GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Methods of Safety Assessment in Transportation Systems, PG_00060649		
Field of study	Transport and Logistics		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
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	2	Language of instruction	Polish
Semester of study	4	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	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 inż. Roman Liberacki	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	15.0	0.0	0.0	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	51.0	100

Subject objectives

To acquaint students with hazards in transport and methods of reliability and risk assessment.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K03] understands non-technical aspects and effects of activity in the profession of an engineer and its impact on the environment; is aware of the responsibility for decisions made	The student understands that the existence of transport generates risks for people and the environment. The studenti is aware that the level of social and environmental safety depends on the decisions made by a transport engineer.	[SK5] Assessment of ability to solve problems that arise in practice
[K6_U01] can obtain information from literature, databases and other sources; verify and systematize the information obtained, interpret it and draw conclusions, formulate and justify opinions	The student is able to search for safety regulations and data necessary to assess reliability and safety of transportation systems.	[SU1] Assessment of task fulfilment
[K6_W06] has established knowledge of engineering methods and design tools enabling the implementation of projects in the field of construction and operation of transport means and systems	The student knows the methods used in designing of vehicles for the required level of reliability.	[SW1] Assessment of factual knowledge
[K6_U71] is able to apply knowledge from humanistic, social, economic or legal sciences in order to solve problems	The student is able to apply knowledge of law and economics in pursuit of safe and financially rational construction and operation of transport vehicles and systems.	[SU1] Assessment of task fulfilment

Subject contents

Course content – lecture
The qualification of reliability, reliability coefficients, mathematical models of valuations of the units and systems reliability. The human factor. Method of the valuation of the probability of the human mistakes. Typical hazards occurring in transport. The definition of risk, the measure of the risk, mathematical models of risk valuations. The criterion ALARP. The method FSA (Formal Safety Assessment) in navigation. Reliability in supply chains.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="2">Basic knowledge of the probability theory.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>Written exam</td><td>50.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Girtler J., Kuszmider S., Plewiński L.: Wybrane zagadnienia eksploatacji statków morskich w aspekcie bezpieczeństwa żeglugi. WSM, Szczecin 2003.
2. Gołąbek A.: Wybrane zagadnienia bezpieczeństwa maszyn. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2002.
3. Guidelines for Formal Safety Assessment (FSA) for Use in The Imo Rule-Making Process, International Maritime Organization 2002.
4. Radkowski S.: Podstawy bezpiecznej techniki. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2003.
5. Brandowski A., Metodyka formalnej oceny bezpieczeństwa statku (FSA), I-sza Międzynarodowa Szkoła Letnia Bezpieczeństwo na Morzu, Politechnika Gdańska, Gdańsk 2001.
6. Normy: OHSAS 18001:2007
7. ISM CODE
8. SPIS CODE</td></tr>
<tr><td>Supplementary literature</td><td>1. Modarres M., What every engineer should know about Reliability and Risk Analysis, Center for Reliability Engineering, University of Maryland, College Park, Maryland, Marcel Dekker, Inc., New York, Basel, Hong Kong, 1993.</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1. Describe the hazards in the water transport.
2. Explain the ALARP class risk criterion.
3. List the steps of the FSA method.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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