COURSE DESCRIPTION CARD - SYLLABUS

Course name
Human reliability [S1IBez2>NC]

Course

Field of study
Safety Engineering

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

Number of credit points

2,00

Coordinators

dr hab. inż. Małgorzata Sławińska prof. PP
malgorzata.slawinska@put.poznan.pl

Lecturers

Prerequisites

The student should have basic knowledge in the field of occupational health and safety, ergonomics and psychology. The student should know the general principles of operation of technical facilities and modern management concepts. He can recognize cause-and-effect relationships occurring in the area of broadly understood safety. The student should be able to assess the degree of compliance of the workplace organization with the applicable requirements in the field of ergonomics, occupational health and safety and environmental protection regulations.

Course objective

Provide students with knowledge of theoretical premises and practical solutions that, when applied, will contribute to the rational shaping of optimal working conditions. Motivating to acquire knowledge and skills in the field of improving work organization, preventing occupational diseases and accidents at work. To lay the foundations for the development of the ability to apply the concept of distributed cognition in the design and application of technologies related to the work process.

Course-related learning outcomes

Knowledge:

1. The student knows in depth the issues of technical safety, safety systems, occupational health and safety as well as threats and their effects [K1_W01]
2. 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]
3. The student has advanced knowledge of ergonomics, human ecology and environmental protection [K1_W05]
4. The student knows the fundamental dilemmas of modern civilization and development trends as well as the best practices in the field of security engineering [K1_W10]
5. The student has anadvanced knowledge of the concepts and principles of copyright protection, information security and intellectual property protection in a market economy [K1_W12]

Skills:
1. The student is able to apply standards and norms in solving practical engineering tasks in the field of Safety Engineering [K1_U08]
2. The student is able to take part in the debate, to present the problem within the framework of safety engineering using properly selected means [K1_U09]
3. The student is able to identify changes in the requirements, standards, regulations and technical progress and the reality of the labor market, and on their basis define the need for supplementing knowledge [K1_U12]

Social competences:
1. The student is aware of the importance of knowledge in solving problems in the field of safety engineering and continuous improvement [K1_K02]
2. The student is aware of the understanding of non-technical aspects and effects of engineering activities, including its impact on the environment and the related responsibility for decisions made [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 area of security engineering [K1_K05]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:
- lecture: evaluation of activity and presentation of the effects of a problem lecture, presentation of premises in relation to the problem in question,
- exercises: evaluation of reports from performed exercises and evaluation of tasks to be performed by oneself.
Summative assessment:
- exercises: average of the marks for the prepared reports,
- lecture: written test in which at least one answer is correct (the answer is scored in the range of 0 to 10) or written answers to open questions (answers are scored on a scale from 0 to 100); a student receives a credit after reaching at least 51% of the possible points.

Programme content

- lecture: Basic concepts and measures used in the area of security issues. Reliability in terms of systems. Fundamentals of reliability modeling. Reliability structure of the facility. System analysis. Psychological human abilities as the basis for predicting errors. Creating measures of human reliability. The role of man in ensuring the reliability of technical and social systems. System readiness measures. The essence of designing the information environment. Improving the operator's work system. Active operator strategy.
- exercises: Relationships of risk measures with measures of reliability and hazard. Modeling of phenomena leading to disabilities. Characteristics of difficult situations. Practical application of knowledge about human reliability. Conditions for the correct course of information processes. Application of the theoretical approach of cognitive psychology. The use of elements of cognitive ergonomics in the design of human interaction with an industrial process. Implementation of system adaptation mechanisms.

Teaching methods

- lecture: problem lecture with elements of gathering premises and the stage of solving the problem,
- exercises: the round table method interchangeably with the panel method.

Bibliography

Basic:
1. Sławińska M., (2012), Niezawodność człowieka w interakcji z procesem przemysłowym, Wydawnictwo Politechniki Poznańskiej, Poznań.
2. Sadłowska-Wrzesińska J., Lewicki L., (2018), Podstawy bezpieczeństwa i zdrowia w pracy, Wydawnictwo WSL, Poznań.
3. Dahlke G. (2013), Zarządzanie bezpieczeństwem pracy i higieną pracy, Wydawnictwo Politechniki Poznańskiej, Poznań.
4. Tadeusz Szopa, (2016), Niezawodność i bezpieczeństwo, Oficyna Wydawnicza Politechniki Poznańskiej, Warszawa.
5. Sikorski M., (2010), Interakcja człowiek-komputer, Wydawnictwo PJWSTK, Warszawa.
6. Górska E., (2021). Ergonomia, projektowanie, diagnoza, eksperymenty. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa.
7. PN-ISO 45001:2018-06, Systemy zarządzania bezpieczeństwem i higieną pracy. Wymagania i wytyczne stosowania, PKN, Warszawa.

Additional:
1. Górny A., Sławińska M., Sobczak W. (2016), Ocena kompetencji jako narzędzie zapewnienia bezpieczeństwa w przedsiębiorstwie budowalnym, Finanse, Rynki Finansowe, Ubezpieczenia, nr 5 (83/2), s. 109-119.
2. Kępka P. (2015), Projektowanie systemów bezpieczeństwa, BEL Studio, Warszawa, ISBN: 978-83-7798-
232-7.
3. Sławińska M., Wróbel K., (2021). Indicative Method of Human Failure in Sustainable Chain of Custody Management. European Research Studies Journal Volume XXIV Special Issue 5, p. 709-725.
4. Pieniążek J., (2014). Kształtowanie współpracy człowieka z lotniczymi systemami sterowania. Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów, s. 179-236.
5. . PKN-ISO Guide 73:2012, Zarządzanie ryzykiem. Terminologia, PKN, Warszawa.
6. Tomaszewski T., Tomaszewski K., (2006). Przepisy i normy w projektowaniu ergonomicznym. [W:] Ergonomia produktu. Ergonomiczne zasady projektowania produktów, Jabłoński J., (red). Wydawnictwo Politechniki Poznańskiej, Poznań.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	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)	30	1,00