

ECAP6004 – Biological and Cognitive Neuroscience.

Module Leader: Dr Stuart Jones.

Session Number	Topic	Content	Recommended Reading
1	Introduction and Re-Cap	1. What is Neuroscience. 2. Neuroscience Terminology. 3. Hormones. 4. Types of Communication 5. Organisation of Hormones. 6. Regulation of Hormones. 7. Excessive and Deficient Hormone production. 8. Critical Thinking in Neuroscience.	1. Gazzaniga, M.S., Ivry, R. B., & Mangun, G. R. (2014). <i>Cognitive neuroscience: The biology of the mind</i> (4 th ed.). Norton.
2	Neuroscience Technologies 1.	1. Historical Timeline of approaches 2. Invasive Procedures. 3. TMS 4. DBS 5. Pet Scan 6. Discussion on Assessment 2 (Presentation).	1. O'Shea, J., & Walsh, V. (2007). Transcranial magnetic stimulation. <i>Current Biology</i>, 17(6), R196-R199. 2. Brownell, G. L. (1999). A history of positron imaging. <i>Physics Research Laboratory, Massachusetts General Hospital, MIT</i>, 1-11. 3. 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.
3	Neuroscience Technologies 2.	1. CT Scanning 2. MRI 3. FMRI 4. EEG 5. MEG	1. Borman, T., & Stoel, B. (2009). Review of the Uses of Computed Tomography for Analyzing Instruments of the Violin Family with a Focus on

		6. Neuroimaging Techniques activities. 7. Research Ethics and Neuroscience.	the Future. J Violin Soc Am: VSA Papers, 22(1), 112. 2.Aine, C. J. (1995). A conceptual overview and critique of functional neuroimaging techniques in humans: I. MRI/fMRI and PET. Critical reviews in neurobiology, 9(2-3), 229-309. 3.Ioannides, A. (2006). Magnetoencephalography as a Research Tool in Neuroscience: State of the Art. The Neuroscientist, 12(6),524-544. 4.Collura, T. F. (1993). History and evolution of electroencephalographic instruments and techniques. Journal of clinical neurophysiology, 10(4), 476- 504.
4	Drugs, Behaviour and Neuroscience.	1. Recap on the synaptic transmitter. 2. Explore Neuroscientific research on endogenous ligands. 3. Exploration in to drugs and behaviour via drug classification type. 4. Examination of Neuroscientific studies exploring the drugs and behaviour. 5. Critically reviewing Neuroscience Papers exploring	1.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. 2.Schweinsburg, A. D., Schweinsburg, B. C., Medina, K. L., McQueeny, 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. <i>Journal of Psychoactive Drugs</i>, 42(3), 401-412.

		Drugs and Behaviour.	3.Meda, S. A., Calhoun, V. D.,Astur, R. S., Turner, B. M.,Ruopp, K., & Pearson, G. D. (2009). Alcohol dose effects on brain circuits during simulated driving: an fMRI study. <i>Human brain mapping</i> , 30(4), 1257-127.
5	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. 6. Discussion is the Wernicke Geschwind Model out of date?	1.Mitchell, R. L., & Crow, T. J. (2005). Right hemisphere language functions and schizophrenia: the forgotten hemisphere?. <i>Brain</i>, 128(5), 963-978. 2.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. 3.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.
6	Memory and Neuroscience.	1. Sensory Memory and Neuroscience. 2. Working Memory and Neuroscience. 3. Animal Studies and Memory. 4. Object Recognition and Neuroscience. 5. Korsakoff Syndrome and Neuroscience.	1. Jack, C. R., Dickson, D. W., Parisi, J. E., Xu, Y. C., Cha, R. H., O'brien, P, C., ... & Kokmen, E. (2002). Antemortem MRI findings correlate with hippocampal neuropathology in typical aging and dementia. <i>Neurology</i>, 58(5), 750 - 757. 2. Oliveri, M., Turriziani, P., Carlesimo, G. A., Koch,

		6. Episodic Memory and Neuroscience. 7. Familiarity, Memory and Neuroscience. 8. Alzheimer's Diseases and Neuroscience.	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. 3. 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.
7	Attention and Neuroscience.	1. Balint's Syndrome. 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.	1. Tian, L., Jiang, T., Liang, M., Zang, Y., He, Y., Sui, M., & Wang, Y. (2008). Enhanced resting - state brain activities in ADHD patients: a fMRI study. <i>Brain and Development</i> , 30(5), 342-348. 2. Silk, T. J., Vance, A., Rinehart, N., Bradshaw, J. L., & Cunningham, 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. 3. 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.
8	Social Cognition and Neuroscience.	1. The Self, Identity and Neuroscience. 2. Identity development	1. Rizzolatti, G., & Craighero, L. (2004). The mirror-neuron system. <i>Annu. Rev. Neurosci.</i> , 27, 169-192.

		and Neuroscience. - Classic Case studies in Neuroscience on the self. - Autism research and Neuroscience. - Mirror Neurons.	2. Purves, D. Brannon, E.M., Cabeza, R., Huettel, S.A., LaBar, K.S., Piatt, M.L., & Woldorff, M.G. (2008). <i>Principles of cognitive neuroscience</i>. Sinauer Associates.
9	Sensation and Perception 1	- Cortical and Subcortical regions involved in Auditory Perception. - Cortical and subcortical regions involved in Visual Perception. - Neuroimaging studies exploring brain structure in visual and auditory perception. - Examination structure.	1. Gazzaniga, M.S., Ivry, Richard B., & Mangun, G. R. (2014). <i>Cognitive neuroscience: The biology of the mind</i> (Fourth ed.). Norton.
10	Sensation and Perception 2.	- Disorders of Auditory perception and Neuroscience. - Disorders of Visual Perception and Neuroscience. - Neuroscience and the study of visual illusions. - Future Direction in Neuroscientific Research. - Recap of the module.	1. Gazzaniga, M.S., Ivry, Richard B., & Mangun, G. R. (2014). <i>Cognitive neuroscience: The biology of the mind</i> (Fourth ed.). Norton.