

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Construction of railroad superstructure		Code 1010101171010104818
Field of study Civil Engineering First-cycle Studies	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: - Project/seminars: -		No. of credits 4
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art		ECTS distribution (number and %)
Responsible for subject / lecturer: DSc Eng. Włodzimierz Bednarek email: wlodzimierz.bednarek@put.poznan.pl tel. 61 665 2407 Department of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K_W06. Has knowledge about rules governing design of railroads. K_W07. Knows rules for dimensioning railway superstructure elements. K_W10. Has basic knowledge about designing elements of railway superstructure
2	Skills	K_U01. Has an ability to classify railways. K_U07. Has an ability to design chosen railway's superstructure elements
3	Social competencies	K_K01. Can work individually and in a group on a given task. K_K10. Behaves with regard to rules of ethics
Assumptions and objectives of the course: 1) Deliver engineering knowledge about railway superstructure construction. 2) The analysis of deflections and stress values in the railway superstructure elements. 3) Geometrical state assessment of railway track. 4) Strength of railway superstructure. 5) Stress distribution in the railway superstructure. 6) Diagnostics, maintenance and current repairs of the railway track		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Knows rules of the calculations of railway superstructure construction - [K_W05] 2. Knows rules of the dimensioning of railway superstructure elements - [K_W07]		
Skills: 1. Has an ability to dimension basic elements of railway track - [K_U08]		
Social competencies: 1. Is able to work independently - [K_K01] 2. Own complements and extends knowledge of the railway superstructure - [K_K03] 3. Is aware of the need of improving professional competences - [K_K06]		
Assessment methods of study outcomes		

Students' knowledge and abilities assessed on the basis of oral colloquium and written calculations. Examination consists of 2 theoretical questions and 1 computational task. Information about the form, term and duration of a test is given on the first lecture in the semester.

Course description

1. Influence of the temperature on the continuous welded track.
2. Stresses in the continuous welded rail.
3. Geometrical state assessment of railway track.
4. Strength of railway superstructure elements.
5. Transmitting the loads from the wheel on the railway subgrade.
6. Designing of the railway subgrade protection layer.
7. Diagnostics and current repairs of the railway track.

Basic bibliography:

1. Bałuch H.: Diagnostyka nawierzchni kolejowej. Wydawnictwa Komunikacji i Łączności, Warszawa, 1978
2. Bałuch M.: Podstawy dróg kolejowych. Politechnika Radomska, Radom, 2001
3. Bogdaniuk B., Towpik K.: Budowa, modernizacja i naprawy dróg kolejowych. PKP Polskie Linie Kolejowe S.A., Warszawa 2010
4. Czyczula Wł: Tor bezстыkowy. Wydawnictwo Politechniki Krakowskiej, Kraków 2002
5. Esveld C.: Modern railway track, Second Edition, Delft 2001
6. Łoś M.: Wpływ temperatury na pracę bezстыkowego toru kolejowego. WKiŁ, Warszawa 1987

Additional bibliography:

1. Dziennik Ustaw Rzeczypospolitej Polskiej, Warszawa, dnia 15 grudnia 1998 r., Nr 151, Poz. 987: Rozporządzenie Ministra Transportu i Gospodarki Morskiej z dnia 10 września 1998 r. w sprawie warunków technicznych, jakim powinny odpowiadać budowle kolejowe i ich usytuowanie

Result of average student's workload

Activity	Time (working hours)
1. Student's attendance to lectures	29
2. Student's preparation to colloquium	82
3. Colloquium	1

Student's workload

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	30	1
Practical activities	0	0