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

part-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

10

Laboratory classes

Other (e.g. online)

Tutorials

14

Projects/seminars

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

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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

1. Student 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]

2. Student 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 [P6S_WG_02]

Skills

1. Student identifies connections between system elements, taking into account organizational, technical and economic relations [P6S_UW_03]

2. Student can determine the supervision measures in relation to the identified threats, justifies the need for them [P6S_UW_05]

Social competences

1. Student 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 [P6S_KK_01]

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: pass a test questions, scored on a two-point scale of 0, 1. Passing threshold: 50% of the 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

Tutorials: 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

Lecture: multimedia presentation illustrated with examples given on the board.

Tutorials: multimedia presentation illustrated with examples given on the blackboard and carrying out the tasks given by the teacher - practical exercises.

Bibliography

Basic

Gleirscher M. (2013) Hazard Analysis for Technical Systems. In: Winkler D., Biffl S., Bergsmann J. (eds) Software Quality. Increasing Value in Software and Systems Development. SWQD 2013. Lecture Notes in Business Information Processing, vol 133. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-35702-2_8 https://link.springer.com/chapter/10.1007/978-3-642-35702-2_8#citeas

Risk acceptance criteria for complex technical systems, 2019
https://iopscience.iop.org/article/10.1088/1757-899X/687/6/066007/pdf

OVERVIEW OF INDUSTRIAL RISK ASSESSMENT
https://web.iitd.ac.in/~arunku/files/CEL899_Y13/Industrial%20Risk%20Management_Overview.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

Additional

EN 61882:2016 Hazard and operability studies (HAZOP studies). Application guide

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	24	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	76	3,0

[1] delete or add other activities as appropriate