GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	ITS design and maintenance, PG_00062456						
Field of study	Transport						
Date of commencement of studies	February 2025		Academic year of realisation of subject	2025/2026			
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	Department of Transportation Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jacek Oskarbski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	15.0	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	Acquire the knowledge and skills necessary to design, implement and maintain Intelligent Transportation Systems (ITS), taking into account the principles of operation, safety and efficiency of these systems to counter transport problems						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W02] explains the importance and interdependence of key components describing transport systems and processes and their environment, using in-depth knowledge in accordance with the main trends in the development of scientific disciplines related to the field of study	The student is able to explain in detail the importance and interdependence of the main elements of transportation systems and analyze their environment in the context of the latest scientific and technological trends, using in-depth and up-to-date knowledge of the scientific disciplines related to the field of study.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge
[K7_U01] creates innovative solutions to complex and unstructured problems, taking into account the variability of the environment by synthesizing information from many sources, using analytical, simulation and experimental methods	The student is able to create innovative solutions to complex and unstructured problems in the ITS area, taking into account the variability of the environment by synthesizing information from various sources and using analytical, simulation and experimental methods in the process of design and maintenance of ITS systems	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
[K7_K02] makes competent and ethical decisions, caring for the public interest and maintaining economic, social and environmental values	The student makes competent and ethical decisions in the design and maintenance of ITS systems, taking into account the need to protect the public interest, user safety and sustainable development. In the process, he or she ensures that the designed solutions comply with applicable norms, legal regulations and ethical standards, and that their implementation and maintenance do not violate economic, social and environmental values. In addition, it engages in activities that minimize negative environmental and social impacts by promoting sustainable solutions for the transportation industry.	[SK5] Assessment of ability to solve problems that arise in practice [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work [SK2] Assessment of progress of work [SK1] Assessment of group work skills

Subject contents

Course content – lecture
ITS design and maintenance process. Conceptual design. Functional-utility program. Feasibility study. Communication protocols and data exchange standards. Description of the subject of the contract. Requirements for the Traffic Management Center. Testing of systems. Standardization, data flows and formats. Communication interfaces. Systems in cities. Systems on urban roads. Maintenance of systems.

Prerequisites and co-requisites

Planning of intelligent transport systems

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Credit for lecture	60.0%	50.0%
Project credit	100.0%	25.0%
Laboratory credit	100.0%	25.0%

Recommended reading

Basic literature

Lawrence A. Klein, Sensor technologies and Data requirements for ITS. Boston : Artech House, ©2001. Artech House ITS library. ISBN: 158053077X 9781580530774
Thill Jean-Claude, Geographical Information Systems in Transportation Research, Pergamon, 2000.
J.M. Sussman, Perspectives on Intelligent Transportation Systems (ITS), Springer, 2005
M.A. Chowdhury and A. Sadek, Fundamentals of Intelligent Transportation Systems Planning, Artech House, 2003
ITS Hand Book 2000: Recommendations for World Road Association (PIARC) by Kan Paul Chen, John Miles

	Supplementary literature	Websites and journals: IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, IEEE TRANPORTATION RESEARCH, PART C: EMERGING TECHNOLOGIES, PERGAMON-ELSEVIER SCIENCE LTD JOURNAL OF INTELLIGENT TRANSPORTATION SYSTEMS, TAYLOR & FRANCIS INC INTERNATIONAL JOURNAL OF VEHICLE INFORMATION AND COMMUNICATION SYSTEMS, INDERSCIENCE ENTERPRISES IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, IEEE http://frame-online.eu/ https://www.its.dot.gov/research_archives/arch/architecture_plan.htm https://local.iteris.com/arc-it/index.html Adresy eZasobów Adresy na platformie eNauczanie
	eResources addresses	
Example issues/ example questions/ tasks being completed	Proposal for the application of ITS service groups on the highway - a brief characterization of services. Proposal for the application of ITS service groups in the urban street system - a brief characterization of services Characterize and design a service for metering traffic at highway entrances. Methods of traffic management at road junctions using ITS. Ways to ensure the openness of the ITS system to area and functional development.	
Practical activites within the subject	Not applicable	

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