GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Risk analysis of technical systems, PG_00057290		
Field of study	Ocean Engineering		
Date of commencement of studies	February 2023	Academic year of realisation of subject	2022/2023
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	Part-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	1	ECTS credits	4.0
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	dr inż. Roman Liberacki	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	18.0	9.0	0.0	0.0	0.0	27

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	27	10.0	63.0	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
[K7_W03] has a widened knowledge in the range of reliability and safety of ocean technology objects and systems and environmental protection in ocean technology	The student has knowledge of the methods of determining the reliability and safety level of marine facilities and ships.	[SW1] Assessment of factual knowledge
[K7_K04] can properly define the priorities for the realization of a specified objective or task, can correctly identify and solve dilemmas associated with the job	The student is able to analyze the most important hazards related to the technical object.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U02] can plan and conduct research experiments on selected problems in ocean technology using various research methods	The student creates models to assess the reliability of components and systems.	[SU1] Assessment of task fulfilment

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. Norms and standards OHSAS 18001, ISM and ISPS Code and the ISM Code and SPIS as the tools of safety management in shipping.

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	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
	Supplementary literature	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: Analiza ryzyka systemów technicznych, studia niestacjonarne, W, C, sem.1, letni 22/23 (PG_00057290) - Moodle ID: 28936 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=28936
Example issues/ example questions/ tasks being completed	1. Describe the hazards in the water transport. 2. Explain the ALARP class risk criterion. 3. List the steps of the FSA method.	
Work placement	Not applicable	