COURSE DESCRIPTION CARD - SYLLABUS

Course name
System engineering [N1IBez2>IS]

Course

Field of study
Safety Engineering

Year/Semester
3/5

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
polish

Form of study
part-time

Requirements
elective

Number of hours

Lecture
0

Laboratory classes
16

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

A student starting this course should have a basic knowledge of the basics of management and information technology in security engineering. He/she should also have the ability to acquire information from indicated sources and have the readiness to cooperate within a team.

Course objective

The aim of the course is to provide knowledge of systems theory and engineering in the context of security engineering problems. As a result of the course realization, the student will acquire knowledge and skills in description, principles of operation, design, modeling, analysis, evaluation and improvement of sociotechnical systems.

Course-related learning outcomes

Knowledge:
The student knows in depth the issues of engineering safety, safety systems, H&S and threats and their consequences [K1_W02].
The student knows in an advanced degree the issues of mathematics and statistics in solving practical engineering problems [K1_W04].

The student knows to an advanced degree the methods, techniques, tools and materials used in preparing for scientific research and solving simple engineering tasks using information technology, information protection and computer support [K1_W11].
The student knows rules of creating and developing forms of individual entrepreneurship and problems resulting from enterprises activity in market environment [K1_W13].

Skills:
Students are able to select properly sources and information from them, evaluate, critically analyse and synthesize such information [K1_U01].
The student is able to perceive in the engineering tasks the system and non-technical aspects, as well as social-technical, organizational and economical [K1_U03].
The student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks, also by using methods and tools of information and communication [K1_U04].

Social competences:
The student is able to notice cause-effect correlations in realization of set objectives and apply ranks in relation to significance of alternative or competitive tasks [K1_K01].
The student is aware of understanding non-technical aspects and effects of engineering activities, including its impact on the environment and associated responsibility for the decisions taken [K1_K03].
The student is aware of the professional behaviour, observing the rules of professional ethics and respecting the diversity of views and cultures [K1_K06].

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

1) Passing test colloquium: 50% of the points
2) Semester paper: 50% of the points
Threshold for passing: at least 50% of the points from the test and the term paper.

Programme content

General systems theory and its application in science and practical activities. Overview of the principles of the systems approach. System traps and opportunities. Fundamentals of systems modeling and principles of systems analysis and description using selected notations.

Teaching methods

Multimedia presentation illustrated with examples given on the blackboard and performing the tasks given by the instructor - practical exercises.

Bibliography

Basic:
Meadows D.H., Myślenie systemowe. Wprowadzenie, Wydawnictwo Helion 2020
Piotrowski M., Procesy biznesowe w praktyce, Wydawnictwo Helion 2016

Additional:
Dennis A., Wixom B.H., Roth M.R., Systems analysis and design, Wiley 2019
Cempel C., Teoria i inżynieria systemów – zasady i zastosowania myślenia systemowego, Wydawnictwo Naukowe Instytutu Technologii Eksploatacji, Radom 2008.
Piekarczyk, A., & Zimniewicz, K., Myślenie sieciowe w teorii i praktyce. Polskie Wydawnictwo Ekonomiczne 2010
Mierzwiak R., Nowak M., Modele decyzyjne w teorii systemów szarcyh. Wydawnictwo PTE Poznań 2020

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	16	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	44	1,50