



Subject card

Subject name and code	Risk and Reliability of Systems, PG_00062665						
Field of study	Naval Architecture and Offshore Structures						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2023/2024		
Education level	second-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	1	Language of instruction			English		
Semester of study	1	ECTS credits			6.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Zakład Siłowni Okrętowych -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Roman Liberacki				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	30.0	0.0	75
	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	75		15.0		60.0	150
Subject objectives	Introducing students to methods of reliability assessment and risk analysis of technical systems.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_K02] Is aware of their social role as a graduate of a technical institution, understanding the importance of adhering to professional ethics and respecting diverse perspectives	The student is aware of the responsibility he takes for the level of safety of the technical systems he design.			[SK5] Assessment of ability to solve problems that arise in practice		
	[K7_W05] Considers in advanced analyses the technical, environmental, economic, legal, and ethical aspects related to maritime activities, demonstrating an awareness of responsibility for decisions made and fostering the development of individual entrepreneurship	The student has knowledge in the field of methods for determining the reliability and safety level of ships and the other marine constructions.			[SW1] Assessment of factual knowledge		
	[K7_U05] Efficiently collaborates with team members both as a leader and a collaborator, achieving group goals through effective teamwork	The student is capable of carrying out a project task within a team of collaborators.			[SU1] Assessment of task fulfilment		
Subject contents	LECTURE AND EXERCISES: Concept of reliability, reliability indicators, mathematical models for assessing the reliability of elements and systems. Statistical hypothesis testing. Maintainability and availability of technical systems. Human factors. Methods for assessing the probability of human errors. Concept of risk, risk measures, mathematical models for risk assessment. ALARP criterion. Formal Safety Assessment (FSA) method in shipping. Safety management. PROJECT: Risk analysis of a selected technical object.						
Prerequisites and co-requisites	Basic knowledge of the construction and operation of machines and devices.						
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"> 1. Girtler J., Kuzmider S., Plewiński L.: Wybrane zagadnienia eksploatacji statków morskich w aspekcie bezpieczeństwa żeglugi. WSM, Szczecin 2003. 2. Gołębek 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
	Supplementary literature	<ol style="list-style-type: none"> 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.
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Define reliability from a probabilistic perspective. 2. Explain the ALARP risk criterion and its significance. 3. List the stages of the FSA method. 4. Conduct a risk analysis of a selected technical object. 	
Work placement	Not applicable	