



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Transport technology [S1Trans1>TP]

### 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

full-time

Requirements

elective

### Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

4,00

### Coordinators

dr hab. inż. Małgorzata Orczyk prof. PP  
malgorzata.orczyk@put.poznan.pl

### Lecturers

### Prerequisites

**KNOWLEDGE:** The student has basic knowledge of the operation of means of transport and the impact of transport on the environment, knows the general characteristics of the functional properties and basic technical and operational parameters of land means of transport. **SKILLS:** The student is able to use the acquired knowledge to solve simple problems related to determining the impact of transport on the environment and is able to apply the scientific method in solving research problems. **SOCIAL COMPETENCES:** The student is able to work in a group taking different roles in it, shows independence in solving problems, gaining and improving the acquired knowledge and skills, is aware of the importance and understands the non-technical aspects and effects of transport impact on the environment

### Course objective

To acquaint students with the basic issues of transport technologies used in rail transport, discuss the organization and characteristics of freight rail transport, their infrastructure, the transport technologies used and the impact of these technologies on the environment.

### 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.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

For discussion, ongoing preparation and activity in class. Written credit. Mandatory individual reports on laboratory activities. Final credit of laboratory classes.  
Lecture part exam.

### Programme content

The module program covers the following topics:

1. Load handling processes in rail means of transport.
2. Rules for loading and securing cargo in freight wagons.
3. Transport corridors in Poland.
4. Technologies of intermodal transport processes.
5. Technologies for transporting dangerous goods on the railway.
6. Educational trips to units that tranship cargo and design units for rail transport.  
characteristics of points serving rail freight transport. Intermodal transport terminals, logistic centers.  
Acquainting students with the practical operation of railway business entities related to the transport of hazardous materials and intermodal transport - study visit to a research unit, logistics company and PKP group.

### Course topics

The lecture program covers the following topics:

1. The cargo transport process in individual modes of transport.
2. Construction and tasks of freight wagons - reminder and supplementation of knowledge.
3. Rules for loading and securing cargo in railway wagons.
4. Transport corridors in Poland.
5. Characteristics and conditions of operation of intermodal transport in Poland.
6. Technologies of combined transport processes.
7. Repetition and supplementation of information about loading units, with particular emphasis on loading units used in the railway industry.

8. Logistics centers as nodes of an intermodal logistics network.
9. Technologies for the transport of hazardous materials.
10. Summary of classes.

The laboratory program covers the following topics:

1. Introduction to laboratory classes.
2. Reminder and systematization of information about railway wagons.
3. Rules for arranging loads in wagons.
4. Educational visit to a unit that handles the reloading of railway cargo units.
5. Going to the unit responsible for designing intermodal cargo units.
6. End and summary of classes.

### Teaching methods

1. Lecture with multimedia presentation
2. Computational exercises
3. Training and educational output.

### Bibliography

Basic

Podstawowa

1. Stokłosa J., Transport intermodalny Technologia i organizacja. Wydawnictwo Naukowe Wyższej Szkoły Ekonomii i Innowacji, Lublin 2011.
2. Kwaśnowski S., Nowakowski T., Zając M., Transport intermodalny w sieciach logistycznych. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2008.
3. Medwid M., Cichy R., Techniczne środki transportu kombinowanego kolejowo – drogowego. Instytut Pojazdów Szynowych TABOR, Poznań 2016.
4. International Union of Railways., Loading Guidelines. Code of practice for the loading and securing of goods on railway wagons. Volume I, II (Principles, Goods). Version 01/04/2020.
5. Terczyński P., Atlas wagonów towarowych. KOLPRESS 2011.
6. Poliński J., Rola kolei w transporcie intermodalny. Instytut Kolejnictwa. Warszawa 2015.

Uzupełniająca

1. Wronka J., Transport kombinowany / Intermodalny Teoria i Praktyka. Wydawnictwo Naukowe Uniwersytetu Szczecińskiego, Szczecin 2014.
2. Materiały Urzędu Transportu Kolejowego.
3. Materiały Głównego Urzędu Statystycznego.
4. Zalewski P., Siedlecki P., Drewnowski A., Technologia Transportu Kolejowego. Wydawnictwa komunikacji i Łączności, Warszawa 2013.
5. Rokicki T., Intermodalne jednostki ładunkowe. Wydawnictwo SGGW, Warszawa 2015.
6. Rydzkowski W., Przewozy Intermodalne. Biblioteka logistyka, Poznań 2015.
7. Gronowicz J.: Ochrona środowiska w transporcie lądowym. Wydawnictwo i Zakład Poligrafii Instytutu Technologii Eksploatacji Radom 2005.
9. Regulamin międzynarodowego przewozu kolejami towarów niebezpiecznych RID.
10. Instrukcja postępowaniu przy przewozie koleją towarów niebezpiecznych Ir-16.
11. Instrukcja o kolejowym ratownictwie technicznym Ir- 15..
12. Instrukcje PKP dot. zasad przewozu ładunków.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	90	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	2,00