

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject (-)Construction and maintenance of roads		Code 1010101161010123858
Field of study Civil Engineering First-cycle Studies	Profile of study (general academic, practical) (brak)	Year /Semester 3 / 6
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 30 Classes: 15 Laboratory: - Project/seminars: 30		No. of credits 5
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 5 100%
Responsible for subject / lecturer: dr inż. Jarosław Wilanowicz email: jaroslaw.wilanowicz@put.poznan.pl tel. 61-665-24-86 Faculty of Civil and Environmental Engineering 5, Piotrowo str., 60-965 Poznań		Responsible for subject / lecturer: dr inż. Andrzej Pożarycki email: andrzej.pozarycki@put.poznan.pl tel. 61 647-58-17 Faculty of Civil and Environmental Engineering 5, Piotrowo str., 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	K_W02 - The student has a basic knowledge in the field of road construction (Soil mechanics, Technology of road materials and Basic of road construction) K_W05 - The student knows the basic methods, techniques, tools and materials used in solving simple engineering tasks. K_W06 - The student has a basic knowledge necessary to understand the social, economic and legal conditions of engineering activity.
2	Skills	K_U01 ? The student can make an identification and formulate the specification of simple engineering tasks of a practical nature. K_U05 - The student can obtain information from literature, databases and other sources, integrate the received information, make their interpretation, and draw conclusions. K_U09 - The student can make a critical analysis of the methods of operation and evaluate the existing technical solutions.
3	Social competencies	K_K01 - The student can work independently and collaborate as a team on a designated task. K_K02 - The student can properly identify the priorities for implementation of the task specified by himself or others.
Assumptions and objectives of the course:		
1. Transfer of knowledge within the scope of technology of road pavement construction. 2. Creation of skills for solving tasks related to the maintenance of roads, both in terms of the current maintenance as well as the system maintenance. 3. Transfer of the basic knowledge within the scope of the classification and characteristics of road intersections and grade separated junctions (types, collision, traffic management systems) and creation of skills for their use in practice.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. The student knows the overall technical specifications concerning the road investment works and the technical requirements WT-2010 - [[K_W06]] 2. The student knows the technologies of construction of individual structure courses of the road pavement - [[K_W11]] 3. The student knows the methods of assessment of the technical condition of the road pavements, shoulders and drainage, and the methods of road management - [[K_W14]] 4. The student knows the issues of the current and system maintenance of the technical condition of the elements included in the total land requirement and the technical specifications for road maintenance works - [[K_W15]] 5. The student knows the basic rules of construction, dimensioning and designing of geometric components of road intersections and grade separated junctions - [[K_W16]]		

Skills:
<p>1. The student can take advantage of the overall technical specifications to create the detailed technical specifications for road pavement works - [[K_U05]]</p> <p>2. The student can define tasks within the scope of the current road maintenance and pavement management systems (PMS) and appoint a global assessment of the technical condition of the road pavement - [[K_U16]]</p> <p>3. The student can measure the construction components of road intersections and grade separated junctions and design the simple geometric form of intersection, check the visibility and passability at intersections and exits - [[K_U08]]</p>
Social competencies:
<p>1. The student can formulate opinions on the technical and technological processes in road construction - [[K_K07]]</p> <p>2. The student understands the need to forward knowledge on the technical condition of road pavements and inform the public in a sufficiently convincing manner as the failure or delay of intended pavement maintenance works could affect adversely the condition and usability of the road network - [K_K08]. - [[K_K08]]</p> <p>3. The student understands the need for learning all his life, can inspire and organize the learning process to others - [[K_K03]]</p>

Assessment methods of study outcomes
<p>Suitable execution of the project within the scope of the technology of road pavement construction, the maintenance of roads and the assessment of technical condition of road pavements.</p> <p>Suitable execution of the project within the scope of dimensioning the geometric components of road intersections and passing the classes in writing.</p> <p>Written exam. Information about the exam questions and the form of exam is passed on to students during the first lecture.</p> <p>Number of points - the rating</p> <p>from 90 to 100 - very good</p> <p>from 80 to 90 - good plus</p> <p>from 70 to 80 - good</p> <p>from 60 to 70 - sufficient plus</p> <p>from 50 to 60 - sufficient</p> <p>below 50 ? insufficient</p>
Course description
<p>Characteristics of road traffic. The technical requirements that the road pavements should be correspond to.</p> <p>Configurations (layouts) of the road courses. Methods of strengthening of the road subgrade.</p> <p>Wet mix macadam. Soil stabilization with binders. Road foundations. Technologies of road pavements construction of the bituminous mixtures. Factors having an effect on compaction of coated materials (blacktops). Technologies of road pavements construction from the drystone and gravel, sett paving, concrete block paving, paving stones. Technologies of construction of the road concrete pavements. Technologies of construction of the footway and cycle track pavements. Principles of making acceptances of road works.</p> <p>Bases of maintenance of roads. Tasks of the road manager. Current maintenance. Spring, summer, autumn and winter maintenance. Pavement management systems (PMS). System of assessment of the technical condition of road pavements SOSN. System of assessment of the shoulders and drainage SOPO.</p> <p>Maintenance system of road pavements in informatics system of road network management. Presentation of the street network management system for Poznań city.</p> <p>Classification and characterization of the grade junctions and the grade separated interchanges (one-, two- and multi-level crossing). The types of traffic maneuvers at junctions and road interchanges, their impact on the collision and traffic safety. Methods used in traffic management systems. Basic principles of design of geometric details of junctions and road interchanges (road safety, traffic flow, visibility at the intersection, aesthetics of solutions). Traffic capacity. Advantages and disadvantages of different geometric forms of the junctions and road interchanges.</p>
Basic bibliography:
<ol style="list-style-type: none"> Overall technical specifications concerning the road investment works and the road maintenance works. The collective work. Branżowy Zakład Doświadczalny Budownictwa Drogowego i Mostowego, GDDKiA, Warszawa, 1998-2012. Piłat J., Radziszewski P., Asphalt concrete pavements, Wyd. Komunikacji i Łączności, Warszawa 2004. Szydło A., Road concrete pavements, Polski Cement sp. z o.o., Kraków 2004. Krystek R., - the collective work - Road and motorway interchanges, WKiŁ, Warszawa, 2008. Design guidelines of the road grade junctions, Generalna Dyrekcja Dróg Publicznych, Warszawa 2001.

Additional bibliography:		
1. Szrajber J., - the collective work - Instruction of assessment of the economic efficiency for the road and bridge projects, Instytut Badawczy Dróg i Mostów, Warszawa, 2007.		
2. Błażejowski K., Styk S., Technology of the bituminous layers, WKŁ, Warszawa 2009. 3. Technical Requirements WT 2010, GDDKiA, Warszawa 2010.		
3. Szczuraszek T., Urban traffic safety, WKiŁ, Warszawa 2006.		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in the lectures.	30	
2. Participation in the classes.	15	
3. Participation in the projects.	30	
4. Performance of projects and the consultations.	30	
5. Preparing to pass the classes.	10	
6. Exam Preparation.	25	
Student's workload		
Source of workload	hours	ECTS
Total workload	140	5
Contact hours	75	3
Practical activities	65	2