NEUR90013 Neuroscience of Behaviour & Cognition A

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: March, Parkville - Taught on campus. May, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 32 hours, 19 hours of lectures, 10 hours of tutorials, a one-hour practical demonstration and two x 1-hour seminars by guest speakers. Total Time Commitment: 120 hours, including 32 contact hours
Prerequisites:	None
Corequisites:	Students based at the Melbourne Brain Centre and the Howard Florey Laboratories enrolling in this subject must also enrol in the following subjects at the same time: NEUR90007 Design and Analysis for Neurosciences A (12.5) or NEUR90008 Design and Analysis for Neurosciences B (6.25) NEUR90009 Brain Imaging and Neural Networks A (12.5) or NEUR90010 Brain Imaging and Neural Networks B (6.25) NEUR90011 Molecular and Cellular Neuroscience A (12.5) or NEUR90012 Molecular and Cellular Neuroscience B (6.25)
Recommended Background Knowledge:	Three years of an undergraduate third-year sequence in a relevant biomedical science, psychology or engineering discipline.
Non Allowed Subjects:	Students cannot enrol in and gain credit for this subject and:

Subject	Study Period Commencement:	Credit Points:
NEUR90014 Neuroscience of Behaviour & Cognition B	May	6.25

Core Participation Requirements:	For the purposes of considering requests for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Overview, Objectives, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and the Disability Liaison Unit:http://www.services.unimelb.edu.au/disability/
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Subject Overview:	This subject is an intensive 5 consecutive day overview of the range of research methodologies used to understand how different structures, chemicals and neural response within the brain work together to achieve complex behaviour and cognitive functions. Through exposure to a selection of current research topics and available experimental methodologies the subject explains how the interplay between clinical populations' studies, healthy subjects' studies combined with animal models of behaviour contribute to advances in the field. The multi-disciplinary nature of this fast-developing field is emphasised through the various collaborations between the presenters from disciplines spanning Biomedical and Health Sciences, Psychology and Electrical Engineering. Seven themes are discussed as follows: 1 Behaviour measures in healthy populations: Uncovering mechanisms underlying perception and behaviour. 2 Clinical brain lesion populations: Providing insights into anatomic regions involved in cognition. 3 Primate electrophysiology: Decoding the contribution of individual neurons in perception. 4 Computational modelling: Understanding the auditory system to create artificial hearing devices. 5 Rodent models: Understanding the genetic, physiological and pharmacological factors underlying human cognition and behaviour. 6 Human electrophysiology: Explore the neural dynamics of perception. 7 Neuropharmacology: How neurotransmitters modulate brain function. A group project will focus on reward-encoding to demonstrate how an interdisciplinary approach played a critical role in informing our current understanding of how the brain processes reward. This example will also illustrate how a single element of brain function can have a vast array of consequence ranging from complex patterns of global economic behaviour through to clinical symptoms of addiction. Students are split into multi-disciplinary groups to analyse a set paper, each representing a different investigative technique for the same problem. Class presentations at the end of week allow each group to discuss their conclusions and share a class discussion illustrating the points outlined above.
Learning Outcomes:	On completion of this subject students will be able to: # Gain knowledge of the major research approaches currently used to investigate the neural mechanisms underlying cognitive processes. # Develop an awareness of current topics in cognitive neuroscience relevant to language, memory, vision, audition, attention, mood multi-sensory integration and executive function. # Develop a basic understanding of how clinical populations can be used to inform our understanding of healthy cognitive processing and how studying healthy cognition can inform clinical research and potential treatment strategies. # Develop a basic understanding of how rodent and non-human primates can provide insights into human cognition. # Appreciate what is required on a practical level to use different research approaches in cognitive neuroscience. # Acquire a capacity to critically evaluate which approach / technology is best suited to investigate a particular aspect of cognitive function and to understand the benefits and limitations associated with each methodology. # Read research papers with a greater awareness of the conceptual, theoretical and practical context in which the research was conducted. # Become aware of the potential to initiate fruitful research collaborations with cognitive neuroscientists. # Demonstrate the application of the principles learned in the subject to their research project.
Assessment:	Full 5 days attendance of the subject throughout the course and full participation in class exercises, group project, presentation and discussion are required. A minimum 85% attendance is required (= x 1); a pro rata attendance multiplier will apply to total assessment. One oral group presentation (total 20 min; 5 min per student) plus class discussion, equivalent to 1,000 words (at the end of the week-subject), worth 20% times attendance multiplier One written literature review on the chosen research topic related to this area, of minimum 4,000 words excluding cited references (to be submitted by the end of August) (ie. week 27), worth 80% times attendance multiplier.

Prescribed Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	On completion of this subject, students will have developed the following generic skills: # Understanding of and critical reading skills in a wide range of research methodologies. # Oral communication skills ranging from public speaking to interpersonal communication. # High-level written communication skills. # Team work skills and becoming aware of the value of collaborating with other disciplines. # High organisation and time management skills in the short and loner term. # The capacity to apply concepts learned in their own area of research.