

ECAP6004 – Biological and Cognitive Neuroscience

Module Leader – Dr Stuart Jones.

9.30-11 Session 1 (90 minutes)

11-11.15 Comfort break (30 minutes)

11.30-12.30 Session 2 (60 minutes)

12.30-1.15 Lunch (45 minutes)

1.15-2.45 Session 3 (90 minutes)

2.45-3 Comfort break (15 minutes)

3-4 Session 4 (60 minutes)

Date W/B	Recorded Session	Additional online engagement activities/key readings	On Campus Session.
24 th Jan	Introduction and Re-Cap	Gazzaniga, M.S., Ivry, R. B., & Mangun, G. R. (2014). Cognitive neuroscience: The biology of the mind (Fourth ed.). Norton.	
31 st Jan	Neuroscience Technologies 1. 1. Historical Timeline of approaches 2. Invasive Procedures	O'Shea, J., & Walsh, V. (2007). Transcranial magnetic stimulation. Current Biology, 17(6), R196R199. Brownell, G. L. (1999). A history of positron imaging. Physics Research Laboratory, Massachusetts General Hospital, MIT, 1-11.	Session 1 Part A – Neuroimaging Techniques. 1. TMS 2. DBS 3.. PET Scan Part B – Hormones Task.

		Engel, A. K., Moll, C. K., Fried, I., & Ojemann, G. A. (2005). Invasive recordings from the human brain: clinical insights and beyond. <i>Nature Reviews Neuroscience</i> , 6(1), 35.	Part C – Discussion on Assessment 2 (Presentation). Part D – Critical Thinking in Neuroscience.
7 th Feb	Neuroscience Technologies 2. 1. CT Scanning 2. MRI 3. FMRI 4. EEG 5. MEG	Borman, T., & Stoel, B. (2009). Review of the Uses of Computed Tomography for Analyzing Instruments of the Violin Family with a Focus on the Future. <i>J Violin Soc Am: VSA Papers</i> , 22(1), 112. Aine, C. J. (1995). A conceptual overview and critique of functional neuroimaging techniques in humans: I. MRI/fMRI and PET. <i>Critical reviews in neurobiology</i> , 9(2-3), 229-309. Ioannides, A. (2006). Magnetoencephalography as a Research Tool in Neuroscience: State of the Art. <i>The Neuroscientist</i> , 12(6), 524-544. Collura, T. F. (1993). History and evolution of electroencephalographic instruments and techniques. <i>Journal of clinical neurophysiology</i> , 10(4), 476- 504.	
14 th Feb	Memory and Neuroscience	Jack, C. R., Dickson, D. W., Parisi, J. E., Xu, Y. C., Cha, R. H., O'Brien, P.	Session 2

	● Sensory Memory and Neuroscience ● Working Memory and Neuroscience ● Animal Studies and Memory ● Object Recognition and Neuroscience ● Korsakoff Syndrome and Neuroscience	C., ... & Kokmen, E. (2002). Antemortem MRI findings correlate with hippocampal neuropathology in typical aging and dementia. <i>Neurology</i>, 58(5), 750 -757. Oliveri, M., Turriziani, P., Carlesimo, G. A., Koch, G., Tomaiuolo, F., Panella, M., & Caltagirone, C. (2001). Parieto-frontal interactions in visual object and visual spatial working memory: evidence from transcranial magnetic stimulation. <i>Cerebral Cortex</i>, 11(7), 606 -618. Smith, E. E., Jonides, J., & Koeppe, R. A. (1996). Dissociating verbal and spatial working memory using PET. <i>Cerebral Cortex</i>, 6(1), 11 -20	Part A – Task on Neuroimaging Techniques. Part B – Memory and Neuroscience 2 ● Episodic Memory and Neuroscience ● Familiarity, Memory and Neuroscience ● Alzheimer’s Diseases and Neuroscience Part C – Drugs and Neuroscience 1 ●. Recap on the synaptic transmitter ●. Explore Neuroscientific research on endogenous ligands. Part D – Research Ethics and Neuroscience Research.
READING WEEK			
28 th Feb	Drugs and Neuroscience 2. ● Exploration in to drugs and behaviour via drug classification type. ● Examination of Neuroscientific studies exploring the drugs and behaviour.	Serra-Grabulosa, J. M., Adan, A., Falcón, C., & Bargalló, N. (2010). Glucose and caffeine effects on sustained attention: an exploratory fMRI study. <i>Human Psychopharmacology: Clinical and Experimental</i>, 25(7-8), 543-552. Schweinsburg, A. D., Schweinsburg, B. C., Medina, K. L., McQueeney, T., Brown, S. A., & Tapert, S. F. (2010). The influence of recency of use on	

