



COURSE SPECIFICATION

Course code	B2-1-BD-204
Course title in Polish	Technologia materiałów drogowych
Course title in English	Technology of pavement materials
Valid from academic year	2019/2020

CURRICULAR ALIGNMENT

Programme	CIVIL ENGINEERING
Level	second-cycle
Programme profile	academic
Mode of attendance	full-time
Specialism	Highway Engineering
Academic unit responsible for the course	Department of Transport Engineering
Course coordinator	Dr hab. inż Anna Chomicz-Kowalska, prof PŚk
Approved by	prof. dr hab. inż. Marek Iwański

COURSE DESCRIPTION

Teaching block	specialism
Course status	required
Language of instruction	Polish
Semester of delivery	semester I
Prerequisites	-
Exam (YES/NO)	YES
ECTS	5

Mode of teaching	lecture	class	lab	project	seminar
Number of hours per semester	30		30		

LEARNING OUTCOMES

Category	Code	Learning outcomes	Corresponding programme outcome code
Knowledge	W01	Students know the principles of analysis, construction and dimensioning of road construction components.	B2_W02

	W02	Students know the principles of industrial production and construction products related to road repair technologies.	B2_W05
	W03	Students know standards and guidelines for the design of bituminous mixtures for pavement structural layers.	B2_W14
Skills	U01	Students can design a mixture for pavement structural layers.	B2_U03
	U02	Students are able to plan and carry out a laboratory experiment leading to the assessment of the quality of materials to be used in the pavement structural layers.	B2_U11
Competence	K01	Students can work independently.	B2_K01
	K02	Students are responsible for the reliability of the results of their work and the assessment of the work of other team members.	B2_K02
	K03	Students are aware of the need to independently expand their knowledge of modern processes and technologies in road construction related to pavement rehabilitation.	B2_K03

COURSE CONTENT

Teaching mode*	Topics covered
lecture	<p>1. Soil as the subgrade and the material for pavement structure.</p> <p>2. Characterization of aggregate as pavement structural layers material. Requirements for aggregate according to EN 13043 and WT-2 of 2010. The role of aggregate in the performance of asphalt pavement.</p> <p>3. Classification of bituminous binders. Properties of natural and petroleum asphalts. Characteristics of new types of paving asphalts. Special binders.</p> <p>4. The affinity of asphalt and aggregate. Phenomenon of absorption of asphalt by aggregate.</p> <p>5. Classification of road base course layers. Characteristics of base types.</p> <p>6. Classification of asphalt mixes.</p> <p>7. Characteristics of basic asphalt mixtures according to PN-EN 13108-4 and WT 2 of 2010.</p> <p>8. Asphalt mix production and laying technology.</p> <p>9. The Strategic Highway Research Program (SHRP) - latest requirements for asphalt binder and asphalt mixture.</p> <p>10. Design of asphalt mixtures using the Superpave methodology.</p> <p>11. Cement concrete road pavements.</p> <p>12. Non-destructive testing of the properties of in-service asphalt pavements.</p>
lab	<p>1. Determination of basic parameters of road asphalts.</p> <p>2. Determination of aggregate granulometry.</p> <p>3. Design of mineral mixture.</p> <p>4. Selection of optimum quantity of asphalt binder.</p> <p>5. Preparation of asphalt mixes using ordinary and multigrade asphalt.</p> <p>6. Testing physical and mechanical properties of asphalt mixtures, along with water and frost resistance, and indirect tensile tests for elastic stiffness moduli.</p> <p>7. Roughness tests of asphalt pavements under laboratory conditions based on Marshall samples and British pendulum.</p>

METHODS OF LEARNING OUTCOMES VERIFICATION

Learning outcome	Learning outcome verification methods					
	Oral exam	Written exam	Test	Project	Report	Other
W01		X	X		X	
W02		X				
W03		X	X		X	
U01		X	X		X	
U02		X	X		X	
K01			X		X	
K02			X		X	
K03		X	X		X	

ASSESSMENT

Teaching mode*	Assessment type	Criteria
lecture	exam	Scoring at least 50% on the exam.
lab	mark-based	A passing grade or higher on each report and test.

STUDENT WORKLOAD

ECTS weighting							
	Activities	Student workload					Unit
		W	C	L	P	S	
1.	Scheduled contact hours	30		30			h
2.	Other (office hours, exams)	4		2			h
3.	Total number of contact hours	66					h
4.	Number of ECTS credits for contact hours	2,64					ECTS
5.	Independent study hours	59					h
6.	Number of ECTS credits for independent study	2,36					ECTS
7.	Practical hours	60					h
8.	Number of ECTS credits for practical hours	2,4					ECTS
9.	Total workload	125					h
10.	ECTS credits for the course <i>1 ECTS credit =25 student learning hours</i>	5					ECTS

READING LIST

1. Rolla S. Badania materiałów i nawierzchni drogowych. WKiŁ, W-wa, 1979.
2. Piłat J., Radziszewski P. Nawierzchnie asfaltowe, WKiŁ, W-wa, 2008.
3. Tylman E. Technologia materiałów drogowych. WKiŁ. W-wa, 1987.
4. Luszawski St., Wojdanowicz St. Nowoczesne nawierzchnie bitumiczne. WKiŁ. W-wa, 1977.
5. Czasopisma naukowo-techniczne: Drogownictwo, Drogi i Mosty.
6. Normy przedmiotowe.