GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00072910		
Field of study	Civil Engineering		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Optional 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	1	ECTS credits	2.0
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 inż. Marcin Budzyński	
	Teachers		

Lesson types

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	3.0	17.0	50

Subject objectives

The aim of the course is to acquire knowledge in the design of interchanges.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W04] analyses in-depth complex problems on the basis of reliable data and appropriately chosen methods, reaching logical conclusions	The ability to assess the performance of a road interchange, and knowledge of data sources, data collection techniques and assessment methods.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
[K7_U02] interprets, in an in-depth way, phenomena and relationships between processes in the construction industry, using modern knowledge in line with the main trends in the development of scientific disciplines related to the field of study	Acquiring knowledge and competencies in road infrastructure design, particularly the design of road interchanges.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject
[K7_U03] uses, to a deeper extent, appropriately selected analytical, numerical and experimental tools and methods to carry out tasks in the construction industry	Acquiring knowledge of the use of analytical methods—including road traffic forecasting, road crash databases and field surveys—to assess the performance of road interchanges.	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K7_W01] identifies in-depth the phenomena related to the field of study and the theories describing them, indicating reliable sources of knowledge and information relevant to the issues analysed	The ability to identify design errors and road safety hazards, and to apply appropriate design solutions.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation [SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Course content – lecture

1. General information about interchanges
2. Detailed analysis of design elements for selected types of interchanges
3. Capacity of interchanges
4. Problems of safety, economics and environmental protection in road investments
5. Design errors
6. Road barriers and other expressway equipment

Course content – project

Design of road interchange elements: main carriageways, ramps, acceleration and deceleration lanes, and collector-distributor roads.

Alternative conceptual designs for different interchange types.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Knowledge obtained at the stage of first-cycle studies in the subjects Road and Motorway Construction,</td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Passing the project</td><td>60.0%</td><td>80.0%</td></tr>
<tr><td>Attendace</td><td>80.0%</td><td>20.0%</td></tr>
</table></td></tr>
<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>Collective work, ed. R. Krystek Road and motorway junctions, WKiŁ 2008
Intechanges design guidelines. Patterns and Standards. Ministry of Infrastructure. 2022
Intersection design guidelines. Patterns and Standards. Ministry of Infrastructure. 2022
Guidelines for designing rural roads. Patterns and Standards. Ministry of Infrastructure. 2022</td></tr>
<tr><td>Supplementary literature</td><td>Blue Book. Road infrastructure, Jaspers, 2008
AASHTO. Policy on Geometric Design of Highways and Streets. 2018.US</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
</table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>1. Sketch a road interchange layout based on the given parameters.
2. Identify design errors in the field.
3. Identify design errors in interchanges and high-speed road sections that may pose safety hazards.
4. Calculate the capacity of selected road interchange elements.
5. Identify operational problems in the specified interchange examples.</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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