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Title: Applied Neuroscience
Status: Definitive
Code: **7103BRAIN** (126658)
Version Start Date: 01-08-2021

Owning School/Faculty: Psychology
Teaching School/Faculty: Psychology

Team	Leader
Stephen Fairclough	Y
Michael Richter	
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Academic Level: FHEQ7 **Credit Value:** 20 **Total Delivered Hours:** 42
Total Learning Hours: 200 **Private Study:** 158

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	26
Practical	6
Workshop	10

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Presentation	PRES	Students use a poster to present their research proposal to the group (15 - 20 minutes including 5 minutes questions)	25	
Essay	RES PROP	Research Proposal (3000 words)	75	

Aims

To provide an understanding of methods in neurophysiology and psychophysiology from the perspective of applied research. To provide students with a technical background in signal treatment and analyses for these methods and examples of their application in the real-world.

Learning Outcomes

After completing the module the student should be able to:

- 1 Understand the basis of neurophysiological and psychophysiological methods with respect to biological underpinning, technical apparatus and signal analyses.
- 2 Critically assess the use of neurophysiological and psychophysiological methods for applied research.

Learning Outcomes of Assessments

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

PRESENTATION	1	2
RESEARCH PROPOSAL	1	2

Outline Syllabus

This module focuses on methodologies from neurophysiology and psychophysiology and how these methods can be applied to research in the real-world. Specifically, the module is constructed around four methodologies, one derived from neurophysiology: ElectroEncephaloGraph (EEG) and three from psychophysiology: ElectroCardioGraphy (ECG), Pupillometry and facial ElectroMyoGraphy (fEMG). The module will provide a detailed description of each method, associated apparatus and the protocol for signal analyses. Lectures will be paired with practical sessions where students will be able to gain hands-on experience with apparatus and associated data. The module will consider these methodologies from the perspective of applied research via examples drawn from a number of real-world applications, such as: transportation human factors (aviation, driving, maritime), brain-computer interfaces, listening effort and assessment of emotions for marketing.

Learning Activities

Student will experience a number of practical sessions with research apparatus in order to enhance understanding. In order to highlight the importance of methodology and signal interpretation, students will study the application of these methods to the study of real-world issues. For the purposes of assessment, students will be provided with a number of real-world research problems and required to develop a research proposal that incorporates one or more of the four methods. This assessment requires critical thinking and creative problem-solving in order to design a proposal where methods are deployed in a way that is appropriate, realistic and

scientifically valid. Students are also provided with an opportunity to practice their presentation skills and receive feedback on their proposal via a poster presentation.

Notes

Building on what they have learned about the design and analysis of neuro-scientific studies in semester 1, this module will introduce students to additional neuro-physiological and psychophysiological techniques and emphasise the additional technical challenges of conducting this research outside the laboratory in real world settings.

The module is designed to provide students with a technical grounding in four neuro/psychophysiological methods, from the underpinning biological processes to the treatment of signals. The module will allow the students to develop a critical perspective by introducing them to methodological issues surrounding data capture, such as electrical noise, physical artefacts etc, and the process of inference, i.e. how to accurately interpret these data.