

Subject Description Form

Subject Code	APSS 5052		
Subject Title	Cognitive neuroscience in applied settings		
Credit Value	3		
Level	5		
Pre-requisite / Co-requisite/ Exclusion	Nil		
Assessment Methods	100% Continuous Assessment	Individual Assessment	Group Assessment
	1. Seminar		
	Individual presentation	30%	--
	Group collaboration	20%	
	2. Quiz	50%	--
	3. Laboratory participation	10%	--
	0% Examination	100%	--
	<ul style="list-style-type: none"> • The grade is calculated according to the percentage assigned; • The completion and submission of all component assignments are required for passing the subject 		
Objectives	<p>The subject aims to enable students to:</p> <ol style="list-style-type: none"> 1. To develop awareness of the importance of the ever-expanding research and knowledge in cognitive neurosciences 2. To appreciate and be familiar with common investigative techniques used in cognitive neurosciences 3. To understand everyday behaviors and manifestation of brain disorders from neuroimaging and electrophysiological perspectives 4. To appraise the usefulness and limitations of common assessments and interventions used in clinical, educational and social settings 5. To develop critical thinking understanding brain and behavior relationships in bio-psycho-social contexts 		

<p>Intended Learning Outcomes</p>	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. identify the importance of the ever-expanding research and knowledge in cognitive neurosciences b. formulate some conceptual framework to appreciate the relationships between cognition and investigative techniques in neurosciences c. understand the principles of applying theoretical knowledge to understanding everyday behavior and common types of brain disorders d. critically re-thinking the relevance and contributions as well as limitations of recent literature e. develop perspectives in understanding brain and behavior relationships in bio-psycho-social contexts
<p>Subject Synopsis/ Indicative Syllabus</p>	<p>Understanding the nervous system: Building blocks of the nervous system, brain geography and major subdivisions of the central nervous system, electrochemical signaling and neurotransmission</p> <p>Neuroanatomy and development: Cerebral cortex, limbic system, basal ganglia, hippocampus and diencephalon, brain-stem and cerebellum, cerebral specialization, integration of information between hemispheres, neural bases of mental functions, developmental aspects, plasticity and individual differences</p> <p>Methods of investigation: Populations of research participants, techniques of assessing brain anatomy and physiological functions including MRI, CT, EEG and fMRI, techniques for modulating brain activity, techniques for analyzing behavior and modeling brain-behavior relationships</p> <p>Motor control: Cortical and subcortical structures involved in motor control, motor disorders</p> <p>Perceptual processing: Visual and auditory processing, the “what” and “where” of the visual system, object recognition and spatial cognition</p> <p>Language: Roles of the left and right hemisphere, neural organization of language as inferred from brain damaged patients and other populations</p> <p>Memory: Multiple memory systems, brain systems that contribute to encoding, consolidation and storage and retrieval, working memory and the relationship between memory systems, amnesia and other disorders of memory</p> <p>Attention: brain structures of involved in attention, network models of attention control, hemineglect and other clinical problems</p> <p>Executive function: Controlled versus automatic porcessess, goal-directed behaviors, higher order thinking, organization of the frontal lobe for executive function, working memory and executive function</p>

	<p>Emotion and social cognition: Cortical and subcortical contributions to emotion, emotional learning, motivation, incorporating emotion into decision making, regulating and communicating emotion, understanding the mental states of others.</p> <p>Broad-based phenomena: understanding the psychopathology of schizophrenia, depression, anxiety and addiction problems as well as developmental disorders</p>																																													
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> <th>e</th> </tr> </thead> <tbody> <tr> <td>1. Term paper and seminar presentation</td> <td>40 %</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Quiz</td> <td>40 %</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>3. Laboratory participation</td> <td>20 %</td> <td></td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>Total</td> <td>100 %</td> <td colspan="5"></td> </tr> </tbody> </table>	Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					a	b	c	d	e	1. Term paper and seminar presentation	40 %	✓	✓	✓	✓	✓	2. Quiz	40 %		✓	✓	✓	✓	3. Laboratory participation	20 %		✓	✓	✓		Total	100 %						<p>The quiz is to help students to develop a firm grasp of basic concepts. The term paper and presentation are intended to develop independent and analytical thinking. Laboratory participation is to provide hands-on experience in investigative techniques.</p>				
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Student Study Effort Expected	Class contact:																																													
	▪ Lectures				18 Hrs.																																									
	▪ Seminars				21 Hrs.																																									
	Other student study effort:																																													
	▪ Private reading, self-reflection and writing task				30 Hrs.																																									
	▪ Preparation for tutorial, seminar and supervised practices				30 Hrs.																																									
	▪ Participation and practice				18 Hrs.																																									
	Total student study effort					117 Hrs.																																								
Reading List and References	<p><u>Essential</u></p> <p>Banich M. T. & Compton R. J. (2011). <i>Cognitive Neuroscience</i>. Wadsworth: Cengage Learning.</p>																																													

Diamond M. C., Scheibel A. B. & Elson L. M. (1985). *The Human Brain Coloring Book*. New York: Harper Collins Publishers, Inc.

