



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Systems analysis

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### Course

Field of study

Safety Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/5

Profile of study

general academic

Course offered in

Polish

Requirements

elective

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### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

Tutorials

Projects/seminars

### Number of credit points

2

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### Lecturers

Responsible for the course/lecturer:

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Faculty of Engineering Management

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Responsible for the course/lecturer:

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### 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

General systems theory and its application to science and practical activities. Systems design and life cycle Review of the principles of the systems approach. Systems traps and opportunities. Stages of system analysis. Principles of systems modeling analysis in the context of a selected business process description notation. 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, the student will acquire knowledge and skills in the principles of systems approach with particular emphasis on the problems of systems analysis, and will be able to describe and model complex sociotechnical systems using a selected business notation

### 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 to science and practical activities. Systems design and life cycle Review of the principles of the systems approach. Systems traps and opportunities. Stages of system analysis. Principles of systems modeling analysis in the context of a selected business process description notation.

### Teaching methods

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

### Bibliography

Basic

Dennis A., Wixom B.H., Roth M.R., Systems analysis and design, Wiley 2019

Piotrowski M., Procesy biznesowe w praktyce, Wydawnictwo Helion 2016

Additional

Meadows D.H., Myślenie systemowe. Wprowadzenie, Wydawnictwo Helion 2020

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

Mierzwik R., Nowak M., Modele decyzyjne w teorii systemów szarych. Wydawnictwo PTE Poznań 2020



**Breakdown of average student's workload**

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for classes/tutorials, preparation for tests/exam, term paper preparation <sup>1</sup>	30	1,0

<sup>1</sup> delete or add other activities as appropriate