



## Subject card

Subject name and code	Implementation of scientific research in the development of transport systems, PG_00050330						
Field of study	Transport						
Date of commencement of studies	February 2023		Academic year of realisation of subject		2023/2024		
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		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Transportation Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Wojciech Kustra				
	Teachers		mgr inż. Łukasz Jeliński  mgr inż. Patrycja Jerzyło  dr hab. inż. Kazimierz Jamroz  dr inż. Sławomir Grulkowski  dr hab. inż. Piotr Jaskuła  dr hab. inż. Jacek Oskarbski  dr inż. Wojciech Kustra				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	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		5.0		25.0	75
Subject objectives	Knowledge of research methods in transport, their application in practice and their impact on the development and operation of transport.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_U06] able to integrate knowledge of mathematics, physics, electronics, power engineering, traffic engineering, civil engineering of transport and other fields by applying a system based approach, including non-technology aspects (economics, psychology, sociology, environment, health and safety), able to define the effect these fields have on the development of transport systems, able to use new technical and technological achievements and assess their utility for transport		The student is able to obtain and process source data and use it in the management and organization of transportation systems.		[SU1] Assessment of task fulfilment		
	[K7_W06] has broad knowledge of transport management		The student knows the data sources related to transportation and their acquisition and analysis methods. He has knowledge of their usefulness and applicability in the multi-faceted development of transportation systems.		[SW3] Assessment of knowledge contained in written work and projects		

Subject contents	LECTURES: Elements of the transport system, Demand for research in the field of transport, Implemented research results in transport, Research techniques, Creativity in research, Defining the research problem, Acquiring knowledge from current research, Experimental methodology, Proposed research project, Research project management, Evaluation research results, Implementation of results in practice, Research ethics.  TUTORIALS: Interdisciplinary group projects, Group study of a selected research topic.		
Prerequisites and co-requisites	knowledge of the basics of mathematics and statistics		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project evaluation	50.0%	50.0%
	test	50.0%	50.0%
Recommended reading	Basic literature	Research Methodology: a Step-by-Step Guide for Beginners (2014), Kumar, R., SAGE, ISBN: 978-1446269978.  Research Strategies: Finding your Way through the Information Fog (2014), Badke, W. B., 5th ed., Bloomington, IN, ISBN: 978-149172233	
	Supplementary literature	Understanding the Research Process (2010), Oliver, P., SAGE Publications, ISBN: 978-1849201117	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	Interdisciplinary group projects, Group study of a selected research issue.		
Work placement	Not applicable		