



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Organization of rail transport

### Course

Field of study

Year/Semester

Transportation

3/6

Area of study (specialization)

Profile of study

Railway Transport

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

full-time

elective

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

30

15

Tutorials

Projects/seminars

15

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr inż. Piotr Smoczyński

piotr.smoczynski@put.poznan.pl

Responsible for the course/lecturer:

mgr inż. Mateusz Motyl

mateusz.motyl@put.poznan.pl

### Prerequisites

Basic knowledge of mathematics, basic computer skills and working in groups

### Course objective

Provide students with basic knowledge of the functioning of rail transport

### 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.

Skills

1. The student is able to obtain information from various sources, including literature and databases (both in Polish and in English), integrate it properly, interpret it and critically evaluate it, draw conclusions, and comprehensively justify his/her opinion.



2. The student can communicate in Polish and English using specialized terminology, using various techniques, both in the professional environment and in other environments, also with the use of tools in the field of transport engineering.

#### 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.

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: oral exam consisting of four obligatory questions of different difficulty levels:

1. Question regarding the reconstruction of information from lectures (for 3.0)
2. The question verifying the understanding of the lecture knowledge (4.0)
3. A question verifying the ability to solve problems analogous to those discussed in the lectures (4.5)
4. Problem question, requiring supplementing the opinion based on the literature (5.0).

Students answer the questions in the order given, and the grade results from the last question to which they answered correctly.

The effects of practical classes are verified on an ongoing basis by the teacher

#### Programme content

Discussion of the role of entities operating in the European Union railway system (infrastructure managers, carriers, supervisory and research institutions, etc.). Railway stations and railway network: nomenclature, station plans, division of the railway network, types of traffic posts). Railway signaling (basic signals and indicators used on Polish railways). Railway traffic management (train traffic, shunting, line blockade, written orders, European Rail Traffic Control System). Timetables (train traffic graphs, traction characteristics of railway vehicles, train driving method - minimal time, energy-saving, timetable development). The activity of railway carriers (vehicle rosterings). Railway regulations (legal acts at the EU and national level and the manner of their adoption). Rail-road crossings (categories, safety systems used, social campaigns). Railway positions (legal requirements).

#### Teaching methods

Informative and conversational lecture with the use of boards and multimedia content. The method of production exercises to master the knowledge of the theory of vehicle motion. Project method - a self-developed timetable with a rostering plan of traction vehicles for a given problem situation

#### Bibliography



Basic

Zalewski P., Siedlecki P., Drewnowski A., Technologia transportu kolejowego, WKŁ 2013, ISBN: 978-83-206-1919-5

Gołębiowski P., Krześniak M., Jacyna M., Szkopiński J., Organizacja ruchu kolejowego, PWN, Warszawa 2019, ISBN 978-83-01-20692-5

Additional

Żurkowski A., Pawlik M., Ruch i przewozy kolejowe: sterowanie ruchem, Polskie Linie Kolejowe: Związek Pracodawców Kolejowych, Warszawa 2010, ISBN 978-83-930600-5-4

Chełmecki W., Stacje kolejowe cz. 1, skrypt Politechniki Krakowskiej, Kraków 1997, ISBN: 83-903878-4-0

Energetyka transportu zelektryfikowanego, pod red. K. Karwowskiego, Wyd. Politechniki Gdańskiej, Gdańsk 2018, ISBN: 978-83-7348-739-0

Pawlik M., Europejski system zarządzania ruchem kolejowym. Przegląd funkcji i rozwiązań technicznych – od idei do wdrożeń i eksploatacji, KOW, Warszawa 2015, ISBN: 978-83-943085-1-3

Engelhardt J., Sektor kolejowy w polityce transportowej Unii Europejskiej. Etapy tworzenia jednolitego europejskiego obszaru kolejowego, edu-Libri, Kraków-Legionowo 2018, ISBN 978-83-656-4825-9

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	75	2,0
Classes requiring direct contact with the teacher	60	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	15	0,5

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