

Subject card

Subject name and code	Neuropharmacology and neurotoxicology, PG_00154587						
Field of study	Medical Biology						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2026/2027		
Education level	Bachelor's studies		Subject group		Obligatory subject group in the field of study Optional subject group Subject group related to scientific research in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	3		Language of instruction		Polish		
Semester of study	5		ECTS credits		3.0		
Learning profile	academic		Assessment form		exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Irena Majkutewicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		4.0		41.0	75
Subject objectives	Course objectives: 1. to learn about the uses, mechanisms of action, and side effects of selected biologically active substances, including some drugs, on the central nervous system (CNS), as well as on physiology and behavior 2. to understand basic concepts and phenomena in pharmacokinetics 3. to learn about the mechanisms of toxic action of selected chemicals, drugs, and narcotic substances on the nervous system.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BIOLMEDL3_U15] learns independently, in a focused manner	A student, using various sources of information, describes the uses, mechanisms of action, pharmacokinetics, side effects, and contraindications of a selected drug that affects the central nervous system.	[SU3] text preparation/written work
	[BIOLMEDL3_K01] understands the need for lifelong learning and to update his/her knowledge of medical biology and related disciplines	The student can point out the latest trends in the treatment of Alzheimer's, Parkinson's, and selected mental illnesses.	[SK4] test/exam - oral or written
	[BIOLMEDL3_K03] is aware of his/her own limitations and knows when to seek expert assistance	The student identifies diseases and disorders of CNS function based on symptom descriptions that require consultation and/or treatment by a neurologist or psychiatrist.	[SK4] test/exam - oral or written
	[BIOLMEDL3_U07] is able to identify problems corresponding to the needs of an individual and a social group and to undertake basic diagnostic, preventive and educational activities appropriate to the profession of medical biologist	The student, based on the description of the patient's symptoms, identifies their health problem and points out actions to solve it.	[SU4] test/exam - oral or written
	[BIOLMEDL3_W17] explains the relationship between the achievements of biology and related disciplines and the possibilities of their use in neuroscience and diagnostics, which can have an impact on socio-economic life	The student explains how achievements in the field of neuropharmacology can be used in neurobiology, neurology, psychiatry, and diagnostics, and what impact this could have on social and economic life.	[SW3] text preparation/written work
	[BIOLMEDL3_W12] is oriented in the development and current state of knowledge and the latest trends in medical biology; indicates their relationship with other disciplines of natural or medical sciences	The student points out the latest trends in neuropharmacology.	[SW4] test/exam - oral or written
	[BIOLMEDL3_W11] posiada zaawansowaną wiedzę dotyczącą metod oceny stanu zdrowia oraz objawów i przyczyn wybranych zaburzeń i zmian chorobowych oraz zna podstawy zdrowego trybu życia, potrafi je uzasadnić i promować	The student is familiar with the causes and symptoms of selected neurological diseases and can identify elements of a healthy lifestyle that reduce the risk of their occurrence.	[SW4] test/exam - oral or written
	[BIOLMEDL3_W06] describes, explains and compares systemic control mechanisms in animal and human organisms (including onto- and phylogenetic points of view) and the neurobiological and genetic basis of different disorders	The student is familiar with the structures of the nervous system and their role in controlling motor, cognitive, and emotional functions, as well as the most common functional disorders; the student can also identify the mechanisms of action of drugs used to alleviate these disorders.	[SW4] test/exam - oral or written
	[BIOLMEDL3_W09] identifies the tools of mathematics necessary to understand the laws of nature and to describe the processes of life	The student defines the relationship between the chemical structure and biological activity of a drug; understands the fundamental mechanisms and multifaceted effects of biologically active substances on the organism, particularly on the nervous system and behavior.	[SW4] test/exam - oral or written [SW3] text preparation/written work
	[BIOLMEDL3_W10] understands and describes the physicochemical and biological basis of health sciences	The student is able to identify the physicochemical properties of certain drugs that determine their effect on the human neurohormonal system.	[SW4] test/exam - oral or written [SW3] text preparation/written work
	[BIOLMEDL3_W16] explains the theoretical basis of experimental methods and lists the most important techniques of biological sciences that can be applied to medical biology and diagnostics	The student lists the most important techniques used in drug pharmacokinetics research.	[SW4] test/exam - oral or written

Subject contents	Introduction to pharmacology: history of pharmacology; general concepts and definitions; names and groups of drugs acting on the CNS; pharmacokinetics: absorption, distribution, metabolism, elimination, drug concentration-time relationship based on route of administration; pharmacodynamics: receptors and mechanisms of drug action (receptor-mediated and non-receptor-mediated), dose-effect relationship, drugs acting on the autonomic nervous system, pharmacology of the extrapyramidal system (including treatment of Parkinson's disease and Huntington's chorea); sedatives, hypnotics, and anesthetics; analgesics; anxiolytics and antidepressants; neuroleptics (including treatment of schizophrenia); nootropics and pro-cognitive drugs (including therapies for Alzheimer's disease); psychoactive substances and illicit drugs (overview of mechanisms affecting the CNS); neurotoxicology (poisoning by metals, drugs, psychostimulants, antidepressants, alcohol, mushrooms, and chemical warfare agents); antidotes; drug development; placebo effect.		
Prerequisites and co-requisites	Fundamentals of Neuroanatomy; Animal and Human Physiology		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	written assignment	51.0%	33.0%
	written test	51.0%	67.0%
Recommended reading	Basic literature	1. Kostowski W., Herman Z. S. 2008. Pharmacology: Fundamentals of Pharmacotherapy. PZWL Medical Publishing, Warsaw, 2. Lullmann, Mohr, Hein (2nd Polish edition; Ed. T. F. Krzemiński) Lullmann's Illustrated Compendium of Pharmacology. Czelej Publishing. 3. Mutschler E., Geisslinger G., Kroemer H.K., Schäfer-Korting M. Pharmacology and Toxicology (Ed. Andrzej Danysz). Urban & Partner Medical Publishers, Wrocław, 2004.	
	Supplementary literature	Ball S. (Polish translation). The Chemistry of Grey Matter: Neurochemistry and Toxicology of the Central Nervous System. Oficyna Wydawnicza "Medyk", Warsaw 1996. Sadowski B. 2005. Biological Mechanisms of Human and Animal Behavior. PWN, Warsaw.	
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Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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