COURSE DESCRIPTION CARD - SYLLABUS

Course name
Fundamentals of safety engineering [N1MiBP1>PIB]

Course

Field of study
Mechanical and Automotive Engineering

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
9

Laboratory classes
0

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

The student starting this course has knowledge of the construction, manufacture, operation of means of transport and the use of basic probabistic and statistical models in the field of reliability of technical facilities and systems. The student has the ability to obtain information from the indicated sources. Is aware of the need to apply restrictions resulting from the need to ensure acceptable levels of safety In specific areas of human activity.

Course objective

Learning the methods and acquiring skills in the field of safety management in selected areas of analysis related to technical systems, in particular in the domains of construction, production and operation of means of transport.

Course-related learning outcomes

Knowledge:
Is aware of the latest trends in machine construction, i.e. automation and mechatronization, automation of machine design and construction processes, increased safety and comfort of operation, the use of modern construction materials.

Has elementary knowledge of the impact of technology changes on the organization of social life as well as the health and psyche of individuals in human-machine contact.
Has elementary knowledge of law, in particular security, copyright and security law industrial property and its influence on the development of technology.

Skills:
Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.
Can apply basic technical standards regarding unification and safety and recycling.
Can develop a safety instruction for a simple and medium complex machine.

Social competences:
Is ready to critically assess his knowledge and received content.
Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on his own.
Is ready to fulfill social obligations and co-organize activities for the benefit of the social environment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows: The knowledge acquired during the lecture is verified on the basis of one 45-minute test taking place AT the last lecture. The test consists of 10-12 questions (test and open-ended), with different scores.

Programme content

Demand for safety analysis. The concept of a safety management system (SMS). Risk management as an element of SMS. Risk management levels and types of risk. Hazard sources, hazards, adverse events, incidents, dangerous events, risk, identification of hazard sources and characterization of hazards, activation of hazards, levels of possibilities and levels of effects of activation of hazards. Risk models, generalized risk model, risk models in known risk assessment methods, risk estimation. Risk evaluation / valuation, risk categories / classes. Risk management - elements of safety systems, safety systems, models of safety systems. Risk monitoring and risk communication. Examples of applying procedures for risk management methods in the areas of analysis related to technical systems, in particular in the domains of construction, production and operation of means of transport.

Teaching methods

Lecture with the use of multimedia presentations.

Bibliography

Basic
1. Chruzik K., Inżynieria bezpieczeństwa w transporcie. Wyd. Politech. Śląskiej, Gliwice, 2016.
2. Gill A., Warstwowe modele systemów bezpieczeństwa do zastosowań w transporcie szynowym. Wyd. Politechniki Poznańskiej, Poznań 2018.
3. Kadziński A., Zarządzanie ryzykiem zagrożeń na stanowiskach pracy. Rozdział 3 w: praca zbiorowa red. L. Lewicki, J. Sadłowska-Wrzesińska, Istotne aspekty BHP. Wydawnictwo Wyższej Szkoły Logistyki, Poznań 2014, s. 149÷195.
4. Szymanek A., Teoria i metodologia zarządzania ryzykiem w ruchu drogowym. Wyd. Politechniki Radomskiej, Radom 2012.
5. Zintegrowany system bezpieczeństwa transportu. III tom Koncepcja zintegrowanego systemu bezpieczeństwa transportu w Polsce. Praca zbiorowa – red. R. Krystek, Politechnika Gdańska, WKŁ, Warszawa 2010.
Additional
1. Daliga M., Przegląd międzynarodowych standardów i metodyk zarządzania ryzykiem w przedsiębiorstwie. Inprogress 2011, http://www.4pm.pl/upload/artykuly/InLab.pdf
2. Gucma L., Wytyczne do zarządzania ryzykiem morskim. Wyd. Naukowe Akademii Morskiej, Szczecin2009.
3. Jamroz K., Metoda zarządzania ryzykiem w inżynierii drogowej. Wyd. Politechniki Gdańskiej, Gdańsk 2011.

4. Markowski A. S., Zarządzanie ryzykiem w przemyśle chemicznym i procesowym. Wydawnictwo Politechniki Łódzkiej, Łódź, 2001.
5. Kosieradzka A., Zawiła-Niedźwiecki J., Zaawansowana metodyka oceny ryzyka w publicznym zarządzaniu kryzysowym. Wydawnictwo edu–Libri, Kraków-Legionowo 2016.
6.Zarządzanie ryzykiem korporacyjnym – zintegrowana struktura ramowa. Tom I. COSO II – The Committeeof Sponsoring Organizations of the Treadway Commission. Wyd. polskie Polski Instytut Kontroli Wewnętrznej, Warszawa 2004.

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	9	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	16	0,50