GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Designing elements of transportation systems, PG_00064990		
Field of study	Transport and Logistics		
Date of commencement of studies	February 2026	Academic year of realisation of subject	2026/2027
Education level	second-cycle studies	Subject group	Specialty subject group 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	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Division of Hydromechanics and Ship Design -> Institute of Naval Architecture -> Faculty of Mechanical Engineering and Ship Technology -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. szt. Paweł Gełesz	
	Teachers	dr hab. szt. Paweł Gełesz	

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	30.0	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	4.0	26.0	75

Subject objectives

The programme focuses on project-based activities relating to the design of transport system components, including water transport systems, drawing on knowledge from the fields of engineering and ergonomics. The programme envisages the use of: design experiments (e.g. in a virtual environment), the method of successive approximations, the synthesis of results (teamwork) and an original design proposal. An important feature of the programme is the development of students' competences, particularly at the analytical and creative levels.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W13] explains the main principles of individual and teamwork organization, including various forms of entrepreneurship utilizing knowledge from the field of engineering and technical sciences and disciplines relevant to the course of study	The student has a basic understanding of creative work carried out, in particular, within a small project team.	[SW3] Assessment of knowledge contained in written work and projects
[K7_U15] evaluates the feasibility of advanced methods and tools for solving complex engineering tasks of a practical nature, characteristic of the field of study, and selects and applies appropriate methods and tools for this purpose	The student has advanced knowledge of the implementation of the design process. They consciously select and apply both analytical and creative methods.	[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K7_U13] evaluates the feasibility and potential for utilizing new technical and technological achievements in accomplishing tasks characteristic for the field of study	The student has the basic skills required for the design of modern transport systems (in particular intermodal systems operating at the interface between land and water).	[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment

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

Components of the transport system; subsystems: technical, organisational, financial and regulatory. Infrastructure as a key factor determining transport accessibility in a given area.
Case studies – existing public transport systems (land and water-based).

Course content – project

This module focuses on the technical and functional aspects of a transport system situated at the interface between land and water. Analysis of regional (local) geographical conditions and their impact on the system’s parameters. A conceptual (ideational) study defining the key features of an innovative structure that may serve as the basis for further design work. Conceptual design drawing, virtual model, teamwork, simple technical drawing, description
Research through design</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Students commencing the course should be enrolled in the second year of a second-cycle degree programme. The requirements in terms of knowledge, skills and competences stem from the completion of the required modules; in particular,
the following are expected:
- advanced knowledge of design methods (including teamwork),
- competences relating to analytical skills and the ability to communicate the results of one’s work using various information technologies,
- the ability to critically assess one’s own knowledge and skills and to recognise the importance of</td></tr>
<tr><td>Assessment methods and criteria</td><td>
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<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>project</td><td>50.0%</td><td>25.0%</td></tr>
<tr><td>raport</td><td>50.0%</td><td>75.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Puan, O. C., Yahaya, F. M., Zakaria, H., Amalina, F. (2026). Reviewing public water transport literature and their future agenda. Research in Transportation Business and Management, 67, 101639. DOI: 10.1016/j.rtbm.2026.101639.

A.Papanikolaou, Ship Design - Methodologies of Preliminary Design, ISBN: 978-94-017-8750-5

Tarkowski, M., Połom, M., Puzdrakiewicz, K. (2021). Bridging tourist attractions. The role of waterbuses in urban tourism development: The case of the coastal city of Gdańsk (Poland). GeoJournal of Tourism and Geosites, 34(1), 126–131. DOI: 10.30892/gtg.34116-627.

Tarkowski, M., Puzdrakiewicz, K. (2021). Connectivity Benefits of Small Zero-Emission Autonomous Ferries in Urban Mobility—Case of Gdańsk. Sustainability, 13(23), 13183. DOI: 10.3390/su132313183.</td></tr>
<tr><td>Supplementary literature</td><td>A.Lerch. Architektura statków niepasażerskich. Inspiracje projektowe, ISBN 83-908796-4-6</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Conceptual architectural design for a small container ship intended for transport operations within the short sea shipping sector. An attempt to define the technical characteristics of a ship adapted for the transport
of INNO-type containers (www.innofreight.com).

Urban pedestrian and cycle ferry: functional and usability study, conceptual design</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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