



## Subject card

|   |   |  |                                     |            |  |         |     |
|---|---|--|-------------------------------------|------------|--|---------|-----|
| Subject name and code                       | Railway Traffic Engineering, PG_00044620  |  |                                     |            |  |         |     |
| Field of study                              | Transport   |  |                                     |            |  |         |     |
| Date of commencement of studies             | October 2021  | Academic year of realisation of subject  |                                     |            | 2023/2024  |         |     |
| Education level                             | first-cycle studies   | Subject group  |                                     |            | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |         |     |
| Mode of study                               | Full-time studies   | Mode of delivery   |                                     |            | at the university  |         |     |
| Year of study                               | 3   | Language of instruction  |                                     |            | Polish   |         |     |
| Semester of study                           | 5   | ECTS credits   |                                     |            | 4.0  |         |     |
| Learning profile                            | general academic profile  | Assessment form  |                                     |            | exam   |         |     |
| Conducting unit                             | Department of Railway Engineering -> Faculty of Civil and Environmental Engineering   |  |                                     |            |  |         |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  | dr inż. Sławomir Grulkowski  |                                     |            |  |         |     |
|   | Teachers  | dr inż. Sławomir Grulkowski  |                                     |            |  |         |     |
| Lesson types and methods of instruction     | Lesson type   | Lecture  | Tutorial                            | Laboratory | Project  | Seminar | SUM |
|   | Number of study hours   | 30.0   | 0.0                                 | 0.0        | 15.0   | 0.0     | 45  |
|   | E-learning hours included: 0.0  |  |                                     |            |  |         |     |
| Learning activity and number of study hours | Learning activity   | Participation in didactic classes included in study plan   | Participation in consultation hours |            | Self-study   |         | SUM |
|   | Number of study hours   | 45   | 5.0                                 |            | 50.0   |         | 100 |
| Subject objectives                          | The aim of the course is to familiarize students with the principles of railway traffic on the railway network (lines and stations). The student learn about the classification of the elements of the railway network and railway traffic control systems. The basic principles for calculating of the movement resistance as well as a cappacity problems of railway lines are discussed. The purpose and ways of implementation of the ERTMS are presented.  |  |                                     |            |  |         |     |
| Learning outcomes                           | Course outcome  | Subject outcome  |                                     |            | Method of verification   |         |     |
|   | [K6_U08] able to solve simple transport logistics and traffic engineering problems  | Ability to solve basic problems in the field of transport logistics and traffic engineering.   |                                     |            | [SU1] Assessment of task fulfilment  |         |     |
|   | [K6_W09] has basic knowledge of transport traffic engineering to understand its importance for transport operation and differentiate between how it is applied in different modes of transport  | Knowledge of railway traffic engineering in the context of other transport systems.  |                                     |            | [SW3] Assessment of knowledge contained in written work and projects   |         |     |
|   | [K6_K01] able to think and act creatively and enterprisingly; able to define priorities to support the delivery of an individual or group task; understands the need for continuous education and taking responsibility as a professional for their work and the work of the team   | The ability to define priorities and select appropriate methods for the implementation of the task. Understanding for the need for self-development. |                                     |            | [SK3] Assessment of ability to organize work   |         |     |
| Subject contents                            | Basic principles of the organization of a passenger rail transport. Basic principles of organization of freight transport. Combined transport. Railway network. Traffic posts. Railway stations and their classification. Overview of the traffic control systems. Railway station equipments. Automatic Block Signalling. Traffic safety control systems. European Train Control System (ETCS). The rules of railway signalling. Basic information about rolling stock and combining of trains. Traffic in the routes and in the station area. Scheduling railway traffic on the network. Timetables of trains. Graphs of the train traffic. The relationship between the railway infrastructure and the train traffic. Queuing model and its application to calculate the required number of track in a station. The capacity of railroads. The way of incrising of the capacity of railroads. Measures of efficiency of the traffic. |  |                                     |            |  |         |     |
| Prerequisites and co-requisites             | Not required  |  |                                     |            |  |         |     |

| Assessment methods and criteria                                | Subject passing criteria   | Passing threshold  | Percentage of the final grade |
|--|--|--|-------------------------------|
|  | Lectures test  | 50.0%  | 60.0%                         |
|  | Practical exercise   | 50.0%  | 40.0%                         |
| Recommended reading  | Basic literature   | 1. Bergiel K., Karbowski H.: Automatyzacja prowadzenia pociągu. EMI-PRESS. Łódź 2005 2. Bogdaniuk B., Massel A.: Podstawy transportu kolejowego. Wydawnictwo PG. Gdańsk 1999 3. Zalewski P., Siedlecki P., Drewnowski A.: Technologia transportu kolejowego. WKiŁ. Warszawa 2004 |                               |
|  | Supplementary literature   | Not required   |                               |
|  | eResources addresses   | Adresy na platformie eNauczanie:<br>Inżynieria Ruchu Kolejowego - 5T_I - Moodle ID: 34064<br><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34064">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=34064</a>   |                               |
| Example issues/<br>example questions/<br>tasks being completed | Dimensioning and constructing a functional diagram of a node station |  |                               |
| Work placement   | Not applicable   |  |                               |