



## Subject card

Subject name and code	Research Metodology, PG_00060108						
Field of study	Automation, Robotics and Control Systems						
Date of commencement of studies	February 2022	Academic year of realisation of subject			2022/2023		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Katedra Inteligentnych Systemów Sterowania i Wspomagania Decyzji -> Faculty of Electrical and Control Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Michał Grochowski					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	30.0	15.0	45
	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	45		10.0		20.0	75
Subject objectives	<p>The general objective of the course is to acquire the basic knowledge of research methodology necessary for the correct execution of the research process and the reporting of its results.</p> <p>The research methodology explains what and how the research was done, allowing readers to assess the reliability and validity of the research.</p> <p>The specific aim of the course is to prepare students to correctly formulate research objectives, analyse the problem, select tools, analyse research results, skilfully draw conclusions from them and comment on them objectively.</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K7_U10	The student designs and implements simple diagnostic systems. On the basis of conducted research, the Student is able to draw conclusions.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
	K7_U01	The student reviews the literature in a given research area, extracts and interprets the knowledge contained in the given publications. The student is able to present his/her own research objectives in the context of the reviewed literature.	[SU2] Assessment of ability to analyse information [SU5] Assessment of ability to present the results of task
	K7_W04	The student selects an appropriate optimisation algorithm that allows for the synthesis of decision-making systems, or knows how to develop a hybrid optimisation algorithm and then implements it	[SW1] Assessment of factual knowledge
	[K7_K71] is able to explain the need to apply knowledge from humanistic, social, economic or legal sciences in order to function in a social environment	The student is able to design a system employing artificial intelligence models that operates in a way that is trustworthy and acceptable to the community, such as the medical community.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice
	K7_W11	Students design and implement algorithms to model and analyse control engineering and robotics systems, e.g. decision support systems.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
K7_U04	The student makes use of the state-of-the-art monographic literature, publication databases (e.g. IEEE, Elsevier), courses (e.g. Coursera), or repositories such as Github in order to develop their own competences.	[SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools	
Subject contents	<p>The subject will discuss the methodology of the research conducted, i.e. information on</p> <ul style="list-style-type: none"> <li>- the type of research conducted</li> <li>- the method of data collection and analysis</li> <li>- justification for the choice of methods and tools used in the research,</li> <li>- the manner of drawing conclusions from the conducted research,</li> <li>- the way of limiting and avoiding errors.</li> </ul> <p>As part of the course, students, with the support of the instructor, will prepare a scientific article and a presentation of the results of the conducted research, enabling them to present them e.g. at a scientific conference.</p> <p>Students will also learn about tools supporting the preparation of scientific publications, such as Overleaf, Zotero, Mendeley.</p>		
Prerequisites and co-requisites	Students must pursue teaching as part of their individual research studies		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Seminar	50.0%	25.0%
	Project	50.0%	75.0%

Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. McCombes, S. &amp; George, T. (2023, January 30). What Is a Research Methodology?   Steps &amp; Tips. Scribbr. Retrieved March 28, 2023, from <a href="https://www.scribbr.com/dissertation/methodology/">https://www.scribbr.com/dissertation/methodology/</a></li> <li>2. <a href="#">Y.k.singh</a>. Research Methodology Data Presentation. (n.d.). (n.p.): APH Publishing, 2009.</li> <li>3. Kumar, R. (2014). Research Methodology: A Step-by-Step Guide for Beginners. Wielka Brytania: SAGE Publications.</li> </ol>
	Supplementary literature	<ol style="list-style-type: none"> <li>1. Information Technology: Artificial Intelligence : Overview of Trustworthiness in Artificial Intelligence, <a href="#">International standard</a>, ISO/IEC, 2020</li> <li>2. <a href="#">Beena Ammanath</a>, Trustworthy AI: A Business Guide for Navigating Trust and Ethics in AI, John Wiley &amp; Sons, 2022</li> </ol>
	eResources addresses	
Example issues/ example questions/ tasks being completed	Based on the literature analysis carried out, find the knowledge gap and formulate the research objectives of your study.	
Work placement	Not applicable	