



Subject card

Subject name and code	Fundamentals of Reliability and Safety , PG_00044623						
Field of study	Transport						
Date of commencement of studies	October 2021	Academic year of realisation of subject			2023/2024		
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	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Railway Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	dr Anita Milewska					
	Teachers	dr Anita Milewska mgr inż. Łukasz Jeliński dr inż. Joanna Wachnicka					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	15.0	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	5.0		50.0	100	
Subject objectives	The aim of the subject on safety in Transport is to provide the basics of various fields of transport: road, sea, inland waterway, rail and air. Basic knowledge about the state of safety in these areas on various geographic scales as well as about the institutions responsible for the supervision of the safe and efficient functioning of all transport modes.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U07] able to identify the effects of management, progress in technology, spatial policy, environmental protection, health and safety on the operation and development of transport and include these in the process of planning, designing, building and operating means and systems of transport	He can analyze the problem of transport safety in many aspects and plan actions to improve safety.	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools
	[K6_W15] has basic knowledge of ergonomics, safety and reliability in transport which is useful for solving simple tasks involved in transport	The student solves problems related to the analysis and assessment of the structural reliability of non-renewable technical facilities.	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge
	[K6_K02] understands the need to formulate and communicate to the public information and opinions on the achievements of environmental engineering and other aspects of work of a sanitary industry engineer; is aware of the importance of and understands non-technical aspects and consequences of engineering; takes steps to communicate such information and opinions in a comprehensible manner and present different points of view	The ability to visualize and comment on the observed phenomena.	[SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills [SK3] Assessment of ability to organize work
Subject contents	<p>Parameters and functional characteristics of the reliability of non-renewable systems. Structural reliability. Analysis of the impact of changing the characteristics of an element on the characteristics of the system.</p> <p>In the part on the basics of transport safety, they will learn about various fields of transport: road, sea, inland waterway, rail and air. He learns the basics of security management systems in individual branches, the state of this security, threats and methods of their elimination. During the design classes, he prepares a project to analyze the impact of individual factors on the level of safety.</p>		
Prerequisites and co-requisites	Basic knowledge of mathematical statistics, probability, transport systems.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Passing (in writing) of the lectures material on the basics of reliability	55.0%	34.0%
	The project related with the basics of reliability	100.0%	16.0%
	The project related with the basics of safety	100.0%	25.0%
	Passing (in writing) of the lectures material on the basics of safety	55.0%	25.0%

Recommended reading	Basic literature	<p>Bobrowski D., Modele i metody matematyczne teorii niezawodności. WNT</p> <p>Ważyńska-Fiok K., Jaźwiński J., Niezawodność systemów technicznych. PWN</p> <p>Czynnik ludzki w lotnictwie Makarowski R. Przegląd psychologiczny 2012</p> <p>Zintegrowany System Bezpieczeństwa Transportu. Tom I. Krystek R. i inni. WKŁ 2009</p> <p>Stan bezpieczeństwa na kolei w Polsce i Europie. Marek Sitarz, Marzena Graboń-Chałupczak TTS 2019</p> <p>Inżynieria Bezpieczeństwa W Transporcie Katarzyna Chruzik</p>
	Supplementary literature	<p>Jaźwiński J., Borgoń J., Niezawodność eksploatacyjna i niezawodność lotów. WKŁ</p> <p>https://www.rynek-kolejowy.pl/mobile/utk-podsumowuje-bezpieczenstwo-na-kolei-w-2018-r-90922.html</p> <p>https://www.utk.gov.pl/pl/bezpieczenstwo-systemy/14722,Bezpieczenstwo-i-nadzor.html</p> <p>https://www.drogigminneipowiatowe.pl/technologie/przejazdy-kolejowe-nowe-wymogi-dla-zaradcow-drog</p> <p>http://www.repozytorium.put.poznan.pl/Content/436003/Krzysztof_Marian_Szymaniec_Systemowe_zarzadzanie_ryzykiem_zagr</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	List the functional characteristics of the reliability of non-renewable elements. What is the system reliability structure? Assessing the reliability of the system based on the reliability of the elements. What factors affect the level of transport safety: road, sea, inland waterway, rail and air?	
Work placement	Not applicable	