



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Safety and environmental risks in rail transport [S2Trans1E-TrZ>BiZwTS]

Course

Field of study

Transport

Year/Semester

2/3

Area of study (specialization)

Sustainable Transport

Profile of study

general academic

Level of study

second-cycle

Course offered in

English

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

dr inż. Paweł Komorski

pawel.komorski@put.poznan.pl

Lecturers

Prerequisites

Knowledge: Student has basic knowledge in the field of operation of rail vehicles and has basic knowledge of issues related to environmental hazards caused by transport Skills: Student is able to use the acquired knowledge to solve simple problems related to determining the impact of transport on the environment Social competences: Student is aware of the importance and understands the non-technical aspects and effects of rail transport on the environment

Course objective

To present basic concepts of environmental protection and safety, the existing threats related to the operation of rolling stock and the necessary actions leading to the reduction of the negative impact of rail transport on the environment and people in the vehicle

Course-related learning outcomes

Knowledge:

Student has advanced detailed knowledge of selected issues in the field of transport engineering

Student has advanced and detailed knowledge of the processes taking place in the life cycle of transport systems

Skills:

Student is able to obtain information from literature, databases and other sources (in Polish and English), integrate them, interpret and critically evaluate them, draw conclusions and formulate and exhaustively justify opinions

Student is able to communicate in Polish and English using various techniques in a professional environment and in other environments, also with the use of issues related to transport engineering

Social competences:

Student understands the importance of using the latest knowledge in the field of transport engineering in solving research and practical problems

Student is aware of the need to develop professional achievements and adhere to the rules of professional ethics

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 and final test for tutorials

Programme content

Introduction to environmental protection and safety issues in transport. Characteristics of environmental hazards caused by rail means of transport.

Identification of the main sources of noise and vibrations in rail vehicles, measurement methods and criteria for the evaluation of vibroacoustic phenomena occurring in rail vehicles and their impact on man and the environment. Methods of reducing noise and vibrations in rail transport.

Legal requirements related to the process of managing the risk of hazards related to changes introduced to the railway system. Basic methods of hazard identification. Documenting the risk assessment process. Selected problems of the impact of hazardous materials transported by rail on the environment,

Course topics

The course topics cover environmental protection and safety in rail transport, with particular emphasis on the identification and assessment of hazards related to rail transport, noise, vibrations, as well as methods for reducing these hazards and risk management.

Teaching methods

Lecture with multimedia presentation. Tutorials: solving problems.

Bibliography

Basic

1. Rail Safety and Standards Board Limited, Guidance on the Common Safety Method for Risk Evaluation and Assessment, 2017
2. Thompson D.: Railway Noise and Vibration - Mechanisms, Modelling and Means of Control. Elsevier 2009
3. European Railway Agency. Guide for the application of the Commission Regulation (EU) N°1078/2012 on the CSM for monitoring. Version in ERA: 1.0. Date: 17/07/2014.

Additional

1. Smoczyński, P., Gill, A., Kadziński, A. Modelling of railway accidents with accimap – Case study, Transport Means - Proceedings of the International Conference, 2019, 2019-October, s. 113-117
2. Smoczyński, P., Kadziński, A., Gill, A., Kobaszyńska-Twardowska, A., Calibration of the risk model for hazards related to the technical condition of the railway infrastructure, Advances in Intelligent Systems and Computing, 2019, 854, s. 274-283
3. Smoczyński, P., Kadziński, A., Estimation and evaluation of risk in the railway infrastructure, Lecture Notes in Networks and Systems, 2018, 36, s. 182-191
4. De Toni A., Tonchia S.: Performance measurement systems. Models, characteristics and measures. International Journal of Operations & Production Management.
5. Smoczyński P., Gill A., Kadziński A., Safety Recommendations as a Method of Strengthening Resilience

of the Railway System In: Proceedings of the 24rd International Scientific Conference : Transport Means 2020: Kaunas University of Technology, 2020 - 804-809

6. Helak M., Smoczyński P., Kadziński A., Implementation of the Common Safety Method in the European Union railway transportation, Scientific Journal of Silesian University of Technology. Series Transport - 2019, vol. 102, 65-72

7. Kadziński A., Gill A., Smoczyński P., Risk Monitoring in Rail Transport Performed at the Operational Level In: Proceedings of the 23rd International Scientific Conference : Transport Means 2019: Kaunas University of Technology, 2019 - 393-397

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	0,50