



Subject card

Subject name and code	Risk Analysis and Decision Making, PG_00060642						
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	3	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Ship Design - None (Existed Previously) -> 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	prof. dr hab. inż. Jakub Montewka					
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	30.0	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	Familiarizing students with the theoretical and practical aspects of the decision-making process under conditions of uncertainty using information obtained as a result of the risk analysis; Providing students with the basics of creating probabilistic causal models as a tool to support the decision-making process.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W07] has general knowledge in the field of humanities, social and economic sciences. Knows the principles of creating forms of individual entrepreneurship and running a business, and knows how to protect industrial and intellectual property and copyright law		The student has basic knowledge of the ownership structure of sea ports and transshipment terminals.		[SW1] Assessment of factual knowledge		
	[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 a wide range of aspects related to the profession and its impact on the environment.		[SK5] Assessment of ability to solve problems that arise in practice		
	[K6_W08] has knowledge of the principles of sustainable development		The student is aware of the need to develop in a sustainable manner, taking into account a number of aspects related to a given system and the environment in which this system operates.		[SW2] Assessment of knowledge contained in presentation		
	[K6_U03] is able to use computer methods to support the design, development and operation of transport means and systems		The student is able to use a selected mathematical modeling tool related to risk analysis and supporting the risk-based decision-making process.		[SU4] Assessment of ability to use methods and tools		

Subject contents	Course content – lecture 1. Risk, definition of the concept, measures used 2. Probability, uncertainty, belief, bias 3. Risk assessment process in transport systems 4. Theories of decision making 5. Bayesian networks, influence diagrams 6. Methodological framework, mathematical models of risk in transport systems 7. Assessment of sensitivity, uncertainty, value of information		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lecture pass	51.0%	50.0%
	Assignment pass	51.0%	50.0%
Recommended reading	Basic literature	1. Fenton, N., & Neil, M. (2018). Risk Assessment and Decision Analysis with Bayesian Networks (2nd ed.). Chapman and Hall/ CRC. https://doi.org/10.1201/b21982 2. Aven, T. (2011). Quantitative Risk Assessment: The Scientific Platform. Cambridge: Cambridge University Press. doi:10.1017/CBO9780511974120	
	Supplementary literature	1. Galavotti, M.C. The Interpretation of Probability: Still an Open Issue? <i>Philosophies</i> 2017, 2, 20. https://doi.org/10.3390/philosophies2030020 2. Aven T, The risk concept historical and recent development trends, <i>Reliability Engineering & System Safety</i> , Volume 99, 2012, Pages 33-44, https://doi.org/10.1016/j.ress.2011.11.006 . 3. http://c4tx.org/ctx/pub/fsa.pdf 4. Wróbel K., Montewka J., Kujala P., System-theoretic approach to safety of remotely-controlled merchant vessel, <i>Ocean Engineering</i> , Volume 152, 2018, Pages 334-345, https://doi.org/10.1016/j.oceaneng.2018.01.020 .	
	eResources addresses		
Example issues/ example questions/ tasks being completed	1. Project I - conducting a literature analysis for a selected set of scientific articles in order to determine the adopted definitions and risk measures. 2. Project II - creation of a probabilistic cause-and-effect risk model for a selected transport scenario and a selected adverse event, enabling risk analysis. 3. Project III - expansion of the model developed in Project II into an impact diagram, enabling the decision-making process and selection of the best solution from the point of view of costs and profits.		
Practical activities within the subject	Not applicable		

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