		fMRI response during spatial working memory in adolescent marijuana users. Journal of Psychoactive Drugs, 42(3), 401-412. Meda, S. A., Calhoun, V. D., Astur, R. S., Turner, B. M., Ruopp, K., & Pearlson, G. D. (2009). Alcohol dose effects on brain circuits during simulated driving: an fMRI study. Human brain mapping, 30(4), 1257-1270	
7 th March	Language and Neuroscience 1. Re-Cap Neuropsychology of Language 2. Practical challenges that face Neuroscientists in this field. 3. Mono, Bi and Multilingualism 4. Language Laterality 5. Language Disorders and Neuroscience.	Mitchell, R. L., & Crow, T. J. (2005). Right hemisphere language functions and schizophrenia: the forgotten hemisphere?. <i>Brain</i>, 128(5), 963-978 Jabbour, R. A., Hempel, A., Gates, J. R., Zhang, W., & Risse, G. L. (2005). Right hemisphere language mapping in patients with bilateral language. <i>Epilepsy & Behavior</i>, 6(4), 587 -592. Knecht, S., Dräger, B., Deppe, M., Bobe, L., Lohmann, H., Flöel, A., ... & Henningsen, H. (2000). Handedness and hemispheric language dominance in healthy humans. <i>Brain</i>, 123(12), 2512 -2518	Session 3 – Part A – Discussion is the Wernicke Geschwind Model out of date? Part B Drugs and Neuroscience – select and review a selected journal article looking at the impact of drugs on behaviour / cognition from a neuroscientific perspective. Part C – Attention focused discussion – 1) .Design a study to provide further evidence of the neural firing in ADHD 2) Part D neuroscience answering its Key objectives when researching attention
14 th March	Attention and Neuroscience 1. Balint's Syndrome	Tian, L., Jiang, T., Liang, M., Zang, Y., He, Y., Sui, M., & Wang, Y. (2008).	

	2. Goals of Attention Research in Neuroscience 3. Use of EEG to study attention 4. Use of MEG to study attention 5. Selective Attention 6. Adhd and Attention.	Enhanced resting -state brain activities in ADHD patients: a fMRI study. <i>Brain and Development</i> , 30(5), 342-348. Silk, T. J., Vance, A., Rinehart, N., Bradshaw, J. L., & Cunnington, R. (2008). Dysfunction in the fronto-parietal network in attention deficit hyperactivity disorder (ADHD): an fMRI study. <i>Brain Imaging and Behavior</i>, 2(2), 123-131. O'Craven, K. M., Downing, P. E., & Kanwisher, N. (1999). fMRI evidence for objects as the units of attentional selection. <i>Nature</i>, 401(6753), 584	
21 st March	Social Cognition and Neuroscience 1.The Self, Identity and Neuroscience. 2. Identity development and Neuroscience. 3. Classic Case studies in Neuroscience on the self. 4. Autism research and Neuroscience. 5. Mirror Neurons.	Rizzolatti, G., & Craighero, L. (2004). The mirror-neuron system. <i>Annu. Rev. Neurosci.</i>, 27, 169-192. Purves, D. (2008). Principles of cognitive neuroscience.	Session 4 Part A – Assessment Focused Session. Part B – Recap on what has been covered so far. Part C - Neuroscience and the study of visual illusions. Part D – Future directions in Neuroscience Research / Motor Control.

28 th March	Sensation and Perception and Neuroscience – 1 1. Cortical and Subcortical regions involved in Auditory Perception. 2. Cortical and subcortical regions involved in Visual Perception	Gazzaniga, M.S., Ivry, Richard B., & Mangun, G. R. (2014). <i>Cognitive neuroscience: The biology of the mind</i> (Fourth ed.). Norton.	
EASTER VACATION			
25 th April	Sensation and Perception in Neuroscience - 2 3. Disorders of Auditory perception and Neuroscience 4. Disorders of Visual Perception and Neuroscience	Gazzaniga, M.S., Ivry, Richard B., & Mangun, G. R. (2014). <i>Cognitive neuroscience: The biology of the mind</i> (Fourth ed.). Norton.	