



Subject card

Subject name and code	Ergonomics and security management, PG_00059504						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional 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 Anna Dembicka					
	Teachers	dr Anna Dembicka dr inż. Roman Liberacki					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	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		6.0		24.0	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_U06] can - when formulating and solving engineering tasks - see their systemic aspects and social conditions, environmental, economic, legal and others	The student notices socio-economic and legal aspects in the course of formulating and solving engineering tasks.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment
	[K7_W05] has the knowledge necessary to understand social, economic, legal and other non-technical conditions of activity engineering, including copyright.	The student has acquired knowledge in the field of social, economic and legal sciences, including copyright law.	[SW3] Assessment of knowledge contained in written work and projects
	[K7_W01] knows and understands to a greater extent selected issues in the field of management and quality sciences and mechanical engineering, their location in the field of social sciences and engineering and technical sciences, as well as relationships with related disciplines, and sees the possibility of applying the knowledge in practice	The student has the ability to combine issues in the field of management science and mechanical engineering with the area of social sciences and engineering and technical sciences.	[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation
	[K7_U05] is able - in accordance with a given specification, taking into account non-technical aspects - to design a complex device, object, system or process related to the studied engineering discipline, and to implement this project - at least in part - using appropriate methods, techniques and tools, if necessary, adapting to it the purpose of existing or developing new tools	The student has acquired the knowledge and appropriate skills needed to implement engineering projects, using the appropriate methods, techniques and tools.	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
[K7_K04] is aware of the social role of the university graduate, and especially understands the need to formulate and communicate to society - incl. through the mass media - information and opinions on technological achievements and other aspects of an engineer's activity; makes efforts to provide such information and opinions in a generally comprehensible manner, justifying different points of view	The student is able to provide information and opinions on the achievements of technology and other aspects of the engineer's activity in a generally understandable way, taking into account various points of view.	[SK3] Assessment of ability to organize work [SK1] Assessment of group work skills [SK4] Assessment of communication skills, including language correctness	
Subject contents	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. Pass - half of the course Introduction to the security of technical/production systems. Risk as a measure of system security, risk criterion based on the ALARP principle. Reliability, serviceability, readiness for operation 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. Safety level indicators (SPIs) leading and resulting. Assessment - second half of classes		
Prerequisites and co-requisites	Economic analysis, Fundamentals of economics and management		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	lecture	60.0%	50.0%
	exercises	60.0%	50.0%

Recommended reading	Basic literature	<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>Gołąbek 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. Guttmann: Handbook of Human Reliability Analysis with Emphasis on Nuclear Power Plant Applications. Final Report. 1983.</p>
	Supplementary literature	<p>L. Kozioł, 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	<p>Adresy na platformie eNauczanie:</p> <p>Ergonomia i zarządzanie bezpieczeństwem (PG_00059504), W/Ć, Specjalność: zarządzanie systemami produkcyjnymi, sem. zimowy 2023/24 - Moodle ID: 32739 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32739</p> <p>Ergonomia i zarządzanie bezpieczeństwem (PG_00059504), W/Ć, Specjalność: zarządzanie systemami produkcyjnymi, sem. zimowy 2023/24 - Moodle ID: 32739 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=32739</p>
Example issues/ example questions/ tasks being completed	<p>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>Sample questions: 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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