COURSE DESCRIPTION CARD - SYLLABUS

Course name
Safety of social engineering systems [S2IBiJ1-JiEwBP>BUS]

Course

Field of study
Safety and Quality Engineering

Year/Semester
2/3

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
elective

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
15

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

The student has basic knowledge of ergonomics and management. Can properly analyze the causes and course of ergonomic phenomena and interpret the results of these observations.

Course objective

Acquiring knowledge and skills in the practical application of technical issues, the possibilities of social sciences and planning, as well as effective creation of social changes in the areas of work safety, quality and ergonomics.

Course-related learning outcomes

Knowledge:
1. Student knows in depth the methods and theories used in solving the problems of modern safety engineering, ergonomics and occupational safety [K2_W03].
2. Student knows in-depth the principles and rules of management, in particular project management, characteristic of safety engineering and ergonomics [K2_W06].
3. Student knows in depth the design methodology that takes into account the principles of safety and ergonomics [K2_W09].

Skills:
1. Student is able to develop and properly apply methods and tools for solving complex problems characteristic of the area of safety engineering, ergonomics and work safety, or select and apply existing and known analytical methods and tools in their area [K2_U03].
2.Student is able to identify changes in requirements, standards, regulations, innovations and technical progress as well as economic reality and to use them properly in solving problems in the field of safety engineering, ergonomics and occupational safety [K2_U06].
3. Student is able to cooperate with other people as part of teamwork on solving a problem characteristic of the area of safety engineering, ergonomics and occupational safety, as well as take a managerial role in these teams [K2_U13].

Social competences:
1. Student correctly identifies and resolves dilemmas related to broadly understood security, understands the need to raise public awareness of the need to shape security [K2_K02].
2. Student is ready to initiate actions and solutions related to improving safety [K2_K03].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:
- lectures: discussion on current lecture problems,
- classes: evaluation of reports on completed exercises and assessment of tasks to be completed independently,
- project classes: assessment of progress in the implementation of the project task (compliance with the adopted schedule of project implementation) and activities during the classes.
Summative assessment:
- lectures: colloquium on definitions and concepts in the last lecture class, closed test 10 questions, pass mark: 51%,
- tutorial classes: average of the grades for prepared reports, pass mark 51%,
- project classes: evaluation of the completed of the project, taking into account the assessment of progress in the implementation of the project task and activity in classes during the implementation of the project task, the pass threshold of 51%.
Grading scale:
0 - 50 insufficient
51 - 59 sufficient
60 - 69 sufficient plus
70 - 79 good
80 - 89 good plus
90 - 100 very good.

Programme content

Problems of designing socio-technical systems. Security of complex socio-technical systems.

Course topics

Lectures: Paradigm of development in the field of human factor in technology. Evaluation and decomposition of sociotechnical criteria. Formal synthesis of ratings. Criteria problem in designing sociotechnical systems (complexity of relations in systems). Basic methodological assumptions of non-traditional design information. Diagnostics of systems (Model, Concept, Problem of diagnostic conditions, Problem list). Social engineering of the first and second degree. Classes: ergonomic diagnostics of a selected socio-technical means (man - technical means - environment). Ergonomic diagnostics of the selected facility in the following phases: formulating assumptions and requirements;
project development; manufacturing; operation and disposal.
Projects: Recognition and analysis of the
class of the current ergonomic state (dangerous, harmful, onerous, normal) and indication of the factors causing the occurrence of a class other than the normal state in selected social engineering systems.

Teaching methods

Lecture classes: information lecture, problem lecture, seminar with the use of a multimedia presentation.
The lecture is conducted using distance learning techniques in a synchronous mode.
Acceptable platforms: eMeeting, Zoom, Microsoft Teams.
Classes: the method of expert tables interchangeably with the method of cases. Project: multi-stage cognitive task.

Bibliography

Basic:
1. Pacholski L., Jasiak A., (2011), Makroergonomia, Wyd. Politechniki Poznańskiej, Poznań.
2. Jasiak A., Misztal A., (2004), Makroergonomia i projektowanie makroergonomiczne. Materiały pomocnicze., Wyd. Politechniki Poznańskiej, Poznań.
3. Jasiak, A. (2020). The fourth face of macroergonomics. Zeszyty Naukowe Politechniki Poznańskiej seria Organizacja i Zarządzanie, 71, 137-150.
4. Vargas, A. R., Maldonado-Macías, A. A., & García-Alcaraz, J. L. (2017). Macroergonomics for Manufacturing Systems: An Evaluation Approach. Springer.
5. Jabłoński J. (red.), Ergonomia produktu. Ergonomiczne zasady projektowania produktów, Wyd. Politechniki Poznańskiej, Poznań, 2006.
6. Butlewski M., Projektowanie i ocena wyrobów. - Poznań: Wydaw. Politechniki Poznańskiej , 2013. - 106 s.

Additional:
1. Sławińska M., (2019), Ergonomic engineering of technological devices, Wyd. Politechniki Poznańskiej, Poznań.
2. Jasiak A., Makroergonomia w projektowaniu systemów pracy i jakości życia., (2015), Wyd. Politechniki Poznańskiej, Poznań.
3. Dewicka-Olszewska A., Application and role of ergonomic innovations in small and medium-sized enterprises, Procedia Manufacturing - 2021, vol. 55, s. 521-526.
4. Butlewski, M., Jasiulewicz-Kaczmarek, M., Misztal, A., Sławińska, M., Design methods of reducing human error in practice, (2015) Safety and Reliability: Methodology and Applications - Proceedings of the European Safety and Reliability Conference, ESREL 2014, pp. 1101-1106.
5. Norman, D. (2013). The design of everyday things: Revised and expanded edition. Basic Books (AZ).6. Norman, D. A. (2004). Emotional design: Why we love (or hate) everyday things. Basic Civitas Books.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
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)	30	1,00