



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Rail transport infrastructure [N1Trans1>ITSz]

### Course

Field of study

Transport

Year/Semester

3/6

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

18

Laboratory classes

9

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

dr inż. Paweł Komorski

pawel.komorski@put.poznan.pl

### Lecturers

### Prerequisites

Knowledge: The student has a basic knowledge of the railway infrastructure. In addition, he knows the construction and repair of railroads and overhead contact line elements. The student knows the main production technologies and methods of railroad assembly. technological processes occurring during the production and repair of railways and overhead lines. The student is able to work in a group, organize the production process and operation in its main outline. The student is able to define the priorities important when solving and setting the tasks before 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 the basic parameters of the railroad and overhead contact line, principles of design, construction, diagnostics and operation.

### Course-related learning outcomes

Knowledge:

1. The student has ordered and theoretically founded general knowledge in the field of key issues of technology and detailed knowledge in the field of selected issues in this discipline of 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 properly plan and conduct perform experiments, including measurements and computer simulations, interpret the obtained results, and correctly draw conclusions.

2. Student is able, when formulating and solving tasks in the field of transport, to apply appropriately selected methods, including analytical, simulation or experimental methods.

3. 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.

Social competences:

1. The student understands that in technology, knowledge and skills very quickly become obsolete.

2. 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.

3. 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.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

- final test (written or verbal)

### Programme content

General characteristics of rail transport, components of the railroad, overhead contact line and its shape, information about the rolling stock. Track beds, railway surfaces, rails, couplings, sleepers, railway ballast. Understanding the directions of development of railway surfaces due to the increase in speed and higher load of freight transport. Getting to know earthworks, parameters of railroads. Classification of railroads. General principles of designing railway lines and stations. Principles of diagnostics and operation.

### Course topics

The course topics cover the general characteristics of rail transport, including the components of the railway track, traction network, and rolling stock, as well as the substructure, railway surfaces, rails, fasteners, sleepers, and ballast. The classes also include the development directions of railway surfaces regarding increasing speed and higher freight loads, earthworks, parameters, and classification of railway tracks, as well as the principles of designing, diagnosing, and operating railway lines and stations.

### Teaching methods

1. Lecture with multimedia presentation

2. Possible didactic trip to the entity conducting maintenance or repair / modernization works

### Bibliography

Basic

1. Sysak J.: Podstawy dróg kolejowych. PWN Warszawa 1982.

Praca zbiorowa pod redakcją Sysak J.: Drogi kolejowe. WKŁ, Warszawa 1986. Batko M.: Drogi kolejowe. WKŁ, Warszawa 1986.

Szajer R.: Drogi kolejowe. WKŁ, Warszawa 1977

Additional

1. Zamięcki H.: Budowa i utrzymanie dróg kolejowych ? tom I. WKŁ, Warszawa 1972

### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
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)	23	1,00