



## Subject card

Subject name and code	Planning, project design and maintenance of Intelligent Transportation Systems, PG_00051709						
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	2	Language of instruction			Polish		
Semester of study	3	ECTS credits			2.0		
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 hab. inż. Jacek Oskarbski					
	Teachers	dr hab. inż. Jacek Oskarbski mgr inż. Karol Żarski					
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	0.0		0.0		30
Subject objectives	To gain knowledge in the planning, design and maintenance of Intelligent Transport Systems services.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W13] has advanced knowledge of the design and management of transport systems to an extent required of the specialty	Student is able to plan and design and assess the effectiveness of ITS services. The student is able to select appropriate ITS services for the purposes they are to serve. The student can use ITS architecture.			[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects		
	[K7_W04] has basic knowledge of teleinformatic systems used in transport	The student is able to select appropriate communication systems and basic IT requirements for ITS services.			[SW1] Assessment of factual knowledge		
	[K7_W05] has basic knowledge of control in transport systems	The student acquires the ability to design advanced traffic control systems.			[SW1] Assessment of factual knowledge		
	[K7_U13] able to solve detailed problems of transport systems to an extent required of the specialty	The student is able to select appropriate ITS services, service delivery devices, communication systems and basic IT requirements.			[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	Definitions, history of ITS creation and development. Role and objectives of ITS application. ITS systems architecture. ITS services. Functional structure. Physical structure including equipment and devices. Logical structure taking into account the links between institutions and transport elements and communication. ITS planning, design and modelling. Selection of equipment. Evaluation of effectiveness of existing and planned ITS systems. Case studies (feasibility studies, traffic analyses, forecasts, economic analyses). Preparation of an application for ITS investment financing. ITS maintenance.						
Prerequisites and co-requisites	Transport Process Modelling. Traffic control. Advanced transport management systems.						

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	100.0%	40.0%
	written exam	60.0%	60.0%
Recommended reading	Basic literature	<p>Lawrence A. Klein, Sensor technologies and Data requirements for ITS. Boston : Artech House, ©2001. Artech House ITS library. ISBN: 158053077X 9781580530774 •</p> <p>Thill Jean-Claude, Geographical Information Systems in Transportation Research, Pergamon, 2000. •</p> <p>J.M. Sussman, Perspectives on Intelligent Transportation Systems (ITS), Springer, 2005 •</p> <p>M.A. Chowdhury and A. Sadek, Fundamentals of Intelligent Transportation Systems Planning, Artech House, 2003 •</p> <p>ITS Hand Book 2000: Recommendations for World Road Association (PIARC) by Kan Paul Chen, John Miles</p>	
	Supplementary literature	<p><u>Web sites and Journals</u></p> <p>•IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, IEEE •TRANSPORTATION RESEARCH, PART C: EMERGING TECHNOLOGIES, PERGAMON-ELSEVIER SCIENCE LTD •JOURNAL OF INTELLIGENT TRANSPORTATION SYSTEMS, TAYLOR &amp; FRANCIS INC •INTERNATIONAL JOURNAL OF VEHICLE INFORMATION AND COMMUNICATION SYSTEMS, INDERSCIENCE ENTERPRISES •IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, IEEE •<a href="http://frame-online.eu/">http://frame-online.eu/</a> •<a href="https://www.its.dot.gov/research_archives/arch/architecture_plan.htm">https://www.its.dot.gov/research_archives/arch/architecture_plan.htm</a> •<a href="https://local.iteris.com/arc-it/index.html">https://local.iteris.com/arc-it/index.html</a></p>	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<p>Proposal to use groups of ITS services on the motorway - short description of services. ITS architecture for the selected group of services. Characteristics of hierarchical structure of traffic management using ITS Objectives of using Intelligent Transport Systems. Logical structure of the traffic incident management system. Advantages and disadvantages of a homogenous and heterogeneous structure of advanced traffic management systems. Proposal of using groups of ITS services in the layout of city streets - short description of services Logical structure of the inter-junctional traffic management module, modes of operation Characterize and design a traffic dosing service at motorway entrances. Traffic management methods at road junctions using ITS. Ways to ensure that ITS is open to area and functional development. Translated with <a href="http://www.DeepL.com/Translator">www.DeepL.com/Translator</a> (free version)</p>		
Work placement	Not applicable		