Module PS5235
Cognitive and Behavioural Neuroscience

2019/2020
Weeks 1 -5, Semester 1

Lecturer: Dr Ines Jentzsch (email: ij7; room 2.04)

Timetable:

<table>
<thead>
<tr>
<th>Date</th>
<th>Week</th>
<th>9-11am</th>
<th>1-2pm</th>
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<tr>
<td>Tuesdays</td>
<td>TBA</td>
<td>Lecture</td>
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<td>18/09/18</td>
<td>1</td>
<td>Lecture</td>
<td>Practical</td>
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<td>25/09/18</td>
<td>2</td>
<td>Lecture</td>
<td>Practical</td>
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<td>02/10/18</td>
<td>3</td>
<td>Lecture</td>
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<td>09/10/18</td>
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<td>Lecture</td>
<td>Practical</td>
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<td>16/10/18</td>
<td>5</td>
<td>Lecture</td>
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In addition, a weekly 1-hour tutorial will complement the content lectures:
Fridays (weeks 1-5): 2:30-3:30pm, Venue: TBA
Aims and Objectives:

This module aims to provide an understanding of psychological knowledge in several inter-related domains concerned with the biological bases of behaviour. Emphasis will be laid on basic experimental science from analysis of synaptic events, brain lesion studies, brain activity scans, and clinical studies. The relationship between cognitive, emotional, behavioural, neurological and physiological processes will be examined and how these processes might differ between individuals focussing on State and Trait Anxiety, Externalizing vs Internalizing Personalities, and Aging.

Teaching will be based on morning lectures and afternoon seminars/practicals in which class members will be expected to play an active part (e.g., group presentations followed by class discussion), based on reading and critical evaluation of original material. Emphasis will be placed on the development of the skill of critical evaluation of alternative methods and models and levels of explanations of behaviour, with a particular focus on current debates and critiques of psychology. Students will learn to construct a coherent argument or debate by demonstrating logical processing of (complex) information and deductive reasoning and test hypotheses, theories, methods and evidence within their proper research contexts.

Intended Learning outcomes
A) Knowledge & Understanding / Intellectual Skills:
(1) to understand the basic research techniques in neuroscience sufficiently to allow comprehension and appraisal of original research papers; (2) to realise limits in methods and theory through critical evaluation; (3) to formulate new studies to advance the field; (4) to realise how brain processing underpins normal and pathological mental symptoms; (5) To understand how individuals can differ in basic behavioural and physiological processes.
B) Module Specific / Practical Skills; Transferable / Key Skills:
(1) Teamwork, (2) Effective communication via oral presentations (3) Practical skills of designing neuroscience experiments (4) Analysis of data arising from neuroscience experiments. (5) To think creatively and independently. (6) To handle complex bodies of information.

Assessment (Continuous Assessment only)
The completion of two pieces of continuous assessment is required:

1. Write a short essay on the topic “Do we need neuroscience to attain a functional understanding of our behaviour? Demonstrate your points using an example.”(1500 words*); deadline for submission: Monday the 7th of October 2019, 12noon; 50% of final mark
2. Write a short essay on the topic “How and/or why do we detect and respond to processing conflicts or errors” (1500 words*); Submission deadline: Monday, the 28th October 2019, 12noon; 50% of final mark.

Essay Formatting: The essays should be presented as follows: a title page stating the title of the work, student’s matriculation number, the module number, and the date; – there must be at least a 1” margin all round (top, bottom, right and left); the text must be in Arial font at 12-point, 1.5 line spaced. The reference list does not count towards the word limit.

*word counts exclude references
Lecture 1. Methods in Cognitive Neuroscience I
Introduction; Lesion studies, TMS/tDCS, PET, fMRI
Reading (Lecture 1 and 2):
(Chapters 1, 3, 12 and 14). Northon and Company: New York.
Additional reading for Conversion students:

Lecture 2. Methods in Cognitive Neuroscience II
EEG/ERP, MEG, Optical Imaging
Additional reading for conversion students:

Lecture 3. Voluntary control over mental processes: Historical debates and experimental paradigms
Key Concepts (The control homunculus, modularity hypothesis); Conflict paradigms (S-R compatibility effect, Simon, Ericson, and Stroop effect)
Reading:
Botvinick et al. (2004). TICS, 8, 539-546.
Practical: Experimental Paradigms: Design and data collection
Additional reading for conversion students:

Lecture 4. Voluntary control over mental processes: Neuroscience
Neuroanatomy of cognitive control; computational modelling
Reading:
Practical: Experimental Paradigms: Data Analysis, interpretation and critique

Lecture 5. Voluntary control over mental processes: Individual Differences
Individual variations affecting Cognitive Control: State and Trait Anxiety, Externalizing vs Internalizing Personalities, Aging, Depression
Reading:
Additional task for conversion students: Prepare a one-page summary of the key findings including critique of the Erickson et al. (2004) paper before the practical session