GDAŃSK UNIVERSITY OF TECHNOLOGY

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 2024	Academic year of realisation of subject	2025/2026
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	Zakład Projektowania Okrętu -> Institute of Ocean Engineering and Ship Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Jakub Montewka	
	Teachers		

Lesson types and methods of instruction

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 transhipment 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

<table>
<tr><td>Subject contents</td><td>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</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Lecture pass</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>Assignment pass</td><td>51.0%</td><td>50.0%</td></tr>
</table>
</td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>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</td></tr>
<tr><td>Supplementary literature</td><td>1. Galavotti, M.C. The Interpretation of Probability: Still an Open Issue? Philosophies 2017, 2, 20. https://doi.org/10.3390/ philosophies2030020
2. Aven T, The risk concepthistorical and recent development trends, Reliability Engineering & System Safety, 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, Ocean Engineering, Volume 152, 2018, Pages 334-345, https://doi.org/10.1016/ j.oceaneng.2018.01.020.</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>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.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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