GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Road Traffic Engineering, PG_00044621						
Field of study	Transport						
Date of commencement of studies	October 2024		Academic year of realisation of subject	2026/2027			
Education level	first-cycle studies		Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	3		Language of instruction	Polish			
Semester of study	5		ECTS credits	5.0			
Learning profile	general academic profile		Assessment form	exam			
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 inż. Wojciech Kustra				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	15.0	15.0	0.0	60
	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	60		5.0		60.0	125
Subject objectives	The aim of the module is to familiarise students with the description and functioning of the ‘human–vehicle–road–traffic–environment’ (HVRTE) system, the main factors influencing the generation of road traffic, and an overview of traffic management methods. On this basis, students should apply selected traffic management methods and design elements of road infrastructure, taking into account efficiency, cost-effectiveness, road safety and environmental requirements.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W05] has knowledge in the field of traffic engineering, methods, algorithms, and technologies for traffic control, as well as safety and reliability in transportation	The student has a basic understanding of how the system—comprising people, vehicles, roads and the surrounding environment—functions. They also have an understanding of methods for conducting road traffic research and tools for road traffic management.	[SW1] Assessment of factual knowledge
[K6_K01] able to think and act creatively and enterprisingly; able to define priorities to support the delivery of an individual or group task; understands the need for continuous education and taking responsibility as a professional for their work and the work of the team	The student defines the components of the CPDRO system, selects methods for measuring road traffic, carries out measurements and, on this basis, assesses the functioning of the object under analysis. The student then they describe the relationships between the basic parameters of road traffic, select methods and measures for traffic management, calculate the capacity of road network elements, assess traffic conditions, and then design elements of road traffic management	[SK5] Assessment of ability to solve problems that arise in practice
[K6_U08] able to carry out simple engineering tasks related to the construction and operation of a selected element of the transport system, select the right methods and tools	The student is able to apply in practice selected traffic research tools and basic traffic management tools to assess the functioning of a selected road infrastructure facility and to apply the most effective methods and measures for traffic management.	[SU4] Assessment of ability to use methods and tools

Subject contents

Course content – lecture

Traffic engineering. Human-Vehicle-Road system. Road users – the human being as an agent in traffic. Vehicles and their operating conditions. Vehicle manoeuvres. Vehicle motion mechanics. Fundamentals of modelling of dynamics and analysis of vehicle motion. The road and its surroundings. Road, traffic, climatic and meteorological factors. Characteristics and parameters of traffic. Traffic surveys, measurements and analyses. Modelling of road traffic. The role of traffic volume and speed as fundamental traffic parameters. Capacity of junctions. Capacity of road and street sections. Methods of traffic organisation. Measures of traffic organisation. Traffic lights. Traffic safety measures. Fundamentals of traffic control.

Course content – laboratory

Methods for calculating the capacity of roundabouts, simple intersection and intersection with traffic lights.

Course content – project

Traffic management plan for the junction. Traffic light scheme for the intersection.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Lecture	60.0%	60.0%
Laboratory	90.0%	20.0%
Project	90.0%	20.0%

Recommended reading

Basic literature	Gaca S., Suchorzewski W., Tracz M.:Traffic Engineering

	Supplementary literature	Victor L. Knoop, Traffic Flow Theory: An Introduction with Exercises David Levinson et al., Fundamentals of Transportation Gartner, Messer, Rathi, Revised Monograph on Traffic Flow Theory, oficjalna monografia FHWA NASEM/TRB, Signal Timing Manual – Second Edition, oficjalny manual NCHRP Roess, Prassas, McShane, Traffic Engineering, 5th ed
	eResources addresses	
Example issues/ example questions/ tasks being completed	Calculate the traffic capacity at a roundabout. Plan the traffic organisation for a selected item of road infrastructure Apply knowledge from other disciplines to solve problems in traffic engineering.	
Practical activites within the subject	Not applicable	

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