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Title: Current Methods in Brain and Behaviour  
 Status: Definitive  
 Code: **7101BRAIN** (126656)  
 Version Start Date: 01-08-2021  
 Owing School/Faculty: Psychology  
 Teaching School/Faculty: Psychology

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**Academic Level:** FHEQ7      **Credit Value:** 20      **Total Delivered Hours:** 44  
**Total Learning Hours:** 200      **Private Study:** 156

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	10
Practical	24
Workshop	10

**Grading Basis:** 50 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	report	Students will produce an experimental report in the style for publication as a short report (2500 words, max 1 table, max 25 references)	70	
Portfolio	port	Students will programme a behavioural task using specialist software and write a protocol for its use in a research study (Protocol 1000-1500 Words)	30	

## Aims

*This module aims to provide students with:*

- 1. Opportunities to explore several current methods in brain and behaviour used to investigate core areas of cognitive neuroscience*
- 2. Opportunities to develop a critical perspective on the complex ethical issues related to research in cognitive neuroscience*
- 3. Hands-on practice in using neuroimaging and neuro-stimulation technologies as well as the design and conduct of cognitive behavioural tasks*
- 4. An ability to design research with neuroimaging (fMRI/fNIRS) and neuro-stimulation techniques (TMS, tDCS);*
- 5. An ability to critically evaluate the data collected using such techniques*
- 6. Conceptual knowledge about the maths that supports the analyses found within published papers in cognitive neuroscience*
- 7. The opportunity and skills to work in a group towards a common research goal.*
- 8. The skills needed to prepare a research report in a concise manner in the style needed for publication.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Have an in-depth understanding of mammalian neuroanatomy and the laboratory techniques used to investigate the relationship between brain and behaviour.
- 2 Critically assess the use of neuroimaging , neuro-stimulation and behavioural research techniques in laboratory research
- 3 Interpret the output of specialist software tools used in neuroimaging, neuro-stimulation and behavioural research.
- 4 Plan and conduct a research project and write up this work in the style of a short manuscript.

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

REPORT	1	2	4	3
PORTFOLIO	1	2		

## Outline Syllabus

*-Neuroanatomy*

*-Methods of Cognitive Neuroscience (fMRI, fNIRS, TMS/tDCS, Cognitive Behavioural Tasks);*

*-advantages and disadvantages in using cognitive neuroscience methods;*

*-piloting and refining research;*

*-preparation of research for publication.*

## **Learning Activities**

Lectures will introduce students to some general principles of cognitive neuroscience research, including neuroanatomy.

These interactive sessions will provide an introduction for students to the basics of neuroimaging and neuro-stimulation research as well as possibilities and limitations of using these techniques.

During workshops, students will receive hands-on experience in small groups in running brain imaging (fMRI/fNIRS) and neuro-stimulation experiments, including brain region localization, electrode montage, minimizing artifacts, and health and safety in the lab. A number of simple experimental paradigms will be used that provide interesting and reliable results. Data processing workshops will provide computer-based training in data handling, screening and analysis (MATLAB). Students will be trained to interpret the output of popular analysis software such as SPM for fMRI

In Practical sessions students will design, programme and conduct a computer based behavioural study.

## **Notes**

This first semester module will provide a grounding in neuroanatomy and related research techniques used to study the relationship between brain and behaviour in humans in health and disease.

This module provides a grounding in knowledge and skills that will be built upon in semester 2 on the modules in applied neuroscience and cognitive neuroscience.