

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: 45 Classes: - Laboratory: - Project/seminars: 30		No. of credits 6
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 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 Faculty 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 Faculty 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 of small 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_K03. 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:		
1) Deliver knowledge about medium and big railway stations, including passenger, yard, marshalling and loading stations. 2) Deliver knowledge about intermodal and combined transport. 3) Deliver knowledge about passenger services (including services for disabled) and connected infrastructure. 4) Deliver knowledge about infrastructure for loading and unloading railway cars, and for railway cars' maintenance. 5) Teach rules of designing medium stations. 6) Deliver knowledge about railway junctions.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Knows rules and codes for railway station design, - [K_W14] 2. Knows rules of passenger service optimisation focused at rail traffic competitiveness, - [K_W09, K_W16] 3. Has knowledge about management of station infrastructure. - [K_W19]		
Skills:		
1. Can design a station's track layout, - [K_U03] 2. Can design a station according to rules for sustainable transport, - [K_U08] 3. Can design a scheme for station's traffic management. - [K_U12]		

Social competencies:
1. Is conscious about a need to fulfil rules of sustainable transport, - [K_K04]
2. Understands a need to present knowledge about rail transport's benefits to modern society, - [K_K08]
3. Takes care about own health and physical fitness by using modes of transport alternative to the car. - [K_K13]

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
Technology of work and design of medium and large railway stations. Large passenger and cargo stations, including maintenance, loading, border and marshalling stations. Specialist station buildings: warehouses, ramps, loading infrastructure, engine yards. Intermodal transport. Railway junctions' layout. Medium station design.

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.

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. Proceedings of a cyclic conference: Drogi kolejowe.

Result of average student's workload

Activity	Time (working hours)
1. Student's attendance to lectures, laboratories and projects.	57
2. Consulting.	20
3. Preparation to exam.	27
4. Designing project outside classrooms.	64

Student's workload		
Source of workload	hours	ECTS
Total workload	150	6
Contact hours	77	3
Practical activities	84	3