COURSE DESCRIPTION CARD - SYLLABUS

Course name
IT systems in safety engineering [S2IBiJ1>SIwIB]

Course

Field of study
Safety and Quality Engineering

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
30

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

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Prerequisites

The student has the ability to use a computer and has knowledge of the basic functions implemented in safety engineering.

Course objective

The goal of the course is to learn about the basic information systems that support safety management functions and safety system design.

Course-related learning outcomes

Knowledge:
1. Students will be knowledgeable in the field of ergonomics, occupational safety and crisis management [K2_W03].
2. The student has an increased knowledge in the field of risk analysis, risk management and risks and their consequences in the working environment [K2_W05].

3. Students will be knowledgeable in the methods, techniques, tools and materials used in solving simple engineering tasks and conducting experiments in the area of security with the application of information technology, information protection, computer-aided design, artificial intelligence and cyber security [K2_W11].

Skills:
1. Students will be able to select relevant sources and information from them, evaluate, critically analyse and synthesise this information, formulate conclusions and substantiate opinions on the structures and scope of safety engineering [K2_U01].
2. Students will be able to use research, analytical, simulation and experimental methods to formulate and solve engineering tasks, also by using information and communication methods and tools [K2_U04].
4. Students will be capable of critically analysing how existing technical solutions, in particular machines, equipment, facilities, systems, processes and services, work and evaluate them in relation to safety engineering [K2_U06].
5. Students are able to plan and perform experiments, including measurements and computer simulations, interpret the results obtained and draw conclusions [K2_U08].

Social competences:
1. Student is aware of perceiving cause-and-effect relationships in the achievement of stated objectives and of ranking the relevance of alternative or competing tasks in emergency and occupational safety management [K2_K01].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:
(a) for laboratory classes: on the basis of two written colloquia and reports;
(b) for lectures: on the basis of a colloquium in the last lecture class.
Summative assessment:
a) as regards laboratory classes: on the basis of the arithmetic mean of the marks from two written colloquia, where 5 tasks must be solved on each of them; these tasks are scored on a scale from 0 to 1; a positive mark is obtained by the Student after solving 51% of the tasks; the condition for passing is a positive mark of the completion of reports from all laboratory exercises.
b) in respect of lecture classes: a mark of a credit colloquium on a scale from 2 to 5.
Grading scale in accordance with part C of the Regulations of First and Second Degree Studies adopted by the Academic Senate of the Poznań University of Technology.

Programme content

Characteristics of information systems. Supporting basic management functions in occupational safety and emergency management. IT support systems for: safety management, safety diagnosis, safety design of work processes and products, safety training, hazard modelling, crisis management.

Teaching methods

Lecture supported by a multimedia presentation. The lecture is conducted using distance learning techniques in a synchronous mode. Acceptable platforms: eMeeting, Zoom, Microsoft Teams.
During laboratory classes, students solve individually prepared problem tasks requiring working with a computer and specialised computer software. During part of the classes they carry out tasks using computer applications.

Bibliography

Basic:
1. Dahlke G., Zarządzanie bezpieczeństwem pracy i higieną pracy. Modele systemowego zarządzania bhp, Wyd. Politechniki Poznańskiej, Poznań 2013, s. 175, ISBN 978-83-7775-248-7
2. Dahlke G., Modelowanie symulacyjne w ergonomii i bezpieczeństwie pracy, w: Zeszyty Naukowe Politechniki Poznańskiej, Seria: Organizacja i Zarządzanie, nr 63, Wydawnictwo Politechniki Poznańskiej, Poznań 2014, ISSN 0239-9415
3. Dahlke G. (2022). Modele formalne pożarów i wybuchów w przygotowaniu infrastruktury krytycznej na sytuacje awaryjne, w: Nauka dla obronności. Bezpieczeństwo infrastruktury krytycznej. Tom 1; red.

Michał Ciałkowski, Tomasz Łodygowski, Andrzej Żyluk, Wydawnictwo Instytutu Technicznego Wojsk Lotniczych, Warszawa, 2022, s. 133-151

Additional:
1. Ładysz, J. (2015). Technologia GIS w inżynierii bezpieczeństwa. Wydawnictwo Wyższej Szkoły Oficerskiej Wojsk Lądowych im. generała Tadeusza Kościuszki, Wrocław.
2. Bajor, T., & Krakowiak, M. (2016). Wykorzystanie systemów informatycznych w zarządzaniu kryzysowym. Gospodarka Materiałowa i Logistyka, (11), 1-10.
3. Dahlke G., (2020), The Anthropometric Criterion in Modeling of Evacuation, [in:] Business Informatics, Publishing House of Wroclaw University of Economics, 1 (55), pp. 21-37, DOI: 10.15611/ie.2020.1.02, ISSN 1507-3858
4. Dahlke G., Idczak K. (2021), Modelowanie warunków ewakuacji w organizowaniu przygotowania na sytuacje awaryjne na przykładzie domu pomocy społecznej, [w:] Bezpieczeństwo osób starszych w przestrzeni miejskiej. Analiza doświadczeń, wnioski i rekomendacje z uwzględnieniem okresu pandemii SARS-CoV-2 / red. Mikołaj Tomaszyk: FNCE, 2021 - s. 481-504
5. Dahlke G., Olszewski J., Olszewski M. (2016), Model humanoidalny w analizie obciążeń statycznych operatorów wózków widłowych. Studium przypadku, Zeszyty Naukowe Politechniki Poznańskiej seria Organizacja i Zarządzanie, Nr 70, ISSN 0239-9415

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00