

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Railroads</b>		Code <b>1010101161010120153</b>
Field of study <b>Civil Engineering First-cycle Studies</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 6</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>15</b> Laboratory: <b>-</b> Project/seminars: <b>15</b>		No. of credits <b>3</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art		ECTS distribution (number and %)
<b>Responsible for subject / lecturer:</b> DSc. Eng. Michał Pawłowski email: <a href="mailto:michal.pawlowski@put.poznan.pl">michal.pawlowski@put.poznan.pl</a> tel. 61 665 24 07 Civil and Environmental Engineering ul. Piotrowo 5, 60-965 Poznań		<b>Responsible for subject / lecturer:</b> DSc. Eng. Jeremi Rychlewski email: <a href="mailto:jeremi.rychlewski@put.poznan.pl">jeremi.rychlewski@put.poznan.pl</a> tel. 61 647 58 16 Civil and Environmental Engineering ul. Piotrowo 5, 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	K_W01; K_W03; K_W04; K_W08; K_W09; K_W14; K_W17
2	<b>Skills</b>	K_U02; K_U05; K_U13; K_U14; K_U16; K_U20
3	<b>Social competencies</b>	K_K01; K_K02; K_K05
<b>Assumptions and objectives of the course:</b> Acquaintance with railway network and railway classification. Acquaintance with rules governing design of railroads in plane and profile. Knowledge about superstructure and subgrade elements. Ability to calculate a train traction. Ability to calculate strength of superstructure and subgrade. Preliminary knowledge about a role of stations.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. has basic knowledge about railway network and it's hierarchy, - [-] 2. knows rules of designing a railway in plane and profile, - [-] 3. has basic knowledge about railway superstructure and subgrade. - [-]		
<b>Skills:</b>		
1. can design a railway line in plane and profile in an uncomplicated terrain, - [-] 2. can propose a solution for railroad drainage, - [-] 3. can conduct train traction calculations. - [-]		
<b>Social competencies:</b>		
1. can work both individually and in a group solving a given topic, - [-] 2. is responsible for credibility of his work's results and their interpretation, - [-] 3. draws conclusions and writes results of his work. - [-]		
<b>Assessment methods of study outcomes</b>		

<p>Assessment of knowledge: activity during classes and a colloquium at semester's end.                  Points might be earned for:                  ? the activity during the classes,                  ? knowledge presented during the colloquium.                  Assessment of skills: an analysis of a state of superstructure and subgrade.                  Points might be earned for:                  ? the activity during the classes,                  ? skills presented during the colloquium.</p>		
<b>Course description</b>		
<p>Characteristics of railways, railway network, classification and categorisation of railways, railroad in plane and profile, standard cross-sections, classical and non-classical superstructure, subgrade, construction of embankments, subgrade drainage, small stations, technology of manoeuvring at a station, train traction calculations.</p>		
<p><b>Basic bibliography:</b></p> <ol style="list-style-type: none"> <li>Bałuch. H., Bałuch M.: Układy geometryczne toru i ich deformacje. KOW, Warszawa 2010.</li> <li>Batko M.: Budowa i utrzymanie dróg kolejowych, WKiŁ, Warszawa 1985.</li> <li>Bogdaniuk B., Topcik K.: Budowa, modernizacja i naprawy dróg kolejowych. KOW, Warszawa 2010.</li> <li>Cieślakowski S.: Stacje kolejowe, WKiŁ, Warszawa 1992.</li> <li>Id-1. Warunki techniczne utrzymania nawierzchni na liniach kolejowych. PKP Polskie Linie Kolejowe S.A., Warszawa 2005.</li> <li>Id-3. Warunki techniczne utrzymania podtorza kolejowego. PKP Polskie Linie Kolejowe S.A., Warszawa 2009.</li> <li>Kiewlicz S., Łączyński J., Pelc S.: Nawierzchnia kolejowa typu S60, S49, S42. WKiŁ, Warszawa 1974.</li> <li>Sancewicz S.: Nawierzchnia kolejowa. KOW, Warszawa 2010.</li> <li>Semrau A., Zamięcki H.: Budowa i utrzymanie dróg kolejowych, tom II, WKiŁ, Warszawa 1975.</li> <li>Sysak J. (red.): Drogi kolejowe. PWN, Warszawa 1986.</li> <li>Topcik K.: Utrzymanie nawierzchni kolejowej. WKiŁ, Warszawa 1990.</li> </ol>		
<p><b>Additional bibliography:</b></p> <ol style="list-style-type: none"> <li>Wilun Z.: Zarys geotechniki, WKiŁ, Warszawa 2005.</li> <li>Infrastruktura Transportu, ELAMED, Katowice</li> <li>Przegląd Komunikacyjny, Stowarzyszenie Inżynierów i Techników Komunikacji Rzeczpospolitej Polskiej, Warszawa</li> <li>Technika Transportu Szynowego, EMI-PRESS, Łódź</li> <li>Transport Miejski i Regionalny, Stowarzyszenie Inżynierów i Techników Komunikacji Rzeczpospolitej Polskiej, Warszawa</li> </ol>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Class attendance:	45	
2. Preparation for knowledge colloquium:	10	
3. Preparation for skills colloquium:	10	
4. Consultancy:	5	
5. Desing of a projects outside classes:	20	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	90	3
Contact hours	60	2
Practical activities	15	1