## PSYC 3204 - Behavioural Neuroscience

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<th>Unit of Study Code:</th>
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| Coordinator:        | Dr Justin Harris  
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| Format of Unit:     | 2 x 1 hour lectures/week x 13 weeks  
1 x 1 hour tutorial/week x 12 weeks  
Tutorial sizes: maximum of 20 students per group |
| Credit Point Value: | 4 Credit Points |
| Qualifying:         | 8 credit points of Intermediate Psychology including PSYC 2111 |
| Assessment:         | The marks will be allocated as follows:  
**Classwork** 35%  
comprised of a tutorial quiz (week 7, 8/9 to 12/9) - 15%  
Poster presentation - 10%  
Class Participation - 10%  
**Final Exam** 65%  
multiple choice questions and short answers |
| Evaluation of teaching and learning: | Date: week 13  
Type: standard CTL evaluation |
Unit of study general description:

This unit carries on from the Neuroscience component of PSYC 2111. It is concerned with neural processes as studied in non-human animals, providing more specialised coverage in the areas of psychopharmacology, molecular neuroscience, the neural bases of motivation and emotion, and the neurobiology of learning and memory. Specific topics include: basic actions of drugs in the brain; the specific mechanisms of action of therapeutic drugs such as antidepressants, anxiolytics, and antipsychotic drugs; the effects of recreational drugs such as ecstasy and opiates; and the use of gene knockout mice to study brain and behaviour; neurobiology of social emotions and social behaviour; the neural bases of perception and action; balance and vestibular function; synaptic plasticity and associative learning; pathophysiology of degenerative brain diseases; and animal models of psychiatric disease.

In the first few weeks of the course, tutorials consist of demonstrations covering basic neuroanatomy, histology and psychopharmacology. In the latter part of the course, tutorials involve groups of students giving poster presentations of recent "hot" papers in the neuroscience field.

Teaching outcomes:

- Knowledge of fundamental functional neurophysiology including neuronal and synaptic transmission.
- Knowledge of the methods in behavioural neuroscience: electrophysiological recording, brain lesions, histology and immunohistochemistry; behavioural measures; and computational analysis.
- Knowledge of psychopharmacology - for example the psychopharmacology of depression and the psychopharmacology of drugs of abuse.
- Understanding of the neurobiology of emotions and social behaviour.
- Understanding of basic mechanisms of plasticity in the nervous system and how the relate to learning.
- Understanding of cognitive neuroscience as studied in non-human primates; relating recent neuronal activity to behaviour and psychological function.
- Knowledge of neuropathology of degenerative neurological conditions and selected models of psychiatric disease.
- Experience in critically evaluating a journal publication in behavioural neuroscience.
- Experience in oral presentation of piece of neuroscience research.

Tutorials
For the first six weeks, tutorials will consist of demonstrations and practicals on such topics as sheep brain dissection, histology, immunohistochemistry, single cell recording and animal models. These practicals, while not at all "gory", are not recommended for people who have a strong ethical objection to animal experimentation. In weeks 8-12, tutorials will involve poster presentations by groups of students in which they discuss a recent paper in the neuroscience field. The final tutorial (in week 13) will involve a quiz on all tutorial material.

Poster presentations
In the first tutorial (week 2) you will be required to form groups of 3 people. A poster topic will be allocated (at random - literally by drawing the topic out of a hat) to each group and you will be required to present a poster on that topic later in the semester. You will work with others in your team to prepare this poster. You will also be responsible for preparing a handout in association with each poster for the rest of the tutorial. Your poster presentation will last around 20 minutes and you must be ready to encourage and handle questions about the material.
PROVISIONAL SYLLABUS

Dr Justin Harris will give lectures on the following:

- Revision of basic neuroanatomy and neurophysiology.
- Mechanisms of synaptic plasticity and their contribution to associative learning;
- Brain structures specialised for specific learning and memory processes;
- How the brain represents space;
- Movement and action.
- Degenerative disorders – Alzheimers, Parkinsons, CJD.

Dr Steve Sivly will give lectures on the following:

- The neurobiological substrates of social emotions including mating, social bonding, attachment and separation,
- The neural bases of play behaviour.

Dr Jennifer Cornish will give lectures on the following:

- Psychopharmacology.
- Molecular neuroscience.
- Addiction and drug abuse
- Schizophrenia
- Depression

Professor Ian Curthoys will give lectures on the following:

- Sensorimotor integration in behavioural neuroscience.
- Clinical implications of work in behavioural neuroscience:
  How understanding the neuroanatomical and physiological basis of a sensory system is used to understand normal function and function after unilateral loss.
- The vestibular system as an example.
- The role of the vestibular system in stabilizing the visual world. The effect of unilateral vestibular disease and loss.
- Plasticity of the vestibulo-ocular reflex. Vestibular compensation.
- Clinical implications.
  Vertigo, vection and motion-sickness.

TEXT

Carlson, N.R. (2002) Foundations of Physiological Psychology, 5th Edition. Boston. Allyn and Bacon. This will be supplemented by references to many recent papers in the areas. Copies of these papers should be available from Special Reserve.