SYLLABUS

Name: Technical engineering safety
Name in Polish:
Name in English:

Information on course:

Course offered by department:	Faculty of Organisation and Management
Course for department:	Silesian University of Technology
Study level and form:	Master's degree, Full-time
Term:	winter semester 3 (SCP), 2024/2025
Coordinator of course edition:	.....

Default type of course examination report:

pass

Language:

English

Course homepage:

https://platforma.polsl.pl/roz/

ECTS

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Short description:

Course objectives: Familiarizing students with the basic concepts and essence of technical safety engineering. Presentation of topics including the functioning of a technical facility, its reliability and the circumstances of threats requiring monitoring. Acquiring the ability to select and construct simple security systems, understanding the principles of their operation and the principles of operation of their basic elements (sensors).

Description:

Forms of conducting classes, along with the number of teaching hours:

Detailed program content:
Lecture: 15 h
1. The essence of safety engineering - basic concepts and connections with other disciplines.
2. The concept of technical safety engineering.
3. Functioning of a technical facility in the operation process.
4. Methodology for constructing a damage tree for a technical facility.
5. Reliability of a technical object - basic concepts.
6. Construction of basic security systems.
7. The use of sensors in security systems.
8. Application of security systems in industrial plants - examples.
Exercises: 15 h
1. Sensors used in gas safety.
2. Analysis of the construction and functioning of the gas safety system on the example of the mining industry.
3. Analysis of the structure and functioning of the gas safety system in the chemical industry.
4. Analysis of safety systems in machine traffic.
5. Construction of work zone protection systems.
6. Examples of safety systems in road transport.
Project: 15 h
1. Phases of designing security systems.
2. Analysis of threats and weak points of the facility
3. Creating a project concept.
4. Creating a security system configuration.
5. Selection of system sensor devices.
6. Selection and implementation of a simple security system design - group consultations.

Forms of conducting classes, along with the number of teaching hours:
Lecture: 15 hours
Exercises: 15 hours

Project: 15 hours

Number of hours devoted to student's own work:
- preparation of the exercise task: 15/0.5
- project development: 15/0.5
- preparation for passing the lecture: 15/0.5

Number of teaching number of ECTS points in classes with direct participation of academic teachers or other people conducting classes: 45/1,5

Bibliography:

1. J. Ignac-Nowicka, „Inżynieria bezpieczeństwa. Wybrane zagadnienia", Wyd. Pol. Śl. Gliwice 2018.
2. K. Chruzik, „Inżynieria bezpieczeństwa w transporcie", Wyd. Pol. Śl. Gliwice 2016.
3. A. Wójcik, „Mechaniczne i elektroniczne systemy zabezpieczeń. Literatura fachowa dla firm i instytucji", Wyd. Verlag Dashofer, Warszawa 2004.
4. J. Ignac-Nowicka, „Rozwój techniki sensorowej jako inteligentna specjalizacja w inżynierii bezpieczeństwa", w: Systemy Wspomagania w Inżynierii Produkcji. Metody i narzędzia inżynierii produkcji dla rozwoju inteligentnych specjalizacji, vol. 4, 2016. (dostępne online)
5. J. Ignac-Nowicka, „Zastosowanie sensorów w inżynierii bezpieczeństwa dla rozwoju inteligentnej specjalizacji", w: Górska M., Staniewska E., (red.): Bezpieczeństwo jako determinanta doskonalenia systemu zarządzania organizacjami. Wyd. Wydziału Inżynierii Produkcji i Technologii Materiałów Politechniki Częstochowskiej, Częstochowa 2016.
6. Trade magazines, bimonthly entitled: „Security" – available on websites

Learning outcomes:

K2A_W02 the student knows and understands the main development trends of the mechanical engineering discipline in connection with other disciplines related to safety engineering
K2A_W09 the student knows and understands typical engineering technologies in the field of study: management and production engineering and, at an extended and in-depth level, selected issues in the field of material technologies used for sensors in safety engineering
K2A_U12 the student is able to communicate on specialized topics with diverse audiences, as well as conduct a debate, appropriately present and justify various opinions and positions in the field of technical safety engineering
K2A_U14 the student is able to manage the work of a team, cooperate with other people as part of team work and take a leading role in teams during practical classes in the subject
K2A_K02 the student is ready to recognize the importance of knowledge in solving cognitive and practical problems and to seek the opinion of experts in case of difficulties in independently solving a problem in the field of technical safety engineering

Assessment methods and assessment criteria:

Passing a colloquium on lecture content, passing a written exercise, completing a written project.
The final grade is 50% of the lecture grade, 25% of the course grade and 25% of the project grade.

Practical placement: