



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Resources of Industry 4.0

### Course

Field of study

Engineering management

Area of study (specialization)

Enterprise resources and process management

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

Polish

Requirements

compulsory

### Number of hours

Lecture

10

Laboratory classes

Tutorials

Projects/seminars

10

Other (e.g. online)

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

Ph.D., D.Sc., Eng. Joanna Kałkowska, University

Professor

Responsible for the course/lecturer:

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Faculty of Engineering Management

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### Prerequisites

Student has knowledge of the foundations of management and information technologies carried out at first cycle of studies. In addition, he is able to integrate and use already acquired knowledge in practice and is ready to work within team structures.

### Course objective

The aim of the course is to interest students in the issues of industry 4.0 and to provide students with knowledge of the various conditions concerning adjusting enterprises to the requirements of industry 4.0 with the particular emphasis on the used resources.

### Course-related learning outcomes

Knowledge



The student describes legal norms affecting resource management in the context of advanced automation and robotization characteristic of Industry 4.0 [P7S\_WG\_01].

The student explains information process modeling techniques related to the management of key technologies of Industry 4.0, including smart technologies and materials [P7S\_WG\_02].

The student explains how various scientific disciplines, such as connectivity, automation and autonomization, affect the management of technological resources in Industry 4.0, identifying and distinguishing key elements of these disciplines and their importance for effective resource management [P7S\_WG\_04].

The student characterizes organizational structures in Industry 4.0, with particular emphasis on the integration of process and internal resources [P7S\_WG\_06].

The student describes modern systems and technical devices of Industry 4.0 and their role in the creation of intelligent products [P7S\_WG\_10].

#### Skills

The student analyzes and evaluates the effectiveness of the application of advanced technologies in resource management, identifying opportunities for integration with the environment and product life cycle [P7S\_UW\_03].

The student independently formulates strategies for adapting organizational resources to the requirements of sharing economy in Industry 4.0 [P7S\_UW\_04].

The student conducts advanced analyses of the problems of adapting enterprise resources to the megatrends of Industry 4.0 [P7S\_UW\_07].

The student evaluates and proposes improvements to existing technical solutions, increasing their compliance with Industry 4.0 standards and requirements [P7S\_UW\_09].

#### Social competences

The student develops skills of interdisciplinary work on projects related to resource management in Industry 4.0, combining technical and organizational knowledge [P7S\_KK\_01].

The student identifies and prioritizes technological and organizational resources, in the context of strategy and leadership in Industry 4.0 [P7S\_KK\_02].

The student demonstrates skills in planning and managing enterprise resource optimization projects, focusing on the use of Industry 4.0 smart technologies. The student is able to identify key areas for optimization, design and implement innovative solutions, and evaluate their effectiveness in the context of business and technology strategy [P7S\_KO\_03].

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Knowledge acquired during the lecture is verified by a test carried out after the last lecture. The test consists of 20 closed questions. Assessment threshold: 50% of the points (satisfactory).



Knowledge acquired under the project is verified on the basis of solving individual tasks covered by the curriculum. The student receives points for each task. Assessment threshold: 50% of the points (satisfactory).

### Programme content

Lecture: The essence of industry 4.0. Challenges and megatrends related to the fourth industrial revolution (advanced automation and robotization, intelligent technologies and materials, sharing economy). Key technologies of industry 4.0. Industry 4.0 pillars and their resources - technological resources (connectivity, automation, autonomization, intelligent product), organizational resources (cooperation, strategy, employees, leadership), process resources (standardization, integration with the environment, product life cycle integration, internal integration). Problems of adjusting enterprise resources to the requirements of industry 4.0.

Project: project of adjusting enterprise resources to the requirements of industry 4.0

### Teaching methods

Monographic lecture in the form of a multimedia presentation, with elements of a seminar lecture.

Project: solving project tasks based on the case study method

### Bibliography

#### Basic

1. Kozłowski K., Zygmuntowski J. (red.), FutureInsights: Technologie 4.0 a przemiany społeczno-gospodarcze, Oficyna Wydawnicza SGH, Warszawa 2017
2. Sobieraj J., Rewolucja przemysłowa 4.0, Instytut Technologii Eksploatacji- PIB w Radomiu, Radom 2018
3. Mazurek G., Transformacja cyfrowa biznesu – perspektywa marketingu”, PWN, Warszawa 2019
4. Moczydłowska J. (2023). Przemysł 4.0 (?): ludzie i technologie, Difin 2. Kaczmarek W. i inni. (2023). Robotyzacja i automatyzacja: przemysł 4.0, Warszawa, PWN

#### Additional

1. Schwab K., The Fourth Industrial Revolution, World Economic Forum, Geneva 2016
2. Kamiński J. (2007): Negocjowanie: Techniki rozwiązywania konfliktów, POLTEXT, Warszawa.



### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	20	1,0
Student's own work (literature studies, preparation for project, preparation for tests) <sup>1</sup>	55	2,0

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