



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Technical risk analysis

### Course

Field of study

Safety Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

15

Tutorials

30

Laboratory classes

Projects/seminars

Other (e.g. online)

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

dr hab. inż. Małgorzata Jasiulewicz-Kaczmarek

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Responsible for the course/lecturer:

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### Prerequisites

A student starting this subject should have basic knowledge of probability theory and basic techniques. He should also be able to obtain information from sources indicated by the teacher

### Course objective

Acquiring by the student the knowledge (systematics and methodology) needed to identify threats and analyze the risks associated with them using quantitative and qualitative methods

### Course-related learning outcomes

#### Knowledge

P6S\_WG\_02: has detailed knowledge of the types of risk; knows the issues of technical safety, security systems, health and safety as well as threats and their effects

P6S\_WG\_02: knows the issues of identifying hazards and assessing their effects, knows the methods for estimating the risk associated with the hazards in the product implementation processes in relation to people and the environment

#### Skills

P6S\_UW\_03: identifies connections between system elements, taking into account organizational, technical and economic relations

P6S\_UW\_05 can determine the supervision measures in relation to the identified threats, justifies the need for them

#### Social competences

P6S\_KK\_01: understands that knowledge and skills in identifying threats and analyzing the risk of their occurrence requires a systematic review, and not only the nature of threats but also the sequences of burns associated with them change, recognizes cause-and-effect relationships and is able to rank and prioritize them.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:

- a) exercises: assessment of current progress of task implementation
- b) lectures: answers to questions about the content of previous lectures,

Summative rating:

- a) exercises: presentation of reports on exercises performed (arithmetic average of partial grades);
- b) lectures: Tests consist of 20-30 questions (test), scored on a two-point scale of 0, 1. Passing threshold: 50% of points. Assessment issues on the basis of which questions are prepared are based on the content provided to students during lectures, and additional materials indicated by the teacher.



## Programme content

### Lecture:

Risk concepts, adverse events, initiating events, critical events. Division of threats. Potential and real threats. Occupational risk, process risk, environmental risk. Risk estimation. Risk determination using matrix, indicator and graphic methods. Determination of security losses. Multidimensional risk analysis. Determining risk acceptability based on probabilistic methods

### Exercises:

Risks in the product life cycle - risk allocation to individual stages of the cycle

Product implementation processes - identification of hazards, emergency events, accident scenario, risk estimation

## Teaching methods

1. Lecture: multimedia presentation, illustrated with examples on the board.
2. Exercises: multimedia presentation illustrated with examples given on a blackboard and performance of tasks given by the teacher - practical exercises.

## Bibliography

### Basic

Thlon M., Charakterystyka i klasyfikacja ryzyka w działalności gospodarczej. Zesz. Nauk. UEK, 2013; 902: 17–36

MATUSZEK J, BYRSKA-BIENIAS K., OCENA I REDUKCJA RYZYKA TECHNICZNEGO MASZYN 2016  
[http://www.ptzp.org.pl/files/konferencje/kzz/artyk\\_pdf\\_2016/T2/t2\\_0423.pdf](http://www.ptzp.org.pl/files/konferencje/kzz/artyk_pdf_2016/T2/t2_0423.pdf)

Biedugnis S., Smolarkiewicz M., Podwójci P., Czapczuk A. Mapy ryzyka funkcjonowania rozległych systemów technicznych 2007 [https://ros.edu.pl/images/roczniki/archive/pp\\_2007\\_022.pdf](https://ros.edu.pl/images/roczniki/archive/pp_2007_022.pdf)

Jasiulewicz-Kaczmarek M. 2015, Practical aspects of the application of RCM to select optimal maintenance policy of the production line, In: Nowakowski, T; Mlynczak, M; Jodejko-Pietruczuk, A; et al. Safety and Reliability: Methodology and Applications - Proceedings of the European Safety and Reliability Conference, ESREL 2014 Location: Wrocław, POLAND Date: SEP 14-18, 2014 Taylor & Francis Group, London, 2015, pp. 1187-1195, ISBN 978-1-138-02681-0

Pamuła W., Niezawodność i bezpieczeństwo. Wybór zagadnień. Wydawnictwo Pol.Śl. Gliwice 2011.

### Additional

Pietrzak L., Modelowanie wypadków przy pracy. BEZPIECZEŃSTWO PRACY 4/2002

PN-EN 61882 HAZOP, Badania zagrożeń i zdolności do działania



### Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	55	2

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