

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Road building</b>		Code <b>1010104191010121920</b>
Field of study <b>Civil Engineering First-cycle Studies</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>5 / 9</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>part-time</b>	
No. of hours Lecture: <b>20</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</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> 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		<b>Responsible for subject / lecturer:</b> dr inż. Andrzej Pożarycki; dr inż. Agnieszka Płatkiewicz email: andrzej.pozarycki@put.poznan.pl; agnieszka.platkiewicz@put.poznan.pl tel. 61-647-58-17; 61-665-24-86 Faculty of Civil and Environmental Engineering 5, Piotrowo str., 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
<b>1</b>	<b>Knowledge</b>	The student has knowledge of road design, construction and maintenance of roads, and related technical conditions and norms. The student knows the rules of the construction of road earthworks. The student knows the general mechanics, strenght of materials, soil mechanics, modeling materials and general principles of shaping the pavements structures.
<b>2</b>	<b>Skills</b>	The student is able to acquire information from literature, databases and other sources and to integrate obtained data. The ability to interpret and draw conclusions. The student knows how to dimension the basic elements of the road. The student can execute a road project documentation at the preliminary design. The student is able to perform simple laboratory experiments to get awareness of the techniques of obtaining parameters for numerical models.
<b>3</b>	<b>Social competencies</b>	The student can work independently and collaborate as a team on a designated task. The student follows the rules of ethics. The student is aware of the need to raise professional and personal competences.
<b>Assumptions and objectives of the course:</b>		
1) Transfer of engineering knowledge in the scope of the pavement mechanics, technology of road works and road maintenance. 2) Development of basic skills to identify and solve the basic tasks concerning the pavement designing, road building and road management.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. The student knows the rules for the implementation of road construction objects and selection of machines and equipment for the execution of the works and the technologies of the works. - [K_W12] 2. The student has a basic knowledge concerning the organization and project management, and knows the rules for drawing up the work schedule of building equipments. - [K_W15] 3. The student knows the elements of road management systems and traffic management systems. - [K_W14] 4. The student knows the principles of design and analysis of pavement structures of varying purposes (roadways, maneuvering squares, terminals, airport boards). - [K_W09]		
<b>Skills:</b>		

<p>1. The student can make a selection of the building equipments in accordance with the rules for their use. - [K_U20]</p> <p>2. The student knows how to make a simple work schedule for building equipments. - [K_U07]</p> <p>3. The student uses information technology, internet resources and other sources to search for information, communication and acquisition of software applications for road manager. - [K_U17]</p> <p>4. The student is able to correctly select computational tools to solve problems of analysis and design of multilayer pavement structures. - [K_U05]</p>
<p><b>Social competencies:</b></p> <p>1. The student can work independently. - [K_K01]</p> <p>2. The student independently complements and extends knowledge within the scope of the technological processes of building roads. - [K_K03]</p> <p>3. The student is aware of the need to improve his professional skills. - [K_K06]</p>

<b>Assessment methods of study outcomes</b>
<p>Student's knowledge and their skills are assessed based on a written pass, which takes place on the last lectures per semester (according to the plan of studies).</p> <p>The written pass consists of three questions and takes 45 minutes.</p> <p>Information about the form and date of test and its duration shall be provided to students during the first lecture in the semester.</p> <p>Grading scale:</p> <p>9 points - A (very good)</p> <p>8 points - B (good plus)</p> <p>7 points - C (good)</p> <p>6 points - D (satisfactory plus)</p> <p>5 points - E (satisfactory)</p> <p>below 5 points - F (fail)</p>

<b>Course description</b>
<p>Theoretical, technical and operating efficiency of a building machine. Classification and characteristics of the building machines used in road construction (purpose, structure and diagrams of the work of machines). General rules for execution of construction works included in the technological process of building roads and ways of their mechanization.</p> <p>Issues related to the use of roads, road management and impact of exploitation of roads on the environment. Rules for keeping records of roads, reference systems, road management system elements including road data banks, systems of assessment of road elements, models and analysis.</p> <p>Introduction to the pavements analysis of different purpose (law basics, classification, technical conditions, diagnostics). Determination of parameters for numerical models of pavements: laboratory methods and testing of in-situ. Pavement mechanics (the elements of prognosis). Modeling the pavement subgrade. Modeling the flexible and rigid pavements.</p>

<p><b>Basic bibliography:</b></p> <p>1. Bogdan Cyunel. Technologia i organizacja budownictwa drogowego; PWN, Warszawa 1986.</p> <p>2. Jerzy Kaniewski, Wiesław Kietliński. Technologia zmechanizowanych robót drogowych, (skrypt Politechniki Warszawskiej, 1994r.);</p> <p>3. Maciej Jodłowski. Operator maszyn do robót drogowych, Wyd. KaBe, Krosno 2003.</p> <p>4. Praca zbiorowa. Eksploatacja dróg. IBDiM. Warszawa 2011.</p> <p>5. Praca zbiorowa. Zasady ochrony środowiska w drogownictwie. IBDiM. Warszawa 1999.</p> <p>6. Firlej S., Mechanika nawierzchni drogowej. Petit s.c. Lublin 2007.</p> <p>7. Nagórski R., Mechanika nawierzchni drogowej w zarysie. PWN. Warszawa 2004.</p>
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<p><b>Additional bibliography:</b></p> <p>1. Ogólne Specyfikacje Techniczne. D.02.00.00 dot. wykonania i odbioru robót ziemnych, Branżowy Zakład Doświadczalny Budownictwa Drogowego i Mostowego Sp. z o.o na zlecenie GDDP, Warszawa 1998.</p> <p>2. Ogólne Specyfikacje Techniczne. D.04.00.00 oraz D.05.00.00 dot. wykonania i odbioru robót związanych z wykonywaniem warstw konstrukcji nawierzchni, Branżowy Zakład Doświadczalny Budownictwa Drogowego i Mostowego Sp. z o.o na zlecenie GDDP, Warszawa 2001.</p> <p>3. Praca zbiorowa. Zagadnienia utrzymania i modernizacji dróg i ulic. WKiŁ. Warszawa 1995.</p> <p>4. Nita P., Budowa i utrzymanie nawierzchni lotniskowych. WKiŁ, Warszawa 1999.</p> <p>5. Maro L., Geosyntetyki do powierzchniowego wzmocnienia gruntu. Lemar. 2010.</p>
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<b>Result of average student's workload</b>	
Activity	Time (working hours)

1. Direct participation of the student in the lectures.	20	
2. Learning student to prepare himself to pass the exam.	35	
3. Direct participation of the student in the writing pass.	1	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	50	2
Contact hours	20	1
Practical activities	0	0