



## Subject card

Subject name and code	Safety and Reliability of Transport Systems, PG_00045263						
Field of study	Transport and Logistics, Transport and Logistics						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2022/2023		
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	6	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Faculty of Ocean Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Roman Liberacki					
	Teachers	dr inż. Roman Liberacki					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
	Bezpieczeństwo i niezawodność w systemach transportowych, W, C, sem.6, letni 22/23 (PG_00041690 i PG_00045263) - Moodle ID: 29551 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29551">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=29551</a>						
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	2.0		18.0		50
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_W05] has an organized knowledge on design, construction and operation of means and systems of transport	The student describes the basic definitions connected with the discipline: safety and reliability of transport systems. The student explains the models used to assess the reliability of components and systems.			[SW1] Assessment of factual knowledge		
	[K6_W06] has an organized knowledge on engineering methods and design tools allowing the conducting of projects within the construction and operation of means and systems of transport	The student knows the methods used in designing of vehicles for the required level of reliability.			[SW1] Assessment of factual knowledge		
	[K6_W07] has a general knowledge on humanities, social and economical sciences. Knows the rules of creating the forms of personal entrepreneurship and economic activity, has knowledge on the protection of intellectual property rights and industrial property rights and copyrights	The student knows the relationship between the level of reliability and economic effects of transport activities.			[SW1] Assessment of factual knowledge		
Subject contents	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.						
Prerequisites and co-requisites	Basic knowledge of the probability theory.						
Assessment methods and criteria	Subject passing criteria		Passing threshold		Percentage of the final grade		
	Written test		50.0%		100.0%		

Recommended reading	Basic literature	<ol style="list-style-type: none"> <li>1. Girtler J., Kuzmider S., Plewiński L.: Wybrane zagadnienia eksploatacji statków morskich w aspekcie bezpieczeństwa żeglugi. WSM, Szczecin 2003.</li> <li>2. Gołębek A.: Wybrane zagadnienia bezpieczeństwa maszyn. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2002.</li> <li>3. Guidelines for Formal Safety Assessment (FSA) for Use in The Imo Rule-Making Process, International Maritime Organization 2002.</li> <li>4. Radkowski S.: Podstawy bezpiecznej techniki. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2003.</li> <li>5. Brandowski A., Metodyka formalnej oceny bezpieczeństwa statku (FSA), I-sza Międzynarodowa Szkoła Letnia Bezpieczeństwo na Morzu, Politechnika Gdańska, Gdańsk 2001.</li> <li>6. Normy: OHSAS 18001:2007</li> <li>7. ISM CODE</li> <li>8. SPIS CODE</li> </ol>
	Supplementary literature	<ol style="list-style-type: none"> <li>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.</li> </ol>
	eResources addresses	
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Describe the hazards in the water transport.</li> <li>2. Explain the ALARP class risk criterion.</li> <li>3. List the steps of the FSA method.</li> </ol>	
Work placement	Not applicable	