COURSE DESCRIPTION CARD - SYLLABUS

Course name

Basics of railroads

Course

Field of study

Sustainable Building Engineering

Year/Semester

3/6

Area of study (specialization)

Profile of study

general academic

Level of study

First-cycle studies

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

0

Projects/seminars

15

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

KNOWLEDGE: student has knowledge of basics of mathematics and physics, neccessary to deal with railroad construction problems;

student has knowledge on making and reading geodesy maps;

student has knowledge from theoretical mechanics, strength of materials and soil mechanics;

student has knowledge on properties, utilisation and probing of construction materials.

SKILLS: student has an ability to obtain information from literature and other properly selected information sources;

student has skills allowing calculations using physical formulas;

student can adjust tools for design tasks;

student can read geodesic maps.

SOCIAL COMPETENCE: student understands ideas of common values, sustainable developement and sustainable transport;

student understands a neccessity to improve professional and personal competence, understand the need and opportunities of continuous learning;

student follows in daily academic life rules of culture and respect for others.

Course objective

To present basic knowledge and teach basic skills on railroad design, construction, maintenance, diagnostics and exploitation.

Course-related learning outcomes

Knowledge

Student acquires basic knowledge on design, construction, maintenance, diagnostics and exploitation of railroads;

Student acquires basic knowlegde on geometrical layout of railway tracks;

Student learns about classification of railway lines and railroad pavements.

Skills

Student learns how to calculate basic railroad curves;

Student aquires an ability to categorise railways and classify railroad track;

Student learns to read topographic maps.

Social competences

Student learns to choose criteria and priorities for a certain task, taking into account common values and sustainable developement;

Student takes responsibility for the accuracy and reliability of working results and their interpretation, gets an ability to critically evaluate the results of own work.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The acquired knowledge is veriffied by a writtne colloquium done on the last lecture. The colloquium will be in a form of a multiple choice test with penalty for wrong answers, and questions of "list with a short desctiption" type. With small number of students it is possible to change the form into an oral colloquium, requiring acceptance from the lecturer and majority of students. To pass the colloquium,

students should acquire at least 50% of points. Activity during the lectures may be taken into account during the colloquium's score evaluation.

Skills and competencies will be checked by a merithorical evaluation of the presented project, social competencies presented during project's consulting, systematic work and a possible defence of the presented project.

Programme content

1. Characteristics of rail infrastructure, categorisation of railway lines, classification of railroad tracks;

2. Railway desing in plane and profile, including transitions curves and wheel-rail contact problems;

3. Basic elements of railroad superstructure and subgrade;

4. Preliminary information on railroad crosssections;

5. Basics of railway construction technology, diagostics, maintenance and exploitation;

Teaching methods

Informative lecture using multimodal presentation, wih an occasional use of a blackboard.

A preliminary project of a railway line in plane and profile.

Bibliography

Basic

1. Chandra S., Agarwal M.: Railway engineering. Oxford University Press, New Delhi 2014.

2. Hessami A.: Modern railway engineering. InTechOpen, 2018.

3. Kędra Z.: Technologia robór kolejowych. Politechnika Gdańska, Gdańsk 2017.

4. Profilidis V.: Railway management and engineering. Ashgate, Burlington 2014.

5. Rozporządenie w sprawie warunków technicznych jakim powinny odpowiadać budowle kolejowe i ich usytuowanie.

6. Shift to rail joint undertaking: Shift to rail moving European railway forward. Luxembourg Publications Office, Luxembourg 2019.

7. Standardy techniczne - szczegółowe warunki techniczne dla modernizacji lub budowy linii kolejowych...

8. Yi S.: Principles of railway location and design. Elsevier, Amsterdam 2018.

Additional

1. Bałuch. H., Bałuch M.: Układy geometryczne toru i ich deformacje. KOW, Warszawa 2010.

2. Basiewicz T., Gołaszewski A., Rudziński L.: Infrastruktura transportu. Politechnika Warszawska, Warszawa 2002.

3. Bogdaniuk B., Towpik K.: Budowa, modernizacja i naprawy dróg kolejowych. KOW, Warszawa 2010.

4. Cieślakowski S.: Stacje kolejowe. WKiŁ, Warszawa 1992.

5. Sancewicz S.: Nawierzchnia kolejowa. KOW, Warszawa 2010.

6. Id-1. Warunki techniczne utrzymania nawierzchni na liniach kolejowych. PKP Polskie Linie Kolejowe S.A., Warszawa 2005.

7. Id-3. Warunki techniczne utrzymania podtorza kolejowego. PKP Polskie Linie Kolejowe S.A., Warszawa 2009.

8. Tolley R., Tolley R. S.: Sustainable transport. Cambridge 2003.

9. Sysak J. (red.): Drogi kolejowe. PWN, Warszawa 1986.

10. Towpik K.: Utrzymanie nawierzchni kolejowej. WKiŁ, Warszawa 1990.

11. Victoria Transport Policy Institute - web page: www.vtpi.org.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,0
Classes requiring direct contact with the teacher	30	1,0
Student's own work (literature studies, preparation for test, project preparation) [1]	30	1,0

[1] delete or add other activities as appropriate