



COURSE SPECIFICATION

Course code	full-time:	B1-6-BD-608
	part-time:	BN1-7-BD-709
Course title in Polish	Technologia budowy dróg	
Course title in English	Road Construction Technology	
Valid from academic year	2023/2024	

CURRICULAR ALIGNMENT

Programme	CIVIL ENGINEERING
Level	first-cycle
Programme profile	academic
Mode of attendance	full-time; part-time
Specialism	Highway Engineering
Academic unit responsible for the course	Department of Transport Engineering
Course coordinator	dr inż. Przemysław Buczyński
Approved by	prof. dr hab. inż. Grzegorz Świt

COURSE DESCRIPTION

Teaching block	specialism specific	
Course status	required	
Language of instruction	Polish	
Semester of delivery	full-time	semester VI
	part-time	semester VII
Prerequisites	Transport Infrastructure Engineering	
Exam (YES/NO)	NO	
ECTS	5	

Mode of teaching		lecture	class	lab	project	other
Number of hours per semester	full-time:	30		30	30	
	part-time:	20		20	20	

LEARNING OUTCOMES

Category	Code	Learning outcomes	Corresponding programme outcome code
Knowledge	W01	Students know the pavement classification and the requirements for these surfaces.	B1_W09
	W02	Students are familiar with materials suitable for road construction.	B1_W08 B1_W18
	W03	Students know the technology of constructing road pavement layers (subbase, binder course and wearing course).	B1_W12 B1_W13
Skills	U01	Students can use basic standards and guidelines related to road construction.	B1_U13
	U02	Students can perform basic tests to identify soils and aggregates used in mineral and asphalt mixes.	B1_U14
	U03	Students can design elements of a road location plan and profile.	B1_U23
Competence	K01	Students are able to work independently and cooperate in a team on an assigned task.	B1_K01
	K02	Students are responsible for the reliability of the results obtained.	B1_K02
	K03	Students formulate conclusions and describe the results of their work.	B1_K04

COURSE CONTENT

Teaching mode*	Topics covered
lecture	Classification of road pavements.
	Classification of soil in terms of road subgrade material and that used in the structural layers of the pavement.
	Classification of aggregates used in roads.
	Characteristics of road base course layers in the aspect of materials - classification, technology of execution.
	Road binders. Modifiers and stabilizers for asphalt and bituminous mixtures.
	Bituminous mixtures. Principles of design and execution. Characteristics of asphalt concrete, stone mastic mix SMA, mastic asphalt.
project	Optimization of the composition of asphalt concrete mineral mix, stone mastic mix, porous asphalt and mastic cast asphalt. Laboratory validation of the composition of the bituminous mixtures. Permissible deviations from the design composition (production simulation).
	Comprehensive road mechanization project.
lab	Health and safety rules in a laboratory.
	Testing the suitability of materials for soil stabilization (with lime or cement) according to the properties of the soil.
	Design of a recipe for cement/lime stabilized soil with determination of the amount of required ingredients.
	Trial mixes and curing of samples.
	Testing of soil-cement/lime mixtures with determination of suitability and purpose for structural layers in terms of their mechanical parameters.
	Tests on the suitability of aggregate for bituminous mixtures. Design of a bituminous mixture for KR1-2 traffic.
	Preparation of a bituminous mixture and preparation of samples under laboratory conditions.
	Determination of basic physical, mechanical properties and water and frost resistance.

METHODS OF LEARNING OUTCOMES VERIFICATION

Learning outcome	Verification methods					
	Oral exam	Written exam	Test	Project	Report	Other
W01			X	X	X	
W02			X	X	X	
W03			X		X	
U01			X	X	X	
U02			X		X	
U03			X	X	X	
K01			X	X	X	
K02			X		X	
K03			X	X	X	

ASSESSMENT

Teaching mode*	Assessment type	Criteria
lecture	mark-based	<i>Obtaining at least 50% of points on the in-class written test.</i>
lab	mark-based	<i>Submitting correctly completed reports and at least 50% on the written test.</i>
project	mark-based	<i>Obtaining at least a passing grade on each project.</i>

STUDENT WORKLOAD

ECTS weighting												
	Activities	Student workload										
		full-time					part-time					
		W	C	L	P	S	W	C	L	P	S	
1.	Scheduled contact hours	30		30	30		20		20	20		h
2.	Other (office hours, exams)	2		2	2		2		2	2		h
3.	Total number of contact hours	96					66					h
4.	Number of ECTS credits for contact hours	3,8					2,6					ECTS
5.	Independent study hours	29					59					h
6.	Number of ECTS credits for independent study	1,2					2,4					ECTS
7.	Practical hours	83					83					h
8.	Number of ECTS credits for practical hours	3,3					3,3					ECTS
9.	Total workload	125					125					h
10.	ECTS credits for the course <i>1 ECTS credit =25 student learning hours</i>	5										

READING LIST

1. Błażejowski K.: SMA. Teoria i praktyka, Wydawnictwo Rettenmaier, Warszawa 2007.
2. Błażejowski K., Styk S.: Technologia warstw asfaltowych, WKŁ, Warszawa 2011.
3. Buczyński P.: Recykling mieszanek na zimno z asfaltem spienionym i zastosowaniem redyspersyjnego proszku polimerowego, Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2023.
4. Edel R.: Odwodnienie dróg, WKŁ, Warszawa 2017.
5. Iwański M.: Wapno hydratyzowane wielofunkcyjne dodatkiem zwiększającym trwałość nawierzchni SMA, Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2014.
6. Kalabińska M., Piłat J., Radziszewski P.: Technologia materiałów i nawierzchni drogowych. OWPW, Warszawa 2004.
7. Martinek W., Tokarski Z., Chojnicki K.: Organizacja budowy asfaltowych nawierzchni drogowych, Wydawnictwo Naukowe PWN, Warszawa 2023.
8. Mazurek G.: Liniowa i nieliniowa lepkość charakterystyka mastyksu asfaltowego w zakresie wysokich temperatur eksploatacyjnych nawierzchni, Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2014.
9. Nagórski R.: Mechanika nawierzchni drogowych w zarysie, PWN, Warszawa 2014.
10. Piłat J., Radziszewski P.: Nawierzchnie asfaltowe, WKŁ, Warszawa 2010.
11. Pisarczyk S.: Grunty nasypowe. Właściwości geotechniczne i metody ich badań, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2009.
12. Szydło A.: Nawierzchnie drogowe z betonu cementowego, Polski Cement, Kraków 2004.
13. Stefańczyk B., Mieczkowski P.: Mieszanki mineralno-asfaltowe. Wykonawstwo i badania, WKŁ, Warszawa 2009.
14. Wiłun Z.: Zarys geotechniki, WKŁ, Warszawa 2013.
15. Katalog Typowych Konstrukcji Podatnych i Półsztywnych, GDDKiA, Warszawa 2014.
16. Normy przedmiotowe.