Supplementary

Au A., Chan A. & Chiu H. (2003). Conceptual organization in Alzheimer's dementia. *Journal of Clinical and Experimental Neuropsychology*, 25, 737-50.

Au A., Chan A. & Chiu H. (2003). Verbal learning in Alzheimer's dementia. *Journal of the International Neuropsychological Society*, 9, 363-75.

Au A. & Chan I. (2011). Profiles of HIV-related Cognitive Impairments in Hong Kong Chinese. The Fifth International Congress of the Asian Society Against Dementia: *Actions, Strategies and Development*. Invited Presentation.

Au A., Cheng, C., Chan, I., Leung, P., Li, P. & Heaton R. K. (2008). Subjective memory complaints, mood and memory deficits among HIV/AIDS patients in Hong Kong. *Journal of Clinical and Experimental Neuropsychology*, 30, 338-348.

Au A., Leung P., Kwok A., Li P., Lui C. & Chan J. (2006). Subjective memory and mood of Hong Kong Chinese adults with epilepsy. *Epilepsy & Behavior*, 9, 68-72.

Chan C. C. H., Leung, A. W. S., Luo, Y. J., & Lee, T. M. C. (2007). How do figure-like orthographs modulate visual processing of Chinese words? *Neuroreport*, 18(8), 757-761.

Chan, C. C. H., Li, Y-Z., Guo, L-G., Zhou, X-N., Luo, Y-J., & Lee, T. M. C. (2010). Chinese herbal medicine and cognitive and emotion functions during 60-day head-down bed rest. *Aviation, Space, and Environmental Medicine*, 81, 754-760.

Chan, C. C. H., Wong, A. W. K., Ting, K-H., Whitfield-Gabrieli, S., He, J-F., Lee, T. M. C. (2011). Cross auditory-spatial learning in early-blind individuals. *Human Brain Mapping*. DOI: 10.1002/hbm.21395.

Chan, C. C. H., Wong, R., Wang, K., & Lee, T. M. C. (2007). Emotional recognition in Chinese people with schizophrenia. *Psychiatry Research*, 157, 67-76.

Chow, K. W. S., Chan, C. C. H., Huang, Y-X, Liu, K. P. Y., Li, L. S. W., & Lee, T. M. C. (2007). Temporal course of vibrotactile imagery. *NeuroReport*, 18(10), 999-1003.

Gazzaniga M. S., Ivry R. B., Mangum G. R. & Steven M. (2009). *Cognitive Neuroscience: The Biology of the Mind*. W. W. Norton & Company.

Huetel S. A, Song A. W. & McCarthy G. (2009). *Functional Magnetic Resonance Imaging*. Sinauer Associates, Inc.

Lau K. & Au A. (In press). Cognition and coping in multiple sclerosis in Hong Kong.

Journal of International Neuropsychology.

Lee, T. M. C., Chan, C. C.H., Leung, A. W. S., Fox, P. T., & Gao, J. H. (2009). Sex-related differences in neural activity during risk taking: An fMRI study. *Cerebral Cortex*, 19(6), 1303-1312.

Liu, K. P. Y, Chan, C. C. H., Wong, R. S. M., Kwan, I. W. L., Yau, C. S. F., Li, L. S. W., & Lee, T. M. C. (2009). A randomized controlled trial of mental imagery augment generalization of learning in acute post-stroke patients. *Stroke*, 40(6), 2222-2225.

Marcotte T. & Grant I. (2010). *Neuropsychology of everyday functioning*. New York : Guilford Press.

Quigg M. (2006). *EEG Pearls*. Mosby Elsevier.

Smith E. E. & Kosslyn S. M. (2009). *Cognitive Psychology*. Pearson. Prentice Hall

Todorov A. B., Fiske S. T. & Prentice D. (2011). *Social neuroscience: toward understanding the underpinnings of the social mind*. Oxford : Oxford University Press 2011.

Ward J. (2009). *Cognitive Neuroscience*. Hove, East Sussex : Psychology Press.

Waxan S. G. (2010). *Clinical neuroanatomy*. New York : McGraw-Hill Medical.

Wu, J. H., Mai, X. Q., Chan, C. C. H., Zheng, Y. Q., & Luo, Y. J. (2006). Event-related potentials during mental imagery of animal sounds. *Psychophysiology*, 43(6), 592-597.

Yuen K. S. L., Lee, T. M. C., Wai, Y. Y., Liu, H. L., Mok, N. H., Li, L. S. W., Chan, C. C. H. (2007). Cortical reorganization for response regulation with unilateral thalamic stroke detected by functional MRI. *NeuroRehabilitation and Neural Repair*, 21 (5), 467-471.

Journals

Journal of Cognitive Neuroscience

Journal of Clinical and Experimental Psychology

Archives of Clinical Neuropsychology

Clinical Neuropsychologist

Aging, Neuropsychology and Cognition