GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Engineering problems in neurology, PG_00055758		
Field of study	Mechanical and Medical Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study 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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	Grzegorz Kozera	
	Teachers	Grzegorz Kozera	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	10.0	0.0	5.0	0.0	0.0	15

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	15	1.0	9.0	25

Subject objectives

To acquaint the student with the basic causes, symptoms and treatments of diseases of the nervous system. Overview of the most important methods of neuroimaging, neurophysiological and ultrasound diagnostics used in neurology. Mastering by the student to solve the basic problems related to the prevention of diseases of the nervous system

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W12] he/she has basic knowledge in the field of fundamental medical sciences, human body anatomy, and physiology, salvage service	The student is able to recognize the basic symptoms of disease, can select adequate diagnostic techniques and knows the rules of prevention.	[SW1] Assessment of factual knowledge
[K6_K02] he/she is aware of importance of professional dealing and to fulfill ethics obligations, he/she understands other (non-technical) abilities of mechanical engineering professional, their influence on the society and security of environment, he/she is aware of importance of social cooperation	The student is aware of the importance of non-technical conditions and effects of engineering activities. The student is aware of the responsibility for the decisions made.	[SK2] Assessment of progress of work
[K6_U10] he/she is able to assess the human body physic and basic functioning of the body organs, he/she is able to use basic medical knowledge to solve mechanical-medical problems in the scope of the MME study	The student describes the basic elements of the nervous system, explains the most important principles of their functioning and the main causes of disease symptoms	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents	1: Basics of the anatomy of the nervous system: - structure of the central and peripheral nervous system, - construction of the motor and sensory system, - the most common disorders in the sensory system. 2: Vascular diseases of the brain - stroke / TIA: - epidemiology and risk factors, - main symptoms s of the disease, - treatment methods, - diagnostics - neuroimaging techniques, - stroke prevention. 3. Diseases of the spine and spinal cord: - anatomy and function of the spine and spinal cord, - the most common diseases of the spine and spinal cord, - diagnostic and therapeutic methods, - prevention of diseases of the spine. 4. Methods of diagnosing nervous system diseases: neurophysiological basics, used used, clinical indications and obtained results A: electrophysiological tests: - electroencephalography, - nerve conduction studies, electromyographic examination, - evoked potentials; B: ultrasound examinations: -ultrasound of intracerebral arteries, - transcranial ultrasound, - ultrasound of peripheral nerves.
Prerequisites and co-requisites	Basic knowledge of the subjects: Physics, Biology, Electrical Engineering

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Attendance / participation in classes	80.0%	100.0%

Recommended reading

Basic literature	Ryszard Podemski. Kompendium Neurologii. Via Medica Gdańsk 2019, wyd.4
Supplementary literature	Okrój-Lubecka Julitta, SZUROWSKA EDYTA, KOZERA GRZEGORZ: Metody neuroobrazowania ostrej fazy udaru niedokrwiennego mózgu w praktyce klinicznej Forum Med. Rodz. 2015 : t. 9, nr 6 Radosław *Kaźmierski* (red.) *Podręcznik* diagnostyki ultrasonograficznej w neurologii, Czelej, Lublin 2011 Grzegorz Kozera, Joanna Wojczal, Walenty Michał Nyka Zastosowanie badań ultrasonograficznych w profilaktyce udaru mózgu. Forum Medycyny Rodzinnej 2008. T 2, nr 6, s
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	Discuss the structure of the nervous system. Justify the statement that a stroke is a growing threat of the 21st century, indicate its most common symptoms. Indicate the most important principles of the prevention of vascular diseases of the CNS, explain why "it is better to heal than to prevent". What does the "time is the brain" principle mean. Point out the advantages and disadvantages of individual neuroimaging techniques. Present the principles of work and everyday ergonomics, which are beneficial in reducing the risk of developing spine diseases. Define indications and discuss the methods of ultrasound and electrophysiological examinations used in neurology.
Work placement	Not applicable