



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Techniques of repairing rail vehicles [N1Trans1>TNPSz]

### Course

Field of study

Transport

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

part-time

Requirements

elective

### Number of hours

Lecture

9

Laboratory classes

18

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

4,00

### Coordinators

dr hab. inż. Wojciech Sawczuk prof. PP  
wojciech.sawczuk@put.poznan.pl

### Lecturers

### Prerequisites

**KNOWLEDGE:** The student has a basic knowledge of machine science, mechanics, the basics of machine construction and the laws of physics related to rail vehicles. **SKILLS:** The student is able to acquire knowledge (information), interpret them, draw conclusions, read diagrams and technical drawings. **SOCIAL COMPETENCES:** The student is aware of the role of means of transport in human economic activity. The student is able to determine the priorities important in solving the tasks set before him.

### Course objective

The aim of the course is to learn about the physical aging processes of rail vehicles, maintenance methods, repair and operational basics. Presentation of vehicle repair technology, also familiarization with assembly and disassembly as well as final acceptance of vehicles.

### Course-related learning outcomes

Knowledge:

1. The student has knowledge of important development trends and the most important technical achievements and of other related scientific disciplines, in particular transport engineering.
2. The student has a basic knowledge of the life cycle of means of transport, both equipment and

software, and in particular about the key processes occurring in the product life cycle.

3. The student knows the basic techniques, methods and tools used in the process of solving tasks in the field of transport, mainly of an engineering nature engineering.

#### Skills:

1. The student is able to take into account in the process of formulating and solving tasks in the field of transport engineering also non-transport aspects, in particular social, legal and economic issues.
2. Student is able to assess - at least in a basic scope - various aspects of the risk associated with a transport project.
3. Student is able to make a critical analysis of the functioning of transport systems and other technical solutions and to evaluate these solutions, including: is able to effectively participate in the technical inspection and assess the transport task from the point of view of non-functional requirements, has the ability to systematically conduct functional tests.

#### Social competences:

1. The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life.
2. The student can think and act in an entrepreneurial way, incl. finding commercial applications for the created system, taking into account not only business benefits, but also social benefits of the conducted activity.
3. The student correctly identifies and solves dilemmas related to the profession of a transport engineer.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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For discussion, ongoing preparation and activity in class. Written credit for lectures and written credit for laboratory classes.

### Programme content

As part of the classes, students will learn about examples of damage to the basic sets of vehicles and means of transport. Causes of damage and methods of their diagnosis. Repair techniques are discussed in detail, including: disassembly of a part or assembly, assessment of the technical condition, verification, selection of a given repair technique as well as preparation and equipment of the stand for repair. Additionally, issues related to work safety while repairing a vehicle are discussed, as well as how to proceed in a hazardous situation.

### Course topics

none

### Teaching methods

1. Lecture with a multimedia presentation,
2. Possible educational trip to the entity producing or maintaining the rolling stock.

### 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.: Wagon towarowy - poradnik techniczny. WKŁ, Warszawa 1975.
3. Cypko J., Cypko E.: Podstawy technologii i organizacji naprawy pojazdów mechanicznych. WKŁ, Warszawa 1989.

#### Additional

1. Dokumentacja Systemu Utrzymania (DSU) wybranych pojazdów szynowych jak lokomotywy, elektrycznego zespołu trakcyjnego, wagonu pasażerskiego oraz towarowego.
2. Moczarski M.: Podstawy organizacji i techniki obsługi pojazdów szynowych. Wydawnictwo.

Politechniki Warszawskiej, Warszawa 1986.

3. Gronowicz J., Technologia naprawy pojazdów szynowych, maszyny i urządzenia elektryczne.

Wydawnictwo Politechniki Poznańskiej, Poznań 1993.

4. Marczewski R., Podemski J., Wózki wagonowe. Wydawnictwo Komunikacji i Łączności, Warszawa 1980.

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	90	4,00
Classes requiring direct contact with the teacher	27	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	63	3,00