

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Construction and maintenance of roads</b>		Code <b>1010101171010123858</b>
Field of study <b>Sustainable Building Engineering First-cycle</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>4 / 7</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>elective</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>-</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 <b>technical sciences</b>		ECTS distribution (number and %) <b>3 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Jaroslaw Wilanowicz email: jaroslaw.wilanowicz@put.poznan.pl tel. 61-665-24-86 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
<b>1</b>	<b>Knowledge</b>	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.
<b>2</b>	<b>Skills</b>	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.
<b>3</b>	<b>Social competencies</b>	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.
<b>Assumptions and objectives of the course:</b> Transfer of the engineering knowledge within the scope of design and construction technology of the road pavements, 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 and develop skills of their application in practice.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
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 basic construction technologies of individual structure courses of the road pavement. - [K_W09] 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]		
<b>Skills:</b>		

<p>1. The student is able to classify the pavement structure. - [K_U01]</p> <p>2. The student can use of the overall technical specifications to create the detailed technical specifications for road pavement works. - [K_U05]</p> <p>3. The student can define tasks within the scope of the current road maintenance and pavement management systems and appoint a global assessment of the technical condition of the road pavement construction. - [K_U16]</p>
<p><b>Social competencies:</b></p> <p>1. The student understands the need for learning all his life, can inspire and organize the learning process to others - [K_K03]</p> <p>2. The student can formulate opinions on the technical and technological processes in road construction - [K_K07]</p> <p>3. 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><b>Assessment methods of study outcomes</b></p>
<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>
<p><b>Course description</b></p>
<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.</p> <p>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><b>Basic bibliography:</b></p> <p>1. 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</p> <p>2. Road Maintenance Management: Concepts and Systems 1998th Edition, by Richard Robinson (Author), Uno Danielson (Author), Martin Snaith (Author), ISBN-13: 978-0333721551, ISBN-10: 0333721551.</p> <p>3. The location, design, construction and maintenance of road pavements. Edited by: C.A. O'Flaherty ISBN: 978-0-7506-5090-8, Publisher's Note: Transferred to Taylor &amp; Francis as of 2012.</p> <p>4. Low-Volume Road Engineering: Design, Construction, and Maintenance. Robert A. Douglas. ISBN 9781138748156.</p>
<p><b>Additional bibliography:</b></p> <p>1. Obwieszczenie Ministra Infrastruktury i Budownictwa z dnia 23 grudnia 2015 r. w sprawie ogłoszenia jednolitego tekstu rozporządzenia Ministra Transportu i Gospodarki Morskiej z 1999 r. w sprawie warunków technicznych, jakim powinny odpowiadać drogi publiczne i ich usytuowanie (Dz.U. z dnia 29 stycznia 2016 r., Poz. 124).</p> <p>2. Rafalski L, (praca zbiorowa) - Eksploatacja dróg, Studia i materiały, zeszyt 65, Instytut Badawczy Dróg i Mostów, Warszawa 2011.</p> <p>3. Błażejowski K., Styk S., Technologia warstw asfaltowych, WKŁ, Warszawa 2009.</p> <p>4. System Oceny Stanu Nawierzchni SOSN, Wytyczne Stosowania, GDDKiA 2010.</p> <p>5. Sybilski D. (praca zbiorowa), Katalog przebudów i remontów nawierzchni podatnych i półsztywnych. GDDKiA, IBDiM, Warszawa 2013.</p>
<p><b>Result of average student's workload</b></p>

<b>Activity</b>		<b>Time (working hours)</b>
1. Participation in the lectures		30
2. Participation in the projects		15
3. Consultations		5
4. Performance of projects		12
5. Exam Preparation		12
6. Participation in the exam		1
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	75	3
Contact hours	45	2
Practical activities	15	1