



COURSE SPECIFICATION

Course code	M#1-S1-MiBM-204
Course title in Polish	Technika samochodowa
Course title in English	Automotive Engineering
Valid from (academic year)	2019/2020

GENERAL INFORMATION

Programme of study	MECHANICAL ENGINEERING
Level of qualification	first-cycle
Type of education	academic
Mode of study	full-time
Specialism	all
Department responsible	Department of Automotive Engineering and Transport
Course leader	dr hab. inż. Rafał Jurecki, prof. PŚk
Approved by	

COURSE OVERVIEW

Course type	programme-specific
Course status	compulsory
Language of instruction	English
Semester of delivery	semester 2
Pre-requisites	None
Examination required (YES/NO)	NO
ECTS value	2

Mode of instruction	lecture	class	laboratory	project	seminar
No. of hours per semester	15		15		

LEARNING OUTCOMES

Category of outcome	Out-come code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	Have a fundamental knowledge of different types of vehicles	MiBM1_W02 MiBM1_W09 MiBM1_W14 MiBM1_W15
	W02	Have a fundamental knowledge of construction and operation the main systems of vehicle	MiBM1_W02 MiBM1_W09 MiBM1_W14 MiBM1_W15
	W03	Have a fundamental knowledge of safety systems of vehicle and elements supporting the work of the driver	MiBM1_W02 MiBM1_W09 MiBM1_W14 MiBM1_W15
Skills	U01	Have the skills to read vehicle diagnostic trouble codes	MiBM1_U01 MiBM1_U05 MiBM1_U11
Competence	K01	He understand the need for training and improving their professional competences in the field of automotive technology	MiBM1_K01
	K02	be aware of the importance and understands the relationship between engineering and non-technical activities in terms of the effects of environmental impact and responsibility for decisions made in the field of automotive technology,	MiBM1_K02
	K03	be aware of and understands the need to provide the public opinion in an understandable manner with information on achievements related to issues related to the automotive industry and environmental threats	MiBM1_K06

COURSE CONTENT

Type of instruction*	Topics covered
lecture	Classification of motor vehicles. General principles of vehicle construction. Division of vehicles into categories and groups. Description of construction systems of various types of cars.
	Construction and operation of drive systems in various types of cars: clutches, gear-boxes, main gears, shafts and driveshafts, differentials.
	Construction and operation of brakes in various types of cars; drum and disc brakes; dunlop and lockhead brake systems, brake assist systems
	Construction of dependent and independent car suspensions; classic, semi-active, and active suspensions. Kinematic and dynamic properties of independent suspensions. Spring elements, dampers, leading elements, and stabilizers. The characteristics of the suspension elements of springs and shock absorbers.
	Construction of the steering system; Tasks and types of units and mechanisms of steering systems of cars and tractors. Conditions to be met by the steering system. Types and construction of steering gears and their properties. Stabilization of steered wheels of cars and tractors. The angles of the steered wheels and the steering knuckle, power steering assist systems
	The operation and requirements for the operation of electronic systems supporting the work of the driver, eg ABS, ASR, ESP, TCS, ACC, EBA, HLA CDC in motor vehicles. Examples of constructions. Vehicle components that increase active and passive safety. Influence of the body and chassis structure on safety (visibility from the driver's seat, body shape, crumple zones, steering system, tires, etc.). Types of air-bags, seat belt tensioners etc.
	Procedures and devices for comprehensive diagnostics of the vehicle and its components and functional systems. Modern electronic diagnostic systems based on OBD, OBDII and EOBD. OBD fault detection

laboratory	Construction of the drive system Construction of the brake system Construction of the suspension Construction of the steering system Passive and active safety elements in road vehicles Vehicle diagnostics with OBD II diagnoscope, fault codes
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ASSESSMENT METHODS

Outcome code	Methods of assessment <i>(Mark with an X where applicable)</i>					
	Oral examination	Written examination	Test	Project	Report	Other
W01			X			
W02			X			
W03			X			
U01					X	
K01			X		X	
K02			X		X	

ASSESSMENT TYPE AND CRITERIA

Mode of instruction*	Assessment type	Assessment criteria
lecture	non-examination assessment	The pass mark is a minimum of <i>50 points out of a possible 100 for the final in-class test.</i>
laboratory	non-examination assessment	A pass mark for each post-lab report and post-lab test. The overall mark for the course is the arithmetic mean of all component marks

OVERALL STUDENT WORKLOAD

ECTS weighting							
	Activity type	Student workload					Unit
		L	C	Lab	P	S	
1.	Scheduled contact hours	15		15			h
2.	Other contact hours (office hours, examination)	2		2			h
3.	Total number of contact hours	34					h
4.	Number of ECTS credits for contact hours	1,4					ECTS
5.	Number of independent study hours	16					h
6.	Number of ECTS credits for independent study hours	0,6					ECTS
7.	Number of practical hours	25					h
8.	Number of ECTS credits for practical hours	1,0					ECTS
9.	Total study time	50					h
10.	ECTS credits for the course <i>1 ECTS credit = 25-30 hours of study time</i>	2					ECTS

READING LIST

1. Poradnik inżyniera samochodowego. Elementy i materiały. Pod red. Z. Jaśkiewicza. WKiŁ, Warszawa, 1990
2. Jaśkiewicz Z., Wąsiewski A. Układy napędowe pojazdów samochodowych: obliczenia projektowe. Oficyna Wydawnictwa Politechniki Warszawskiej. Warszawa, 2002
3. Prochowski L., Żuchowski A. Samochody ciężarowe i autobusy. WKiŁ, Warszawa, 2016
4. Stańczyk T.L., Łomako D. Komputerowe obliczenia zespołów samochodów i ciągników. Skrypt 406, Wyd. II. Wydawnictwo Politechniki Świętokrzyskiej, Kielce 2004
5. Reimpell J. Podwozia samochodów. Podstawy konstrukcji. WKiŁ, Warszawa, 1997
6. Reński A. Budowa Samochodów. Układy hamulcowe i kierownicze oraz zawieszenia. Skrypt, Wydawnictwa Politechniki Warszawskiej, Warszawa, 1992
7. Trzeciak K., Diagnostyka samochodów osobowych, WKiŁ, Warszawa 2005
8. Leiter R. Hamulce samochodów osobowych i motocykli. WKiŁ, Warszawa, 1998
9. ABS: układy zapobiegające blokowaniu kół: Bosch, Bosch 2E, ATE, Teres MK II /tł. z wł. A. Tylusińska – Kowalska. Warszawa: "Auto", 2004
10. Uzdowski M., Abramek K.F., Garczyński K. Eksploatacja techniczna i naprawa. WKiŁ, Warszawa 2003
11. Bocheński C. Badania kontrolne samochodów. WKiŁ, Warszawa 2000
12. Studziński K. Teoria, konstrukcja i obliczenia samochodu. WKiŁ, Warszawa, 1980
13. Cypko J., Cypko E. Podstawy technologii i organizacji napraw pojazdów mechanicznych. WKiŁ, Warszawa 1982
14. Trzeciak K., Wyposażenie warsztatów samochodowych. Wyd. Auto, Warszawa 2003

Journals

1. Automotive Engineering
2. Automobiltechnische Zeitschrift (ATZ)
3. JSAE – Review
4. Auto-Expert