

BIOLOGICAL BASICS OF PSYCHE

Credit points	3 CP		
Duration of the course	1st semester		
Study course annotation	The study course is designed to master knowledge of the mechanisms and principles of the brain work. It introduces students to anatomy and physiology of the central nervous system, shows the role somatic, and autonomic nervous systems, explains mechanisms of neural and endocrine regulation.		
Aim of the study course	To form a modern understanding of the central nervous system as a morphofunctional basis of neuropsychic processes.		
Objectives of the course	<ul style="list-style-type: none"> • Provide students with detailed information about the structures of the central nervous system and their functions; • Prepare students for the subsequent study of psychophysiology. 		
Study course results	Knowledge	Skills	Competences
	<ul style="list-style-type: none"> • On the basic principles and mechanisms of the nervous system. • On the structure of the nervous system. • About reflex activity and its regulation. • About the connection of emotions, attention, speech, memory with the activity of the nervous system. 	<ul style="list-style-type: none"> • Associate features of human behavior with the biological foundations of the psyche. To independently carry out structured tasks using additional literature. 	<ul style="list-style-type: none"> • The ability to analyze motor reactions, emotions, speech and other human activities, given knowledge of the principles and mechanisms of the nervous system.
Study course content	Topics		
	1	Nerve cell as a basic structural unit of the central nervous system.	
	2	Electrical phenomena in a nervous cell as a basis of nervous activity. Resting potential of a membrane. Origination of arousal. Significance of action potential.	
	3	Impulse conduction by the synapses. The structure of the chemical synapse. Excitatory and inhibitory postsynaptic potentials. Mediators. The concept of the second messenger.	
	4	Embryogenesis of the nervous system.	
	5	The mechanism of muscle contraction. The concept of a motor unit. The mechanism of sliding threads. The molecular mechanism of muscle contraction. The value of adenosine triphosphoric acid.	
6	The structure and function of the spinal cord. The longitudinal structure of the		



		spinal cord. Cerebrospinal fluid. Spinal cord segment. Reflex arc. Receptor classification Mono-and polysynaptic reflexes. Pathways of the spinal cord.
	7	Hierarchy of motor centers. Stem and subcortical motorcenters. Sensomotor cortex. Lateral and medial motor systems.
	8	The structure and function of the brain. The general structure of the brain, the brain. Cranial nerves and their functions. Reticular formation. White and gray matter. Analyzers and sense organs. The limbic system and its functions. Neurochemistry of the brain.
	9	Autonomic nervous system. Features of the structure. Sympathetic and parasympathetic departments.
	10	Neuroendocrine system. The function of hormones. The mechanism of action of hormones. Self-regulation of hormones.
	11	Biological motivation and their morphofunctional basis.
Form of assessment:	Exam	
Obligatory literature:		
<ol style="list-style-type: none"> 1. Elaine N. Marieb and Suzanne M. Keller. Essentials of Human Anatomy & Physiology, 13th Edition, ISBN 978-0-13-737556-1, Pearson Education, 2022. 2. Carter, R. (2019). The human brain book. 3rd edition, expanded and updated. New York, DK Publishing. 3. Kaļva I. (2005). Centrālās nervu sistēmas anatomija un fizioloģija. Lekciju kursa konspekts un kontrolzdevumi. R.: BKI.* 		
Additional reading:		
<ol style="list-style-type: none"> 1. Drake K. ed., GRAY'S ANATOMY FOR STUDENTS. 4th Edition. 2020. Elsevier. ISBN:978-0-323-39304-1. 2. Āberberga-Augškalne L. (1986). Cilvēka fizioloģija. Rīga, Zvaigzne. 3. Фрэнсис Эшкрофт. (2015). Искра жизни. Электричество в теле человека. Альпинанон-фикшн Электронная книга. 4. Гайворонский И.В., Г.И.Ничипорук, Гайворонский А.И. (2011). Анатомия и физиология человека. 6-е изд., перераб. и доп. М. 		
Periodicals:		
<ol style="list-style-type: none"> 1. Cortex 2. Brain Research Reviews 3. Physiological Reviews 4. Neuroimage 5. Frontiers in Neuroscience 		
Changes and additions to the program and literature list are possible during the study process		