GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Basics of control , PG_00061902
Field of study	Materials Engineering

Date of commencement of studies	October 2023	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Department Of Corrosion And Electrochemistry -> Faculty Of Chemistry -> Wydziały Politechniki Gdańskiej

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Łukasz Gaweł
	Teachers	dr inż. Łukasz Gaweł

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	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	5.0	15.0	50

Subject objectives	Mastery of basic programming in the derivative of the C language using the TinkerCad tool for learning control of virtual tools, such as temperature sensors, humidity sensors, and servomechanisms. The student will become familiar with basic commands and the structure of a program for handling and reading data from peripheral devices.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others.	The student is able to use libraries and teaching aids to improve his/her competences in programming control systems	[SK5] Assessment of ability to solve problems that arise in practice
	[K6_W04] Knows selected aspects of construction and operation of scientific equipment in materials engineering.	The student is familiar with basic concepts related to the operation of peripheral systems available for microcontrollers	[SW1] Assessment of factual knowledge
	[K6_W05] Has the knowledge of mechanics, technology and electrical engineering, including engineering graphics and using computer aid, the use of databases in the design of technological processes.	The student is familiar with basic concepts related to the functioning of source code and methods of uploading it.	[SW1] Assessment of factual knowledge
	[K6_U03] Can critically analyze and evaluate the functioning – particularly in the context of materials engineering –existing technical solutions, particularly equipment, objects, systems, processes.	Student can assess the type of device and its communication method with the microcontroller.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents	Introduction to Arduino: hardware, programming environment, code structure, virtual tools.Digital and analog I/O channels. Simple I/O operations.Communication and control of peripheral systems. Discussion of selected peripheral systems. Construction of systems based on peripheral devices.Use of available libraries.
Prerequisites and co-requisites	Basic knowledge in the operation of computers and peripheral devices. Basic electrical knowledge.

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory	60.0%	100.0%

Recommended reading	Basic literature	Getting Started with Arduino 4e Michael Shiloh
	Supplementary literature	Online documentation, step-by-step courses, and videos available on popular internet platforms.
	eResources addresses	Adresy na platformie eNauczanie: Podstawy sterowania - Moodle ID: 36651 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36651

Example issues/ example questions/ tasks being completed	Construction of a temperature measurement system based on Arduino. Creation of a system of IO-controlled devices along with software for recording and processing experimental data, signal analysis.
Work placement	Not applicable

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