COURSE SPECIFICATION

Course code	full-time programme:	**M#2-S1-ME-308B**
	part-time programme:	
Course title in Polish	**Bezpieczeństwo maszyn**	
Course title in English	**Machine Safety**	
Valid from (academic year)	**2024/2025**	

GENERAL INFORMATION

Programme of study	**MECHANICAL ENGINEERING**
Level of qualification	**first-cycle**
Type of education	**academic**
Mode of study	**full-time programme**
Specialism	**all**
Department responsible	**Department of Automation and Robotics**
Course leader	**dr hab. inż. Paweł Andrzej Łaski, prof. PŚk**
Approved by	**dr hab. Jakub Takosoglu, prof. PŚk, Dean of the Faculty of Mechatronics and Mechanical Engineering**

COURSE OVERVIEW

Course type		**programme-specific**
Course status		**elective**
Language of instruction		**English**
Semester of delivery	full-time programme	**Semester III**
	part-time programme	
Pre-requisites		
Examination required (YES/NO)		**NO**
ECTS value		**2**

Mode of instruction		**lecture**	**class**	**laboratory**	**project**	**seminar**
No. of hours per semester	full-time programme	**15**			**15**	
	part-time programme					

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	The student has advanced and structured knowledge of concepts and procedures in the field of national and European standardization related to machine safety, primarily focusing on the Machinery Directive. The student understands the importance of standards related to quality management and data security. The student knows the principles of operation of machines and devices.	MiBM1_W02 MiBM1_W05
	W02	The student has advanced knowledge of methods enabling the design of devices and machine components, taking into account the specifics of manufacturing technologies for basic machine elements and devices, their operation, principles of functioning, evaluation of operational properties and wear, diagnostics of technical condition, repair technologies, and safe usage in compliance with the Machinery Directive.	MiBM1_W06 MiBM1_W11
	W03	The student has advanced knowledge of the impact of the broadly defined electro-machinery industry and transportation on the natural environment. The student understands the principles of sustainable design, maintaining safety and accessibility criteria in accordance with current requirements, particularly related to securing local transportation, considering production lines, robots, and manipulators.	MiBM1_W18
Skills	U01	The student is able to use the acquired knowledge to operate various types of machines and equipment. They are able to analyze and interpret the obtained information in the field of key technologies, formulate and justify opinions, enriching them with their own solutions.	MiBM1_U03
	U02	The student is able to use basic forms of communication in mechanics in the field of machine construction and operation. They can present and evaluate different opinions and draw conclusions.	MiBM1_U07 MiBM1_U12
Competence	K01	The student is ready to critically evaluate their knowledge, is aware of the need to continuously update their specialized knowledge throughout life, and is able to select appropriate sources of knowledge and learning methods for themselves and others.	MiBM1_K01 MiBM1_K02
	K02	The student is aware of the responsibility associated with the decisions made within the framework of engineering and managerial activities.	MiBM1_K05

COURSE CONTENT

Type of instruction lecture	Topics covered

lecture	Introducing to the European concept of shaping safety and the formal and technical requirements based on the Machinery Directive. Presenting the basic requirements for developing user manuals for machines and industrial installations, as well as the issues related to determining the reliability of control systems responsible for the safety of machines or processes. Explaining to students the process of risk assessment for machines and the technical protective measures used.
project	The student is prepared to create technical documentation for a machine or device being placed on the market within the European Union. The student begins by conducting a risk assessment of the selected machine or device, identifying potential hazards and determining the risk level based on qualitative and quantitative methods. The student then selects appropriate protective solutions aimed at minimizing the identified risks. Next, the student prepares the necessary technical documentation for the machine, ensuring compliance with the requirements outlined in the Machinery Directive. The student creates documents such as user manuals or commissioning instructions, as well as other technical reports required by the directive, ensuring that all safety measures are properly included. The final project consists of a brief description of the machine, the risk assessment, the applied safety solutions, and the complete technical documentation for the selected machine or system.

ASSESSMENT METHODS

Outcome code	Methods of assessment *(Mark with an X where applicable)*					
	Oral examination	Written examination	Test	Project	Report	Other
W01			x			
W02			x			
W03			x			
U01				x		
U02				x		
K01						x
K02						x

ASSESSMENT TYPE AND CRITERIA

Mode of instruction	Assessment type	Assessment criteria
lecture	non-examination assessment	Successful completion of the final test. Obtaining at least 50% of the points.
project	non-examination assessment	The project is evaluated based on the quality of the conducted risk analysis, the proposed solutions for minimizing the risk, and the accuracy of the prepared documentation.

OVERALL STUDENT WORKLOAD

ECTS weighting												
No.	Activity type	Student workload										Unit
		full-time programme					part-time programme					
1.	Scheduled contact hours	L	C	Lb	P	S	L	C	Lb	P	S	h

		15			15							
2.	Other contact hours (office hours, examination)	2			2							h
3.	**Total number of contact hours**	**34**										h
4.	**Number of ECTS credits for contact hours**	**1,4**										ECTS
5.	**Number of independent study hours**	**16**										h
6.	**Number of ECTS credits for independent study hours**	**0,6**										ECTS
7.	**Number of practical hours**	**25**										h
8.	**Number of ECTS credits for practical hours**	**1,0**										ECTS
9.	**Total study time**	**50**										h
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**2**										ECTS

READING LIST

1. Siemiątkowski Ł., P.: Maszyny : zasadnicze wymagania dotyczące bezpieczeństwa i ochrony zdrowia. Wydawnictwo Wiedza i Praktyka, Warszawa 2018
2. Dyrektywa Maszynowa 2006/42/WE
3. Dyrektywa Narzędziowa WED 2009/104/WE
4. Bezpieczeństwo maszyn – części systemów sterowania związane z bezpieczeństwem. PN-EN ISO 13849-1/-2.
5. Dyrektywa Maszynowa 98/37/WE
6. Kowalewski S.: Bezpieczeństwo maszyn - Wybrane obszary wymagań i odpowiedzialności. Elokon, Warszawa 2012
7. Przewodnik Bezpieczne Maszyny - Bezpieczna maszyna w sześciu Krokach. SICK Sensor intelligence.
8. Bezpieczeństwo maszyn - wprowadzenie. SIEMENS. 2017
9. Bryła R. Bezpieczne stanowisko pracy. Elamed, Katowice 2007.
10. Romanowska-Słomka I., Słomka A.: Zarządzanie ryzykiem zawodowym. Kraków-Tarnobrzeg,
11. 2008.
12. Przewodnik dyrektywy maszynowej 2006/42/WE. Komisja Europejska Przedsiębiorstwa i Przemysł, 2010.
13. Przewodnik po technice bezpieczeństwa. FESTO.
14. Przewodnik bezpieczeństwa maszyn. OMRON.
15. Bezpieczeństwo w systemach sterowania. ABB.
16. Systemy bezpieczenstwa. SCHMERSAL.
17. Bezpieczenstwo maszyn. SCHNEIDER.
18. Bezpieczne maszyny, SICK.
19. Bezpieczeństwo maszyn. SIEMENS.
20. Elementy bezpieczeństwa. METAL WORK.