



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Techniques for manufacturing rail vehicles

### Course

Field of study

Mechanical and Automotive Engineering

Area of study (specialization)

Rail vehicles

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

1/1

Profile of study

general academic

Course offered in

polish/english

Requirements

elective

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

1

### Lecturers

Responsible for the course/lecturer:

mgr inż. Mateusz Motyl

Responsible for the course/lecturer:

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### Prerequisites

The student has a basic knowledge of the aging processes of technical objects. Moreover, he knows technologies of construction and repair of rail vehicles and knows the main production technologies selected sets of rail vehicles, assembly methods and final acceptance. Can use the acquired knowledge to plan the production and repair process of the vehicle rail. He can solve specific technical and technological problems that occur during the production and repair of a rail vehicle. The student is able to work in a group, organize the main outline of the repair and production process. The student is able to determine priorities important in solving the tasks assigned to him. The student shows independence in solving technical problems, gaining and improving the acquired knowledge and skills.



## Course objective

The aim of the course is to learn about the physical aging processes of rail vehicles. Presentation of vehicle construction and repair technologies, also getting acquainted with assembly and final acceptance of rail vehicles.

## Course-related learning outcomes

### Knowledge

Has general knowledge of standardization, EU recommendations and directives, national, industry and international standards systems, and industrial standards.

Has extended knowledge of modern construction materials such as carbon plastics, composites, ceramics, in terms of their construction, processing technology and applications.

Has extensive knowledge of modern machine manufacturing technologies in the field of designing the production process of machine parts and their assembly using computer CAM tools

### Skills

Can program the technological process of manufacturing machine parts, including the development of a simple program to control the machine tool.

Can write user manual and safety manual for designed work machine or vehicle.

He can estimate the cost of making a working machine or a vehicle with a high degree of complexity from a selected group of machines.

### Social competences

It is ready to initiate actions for the public interest.

Is willing to think and act in an entrepreneurial manner.

Is ready to fulfill professional roles responsibly, taking into account changing social needs, including:

- developing the professional achievements,
- maintaining the ethos of the profession,
- observing and developing the rules of professional ethics and acting towards the observance of these rules.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The final test

## Programme content

Steels and plastics used in the construction and repair of rail vehicles, damage units and parts of the drive system, springback, steering, vehicle structure, equipment and other elements, organization of the technology department with the plant, physical processes use of rail vehicles, technology of



manufacturing and repairing vehicles, assemblies and elements such as vehicle frames, boxes, bogie frames, wheel sets and others, assembly of components and machines, electrical equipment and installations, assembly tests, safety during repair and production vehicles, final acceptance.

### Teaching methods

Lecture: multimedia presentation, illustrated with examples given on the board.

### Bibliography

#### Basic

1. Kozłowski M.: Budowa i eksploatacja pojazdów, t. II ? Obsługa, diagnostyka i naprawa zespołów i podzespołów. Wyd. Vogel Publishing, Wrocław 2003.
2. Marczewski R., Płończak Z., Podemski J.: Wagony towarowe ? poradnik techniczny. WKŁ, Warszawa 1975.
3. Cypko J., Cypko E.: Podstawy technologii i organizacji naprawy pojazdów mechanicznych. WKŁ, Warszawa 1989
4. Gieżyński S.: Technologia wytwarzania pojazdów szynowych. Wydawnictwo Politechniki Poznańskiej, Poznań 1979.

#### Additional

1. Moczarski M.: Podstawy organizacji i techniki obsługiwaniania pojazdów szynowych. Wydawnictwo. Politechniki Warszawskiej, Warszawa 1986.
2. Gronowicz J., Technologia naprawy pojazdów szynowych, maszyny i urządzenia elektryczne. Wydawnictwo Politechniki Poznańskiej, Poznań 1993.
3. Marczewski R., Podemski J., Wózki wagonowe. Wydawnictwo Komunikacji i łączności, Warszawa 1980.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,0
Classes requiring direct contact with the teacher	15	0,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	10	0,5

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