GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Data Visualization in Technology, PG_00059227
Field of study	Automation, Robotics and Control Systems

Date of commencement of studies	February 2024	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	
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 Metrology and Information Systems -> Faculty of Electrical and Control Engineering

Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Anna Golijanek-Jędrzejczyk
	Teachers	dr inż. Anna Golijanek-Jędrzejczyk

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	15.0	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	3.0	17.0	50

Subject objectives	The aim of the course is to prepare students for work related to the design of ergonomic interaction systems for automation devices.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_K02	The student is able to work in a group.	[SK1] Assessment of group work skills [SK2] Assessment of progress of work [SK3] Assessment of ability to organize work [SK4] Assessment of communication skills, including language correctness
	K7_W04	Based on the knowledge gained the student knows how to solve complex issues optimization.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
	K7_U02	The student defines and classifies visualization systems. Student knows how to choose a graphic form to presented data. Student knows how to plan and design ergonomic interface user.	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task

Subject contents	Lecture: Information theory. Historically - ways of transmitting information. Definition of visualization. Visualization tasks. Application of visualization. Infovis - definition, history, development and tasks of this discipline. Visual perception. Principles of color selection in visualization. Information visualization methods. Examples of poorly made data visualizations. Examples of well-prepared visualizations. Principles of designing a good visualization. Data mining techniques. Key concepts of data mining. Visualization domains. Dimensionality of the field of visualization. Principles of visualization design. Rules for the preparation of technical documentation. Visualization testing: methods, areas of testing, correctness of results, performance testing, testing pitfalls. Infographics - definition, history and development. Principles of infographics design. Tools for infographics. Ways of presenting symbolic data. Pictograms. Project: Preparation in a group of two visualization projects for the system given by the teacher and technical documentation for the last project. The first project will concern the visualization of measurement data from a research experiment. The second project will consist of: design documentation (design goals and tasks, as well as tests performed; it should include an interface manual), a computer model of the interface and a presentation of the prepared project during classes.
Prerequisites and co-requisites	

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

Recommended reading	Basic literature	1. Osińska V.: Wizualizacja informacji. Studium Informatologiczne.WNUMK, Toruń 2016. 2. Claus O. Wilke: Podstawy wizualizacji danych. Zasady tworzenia atrakcyjnych wykresów. Helion, 2020. 3. S. Berinato: Good Charts: The HBR Guide to Making Smarter, More Persuasive Data Visualizations. Harvard Business Review Press,2016. ISBN-10: 1633690709 4. A. Kirk: Data Visualisation. A Handbook for Data Driven Design. Sage Publications Ltd., 2016. ISBN: 9781473912137 5. Cooper A.: Wariaci rządzą domem wariatów. Dlaczego produkty wysokich technologii doprowadzają nas do szaleństwa i co zrobić, żeby tego uniknąć. 2004. 6. Jacek Matulewski, Tomasz Dziubak, Marcin Sylwestrzak, Radosław Płoszajczak: Grafika. Fizyka. Metody numeryczne. Symulacje fizyczne z wizualizacją 3D. Wydawnictwo Naukowe PWN 2010. 7. Srinivasan Desikan; Gopalaswamy Ramesh: Software Testing: Principles and Practices. Pearson Education India 2006 8. Bogdan Wiszniewski, Bogdan Bereza-Jarociński: Teoria i praktyka testowania programów. PWN 2009 9. Garr Reynolds: Zen prezentacji. proste pomysły i ważne zasady. Helion 2009 10. T. Morzy: Eksploracja danych. Metody i algorytmy. Warszawa, 1, 2021. ISBN: 9788301171759
	Supplementary literature	1. Bednarek J., Multimedia w kształceniu. PWN, Warszawa 2006. 2. Paul Beynon-Davies: Inżynieria systemów informacyjnych. WNT, Warszawa 2004.
	eResources addresses	Adresy na platformie eNauczanie: WIZUALIZACJA DANYCH W TECHNICE [ARiSS][2024/25] - Moodle ID: 39808 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=39808

Example issues/ example questions/ tasks being completed	1. Definition of visualization.
	2. Classification and characteristics of visualization.
	3. Symbolic data and ways of their presentation.
	4. Stages of designing visualization systems.
	5. Principles of developing technical documentation.
Work placement	Not applicable

Document generated electronically. Does not require a seal or signature.