

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Railway Stations and Junctions		Code 1010102121010120233
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: 2 Classes: 1 Laboratory: - Project/seminars: 3		No. of credits 6
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 6 100% 6 100%
Responsible for subject / lecturer: DSc Eng. Jeremi Rychlewski email: jeremi.rychlewski@put.poznan.pl tel. 61 647 5816 Department of Civil and Environmental Engineering ul. Piotrowo 5, 60-965 Poznań		Responsible for subject / lecturer: Prof. DSc Hab. Eng. Łucjan Siewczyński email: lucjan.siewczynski@put.poznan.pl tel. 61 665 2431 Department of Civil and Environmental Engineering ul. Piotrowo 5, 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K_W01. Has an advanced knowledge of sectors of mathematical and physical knowledge important for railway construction. K_W02, K_W14. Knows functions and design rules for small and medium stations. K_W09, K_W10, K_W11. Knows general rules governing optimisation and effectiveness of action, cost and financial management.
2	Skills	K_U02. Has an ability to classify rail network elements and rail traffic posts. K_U03, K_U09. Has an ability to design railway superstructure and layout of turnouts. K_U05. Knows methods for building process optimisation.
3	Social competencies	K_K02. Is responsible for solidity of results acquired from own or subordinate team's work. K_K04. Is conscious about a need to promote ecologically sustainable solutions and effectiveness in construction processes. K_K11. Behaves with regard to rules of ethics.
Assumptions and objectives of the course: A basic goal of this subject is to learn how to shape track layout of a station with installations for passenger service, loading and unloading of cargo, and rail vehicles' management.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Knows technology of work for stations of varying size, - [K_W09]		
2. Has knowledge about designing track layout on stations of various types and size, and about designing railway junctions, - [K_W14]		
3. Knows rules for designing a station within existing spatial arrangement and transport system. - [K_W16]		
Skills:		
1. Can design a track layout and drainage for a medium size railway interchange station, - [K_U03]		
2. Has an ability to calculate parameters of a marshalling hill, - [K_U08]		
3. Can calculate with deterministic methods a needed number of tracks on a station and check station head - [K_U13]		
Social competencies:		
1. Can work individually and in a group on a given task, - [K_K01]		
2. Is responsible for solidity of results acquired from own or subordinate team's work, - [K_K02]		
3. Draws conclusions and describes results of own work. - [K_K07]		

Assessment methods of study outcomes		
Lectures ? written exam at semester?s end, activity during lectures; Project ? achievement of projects with the projects? defence.		
Course description		
Rules for station design. Large passenger and cargo stations, including yard, loading, marshalling and border stations. Specialist station equipment: warehouses, ramps, loading equipment, engine yards. Train control on stations. Calculation of track length. Marshalling hills. Railway junctions. Classes: calculations of required amount of track, checking station's capacity, calculating marshalling hill parameters. Design of a medium interchange station.		
Basic bibliography:		
1. Cieślakowski S.: Stacje kolejowe. WKiŁ, Warszawa 1992. 2. Massel A.: Projektowanie linii i stacji kolejowych. KOW, Warszawa 2010. 3. Sysak J.: Podstawy dróg kolejowych. WKiŁ, Warszawa, 1982. 4. Szajer R.: Drogi żelazne tom III. WKiŁ, Warszawa, 1970. 5. Węgiński J.: Układy torowe stacji ? funkcja I teoria. WKiŁ, Warszawa 1974. 6. Wyrzykowski, W.: Ruch kolejowy. WKiŁ, Warszawa, 1967 7. Id-1. Warunki techniczne utrzymania nawierzchni na liniach kolejowych. PKP Polskie Linie Kolejowe S.A., Warszawa 2005.		
Additional bibliography:		
1. Chwieduk A., Dyr. T.: Projektowanie ruchu pociągów. WPR, Radom 1997. 2. Dąbrowa-Bajon M.: Podstawy sterowania ruchem kolejowym. OWPW, Warszawa, 2002. 3. Rojek A.: Tabor i trakcja kolejowa. KOW, Warszawa 2010. 4. Woch J.: Narzędzia analizy efektywności i optymalizacji sieci kolejowej. WPŚI., Gliwice 2001. 5. Woch J.: Podstawy inżynierii ruchu kolejowego. WKiŁ, Warszawa 1983. 6. Żurkowski A., Pawlik M.: Ruch i przewozy kolejowe, sterowanie ruchem. KOW, Warszawa 2010. 7. Przegląd Komunikacyjny, Stowarzyszenie Inżynierów i Techników Komunikacji Rzeczpospolitej Polskiej, Warszawa. 8. Technika Transportu Szynowego, EMI-PRESS, Łódź. 9. Transport Miejski i Regionalny, Stowarzyszenie Inżynierów i Techników Komunikacji Rzeczpospolitej Polskiej, Warszawa. 10. Proceeding of a cyclic conference: Drogi kolejowe		
Result of average student's workload		
Activity	Time (working hours)	
1. Student?s attendance to lectures, classes and projects.	68	
2. Consulting.	20	
3. Preparation to exam.	30	
4. Preparation to colloquium.	10	
5. Designing project outside classrooms.	40	
Student's workload		
Source of workload	hours	ECTS
Total workload	168	6
Contact hours	68	2
Practical activities	94	4