructor no later than 14 days after the start of this course.

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 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.

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. Students earn 0.5% (0.5 credits) for each full 30 minutes of participation. **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 15th, 2010**.

Student Organizations

Psychology students may wish to join the Psychology Undergraduate Students' Association (PSYCHS). They are located in Administration 170 and may be contacted at 220-5567.

Student Union VP Academic: Phone: 220-3911 suypaca@ucalgary.ca
Student Union Faculty Rep.: Phone: 220-3913 socialsciirep@su.ucalgary.ca

Important Dates

The last day to drop this course and **still receive a fee refund** is **Sep 18th, 2009**. The last day to withdraw from this course is **Apr 16th, 2010**.

Tentative Lecture Schedule

Date	Topic	Readings
Sept 9	Introduction + Philosophy	
Sept 11	History of physiological psychology	1
Sept 14	Anatomy of the brain 1	17
Sept 16	Anatomy of the brain 2 (blood + blood brain barrier)	App. B+C
Sept 18	Anatomy of the brain 3 (blood + blood brain barrier)	App. B+C
Sept 21	Cells of the nervous system	2
Sept 23	Functioning of neurons	2
Sept 25	Anatomy of the brain 4	17 + 18
Sept 28	Neuroanatomy Quiz (5%) during lecture period, held in Admin 047/051	
Sept 30	Anatomy of the brain 5	18
Oct 2	>>>>Class discussion on Neurostimulation<<<<	
Oct 5	Genes and Behaviour	3
Oct 7	Genes and Behaviour	3
Oct 9	>>>>Class discussion on Genetics of behaviour<<<<	
Oct 12	Thanksgiving – University closed	
Oct 14	Exam #1, Short answer (10%) in class Chapters 1-3, 17-18, Appendices B+C	
Oct 16	Ion channels and Membrane potentials 1	6
Oct 19	<<No Class>> Society for Neuroscience Meeting	
Oct 21	<<No Class>> Society for Neuroscience Meeting	
Oct 23	Ion channels and Membrane potentials 2	6
Oct 26	Ion channels and Membrane potentials 3	6-7
Oct 28	Ion channels and Membrane potentials 4	7-8
Oct 30	Ion channels and Membrane potentials 5	8
Nov 2	Ion channels and Membrane potentials 6	8
Nov 4	Action potentials 1	9
Nov 6	Action potentials 2	9
Nov 9	Synaptic Transmission 1	10
Nov 11	Reading Days Nov 11-15 – University closed	
Nov 13	Reading Days Nov 11-15 – University closed	
Nov 16	Exam #2, Short Answer (10%) in class Chapters 6-9	
Nov 18	Synaptic Transmission 2	10
Nov 20	Synaptic Transmission 3	11
Nov 23	Synaptic Transmission 4	12
Nov 25	Synaptic Transmission 5	12
Nov 27	Neurotransmitters 1	15
Nov 30	Neurotransmitters 2	15
Dec 2	Intracellular pathways 1	13
Dec 4	Intracellular pathways 2	13
Dec 7	Neurotransmitters Release Last day to allocate research participation bonus credit	14
Dec 11 - 21	Third Exam during exam period Chapters 10-15	