PSYC3215 – Cognitive Neuroscience & Neuropsychology

Unit of Study Code: PSYC3215

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Format of Unit:
2 x 1 hour lectures/week x 13 weeks
1 x 2 hour tutorial (or laboratory) per fortnight x 6 fortntights

Credit Point Value:
4 Credit Points

Qualifying:
8 credit points of Intermediate Psychology including 2 of PSYC2111
or PSYC2011, PSYC2112 or PSYC2012 and PSYC2113

Assessment:
Classwork:
Unit of study general description:
The course explores neuroscientific and neuropsychological approaches to human cognitive abilities. The Cognitive Neuroscience approach focuses on studying the human brain at different scales of function (microscopic to macroscopic), the link between cognitive and biological models of brain function and dysfunction, and the application of these models to understanding normal cognition and consciousness as well as cognitive neuropsychiatric disorders such as post-traumatic stress disorder (PTSD), schizophrenia and attention-deficit hyperactivity disorder (ADHD). The Neuropsychological approach considers disorders in cognitive domains including visual cognition, language, memory, and executive functioning that occur as a result of a number of neurological disorders including stroke, traumatic brain injury and dementia. Questions of importance to this approach include (1) what are the neuroanatomical underpinnings of various cognitive domains? and (2) what are the implications of focal cognitive deficits in neurological patients for models of normal cognitive function?

TEACHING OUTCOMES

- Knowledge of fundamental principles of cognitive neuroscience and neuropsychology
- Knowledge of the methods and primary sources of information in cognitive neuroscience and neuropsychology – including brain imaging, brain modelling and lesion-based studies.
- Knowledge of the major anatomical and functional brain networks and associated cognitive processes.
- Knowledge of lesion-based disorders in the major functional systems (including attention, language, memory, visual perception, executive function and decision making).
- Knowledge of brain function mechanisms across different scales of focus (single neuron to neural network to whole-brain).

RECOMMENDED READING

There is no set text for this course because much of the material taught is extremely recent. Readings for practical topics will support or complement lecture material. Some lecturers will recommend readings to be available via the library online course readings service, or in Fisher Special Reserve, or will recommend sections from the following books:


LECTURE TIMETABLE

See following page
<table>
<thead>
<tr>
<th>Week</th>
<th>Staff</th>
<th>Lecture Programme</th>
<th>Tutorial Programme</th>
</tr>
</thead>
</table>
| 1    | KC    | **Mon:** Introduction to cognitive neuroscience and neuropsychology  
      | CC    | **Wed:** Neuroanatomy: Structures and functions | No tutorial |
| 2    | CC    | **Mon:** Functional magnetic resonance imaging  
      | IH    | **Wed:** Visual processing of objects 1: cortical organisation | EVEN numbered groups  
      |       | start this week  
      |       | Cognitive neuroscience Lab. 1: Theoretical topics 1-5:  
      |       | Form small groups |
| 3    | IH    | **Mon:** Visual processing of objects 2:  
      | IH    | neuropsychological disorders  
      |       | **Wed:** Spatial transformations of objects and bodies | ODD numbered groups  
      |       | start this week  
      |       | Cognitive neuroscience Lab.1: Theoretical topics 1-5:  
      |       | Form small groups: |
| 4    | CC    | **Mon:** Computational Models of Cognitive Processes  
      | CC    | **Wed:** The Binding Problem | EVEN numbered groups  
      |       | Cognitive neuroscience Lab. 2: Theoretical topics 1-5:  
      |       | Prepare presentation |
| 5    | LW    | **Mon:** Brain imaging: EEG  
      | LW    | **Wed:** Attention & attentional disorders 1 | ODD numbered groups  
      |       | Cognitive neuroscience Lab. 2: Theoretical topics 1-5:  
      |       | Prepare presentation |
| 6    | LW    | **Mon:** Attention & attentional disorders 2  
      | LW    | **Wed:** Emotion & emotional disorders 1 | EVEN numbered groups  
      |       | Cognitive neuroscience Lab. 3: Presentations for  
      |       | theoretical topics 1-5 |
| 7    | LW    | **Mon:** Emotion & emotional disorders 2  
      | KC    | **Wed:** Semantic memory in temporal variant  
      |       | Fronto-Temporal Dementia (tvFTD) and Herpes Simplex Viral Encephalitis | ODD numbered groups  
      |       | Cognitive neuroscience Lab. 3: Presentations for  
      |       | theoretical topics 1-5 |
| 8    | KC    | **Mon:** Word retrieval in tvFTD and epilepsy  
      | KC    | **Wed:** Classical aphasia syndromes after stroke  
      |       | and recent perspectives on localisation of  
      |       | language function | EVEN numbered groups  
      |       | Cognitive neuropsychology Lab. 1: Theoretical topics 1-5  
      |       | Form small groups |
| 9    | KC    | **Mon:** Speech production in acquired deafness and  
      | KC    | following stroke  
      |       | **Wed:** Speech production in bilingual speakers,  
      |       | foreign accent syndrome, dysarthria | ODD numbered groups  
      |       | Cognitive neuropsychology Lab. 1: Theoretical topics 1-5  
      |       | Form small groups  
      |       | **ESSAY DUE Fri Sept. 23** |

**Non-teaching week Sept. 26-Oct 30.**

| 10   | KC    | **Mon:** PUBLIC HOLIDAY  
       |       | **Wed:** Reading, writing and the brain | EVEN numbered groups  
       |       | Cognitive neuropsychology Lab. 2: Theoretical topics 1-5:  
       |       | Prepare presentation |
| 11   | SA    | **Mon:** Theories and models of long-term memory (LTM)  
       | SA    | **Wed:** Cognitive neuroscience of LTM 1 | ODD numbered groups  
       |       | Cognitive neuropsychology Lab. 2: Theoretical topics 1-5:  
       |       | Prepare presentation |
| 12   | SA    | **Mon:** Cognitive neuroscience of LTM 2  
       | BB    | **Wed:** The frontal lobes and higher-order cognitive processes | EVEN numbered groups  
       |       | Cog. neuropsychology Lab 3: Presentations for  
       |       | theoretical topics 1-5 |
| 13   | BB    | **Mon:** Decision making and the brain  
       | BB    | **Wed:** Hormones and cognition | ODD numbered groups  
       |       | Cog. neuropsychology Lab 3: Presentations for  
       |       | theoretical topics 1-5 |