

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Dimensioning of Railway track structure		Code 1010102121010126036
Field of study Civil Engineering Second-cycle Studies	Profile of study (general academic, practical) general academic	Year /Semester 1 / 2
Elective path/specialty Railways	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: - Laboratory: - Project/seminars: 30		No. of credits 4
Status of the course in the study program (Basic, major, other) major		(university-wide, from another field) from field
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 4 100%
Responsible for subject / lecturer: DSc Eng. Włodzimierz Bednarek email: wlodzimierz.bednarek@put.poznan.pl tel. 2407 Faculty 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 of 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 static and kinematic analysis of deflections and stress values in the railway superstructure elements. 3) Geometrical and geometric-kinematical state assessment of railway track. 4) Strength of railway superstructure taking into account irregularity of track geometry. 5) Stress distribution in the railway superstructure. 6) Diagnostics and maintenance 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		
<ol style="list-style-type: none"> 1. Influence of the temperature on the continuous welded track and stresses in the railway track. 2. Geometrical and geometric-kinematical state assessment of railway track. 3. Strength of railway superstructure elements taking into account factors that significantly increase the stresses. 4. Stability of the railway continuous welded track. 5. Diagnostics and maintenance of the continuous welded track. 6. Conditions for the safe operation of the continuous welded track. 		
Basic bibliography:		
<ol style="list-style-type: none"> 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. Czyczuła 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 7. Praca zbiorowa pod red. J. Sysak: Drogi Kolejowe. PWN, Warszawa 1986 8. Szcześniak W.: Statyka, dynamika i stateczność nawierzchni i podtorza kolejowego. Przegląd podstawowych pozycji literatury. Prace Naukowe Politechniki Warszawskiej. Seria Budownictwo, z. 129, 1995 9. Praca zbiorowa pod red. Prof. W. Koca: Drogi szynowe. Gdańsk 2013, 		
Additional bibliography:		
<ol style="list-style-type: none"> 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 2. Mazurek T.: Budowa kolei. Wydawnictwa Komunikacji i Łączności, Warszawa, 1964 3. PKP: Przepisy Id-1 (D-1) Warunki techniczne utrzymania nawierzchni na liniach kolejowych, Warszawa, 2005 4. Sancewicz S.: Nawierzchnia kolejowa. Wojskowa Akademia Techniczna, Warszawa, 2010 		
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	32	1
Practical activities	48	2