



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Engineering of technical safety

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### Course

Field of study

Safety Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

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### Number of hours

Lecture

10

Laboratory classes

0

Other (e.g. online)

Tutorials

12

Projects/seminars

14

### Number of credit points

4

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### Lecturers

Responsible for the course/lecturer:

Ph.D., D.Sc., Eng. Małgorzata Sławińska,  
University Professor

Responsible for the course/lecturer:

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### Prerequisites

Student has an ordered, theoretically supported, general knowledge which covers the key issues within



the scope of the studied discipline. The student has the ability to independently propose solutions to a particular problem and carry out procedures in order to take up decisions in this regard.

### Course objective

Understanding the theoretical and practical issues relating to the assessment and development of the safety level, which should be provided by the technical means used in the process of implementing technological operations. Acquiring skills necessary for conducting an analysis which aims at finding reasons for safety unreliability, as well as skills for designing the safety control system mechanisms .

### Course-related learning outcomes

#### Knowledge

- knows the issues concerning technical safety, security solutions, health and safety at work, the dangers and its effects, [P6S\_WG\_02]
- knows the issues concerning dangers and its effects, risk assessments in work environment, accidents and occupational illnesses, [P6S\_WG\_03]
- knows the issues of product life-cycle range, devices , objects and technical systems, [P6S\_WG\_06]
- knows the issues concerning management and organization as well as marketing and logistic in context of safety ingeneetring, [P6S\_WG\_08]
- knows trends in the development and best practises concerning safety ingeneering, [P6S\_WK\_03]

#### Skills

- is able to appropriately select source and information derived from them, makes evaluation of critical analysis and information synthesis, [P6S\_UW\_01]
- is able to use analytical, simulation and experimental methods to form and solve engineering tasks, also with use of methods and information and communication devices, [P6S\_UW\_04]
- is able to analyse manner of functioning and evaluate - in the context of Safety Engineering - existing technical solutions, in particular machines, devices, objects, systems, processes and services, [P6S\_UW\_06]
- is able to present by means properly select measures problem within safety engineering frame), [P6S\_UK\_01]
- is able to identify modification of requirements, standards, regulations, technical development, reality of label market and base on this basis address the needs of complementing the knowledge, [P6S\_UU\_01]

#### Social competences

- is able to recognize correlations and cause-and-effect dependencies during realization of implementation the objective and rank significance alternative or competitive tasks, [P6S\_KK\_01]



- is aware of the importance of knowledge in solving problems related to safely engineering and continuous improvement, [P6S\_KK\_02]
- is aware of the understanding of non-technical aspects and results of engineering activities including environmental impact and associated with it decisions-making, [P6S\_KK\_03]
- is aware of responsibility for its own work and readiness for compliance with the rules of team work as well as being responsible for achieved goals, [P6S\_KR\_02]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:  
evaluation:

- classes embedded: evaluation of the reports from completed classes and evaluation of self-study task
- project courses: evaluation of progress in project task realization ( compliance with agreed schedule of project task realization schedule) and activity during classes

summative evaluation:

- classes: the average marks from report preparation
- in terms of project courses: project appraisal with taking into account assesses the progress in realization of project task and activity during project realization
- lectures: written examination in a form of test where at least one answer is right (scores 0 or 1) or written answer for open questions ( scores 0 to 3); the student received a credit after reached more than 51% of points available

### Programme content

The essence of the technical and civil safety engineering. Models of safety systems. The cause of the damage. Mechanisms of damage formation caused by technical objects. Estimating the chance occurrence of probability of events. Evaluation of technical measures that are used for implementation of selected technologies, applied in order to assess the level of safety in operation work and the work of technical service. Assessment of the solutions in a work organisation and their impact on technical safety. Technical means to ensure the technical safety of people with disabilities (locomotive, visual, hearing related, , intellectual). Economic and social aspects of technical safety. Expenditure incurred for technical safety and the cost of damage caused by accidents and failures. The role of safety engineering in the progress and development of technology. Managing operations within the scope of the technical safety.

### Teaching methods

- lecture classes: conversational lectures
- exercise classes: expert tables method interchangeably with cases method



- project: multileg cognitive task

## Bibliography

### Basic

1. Polskie normy z zakresu bezpieczeństwa pracy, ergonomii i systemów zarządzania bezpieczeństwem pracy ( SZBP)
2. Wybrane problemy bezpieczeństwa pracy, ergonomii I ochrony środowiska, Jerzy S. Marcinkowski ( red.), Wyd. Pressmedial, Lubin, 2011
3. Niezawodność człowieka w interakcji z procesem przemysłowym, Sławińska M., WPP, Poznań 2012
4. Polskie normy z zakresu bezpieczeństwa pracy, ergonomii i systemów zarządzania bezpieczeństwem pracy ( SZBP)
5. Wybrane problemy bezpieczeństwa pracy, ergonomii I ochrony środowiska, Jerzy S. Marcinkowski ( red.), Wyd. Pressmedial, Lubin, 2011
6. Niezawodność człowieka w interakcji z procesem przemysłowym, Sławińska M., WPP, Poznań 2012

### Additional

1. Elementy eksploatacji obiektów technicznych, Niziński S., Wyd. Uniwersytetu Warmińsko-Mazurskiego, Olsztyn, 2000
2. The Elements of Technical Support for Integrated Safety Management in The Industry 4.0 / Marcin Berlik (WIZ), Małgorzata Sławińska (WIZ) // W: Proceedings of the 36th International Business Information Management Association Conference (IBIMA), 4-5 November 2020, Granada, Spain. Sustainable Economic Development and Advancing Education Excellence in the era of Global Pandemic / red. Khalid S. Soliman: International Business Information Management Association, IBIMA, 2020 - s. 11965-11973
3. The method of ergonomic design of technological devices / Małgorzata Sławińska (WIZ) // W: Advances in manufacturing, production management and process control : Proceedings of the AHFE 2019 International Conference on Human Aspects of Advanced Manufacturing and the AHFE International Conference on Advanced Production Management and Process Control, July 24-28, Washington D.C., USA / red. Waldemar Karwowski, Stefan Trzcieleński (WIZ), Beata Mrugalska (WIZ) - Cham, Switzerland : Springer, 2020 - s. 330-346
4. Ergonomic engineering of technological devices / Małgorzata Sławińska (WIZ) / Wydawnictwo Politechniki Poznańskiej, 2019



### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	36	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	64	2,5

<sup>1</sup> delete or add other activities as appropriate