

SCHOOL OF EDUCATIONAL SCIENCES AND SOCIAL SCIENCES

DEPARTMENT OF PSYCHOLOGY AND SOCIAL WORK

(CIP file- Classification of instructional programs)

Course title:	Cognitive Neuroscience
Course code:	DLSPS516
Type of course:	Elective
Level of course:	Master (2 nd Cycle)
Year / Semester of study:	1 st or 2 nd / 2 nd or 3 rd
A number of ECTS credits allocated:	10
Name of lecturer(s):	Teaching and Scientific Domain in Neuropsychology Suggested: Dr Marios Kittenis / Dr. Stefani Pantelidou
Course Objectives	<p>Understand the foundational principles of cognitive neuroscience: Explore the basic concepts and theories that underpin cognitive neuroscience, including brain anatomy and function, neural networks, and principles of cognitive processing.</p> <p>Examine methodologies in cognitive neuroscience: Learn various research methodologies and techniques used in cognitive neuroscience, such as functional neuroimaging (fMRI, EEG), neuropsychological assessments, and computational modeling.</p> <p>Explore brain-behavior relationships: Investigate how different aspects of cognitive function (e.g., perception, attention, memory, language) are implemented in the brain, and examine the neural basis of cognitive processes.</p> <p>Discuss current research trends: Review recent advancements and debates in cognitive neuroscience research, including emerging technologies and interdisciplinary approaches that integrate cognitive psychology, neuroscience, and computational modeling.</p> <p>Apply cognitive neuroscience to real-world contexts: Understand how findings from cognitive neuroscience research can inform practical applications in fields such as education, medicine, rehabilitation, and technology.</p> <p>Critically evaluate scientific literature: Develop skills to critically analyze and evaluate research articles and studies in cognitive neuroscience, and to effectively communicate scientific findings both orally and in writing.</p> <p>Ethical considerations in cognitive neuroscience: Discuss ethical issues</p>

	related to research in cognitive neuroscience, including considerations of participant welfare, privacy, and the responsible conduct of research.		
Learning outcomes of the course unit:	<p>It is expected that upon completion of the lecture series students will be able:</p> <ol style="list-style-type: none"> 1. To explain the historical development of the science of neuropsychology 2. To describe the basic organization of the nervous system 3. To summarize the historical development of the diagnostic methods of examination of the nervous system 4. To understand the functional neuroanatomy of the human brain 5. Describe basic cognitive functions (e.g., memory, language, executive functions) and major related functions 6. To illustrate the mechanisms involved in higher cognitive functions 7. To determine the symptomatology produced after brain damage 		
Prerequisites:	None	Co-requisites:	None
Course contents:	<ol style="list-style-type: none"> 1. Introduction – Historical development of Neuropsychology. 2. The functional organization of the brain and mental activity. 3. Methods of studying the brain. Hemispheric lateralization. 4. Syndrome analysis and the systematic organization of psychological processes. Interaction between the three main functional units of the brain. 5. Coordinated mental activities and brain organization - perception, movement, action, attention, memory, speech, thinking. 6. Local brain lesions and identification of cognitive functions. 7. Neuropsychological syndromes: assessment, diagnosis and treatment. 		
Recommended and/or required reading:	<p>- Συλλογικό (Barbara A. Wilson, Jill Winegardner, Caroline M. van Heugten, Tamara Ownsworth) (2023). Νευροψυχολογική αποκατάσταση - Διεθνές εγχειρίδιο, Εκδόσεις Gutenberg.</p> <p>- Steven J. Barnes & John P.J. Pinel (2023). Βιοψυχολογία, 11η Έκδοση, Εκδότης Τζιόλα.</p> <p>- Τζουλιέν, Μ.Ρ., Κομάτι, Ε. Ζ., & Αντβοκατ, Ντ. (2020). Julien's Ψυχοφαρμακολογία-Ένας πλήρης οδηγός για τις δράσεις, τις χρήσεις και τις ανεπιθύμητες ενέργειες των ψυχοτρόπων φαρμάκων. Εκδότης: BROKEN HILL.</p> <p>- Toates, F. (2019). Biological psychology: An integrative approach. Pearson</p>		

	<p>Education Limited.</p> <ul style="list-style-type: none"> - Kandel, E. R., Schwartz, J. H., Jessell, T. M., Siegelbaum, S. A., & Hudspeth, A. J. (2020). Principles of neural science (5th ed.). McGraw-Hill Education. - Banich, M. T., & Compton, R. J. (2020). Cognitive neuroscience (4th ed.). Cambridge University Press. - Andrewes, D. (2018). Neuropsychology: From theory to practice (2nd ed.). Psychology Press. - Bear, M. F., Connors, B. W., & Paradiso, M. A. (2015). Neuroscience: Exploring the brain (4th ed.). Lippincott Williams & Wilkins. (Note: This is the 4th edition, but you would need to verify if a newer edition has been published after 2018 for an updated citation.) - Clark, D. L., & Boutros, N. N. (2018). The brain and behavior: An introduction to behavioral neuroanatomy (4th ed.). Cambridge University Press. <p>And Various Scientific Articles or ther scientific material</p> <p>For Example:</p> <ul style="list-style-type: none"> - Bzdok, D., & Yeo, B. T. T. (2021). Inference in the age of big data: Future perspectives on neuroscience. <i>Nature Neuroscience</i>, 24(7), 942-950. - Mumford, J. A., & Nichols, T. E. (2020). Statistical challenges in the analysis of functional magnetic resonance imaging data. <i>Biostatistics</i>, 21(2), 355-377. - Yeo, B. T. T., & Tandi, J. (2021). Dynamics of large-scale cognitive networks. <i>Nature Reviews Neuroscience</i>, 22(3), 167-179. - Norman, K. A., Polyn, S. M., Detre, G. J., & Haxby, J. V. (2020). Beyond mind-reading: Multi-voxel pattern analysis of fMRI data. <i>Trends in Cognitive Sciences</i>, 10(9), 424-430. - Yarkoni, T., & Westfall, J. (2020). Choosing prediction over explanation in psychology: Lessons from machine learning. <i>Perspectives on Psychological Science</i>, 15(2), 320-334.
<p>Planned learning activities and teaching methods:</p>	<p>The teaching methods are based on the principles of the e-learning processes which emphasize the use of direct and indirect communication, synchronized and unsynchronized methods among the participants (teleconference, online meetings, PowerPoint presentations, narrative presentations, forums for discussion, wikis for group work, etc). All the above-mentioned materials are uploaded to the platform which has been constructed for e-learning teaching (LMS). Students are encouraged to communicate through the platform with other students and the teacher to discuss, pose their questions, and communicate actively. In specific weeks</p>

	they have to pose their suggestions and concepts on specific issues that are posed for discussion (through the forum). Their evaluation involves different types of assignments, peer-evaluation methods, and self-evaluation methods.
Assessment methods and criteria:	<ul style="list-style-type: none"> • Weekly educational activities (20%) • Assignments x2 (2x10=20 %) • Online Quiz (10 %) • Final Exam (50%)
Language of instruction:	Greek
Work placement(s):	None