Course Unit	Neurophysiology of Brain			Field of study	Medicine								
	Postgraduate Course in Emotional Education in Health			School	School of Health								
Academic Year	2019/2020	Year of study	1	Level		ECTS credits	5.0						
Type	Semestral	Semester	2	Code	5034-680-1205-00-19								
Workload (hours)	135	Contact hours	T -	TP 25	PL -	TC -	S -	E -	OT 50	O 30			

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Maria Augusta Romão da Veiga Branco

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. To describe anatomical issues of nervous system particularly the anatomical characteristics of strutures related with emotions, memory and learning.
2. To describe the organization of the nervous tissue, as well as the morphology and physiology of the neuron.
3. To describe the neurophysiological mechanisms underlying emotion memory and learning.

Prerequisites

Before the course unit the learner is expected to be able to:
none

Course contents

Anatomical aspects of nervous system. Anatomy.TY - 3D Atlas de Anatomy and Phisiology.
Structures related with emotion, memory and learning. Neurophysiology. Resting Potential. Action Potential. Synapsis. Somatosensitive and somatomotorand systems.
Emotion and visceral nervous system. Neuronal networks undelying memory.

Course contents (extended version)

1. Nervous system anatomy
   - Spinal cord. Spinal segment
   - Brain. Brain stem. Diencephalon. Telencephalon.
2. Neurophysiology
   - Nervous tissue. neuron, glial cells and nervous fibers.
   - Resting potencial. Action potential.
   - Interneuronal connection. Chemical synapsis. Nurotransmitters
3. Sensitive and motor systems
   - Sensitive receptor. aferente neurons. Somatosensitive cortex
   - Somatomotor córtex. corticospinal tract. Efferent neurons
4. Emotion and visceral nervous system
   - Emotion as a response.
   - Amigdala, thalamus and hypothalamus
   - Visceral nervous system. Sympathetic and parassimpathetic components
5. Neuronal networks underlying memory
   - Synaptic Plasticity. Strengthening and weakning of synapsis
   - Dynamic Network Connectivity.
   - Working memory. Neuronal circuitry with recurrent excitatory connections. glutamate
   - Neurophisiological mechanisms underlying long-term memory. The role of hippocampus.

Recommended reading

1. Haines, D. E. (Ed.). (2006). Neurociência Fundamental. (3ª ed.): Rio de Janeiro: Churchil Linvingstone Elsevier.
2. rnsten, A. F. , et al. (2012). Neuromodulation of thought: flexibilities and vulnerabilities in prefrontal cortical network synapses. Neuron, 76(1), 223-239. doi: 10. 1016/j. neuron. 2012. 08. 038
3. Arnsten, A. F. , Paspalas, C. D. , Gamo, N. J. , Yang, Y. , & Wang, M. (2010). Dynamic Network Connectivity. Trends Cogn Sci, 14(8), 365-375. doi: 10. 1016/j. tics. 2010. 05. 003
4. Rolls, E. T. (2000). Memory systems in the brain. Annu Rev Psychol, 51, 599-630. doi: 10. 1146/annurev. psych. 51. 1. 599
5. Martin, S. J. , Grimwood, P. D. , & Morris, R. G. (2000). Synaptic plasticity and memory: an evaluation of the hypothesis. Annu Rev Neurosci, 23, 649-711. doi: 10. 1146/annurev. neuro. 23. 1. 649

Teaching and learning methods

Videoconference classes - active methodology: discussion based on thematic projections.
Theoretical-practical lessons: brief expositions of study subject followed by interaction between students: answers for proposal questions based on images (Anatomy.TY - 3D Atlas de Anatomia e Fisiologia, Program, IPB).
- Students Individual work - guided with resource at practical questions about study subject.

Assessment methods

1. Final Exam - (Regular, Student Worker) (Final)
2. Final Exam - (Regular, Student Worker) (Supplementary)

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Maria Augusta Romão da Veiga Branco	Ana Maria Nunes Português Galvão	Carina de Fatima Rodrigues	Adília Maria Pires da Silva Fernandes
26-04-2020	26-04-2020	26-04-2020	26-04-2020