課程大綱及進度表

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| 開課系所 | 心理學系 |
| 開課學年 | 105 學年 |
| 開課學期 | 第 1 學期 |
| 課程名稱(中文) | **腦波於認知與生活上的應用** |
| 課程名稱(英文) | Brain Potentials in Cognition and Life Applications |
| 課程碼 | |
| 分班碼 | |
| 先修科目或先備能力 | 無 |
| 學分數 | 3 |
| 開課教師 | 謝淑蘭 |
| e-mail | psyhsl@mail.ncku.edu.tw |
| 電話 | 06-2008703 |
| 上課日期與地點 | 每週五 2-4 節； |
| Office Hours | |
| 課程概述 | 中文：這門課程回顧有關使用腦的電位活動來研究認知與行為的理論以及於日常生活中的應用。它探討腦波如何顯現正常的與不正常的知覺，處理，決策歷程，記憶，學習，動作準備，以及理解；也討論一些新興開發的腦波儀技術在學習、認知能力的訓練及其在生活上的應用。<br>英文：This course is designed to introduce you to the use of ERPs to make inferences concerning human cognition and how to apply them to daily life. This course surveys the theory and practice of using recordings of mainly electrical (but also magnetic) activity of the brain to study cognition and behavior and daily applications. It explores what brain-waves reveal about normal and abnormal perception, processing, decision-making, memory, learning, motor preparation, and comprehension. It also introduces some innovative techniques in learning, cognitive training and other daily applications. |
| 教學目標 | 中文：這門課程的主要目的是給學生：(1)如何使用電生理技術來探討認知科學議題的知識 (技術與推論並重)，(2)練習批評性的閱讀及評估這個領域的研究報告及評論，(3)培養經驗如何去發展研究題目，設計實驗以檢驗那些問題，以及(4)如何應用腦波技術於日常生活中，包括腦波回饋訓練與人機介面控制等。<br>**在修畢課程時，學生應該可以：**<br>● 展現基本能力知道如何使用電生理記錄的技術與理論層面<br>● 辨識與解釋電生理方法如何貢獻我們目前所了解認知的各種層面 |

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| | ● 分析與評估在這個領域的研究報告<br>● 發展出一個有趣的且重要的研究問題<br>● 設計出一項應用於日常生活中的腦波技術<br>英文：<br>This course will focus on the application of event-related potential (ERP) technology to questions in psychology and neuroscience. Four areas will be reviewed: 1) Neural substrates of event related potentials and techniques for source localization, 2) Experimental methodology, 3) Event-related potentials studies of sensory and cognitive processes, 4) Event-related potential paradigms in psychopathology and neuropsychology, and 5) how to apply EEG/ERPs to daily life, including neurofeedback training, and brain-computer interface.<br><br>On completion of this course, students should be able to:<br>• demonstrate a basic level of competence with the technical and theoretical aspects of electrophysiological recordings<br>• identify and explain how electrophysiological methods have contributed to our current understanding of various aspects of cognition<br>• analyze and evaluate primary research reports in the area<br>• develop an interesting and important research question<br>• design an innovative EEG/ERP technique |
| 授課課程大綱明細 | 1 電生理的生理基礎與技術面 (*Luck: Chaps. 5, 6, 8*)<br>2 電生理的推論與 ERP 成份波回顧 (Chaps. 1 & 4)<br>3 Neuroscan 實地操作體驗-I 記錄<br>4 Neuroscan 實地操作體驗-II 資料分析與解讀<br>5 電生理資料分析與解讀的探討 (*Luck: Chaps. 4, 9 & 10*)<br>6 期中考<br>7 注意力 (Attention)（視/聽覺）ERP (Chaps. 11 & 12)<br>8 決策 (Decision Making) ERP (Chap. 7)<br>9 記憶 (Memory) ERP (Chaps. 13 & 14)<br>10 運動/反應產生/預期與準備波/錯誤波 (Movement/Response Generation/anticipation and preparation/errors) ERP (Chaps. 8-10)<br>11 可塑性與發展 (Plasticity and Development) (Chap. 17)<br>12 情緒 (Emotion) ERP (Chap. 16)<br>13 神經回饋訓練 (Neurofeedback training)<br>14 腦機介面 (Brain-computer interface)<br>15 腦波應用設計成果發表-1<br>16 腦波應用設計成果發表-2<br>17 腦波應用設計成果發表-3<br>18 期末考 |
| 參考書目 | • Luck S.J. & Kappenman E.S. The Oxford Handbook of Event-related Potential Components. Oxford University Press, 2012.<br>• *Luck S.J. An Introduction to the Event-Related Potential Technique. The MIT Press, 2014.*<br>• Rugg MD & Coles MG (Eds.). Electrophysiology of Mind: Event-Related |

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| | Potentials and Cognition. New York, Oxford, 1995.<br>• Other readings |
| 課程要求 | The class will focus on a specific discussion topic each week, which will be associated with a set of assigned readings. The background and basics unit will be based on a text; the other units will involve journal articles. All required readings must be completed prior to each class, since the discussions will be a major component of what is learned in the seminar. In addition to open discussion, each student will do a brief (5 to 10 minute) summary and critique of one of the readings assigned for that week. When the reading is an article, two students will be responsible for keeping things flowing. |
| 評量方式 | Grades will be based on participation in the seminar (20%), presentations on topics (20%), exams (30%), and **one innovative design related to EEG/ERP** (30%). |
| 課程網址 | |
| 助教資訊 | |