COURSE DESCRIPTION CARD - SYLLABUS

Course name
Standardization and certification of product safety [S2IBiJ1-JiEwBP>NiCBW]

Course

Field of study
Safety and Quality Engineering

Year/Semester
1/2

Area of study (specialization)
Quality and Ergonomics in Work Safety

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
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

2,00

Coordinators

dr hab. inż. Marcin Butlewski prof. PP
marcin.butlewski@put.poznan.pl

Lecturers

Prerequisites

General knowledge of design in particular related to product safety

Course objective

To familiarize students with the principles of standardization and certification for product safety

Course-related learning outcomes

Knowledge:
1. Student has structured and theoretically supported knowledge and knows facts and phenomena characteristic for management and quality sciences, mechanical engineering and safety engineering in the field of product safety [K2_W01].
2. Student has in-depth knowledge of methods and theories used in solving problems of contemporary safety engineering, concerning quality, ergonomics and product safety [K2_W03].
3. Student knows in depth the concepts and principles of industrial property protection and copyright law related to product safety [K2_W13].

Skills:

1. Student can appropriately select sources, including literature and information from them, and evaluate, critically analyse, synthesise and creatively interpret this information, formulate conclusions and fully justify an opinion during a presentation of results in the field of product safety [K2_U01].
2. Student be able to implement the assumptions of project management, including planning activities, scheduling, defining objectives and specific tasks, criteria of their achievement and building project teams, identifying resources and defining control methodology at various stages of the project life cycle in the field of product safety [K2_U09].

Social competences:
1. Student is critical of his/her knowledge, is ready to consult experts when solving cognitive and practical problems related to safety management in organisations in the field of product safety [K2_K01].
2. Student correctly identifies and resolves dilemmas related to safety in a broad sense, understands the need to make the public aware of the need to shape safety in various areas of functioning of organisations in the field of product safety [K2_K02].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative evaluation:
(a) in terms of exercises: ongoing testing of knowledge and skills during exercises
b) in terms of lectures: on the basis of discussion of the material learned in previous lectures;
Summative evaluation:
(a) in terms of exercises: on the basis of the results of the average of the partial marks of the formative assessment
b) in terms of lectures: knowledge test;
A student receives a credit after obtaining at least 51% of the required points. Detailed procedure is described in the Regulations of studies.

Programme content

Product safety - general requirements. Product safety requirements. The concept of a dangerous product. Responsibility for the product. Categories of incidents caused by misuse; Methods of assessing product safety. Systems of certification of products. Safety marks CE certification of products in the EU. Tasks and powers of entities and institutions in the field of product safety. Product certification - institutions and systems and procedures of proceeding. Certification of machines: ISO 12100, EN ISO13849-1 Performance Levels EN., Control system for machine reliability. Qualitative safety index, Determination of the index based on the qualitative risk assessment graph PN-EN 954-1, ISO/FDIS 13849.

Course topics

- Product safety - general requirements
- Product safety requirements
- The concept of a dangerous product
- Product liability
- Categories of incidents caused by improper use
- Methods for assessing product safety
- Product certification systems
- Safety marks
- CE certification of products in the EU
- Tasks and responsibilities of bodies and institutions with regard to product safety
- Product certification - Institutions, schemes and procedures
- Certification of machines: ISO 12100, EN ISO 13849-1 Performance Levels EN
- Control system for the safe operation of the machine
- Qualitative safety indicator
- Determination of the index on the basis of a qualitative risk assessment graph EN 954-1, ISO/FDIS 13849
- Product safety legislation and regulations
- The role of audits in product safety
- Case studies related to unsafe products

- Strategies to minimise product risks
- Processes for implementing and monitoring safety standards
- Product safety education and training
- Impact of technology to improve product safety
- International cooperation on safety standards
- Examples of best practice in product safety
- Quality control mechanisms in the context of safety
- Importance of technical documentation in the certification process
- Challenges and future developments in the area of product safety

Teaching methods

Lectures with multimedia presentation; task exercises on topics related to lectures and project;
The lecture is conducted using distance learning techniques in a synchronous mode.
Acceptable platforms: eMeeting, Zoom, Microsoft Teams.

Bibliography

Basic:
PN-EN ISO 12100: 2011 Bezpieczeństwo maszyn - Ogólne zasady projektowania - Ocena ryzyka i zmniejszanie ryzyka
PN-ISO 1219-1:1994 Napędy i sterowania hydrauliczne i pneumatyczne - Symbole graficzne i schematy układów - Symbole graficzne
PN-ISO 1219-2:1998 Napędy i sterowania hydrauliczne i pneumatyczne - Symbole graficzne i schematy układów - Schematy układów
PN-EN ISO 4413:2011 Napędy i sterowania hydrauliczne - Ogólne zasady i wymagania bezpieczeństwa dotyczące układów i ich elementów
PN-EN ISO 13849-1:2008 Bezpieczeństwo maszyn - Elementy systemów sterowania związane z bezpieczeństwem - Część 1: Ogólne zasady projektowania
PN-EN ISO 13849-2:2008 Bezpieczeństwo maszyn - Elementy systemów sterowania związane z bezpieczeństwem - Część 2: Walidacja
Butlewski M., Projektowanie ergonomiczne wobec dynamiki deficytu zasobów ludzkich, Politechnika Poznańska 2018, ISBN: 978-83-7775-506-8; 255 stron

Additional:
Dyrektywa 2006/42/WE z dnia 17 maja 2006 r. w sprawie maszyn
Dyrektywa 2009/104/WE z dnia 16 września 2009 r. dotycząca minimalnych wymagań w dziedzinie bezpieczeństwa i higieny użytkowania sprzętu roboczego przez pracowników podczas pracy (druga dyrektywa szczegółowa w rozumieniu art. 16 ust. 1 dyrektywy 89/391/EWG)
Butlewski, M., & Sławińska, M. (2014, January). Ergonomic method for the implementation of occupational safety systems. In Occupational Safety and Hygiene II-Selected Extended and Revised Contributions from the International Symposium Occupational Safety and Hygiene, SHO (pp. 621-626).
Lis, T., Nowacki, K. & Łakomy, K. Improvement of the Ergonomic Quality of the Work Process. Multidisciplinary Aspects of Production Engineering, 2018. 1. 703-710. 10.2478/mape-2018-0089.
Lis, T., Nowacki, K. & Łakomy, K. Improvement of the Ergonomic Quality of the Work Process. Multidisciplinary Aspects of Production Engineering, 2018. 1. 703-710. 10.2478/mape-2018-0089.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00