



Subject card

Subject name and code	Ergonomics and security management, PG_00064729						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2025		Academic year of realisation of subject			2025/2026	
Education level	second-cycle studies		Subject group			Specialty subject group 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			Polish	
Semester of study	2		ECTS credits			3.0	
Learning profile	general academic profile		Assessment form			assessment	
Conducting unit	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	15.0	15.0	0.0	0.0	0.0	30
	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	30		9.0		36.0	75
Subject objectives	The aim of the classes is to deepen knowledge about the latest trends in the development of ergonomics, risk assessment methods, as well as to present economic and non-economic aspects of work safety.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W12] identifies and interprets the main developmental trends and significant new achievements in the field of engineering and technical sciences and disciplines relevant to the course of study		A student understands the importance of occupational health and safety in industrial production. He/She can identify the key principles and the latest trends in this area.		[SW1] Assessment of factual knowledge		
	[K7_U03] identifies and formulates the specification of tasks in the field of designing stationary and part-time production and technological systems/processes, including tasks taking into account non-technical aspects of business activity		A student identifies and solves problems in the design of technological systems, taking into account the safety of their operation and maintenance.		[SU1] Assessment of task fulfilment		
	[K7_W04] demonstrates knowledge covering selected issues in the field of advanced detailed knowledge, in particular in the field of methods, techniques, tools and algorithms used in production management and control processes as well as in the design of technological processes		A student lists qualitative and quantitative methods of risk assessment. He/She can apply these methods in the process of management and production control.		[SW1] Assessment of factual knowledge		
	[K7_K13] is ready for responsible performance of professional roles, considering ever-changing need of the society, including self development and supporting and fulfilling work ethics		A student understands the responsibility associated with the engineering profession. He/She strive to minimize risk in solving practical problems."		[SK5] Assessment of ability to solve problems that arise in practice		

Subject contents	<p>Characteristics of ergonomics, The latest directions in the development of ergonomics (humanization of work, ergonomics and work quality, ergonomics in the design of modern workplaces, economic aspects of ergonomics, aesthetic and impression aspects in ergonomics). Ergonomics and occupational safety in the light of European Union directives. Work safety, work safety culture, work safety management, work safety climate. Enterprise financial management (enterprise financial risk, financial risk assessment, elements of the statistical theory of risky decision-making - expected value of profit/loss. Harmful factors in selected work environments, accidents, compensation and insurance. Information security and visual management.</p> <p>Introduction to the Safety of Technical/Production Systems. Risk as a Measure of System Safety, Risk Criterion Based on the ALARP Principle. Reliability, Maintainability, and Availability of Technical/Production Systems. Qualitative Risk Assessment Methods (HR, What if, HAZOP, FMEA, others). Quantitative Risk Assessment Methods (FTA, ETA). Methods for Assessing the Probability of Human-Operator Error. Functional Safety in Industry. Leading and Lagging Safety Performance Indicators (SPIs).</p>		
Prerequisites and co-requisites	Mathematics, Economic analysis, Fundamentals of economics and management.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Written tests	50.0%	50.0%
	Written tests	50.0%	50.0%
Recommended reading	<p>Basic literature</p> <p>J. Ejdys, U. Kobylińska, A. Lulewicz-Sas, Zintegrowane systemy zarządzania jakością, środowiskiem i bezpieczeństwem pracy, Oficyna Wydawnicza Politechniki Białostockiej, Białystok 2012.</p> <p>P. Lubaś Piotr, Diagnoza ergonomicznych czynników ryzyka. Szczecin: Państwowa Inspekcja Pracy 2010.</p> <p>W. Ł. Nowacka, Ergonomia i ergonomiczne projektowanie stanowisk pracy. Warszawa: Politechnika Warszawska 2010.</p> <p>W. Ł. Nowacka, Zagrożenia człowieka w środowisku pracy. Zagrożenia chemiczne biologiczne i pyłowe. Warszawa: Politechnika Warszawska 2011.</p> <p>W. Oleszak, 2012. Kultura bezpieczeństwa w środowisku pracy. Edukacja Humanistyczna 1(26): 181189.</p> <p>Zarządzanie ryzykiem. Przegląd wybranych metod, pod red. D. Wróblewskiego, Wydawnictwo CNBOP-PIB, Józefów 2015.</p> <p>Gołębek A.: Wybrane zagadnienia bezpieczeństwa maszyn. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2002.</p> <p>Radkowski S.: Podstawy bezpiecznej techniki. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2003.</p> <p>Modarres M., What every engineer should know about Reliability and Risk Analysis, University of Maryland, College Park, Maryland, Marcel Dekker, Inc., New York, Basel, Hong Kong, 1993.</p> <p>Massimo Lazzaroni, Loredana Cristaldi, Lorenzo Peretto, Paola Rinaldi, and Marcantonio Catelani.: Reliability Engineering. Basic Concepts and Applications in ICT. 2011 Springer-Verlag Berlin Heidelberg.</p> <p>A. D. Swain, H. E. Guttman: Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant Applications. Final Report. 1983.</p>		

	Supplementary literature	<p>L. Koziół, A. Wojtowicz. 2016. Wybrane praktyki zarządcze a dobrostan pracownicy. Zeszyty Naukowe Politechniki Poznańskiej. Organizacja i Zarządzanie 71: 165177.</p> <p>K. Polek-Duraj, 2017. Jakość pracy determinantą jakości życia jednostki (studium przypadku). Studia Ekonomiczne. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach 309: 133142.</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<p>Part 1: Humanization of work, ergonomics and work quality, ergonomics in the design of modern workplaces, economic aspects of ergonomics, aesthetic and impression aspects in ergonomics, risky decision-making, prospect theory, financial risk of an enterprise, financial risk assessment, elements of the statistical theory of risky decision-making - expected value of profit/loss.</p> <p>Part 2: 1. Explain the risk criterion based on the ALARP principle. 2. List the stages of assessing the security of a technical system. 3. Conduct a qualitative or quantitative safety analysis of the production system.</p>	
Work placement	Not applicable	

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