GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Peripheral Devices, PG_00047485		
Field of study	Electronics and Telecommunications		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	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	2	Language of instruction	English
Semester of study	4	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Metrology and Optoelectronics -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Maciej Wróbel	
	Teachers	dr inż. Maciej Wróbel	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	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	2.0	18.0	50

Subject objectives

The aim is to introduce to principles of working and the basic parameters of typical peripheral devices.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W03] Knows and understands, to an increased extent, the construction and operating principles of components and systems related to the field of study, including theories, methods and complex relationships between them and selected specific issues - appropriate for the curriculum.	The student defines the categories of devices peripheral. The student defines and analyzes the basic parameters utilities of various devices peripheral. The student chooses peripheral devices optimal for specific applications. Student explains the principle of operation of typical peripheral devices. Student makes software for common peripheral devices.	[SW2] Assessment of knowledge contained in presentation
[K7_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, making assessment and critical analysis of the prepared software as well as a synthesis and creative interpretation of information presented with it	The student defines the categories of devices peripheral. The student defines and analyzes the basic parameters utilities of various devices peripheral. The student chooses peripheral devices optimal for specific applications. The student explains the principle of operation of the typical peripheral devices. Student makes software for common peripheral devices. The student designs and prototypes peripheral devices.	[SU1] Assessment of task fulfilment

Subject contents	1. Introduction to the subject of peripheral devices 1.1. Classification of electronic system peripherals . 1.2 Input devices, 1.3. Output devices, 1.4 I / O devices. 1.5 Human perceptions and Human-machine interactions (HCI). 1.6 Integration of peripheral devices in electronic systems. 2. Human perception. 2.1Human ability to receive information from the outside (information receiving channels /output) 2.1 visual parameters, 2.2 hearing parameters (auditory), 2.3 touch parameters (tactile), 2.4 parameters of smell and taste (chemical), others. 3. Human-machine interactions. Human ability to interact with the environment (input): 3.1 parametersmotor / movement / gestures (tactile, kinesthetic, gesture interfaces), 3.2 speech parameters (voice control), others.3.3. Human involuntary parameters, vital parameters: respiration, pulse, interactionelectrical muscle, eye movement. 3.4 parameters of the brain waves, 3.5 physical representation of emotions. 4. Review of peripheral devices (user interfaces) for human-machine communication.4.1 Touch devices (interfaces). Device examples: keyboard, mouse, joystick, touchscreen, radar gestures, other. 4.2. Voice interfaces. Voice recognition technology.4.3. Haptic devices (interfaces). (haptics, feedback), Examples of devices: game controllers, surgical robots, medical phantoms (palpation).4.4. Movement devices (interfaces). Device examples: Upper / lower limb prostheses, exoskeleton, others.4.5. Biofeedback, devices controlling involuntary (vital) parameters, wearable devices (smartwatches,smartglasses), clothes (smart textiles), other.4.6. Brainwave control, Brain Computer Interface (BCI) 4.7. Chemical interfaces (gustatory, olfactory interfaces). Examples of devices: electronic nose, electronic tongue. 5. Peripheral devices and their components.5.1. Traffic control. Elements for the control of linear motion, types of electric motors, elements for control rotary motion, encoders, potentiometers. 5.2. Touch control. Touch screen technologies.5.3. Image presentation (2D information). Digital and analog representation of graphics. Display technologies(computer, HUD, AR), printers (thermal, ink jet, laser).5.4 Retrieving 2D and 3D Information. 1D (barcode) scanners, 2D (image) 3D scanners and 3D scan technologies. Methods of extracting information from images.5.5. Presentation of three-dimensional 3D information. 3D printing technology review. 3D display technologies (VR). 5.6 Assistive devices for the disabled.
Prerequisites and co-requisites	
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
Presentation, colloquium	50.0%	60.0%
Practical exercise	50.0%	40.0%

Recommended reading	Basic literature	Materials at eNauczanie
	Supplementary literature	No requirements
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	