COURSE DESCRIPTION CARD - SYLLABUS

Course name
Management in industry 4.0 [S2TCh2>ZwP]

Course

Field of study
Chemical Technology

Year/Semester
1/2

Area of study (specialization)
Applied Electrochemistry

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

Knowledge of the basics of management, concerning the social, economic, legal and organizational conditions of running a business.

Course objective

The student will learn the essence of management and will become familiar with the importance of management for the creation and development of enterprises in the era of industry 4.0. The student will also learn the principles of operation and achievements of Industry 4.0.

Course-related learning outcomes

Knowledge:
Student:
1. Defines the essence and importance of management for the functioning and development of enterprises in Industry 4.0

2. Identifies management functions in enterprises in Industry 4.0
3. Indicates the benefits of using modern management methods in Industry 4.0

Skills:
Student:
1. Can forecast social processes and phenomena (cultural, political, legal, economic) using standard methods and tools in the field of industry 4.0 management
2. Analyzes proposed solutions to specific management problems and proposes appropriate solutions in this regard and is able to bear responsibility for own work and jointly implemented tasks and is ready to submit to the rules of teamwork
3. Designs solutions to problems with the use of modern information and communication technologies in enterprise management in industry 4.0.

Social competences:
Student:
1. Works in a group during project preparation.
2. Can independently and critically expand knowledge and skills.
3. Can act in an entrepreneurial way.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

During the semester, the student has the opportunity to collect credit points. You can get a maximum of 100 points, passing requires at least fifty points. If the student did not manage to collect the required number of points during the classes, he/she will have the opportunity to do so in the correction session by performing certain tasks.
Scored tasks within the exercises:
- group project - 80 points
- presentation - 20 points

Programme content

Introduction to management in industry 4.0
Management functions in industry 4.0
Industry 4.0 components
Competencies and skills of employees and managers in Industry 4.0
Modern information and communication technologies in management
Internet of Things (IoT) and new value propositions
Intelligent and connected product business models

Course topics

1. Introduction to management issues in industry 4.0:
- Evolution of management principles and methods: from industry 1.0 to 4.0
- Characteristics of Industry 4.0: features and key elements
2. Enterprise management functions in Industry 4.0:
- Planning
- Organizing
- Leadership
- Controlling
- Communication
3. Components of Industry 4.0:
- Digital technologies: big data, artificial intelligence (AI), robotics
- Cyber-physical systems (CPS)
- Smart Factory: intelligent production systems
4. Competencies and skills of employees and managers in Industry 4.0:
- Required digital competences
- Development of analytical and technical skills
- Managing virtual and multicultural teams
5. The use of modern information and communication technologies supporting management:

- ERP systems and their integration with IoT
- Cloud computing in management
- Blockchain technologies in logistics and supply chain management
6. Internet of Things (IoT) and new value propositions:
- The concept of the Internet of Things (IoT) and its applications in industry
- Creating new IoT-based value propositions
- Examples of IoT applications in Industry 4.0
7. Intelligent and connected product business models:
- Data-driven business models
- Creating value through connected products
- Business cases: intelligent products and services

Teaching methods

Excersize classes - discussion, demonstration, subject exercises, problem tasks performed individually, problem tasks performed in a team, case study

Bibliography

Basic:
1. Sobieraj J. (2019), Rewolucja przemysłowa 4.0, Wydawnictwo Naukowe Instytutu Technologii i Eksploatacji - PIB w Radomiu.
2. Schwab K. (2018), Czwarta rewolucja przemysłowa. Wydawnictwo Studio EMKA.

Additional:
1. Ustundag A., Cevikcan E. (2018), Industry 4.0: Managing The Digital Transformation, Springer.
2. Bartodziej Ch.J. (2017) The Concept Industry 4.0. Springer, Wiesbaden.

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50