

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Railway building		Code 1010104191010101738
Field of study Civil Engineering First-cycle Studies	Profile of study (general academic, practical) (brak)	Year /Semester 5 / 9
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 20 Classes: - Laboratory: - Project/seminars: -		No. of credits 2
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: dr hab. inż. Włodzimierz Bednarek email: wlodzimierz.bednarek@put.poznan.pl tel. 2407 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań		Responsible for subject / lecturer: dr inż. Michał Pawłowski email: michal.pawlowski@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	Has knowledge of managing business in the construction sector, knows the standards and guidelines for the design of linear structures; knows and applies acts of law, standards and guidelines
2	Skills	Uses specialized tools in order to find useful information, software supporting the work of the designer and organizer of the construction process; knows how to prepare a schedule of construction works, manage the construction process; is able to analyze the risks during the performance of projects and operation of building
3	Social competencies	Can work individually and in a group on a given task or eventually manage a team; Takes responsibility for solidity of own and team work's results; complements and enhances knowledge about railway construction; Takes responsibility for own and team's safety; Consciousness about a need to improve professional skills and personal competence
Assumptions and objectives of the course: Getting to know the technologies in the repair and maintenance works of railway superstructure and subgrade. The influence of a rolling stock and temperature on the work of continuous welded track.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Student knows maintenance and repair works of the railway superstructure and subgrade - [K_W11] 2. Student knows machineries and processes using in the maintenance and repair works of the railway superstructure and subgrade - [K_W14] 3. Student knows the technologies used for the maintenance of the railway line - [K_W17]		
Skills:		
1. Student is able to choose an appropriate technology for subgrade and superstructure repairs - [K_U05] 2. Student is able to choose an appropriate method of rail stressing process - [K_U10] 3. Student is able to analyze creep of rails and their impact on the work of continuous welded track - [K_U12]		
Social competencies:		
1. Student is responsible for solidity of own work's results - [K_K02] 2. Student alone complements and enhances knowledge about railway construction - [K_K03] 3. Student in conscious about a need to improve professional skills and personal competence - [K_K06]		
Assessment methods of study outcomes		

<p>Verification of knowledge: class participation and colloquium at the end of semester. Getting points for: - active participation in the classes, - knowledge presented at the colloquium.</p>		
Course description		
<p>1. Shaping of a railroad. 2. Selection of machines for railway works - capacity of machines. 3. Strengthening of subgrade. 4. Modernization and maintenance of a railway line. 5. Technology of subgrade and superstructure repair works. 6. Machinery for track works and elements of health and safety at railway works.</p>		
Basic bibliography:		
<p>1. Maszyny i urządzenia do robót torowych, tom I, Koktysz, M. Bernaś, WKiŁ, Warszawa, 1990 2. Budowa i utrzymanie dróg kolejowych, M. Batko, WKiŁ, Warszawa, 1985 3. Budowa i utrzymanie dróg kolejowych, tom II, Semrau, H. Zamięcki, WKiŁ, Warszawa, 1975 4. Budowa, modernizacja i naprawy dróg kolejowych, Bogdaniuk B., Towpik K., KOW, Warszawa 2010 5. Praca zbiorowa pod red. J. Sysak: Drogi Kolejowe. PWN, Warszawa 1986 6. Podstawy dróg kolejowych, J. Sysak, WKiŁ, Warszawa 1982 7. Kolejowe budowle ziemne, Skrzyński E., Sikora R., Tom II. WKiŁ, Warszawa 1987 8. Utrzymanie nawierzchni kolejowej, K. Towpik, WKiŁ, Warszawa, 1990 9. Wpływ temperatury na pracę toru kolejowego, Łoś M, WKiŁ, Warszawa 1974</p>		
Additional bibliography:		
<p>1. Modern Railway Track, C. Esveld, Delft, 2001 2. Stability of continuous welded rail track, M. A. Van, Delft, 1995 3. 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 (z późniejszymi zmianami) 4. Przepisy Id-1 (D-1) Warunki techniczne utrzymania nawierzchni na liniach kolejowych, Warszawa, 2005 5. Przepisy Id-3 (D-4), Warunki techniczne utrzymania podtorza kolejowego, Warszawa, 2004</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. Student's attendance to lectures	20	
2. Current preparation to lectures	5	
3. Preparation to final exam and student's attendance to exam	25	
Student's workload		
Source of workload	hours	ECTS
Total workload	50	2
Contact hours	20	1
Practical activities	0	0