



UNIVERSITY OF
CALGARY

Department of Psychology
Psychology 475(L01) – Behavioural Pharmacology
Winter 2009

Instructor:	Dr. Brian H. Bland	Lecture Location:	SH 278
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Office Hours:	By Appointment		

Course Description and Goals

The behavioural effects of drugs specifically employed to affect the nervous system, as seen in the treatment of mental disorders, behavioural disorders, and other pathological conditions such as Parkinson's disease, and Schizophrenia. Neuro-pharmacologic agents will be discussed as they relate to the biochemistry and physiology of neurotransmitters.

Prerequisites: Psychology 371 or 375, or consent of the Department.

Required Text

Drugs and Human Behaviour, David M. Grilly (2006) 5th Ed. Allyn and Bacon. Available at the bookstore.

Evaluation

Mid-term Exam – 30% -March 3, 2009– Multiple choice and short essay questions. Part 1 of lectures and Chapters 1,2,3,4, and 5.

Final Exam – 40% -Scheduled by Registrar – Multiple choice and short answer essay questions. Part 2 of lectures and Chapters 6,7,12, and 14(Parkinson's Disease).

Essay - 30% -due Tuesday March 23, 2009. Topic of your choice in Behavioural Neuroscience. Length should be 10-12 double-spaced pages in a scientific review format (e.g. Brain Research Reviews). To be handed in at the end of the lecture. Emailed assignments will not be accepted. Late assignments will be assessed a penalty of 10% per day (including weekends).

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-).

Lecture Schedule

Part 1. Electrical properties of neurons

- A. Axonal physiology (the membrane potential and the action potential)**
- B. The synapse**
- C. Neurotransmitters and neuromodulators**

Part 2. Disorders of chemical transmission

- A. Parkinson's disease**
- B. Schizophrenia**

Detailed Outline.

Part 1. Electrical Properties of Neurons

A. Axonal Physiology

1. The organization of signaling in neurons
2. The concept of excitability
3. Membrane potential
4. Resting potential
5. Depolarization
6. Hyperpolarization
7. The action potential
8. Chemical and electrical forces and the Nernst equation
9. The Goldman equation
10. Voltage -dependent
11. Conduction of the action potential

B. The Synapse

1. Polarization of chemical synapses
2. Types of chemical synapses
3. Vesicles
4. Patterns of connections

C. Synaptic Potentials

1. Depolarizing (EPSP) and hyperpolarizing (IPSP) potentials
2. Synaptic integration
3. Current flow during IPSP's and EPSP's
4. Presynaptic factors controlling transmitter release
5. Nature of transmitter release

D. Neurotransmitters and neuromodulators

1. Identification of neurotransmitters and neuromodulators
2. Co-existence of neurotransmitters
3. Transmitter reception
4. Time course of action
5. Some specific transmitters highlighted (ACh, NE, DA, 5-HT, and GABA)

A. Parkinson's Disease

1. Historical remarks

2. Clinical features
3. Basal ganglia and Parkinsonism
 - i) inputs to striatum
 - ii) outputs from striatum
 - iii) putative neurotransmitters in basal ganglia pathways
 - iv) dopamine changes in Parkinsonism
 - v) changes in HVA, TH, and DDC
 - vi) functional consequences of striatal DA deficiency
4. Compensated and decompensated stages
5. Involvement of other neurotransmitters
6. The MPTP story
 - i) MPTP conversion to MPP+
 - ii) Prevention of MPTP-induced Parkinsonism by pargyline
7. Therapeutic aspects
 - i) classic levo-dopa therapy
 - ii) Deep Brain Stimulation (DBS)

B. Schizophrenia

1. Background
2. Clinical features
 - i) Schneider's first rank symptoms
 - ii) positive and negative symptoms
 - iii) introduction to neuroleptics
3. Neurohumoural hypotheses
 - i) Serotonin deficiency
 - ii) NE deficiency
 - iii) DA overactivity
 - iv) Monoamine oxidase deficiency
 - v) GABA deficiency
 - vi) LSD and amphetamine psychoses
 - vii) Mechanism of action of amphetamine
 - viii) Mechanism of neuroleptics
4. Neurochemistry
 - i) Serotonin hypothesis
 - ii) NE hypothesis
 - iii) DA hypothesis
 - iv) GABA deficiency hypothesis
5. Chronic schizophrenia and the "defect state"
6. Chemical and structural changes
 - i) two syndromes
 - ii) relationship between the two syndromes
7. Aetiology
8. Summary

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

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 the student's final grade. Students earn 0.5% (0.5 credits) for each full 30 minutes of participation. 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 **April 16, 2009**.

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 socialscirep@su.ucalgary.ca

Important Dates

The last day to drop this course and still receive a fee refund is **January 23, 2009**. The last day to withdraw from this course is **April 17, 2009**.