COURSE DESCRIPTION CARD - SYLLABUS

Course name
Risk analysis [N1IBez2>AR]

Course

Field of study
Safety Engineering

Year/Semester
1/2

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
10

Laboratory classes
18

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

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:
1. The student has advanced knowledge of the risks and their effects, risk assessment in the work environment as well as occupational accidents and diseases [K1_W03]
2. The student knows at an advanced level issues in the field of mathematics and statistics in the field of solving practical engineering problems [K1_W04]
3. The student has advanced knowledge of quality engineering in relation to products and processes [K1_W07]

Skills:
1. The student is able to properly select the sources and information derived from them, making the assessment, critical analysis and synthesis of this information [K1_U01].
2. The student is able to see system and non-technical aspects in engineering tasks, as well as socio-technical, organizational and economic aspects [K1_U03].
3. The student is able to make a critical analysis of the way of functioning and evaluate, in connection with Safety Engineering, the existing technical solutions, in particular machines, devices, objects, systems, processes and services [K1_U06].

Social competences:
1. The student is able to see the cause-and-effect relationships in the implementation of the set goals and use the ranks in relation to the significance of alternative or competitive tasks [K1_K01].
2. The student is aware of the non-technical aspects and effects of engineering activities, including its impact on the environment and the related responsibility [K1_K03]
3. The student is able to initiate activities related to the formulation and transfer of information and cooperation in the society in the field of security engineering [K1_K05].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:
a) laboratory classes: assessment of current progress of task implementation
b) lectures: answers to questions about the content of previous lectures,
Summative rating:
a) laboratory classes: 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.

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
laboratory classes:
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. laboratory classes: 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
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
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: Wroclaw, 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 zdolnosci do działania

Breakdown of average student's workload

	Hours	ECTS
Total workload	80	4,00
Classes requiring direct contact with the teacher	28	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	52	2,00