



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

The Transportation Systems Diagnostic [S2Trans1-TrSz>DUiST]

### Course

Field of study

Transport

Year/Semester

1/1

Area of study (specialization)

Railway Transport

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

### Number of credit points

2,00

### Coordinators

prof. dr hab. inż. Franciszek Tomaszewski  
franciszek.tomaszewski@put.poznan.pl

### Lecturers

### Prerequisites

**KNOWLEDGE:** Basic knowledge of the construction of transport systems and systems, the principles of their operation and the physics of phenomena occurring in mechanical objects. **SKILLS:** The student is able to solve specific problems appearing in technical systems. **SOCIAL COMPETENCES:** The student is able to work in a group and identify priorities important in solving the tasks set before him.

### Course objective

Understanding the theoretical and practical problems related to the diagnostics of transport systems and systems, solving the problems of assessing their technical condition, classifying the state of objects based on the limit values of symptoms and the principles of using diagnostics in maintenance systems.

### Course-related learning outcomes

Knowledge:

The student knows advanced methods, techniques and tools used in solving complex engineering tasks and conducting research in a selected area of transport.

Skills:

The student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems.

Social competences:

The student is able to use analytical, simulation and experimental methods to formulate and solve engineering tasks and simple research problems

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Written exam, final test

### Programme content

The module program covers the following topics:

1. The concept of technical layout and system.
2. Diagnostics of management systems and organization.
3. Diagnostics of systems and transport systems.
4. On-road vehicle diagnostic systems.
5. Traffic control systems and their diagnostics.

### Course topics

The lecture program covers the following topics:

1. Introduction to the issues of diagnostics of organizational and management systems. Diagnostic and prognostic method for improving organization and management systems.
2. Techniques for controlling transport systems: strategic control, controlling.
3. Introduction to the issues of technical diagnostics: diagnostic tasks in systems and transport systems, diagnostic processes and signals as a source of information about the technical condition of systems.
4. Classification of technical conditions of objects and systems, limit values of symptoms. The state space of objects and signals.
5. Diagnostics of systems: running vehicle, combustion engine, machines electrical and auxiliary equipment.
6. Diagnostics of systems and systems for securing and controlling railway transport.
7. Maintenance methods of transport systems and systems using technical diagnostics.

### Teaching methods

Lecture with multimedia presentation.

### Bibliography

Basic

1. Cempel C., Tomaszewski F., Diagnostyka Maszyn. Zasady ogólne, przykłady zastosowań. Instytut Technologii Eksploatacji, Radom 1992.
2. Marciniak J., Diagnostyka techniczna kolejowych pojazdów szynowych. WKiŁ, Warszawa 1982.
3. M. Hebda, S. Niziński, H. Pelc: Podstawy diagnostyki pojazdów mechanicznych. WKiŁ, Warszawa 1980.

Additional

1. B. Żółtowski: Podstawy diagnostyki maszyn. Wydawnictwo Uczelniane Akademii Techniczno-Rolniczej, Bydgoszcz 1996.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	55	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00