GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	System Diagnostics, PG_00048463		
Field of study	Automatic Control, Cybernetics and Robotics		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2023/2024
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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	1.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Decision Systems and Robotics -> Faculty of Electronics, Telecommunications and Informatics		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Mariusz Domżalski	
	Teachers	dr inż. Mariusz Domżalski	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	15.0	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	2.0	8.0	25

Subject objectives	The aim of the project is to acquaint students with the practical problems and methods of processes and systems diagnostic based on exemplary detailed / practical tasks.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W21] Knows and understands, to an advanced extent, methods and techniques of design and operation of automatic control systems, control and robotics systems, as well as the use of computers in the control and monitoring of dynamic objects	Student knows the principles of design and operation of diagnostic systems.	[SW3] Assessment of knowledge contained in written work and projects
[K7_U03] can design, according to required specifications, and make a complex device, facility, system or carry out a process, specific to the field of study, using suitable methods, techniques, tools and materials, following engineering standards and norms, applying technologies specific to the field of study and experience gained in the professional engineering environment	Student is able to design systems for solving diagnostic problems.	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment
[K7_U21] can individually carry out an in-depth analysis of controlling, diagnostics and signal processing problems; and, to an advanced extent, is able to individually design, tune and operate automatic regulation, control and robotics systems; and use computers to control and monitor dynamic systems	Student is able to analyze and design control systems used in monitoring and diagnostics problems.	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information
[K7_U01] can apply mathematical knowledge to formulate and solve complex and non-typical problems related to the field of study by:n-appropriate selection of source information and its critical analysis, synthesis, creative interpretation and presentation,n-application of appropriate methods and toolsn	Student uses mathematical knowledge to solve practical problems in the field of diagnostics.	[SU3] Assessment of ability to use knowledge gained from the subject
[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.	Student understands the principles of operation of diagnostic systems.	[SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

Subject contents

1. Explanation of exemplary diagnostic issues discussed within the scope of the subject.
2. Individual analysis of a given tasks.
3. Development of a proposed solution to a given diagnostic problem, and preparation of a presentation of the obtained results.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Project completion and acceptance	50.0%	100.0%

Recommended reading

Basic literature	• Z. Kowalczuk, *System Diagnostics* - course notes • Korbicz J., Kościelny J.M., Kowalczuk Z., Cholewa W. (Red.): *Diagnostyka procesów. Modele, metody sztucznej inteligencji, zastosowania* – Warszawa: Wydawnictwa Naukowo-Techniczne, 2002 • Korbicz J., Kościelny J.M., Kowalczuk Z., Cholewa W. (Eds.): *Fault Diagnosis: Models, Artificial Intelligence, Applications* – Berlin: Springer, 2004
Supplementary literature	• Scientific papers in journals.
eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed

Fault detection and diagnosis in industrial systems (eg. in DC electric motors).

Machine learning systems in image classification problems.

Work placement

Not applicable