STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Railway operations**		Code **1010101171010124821**
Field of study **Civil Engineering First-cycle Studies**	Profile of study (general academic, practical) **general academic**	Year /Semester **4 / 7**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **elective**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **30** Classes: **-** Laboratory: **-** Project/seminars: **-**		No. of credits **4**
Status of the course in the study program (Basic, major, other) **other**	(university-wide, from another field) **from another field**	
Education areas and fields of science and art **technical sciences** **Technical sciences**		ECTS distribution (number and %) **4 100%** **4 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	K_W01. Has knowledge of sectors of mathematical and physical knowledge import ant for railway construction and of geotechnics and soil mechanics. K_W09, K_W10. Knows rules for design of rail and car roads. 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:

1) Deliver basic knowledge about turnouts.
2) Deliver basic knowledge about rail vehicle?s control as a function of braking distance.
3) Deliver basic knowledge about design of tram tracks.
4) Deliver knowledge about balance of soil mass.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Knows chosen rules for tram track design and turnouts used in railroads, - [K_W06, K_W09]
2. Knows a method for managing soil mass during construction, - [-]
3. Has knowledge about rail traffic control. - [K_W10]

Skills:

1. Has an ability to use skills connected to railroad design for tram track design, - [K_U08]
2. Can show basic rules governing competition in transport sector. - [-]

Social competencies:
1. Is conscious about a need to improve own professional skills. - [K_K06]

Assessment methods of study outcomes
Written colloquium at lecture?s end (at third attempt and following an oral colloquium may take place), activity during lectures.

Course description
Turnouts. Urban transport. Rail traffic control. Public transport priority. Competition in transport sector. Earthwork?s balance.

Basic bibliography:

1. Cieślakowski S.: Stacje kolejowe. WKiŁ, Warszawa 1992.
2. Datka S., Suchorzewski W.: Tracz M. Inżyniera Ruchu. WKiŁ, Warszawa 1999.
3. Massel A.: Projektowanie linii i stacji kolejowych. KOW, Warszawa 2010.
4. Podoski J.: Transport w miastach. WKiŁ, Warszawa 1977.
5. Wiłun Z.: Zarys Geotechniki. WKiŁ, Warszawa 2005.
6. Żurkowski A., Pawlik M.: Ruch i przewozy kolejowe, sterowanie ruchem. KOW, Warszawa 2010.

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. Ostaszewicz J., Rataj M.: Szybka komunikacja miejska. WKiŁ, Warszawa 1979.
4. Rozkwitalska C.: Koszty i korzyści transportu zbiorowego i indywidualnego w miastach. IGPiK, Warszawa 1997.
5. Woch J.: Podstawy inżynierii ruchu kolejowego. WKiŁ, Warszawa 1983.
6. Przegląd Komunikacyjny, Stowarzyszenie Inżynierów i Techników Komunikacji Rzeczpospolitej Polskiej, Warszawa.
7. Technika Transportu Szynowego, EMI-PRESS, Łódź.
8. Transport Miejski i Regionalny, Stowarzyszenie Inżynierów i Techników Komunikacji Rzeczpospolitej Polskiej, Warszawa.
9. Proceeding of a cyclic conference: Problemy komunikacyjne miast w warunkach zatłoczenia motoryzacyjnego.

Result of average student's workload

Activity	Time (working hours)
1. Student?s attendance to lectures.	23
2. Consulting.	15
3. Literature study.	47
4. Practical activities	15

Student's workload

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	38	1
Practical activities	0	0