# COURSE DESCRIPTION CARD - SYLLABUS

Course name
Elements of railway traffic control [N2Trans1-TrSz>ESRK]

## Course

Field of study
Transport

Year/Semester
2/3

Area of study (specialization)
Railway Transport

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

## Number of hours

Lecture
9

Laboratory classes
9

Other
0

Tutorials
0

Projects/seminars
0

## Number of credit points

2,00

## Coordinators

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

## Lecturers

## Prerequisites

KNOWLEDGE: The student has a basic knowledge of traffic control systems, both rail and road traffic. The student knows the structure of the traffic control system, functional connections between individual elements and subsystem of the control system. The student knows the principles of building and operating characteristics of the main elements of the railway traffic control system. SKILLS: The student is able to use the acquired knowledge to build and manage a railway traffic control system. The student is able to solve specific technical and IT problems related to the traffic control system. SOCIAL COMPETENCES: The student is able to cooperate in a group, manage the railway traffic control system. The student is able to determine the priorities important in case of solving each tasks. The student demonstrates independence in solving technical and IT problems, acquiring and improving the acquired knowledge and skills.

## Course objective

The aim of the course is to provide students with the rules of organization and control of railway traffic.

## Course-related learning outcomes

Knowledge:
The student has advanced and in-depth knowledge of transport engineering, theoretical base, tools and

means used to solve simple engineering problems.
The student has advanced detailed knowledge of selected issues in the field of transport engineering.

Skills:
The student is able to use information and communication techniques used in the implementation of transport projects.
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 understands that in the field of transport engineering, knowledge and skills very quickly become obsolete.
The student understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical 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:
Learning outcomes are verified with marks for discussion, ongoing preparation and activity in the classes. Test in the end of lecture classes and exercise classes are planned.

## Programme content

Basic concepts related to railway traffic: railway network and its components like railway stations. Signaling used in train traffic. General rules for managing train traffic on the lines. Basic concepts of railway traffic control devices. Mechanical railway traffic control devices. Construction and operation of signalling block devices. Managing train traffic on the route with a semi-automatic line block systems and automatic line block systems. Receiving, sending and passing trains at traffic stations. Construction and operation of electromechanical slide devices. Construction and operation of relay devices. The technique of maneuvering with rolling stock. Closing of route and station tracks and conducting traffic during closures. Computerized railway traffic control devices. Organization of passenger and freight rail transport.

## Course topics

Tematyka zajęć dotyczy podstawowych pojęć związanych z ruchem kolejowym, obejmując sieć kolejową, posterunki ruchu, sygnalizację, zasady prowadzenia ruchu pociągów, urządzenia sterowania ruchem kolejowym, mechaniczne i elektromechaniczne systemy blokowe, manewrowanie taborem, zamknięcia torów oraz organizację przewozów pasażerskich i towarowych.

## Teaching methods

1. Lecture with multimedia presentations
2. Exercises - solving problems

## Bibliography

Basic
1. Dąbrowa-Bajon M.: Podstawy sterowania ruchem kolejowym. Funkcje, wymagania, zarys techniki. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2002.
2. Lewiński A.: Problemy oprogramowania bezpiecznych systemów komputerowych w zastosowaniach transportu kolejowego, Seria Monografie Nr 49, Wydawnictwo Politechniki Radomskiej, Radom 2001.
Additional
1. Leśko M., Guzik J.: Sterowanie ruchem drogowym: sterowniki i systemy sterowania i nadzoru ruchu. Wydawnictwo Politechniki Śląskiej 2000.

## Breakdown of average student's workload

| | Hours | ECTS |
|---|---|---|
| Total workload | 43 | 2,00 |
| Classes requiring direct contact with the teacher | 18 | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 25 | 1,00 |