PSYC 3014 –
Behavioural and Cognitive Neuroscience

Unit of Study Code: PSYC3014

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Format of Unit:
3 x 1 hour lectures/week x 13 weeks
1 x 1 hour tutorial/week x 12 weeks

Credit Point Value:
6 Credit Points

Prerequisite:
Intermediate Psychology units including
PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114).
Assessment:

Classwork:

Class Quiz, 10% of the total mark
11 September – 14 September (Week 8)

Class group presentation, 10% of the total mark of the unit
(Week 9 to Week 13), 18 September to 27 October

Essay/report (2,000 words), 25% of the total mark of the unit
Week 10, Friday 6 October

Tutorial Participation, 5% of the total mark of the unit

Examination:
50% multiple-choice and short answer questions

Out of class prescribed student workload
2 hrs/wk: Assignment research and background research for presentation

Unit of study general description:

This unit of study will focus on approaches to studying neurosciences incorporating molecular, preclinical and clinical models of brain function. These biological models of brain function will be linked with behavioural, affective and cognitive function and dysfunction. The implications of focal cognitive deficits in neurological patients for models of normal cognitive function will also be explored. Specific topics to be covered will be selected from the following areas: psychopharmacology, addiction, social neuroscience, molecular neuroscience, sensorimotor integration, the neural basis of learning and memory, language, visual cognition and praxis. In addition to lectures, a practical component will cover basic neuroanatomy, histology and neuropharmacology, and will introduce students to experimental and case-study approaches to studying neurosciences.
Lecture content (draft only)

Iain McGregor will give 10 lectures on the following general topics:

- Revision of basic neuroanatomy, neurophysiology and neurochemistry
- Research methods in behavioural and cognitive neuroscience
- Depression - neural basis, animal models, prevalence and drug treatments. The role of neurogenesis in recovery from depression.
- MDMA ("Ecstasy") and Methamphetamine ("Speed") - use, abuse, possible neurotoxic effects and adverse functional effects.
- The neurobiology of social and sexual behaviour.

Justin Harris will give 4 lectures on the following topics:

- Anatomy and neurophysiology of movement, from spinal cord to motor cortex, cerebellum, and basal ganglia.
- The neuropathology of Parkinson's and Huntington's Diseases.
- The neuropathology of Alzheimers and CJD.
- Electrophysiological and imaging methods for studying brain function.

Ian Curthoys will give 4 lectures on the neural basis of sensorimotor integration, including

- the importance of vestibular (balance) input for normal, sensation, posture
- head-eye coordination during driving
- how recent advances in sensing head movement and measuring performance are providing new understanding of sensorimotor integration

Alex Holcombe will give 6 lectures covering the following topics:

- Attention and attentional disorders
- Sleep and arousal
- Neuropsychological connections and disconnections
- Computational cognitive neuroscience

Irina Harris will give 4 lectures relating to the neural substrates of object processing:

- Cortical organisation of high level visual processing
- Neuropsychological disorders of object recognition and spatial processing
- Perceptual expertise
Karen Croot will give 7 lectures on the following topics:

- Semantic memory impairments in temporal variant Fronto-Temporal Dementia (tvFTD) and Herpes Simplex Viral Encephalitis
- Anomia in tvFTD and epilepsy
- Classical aphasia syndromes after stroke and recent perspectives on localisation of language function
- Speech production in acquired deafness and following stroke (apraxia of speech)
- Foreign accent syndrome & speech production in bilingual speakers.

Sally Andrews will give 3 lectures on the cognitive neuroscience of long-term memory, including

- semantic vs episodic memory
- the hippocampus and LTM
- competing theories of the role of the hippocampus in LTM
  - neuropsychological evidence
  - neuroimaging evidence

Textbook