

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Railway Stations and Junctions		Code 1010102111010120233
Field of study Civil Engineering Second-cycle Studies	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
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: 15 Project/seminars: 15		No. of credits 3
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 %) 3 100% 3 100%
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_W09, K_W10. Knows rules for construction, design and analysis of rail buildings. K_W14. Knows rules for design of railways. K_W17. Has basic knowledge about spatial planning of transport and influence of construction investment on environment.
2	Skills	K_U01. Has an ability to classify rail network elements. K_U06, K_U14. Has an ability to utilise chosen computer programmes and read construction and geodesy drawings. K_U20. Has an ability to analyse investor?s architectural and urbanistic needs and choose railway superstructure material according to planned use.
3	Social competencies	K_K01, K_K03. Can work individually and in a group on a given task; individually improves and enlarges own knowledge concerning modern technology, processes and techniques in railway transport. K_K02, K_K05. Takes responsibility for solidity of own work?s results and interpretation, for own and team?s safety. K_K10. Behaves with regard to rules of ethics.
Assumptions and objectives of the course: A basic goal of this subject is to teach how to shape track layouts on stations, including installations for passengers service and freight distribution.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Knows classification of posts on railway network, - [K_W02] 2. Knows rules for track layout on a station, including technology for management of train and shunting traffic, - [K_W02, K_W14, K_W19] 3. Has knowledge about shaping track layout on small and medium stations. - [K_W19]		
Skills:		
1. Can design a track layout at a medium interchange station, - [K_U03, K_U09] 2. Can calculate deterministically a required number of tracks for a station and check a station head, - [K_U13] 3. Can calculate parameters of a marshalling hill. - [K_U13, K_U16]		
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. Can design railway track layouts according to cost optimisation rules. - [K_K11]

Assessment methods of study outcomes

Lectures - activity during lectures;
 Project - achievement of projects with a possibility of the projects? defence;
 Laboratory - written colloquium.

Course description

Lectures: Railway network and the network's elements: posts, stations. Track layout, station equipment, turnouts. Technology of a station's work. Rules for station design. Marshalling hills.
 Laboratory: Shaping of station's heads. Calculation of required number of tracks. Checking station head's capacity. Calculation of marshalling hill's parameters.
 Project: Project of track layout for a medium interchange station, capacity calculations included.

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.	45
2. Consulting.	10
3. Preparation to colloquium.	10
4. Designing project outside classrooms.	20

Student's workload

Source of workload	hours	ECTS
Total workload	75	3
Contact hours	65	2
Practical activities	45	2