Tadeusz Kosciuszko Cracow University of Technology

Course Card

Faculty of Civil Engineering

Field of study: Civil Engineering

Study profile: general academic

Study form: full-time

Field of study code: BUD

Study cycle: 1st

Specialty: no specialty

1 COURSE INFORMATION

Course name	Podstawy dróg szynowych
Course name in English	Introduction to Rail Roads
Course code	WIL BUD oIS D52 24/25
Course category	Przedmioty profilowe
No. of ECTS points	2.00
Semester	6

2 CLASS TYPE, NUMBER OF HOURS ACCORDING TO THE STUDY PLAN

Semester	Lecture	Class exercise	Laboratory	Computer lab	Design exercise	Seminar
6	15	0	0	0	15	0

3 COURSE OBJECTIVES

Objective 1 Description of basic documents referring to rail transport (Polish and European). Rail transport vs other means of transport.

Objective 2 Introduction to types of rail transport systems (conventional and non-conventional). Types of track super-structures: ballasted and ballastless. Giving characteristics of engineering objects.

Objective 3 Brief characteristics of railway network in Europe (lengths, speeds, loads, etc.) including high speed railways

4 PREREQUISITES IN TERMS OF KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1 Basic knowledge of rail transport in Europe.

2 Rudiments of structural mechanics and strength of materials

5 LEARNING OUTCOMES

LO1 Knowledge Student knows the tracks structures and materials used for construction

LO2 Skills Student knows an outline of the design process, construction and maintenance operations

LO3 Knowledge Student knows the principles of various engineering objects in rail transport and the most common track systems in railways and tramways including turnouts

LO4 Skills Student is able to calculate stresses and displacements in a railway track and design a simple railway line section

6 COURSE CONTENT

Lecture		
No.	Subject matter of the course Detailed description of thematic blocks	No. of class hours
L1	Basic definitions. Conventional vs non-conventional rail systems. Ballasted vs ballastess track systems. Documents referring to rail transport (Polish and European)	4
L2	Components of rail infrastructure (tracks, turnouts, bridges and culverts, subgrade). Brief characteristics of level crossings, power supply systems, etc	5
L3	Types of track structures. Ballasted track and its characteristics. Rails and their characteristics. Rail joints and expansion devices. Thermit welding, electric arc welding - emergence of CWR track. Rehabilitation process - description. Principle of subgrade strengthening. Track and subgrade renewal	6

Design exercise		
No.	Subject matter of the course Detailed description of thematic blocks	No. of class hours
P1	Design of a railway line section (arcs, transirion curves, etc.) including the track structure	15

7 TEACHING TOOLS

N1 Presentations

N2 In-class calculation exercises

N3 Individual design projects

8 Student workload

Activity form	Number of hours of activity
Hours realized in contact with the teacher	
Hours resulting from the study plan	30
Consultation hours	8
Exams and tests during session	2
Hours of autonomous student work	
Preparing for classes, studying literature	10
Developing results	2
Preparing of reports, projects presentations, discussion	4
Total number of hours devoted to the subject	**56**
Total number of ECTS points	2.00

9 Methods of grading

Partial grades

F1 Design project no. 1

F2 Design project no. 2

F3 Lecture-based test

Summary grade

P1 Average of the three marks