



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Industry 4.0 in automotive [S1MiTPM1>P40wM]

### Course

Field of study

Materials and technologies for automotive industry

Year/Semester

4/7

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

15

### Number of credit points

2,00

### Coordinators

dr hab. inż. Natalia Makuch-Dziarska prof. PP

### Lecturers

### Prerequisites

Basic knowledge of materials science, materials processing and manufacturing techniques.

### Course objective

The aim of the course is to learn about Industry 4.0 and to provide knowledge in adapting companies to the requirements of Industry 4.0 with particular emphasis on the automotive industry.

### Course-related learning outcomes

Knowledge:

1. Has the basic knowledge of computer science to describe the information tools of Industry 4.0 used in the automotive industry.
2. Has basic knowledge of development trends in engineering and materials technology in accordance with the assumptions of Industry 4.0.

Skills:

1. Is able to analyze and solve simple technical problems of the automotive industry using knowledge from the field of material science and materials technology consistent with the assumptions of Industry 4.0.

2. Can determine the suitability of Industry 4.0 technologies for the production of motor vehicle parts with specific properties.

Social competences:

1. Is aware of the impact of Industry 4.0 technologies on society and the environment; understands the associated responsibility for decision-making.
2. Is aware of the social role of a technical university graduate and understands the need to communicate information to society regarding the achievements of Industry 4.0.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written credit at the end of the semester (credit in case of obtaining at least 51% of the points).

Project: credit on the basis of a written test and written studies of the implemented program content during the project.

### Programme content

Introducing the essence of Industry 4.0 and the megatrends associated with the fourth industrial revolution in the automotive sector.

### Course topics

Lecture:

1. Genesis and essence of Industry 4.0.
2. The main ideas and objectives of implementing Industry 4.0.
3. Key technologies of Industry 4.0.
4. Modern technologies and the directions of development of the automotive industry.
5. Industrial innovations in automotive enterprises.

Project: project tasks related to the introduction of Industry 4.0 technologies in the automotive industry.

### Teaching methods

Lecture: multimedia presentation.

Project: practical exercises, discussion and teamwork.

### Bibliography

Basic:

1. pod redakcją Marka Fidali, Przewodnik po technologiach przemysłu 4.0, Elamed Media Group, Katowice, 2021.
2. Ewa Stawiarska, Danuta Sz wajca, Mirosław Matusek, Radosław Wolniak, Wdrażanie rozwiązań przemysłu 4.0 w wybranych funkcjonalnych obszarach zarządzania przedsiębiorstw branży motoryzacyjnej : próba diagnozy, CeDeWu, Warszawa, 2021.
3. Wojciech Kaczmarek, Jarosław Panasiuk, Szymon Borys, Robert Dyczkowski, Michał Siwek, Robotyzacja i automatyzacja : Przemysł 4.0, PWN, Warszawa, 2023.

Additional:

1. Kozłowski K., Zygmuntowski J., 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.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00