COURSE SPECIFICATION

Course code	full-time programme:	**M#2-S2-ME-EM-210**
	part-time programme:	
Course title in Polish	**Diagnostyka pojazdów samochodowych**	
Course title in English	**Automotive Diagnostics**	
Valid from (academic year)	**2024/2025**	

GENERAL INFORMATION

Programme of study	**MECHANICAL ENGINEERING**
Level of qualification	**second-cycle**
Type of education	**academic**
Mode of study	**full-time programme**
Specialism	**Machine Operation and Maintenance**
Department responsible	**Department of Automotive Engineering and Transport**
Course leader	**dr hab. inż. Marek Jaśkiewicz, prof. PŚk**
Approved by	**dr hab. Jakub Takosoglu, prof. PŚk, Dean of the Faculty of Mechatronics and Mechanical Engineering**

COURSE OVERVIEW

Course type		**specialism-related**
Course status		**compulsory**
Language of instruction		**English**
Semester of delivery	full-time programme	**Semester II**
	part-time programme	**Semester II**
Pre-requisites		
Examination required (YES/NO)		**NO**
ECTS value		**4**

Mode of instruction		**lecture**	**class**	**laboratory**	**project**	**seminar**
No. of hours per semester	full-time programme	**30**		**30**		
	part-time programme					

LEARNING OUTCOMES

Category of outcome	Outcome code	Course learning outcomes	Corresponding programme outcome code
Knowledge	W01	Has detailed and theoretically supported knowledge related to diagnosing the technical condition of vehicles.	MiBM2_W07
	W02	Has detailed and theoretically based knowledge of measurement systems used in vehicles.	MiBM2_W08
Skills	U01	Is proficient in using information and communication tools in the field of vehicle diagnostics.	MiBM2_U05
	U02	Is able to use analytical and numerical methods.	MiBM2_U11
	U03	Is able to perceive complex connections between engineering decisions and non-technical areas, including environmental protection aspects.	MiBM2_U14
Competence	K01	Is aware of the importance of and understands the non-technical aspects and effects of engineering activities, including its impact on the safety of other people and the impact on the environment.	MiBM2_K02
	K02	He is aware of ethical principles.	MiBM2_K05

COURSE CONTENT

Mode of instruction	Topics covered
lecture	Development of diagnostic systems and data transmission. Computer networks in on-board diagnostics. Functionality of diagnostic systems. Types of networks in vehicles –CAN, etc. Forecasts of network development. Diagnostics of passive and active safety systems, systems and devices. OBD diagnostic systems. Diagnostic information and communication in the OBD system. Characteristics of diagnostic information in OBD systems, Vehicle diagnostic methods using the diagnostic line and chassis dynamometer. Wear processes in combustion engines. Engine control system. Equipment for diagnosing combustion engines. Diagnostics of combustion engines, including: the power supply system, the lubrication system and the cooling system of combustion engines, the ignition and exhaust systems. Diagnostics of the combustion process. Vibroacoustic diagnostics of combustion engines. Diagnosing the technical condition of the engine based on exhaust gas analysis.
laboratory	OBD diagnostics of vehicle systems, including passive and active safety systems, diagnostics of the technical condition of vehicles on the diagnostic line, vehicle testing on a chassis dynamometer. Technical condition assessment based on visual inspection and pressure measurement in engine functional systems. Diagnostics of engine functional systems using a diagnostic tester. Diagnostics of compression ignition engine power supply system components using test benches. Diagnostics of spark ignition engine power supply system components. Diagnostics of engine sensors and actuators.

ASSESSMENT METHODS

Outcome code	Methods of assessment					
	Oral examination	Written examination	Test	Project	Report	Other
W01			X			
W02			X			
U01			X		X	

U02			X		X	
U03			X		X	
K01						X
K02						X

ASSESSMENT TYPE AND CRITERIA

Mode of instruction	Assessment type	Assessment criteria
lecture	non-examination assessment	Successful completion of the final colloquium. Obtaining at least 50% of points
laboratory	non-examination assessment	Positive assessment of the report from individual laboratory exercises. The final grade is an arithmetic mean.

OVERALL STUDENT WORKLOAD

ECTS weighting												
No.	Activity type	Student workload										Unit
		full-time programme					part-time programme					
1.	Scheduled contact hours	L	C	Lb	P	S	L	C	Lb	P	S	h
		30		**30**								
2.	Other contact hours (office hours, examination)	**2**		**2**								h
3.	**Total number of contact hours**	**64**										h
4.	**Number of ECTS credits for contact hours**	**2,6**										ECTS
5.	**Number of independent study hours**	**36**										h
6.	**Number of ECTS credits for independent study hours**	**1,4**										ECTS
7.	**Number of practical hours**	**50**										h
8.	**Number of ECTS credits for practical hours**	**2,0**										ECTS
9.	**Total study time**	**100**										h
10.	**ECTS credits for the course** *1 ECTS credit = 25-30 hours of study time*	**4**										ECTS

READING LIST

1. W. CHOLEWA, J. KAŹMIERCZAK: DIAGNOSTYKA TECHNICZNA MASZYN –PRZETWARZANIE CECH SYGNAŁÓW. SKRYPTY UCZELNIANE NR 1693, POLITECHNIKA ŚLĄSKA. 1992 GLIWICE.
2. W. CHOLEWA, J. KAŹMIERCZAK: DIAGNOSTYKA TECHNICZNA MASZYN –POMIARY I ANALIZA SYGNAŁÓW. SKRYPTY UCZELNIANE NR 1758, POLITECHNIKA ŚLĄSKA. 1993 GLIWICE.
3. W. LOTKO: WYBRANE ZAGADNIENIA DIAGNOSTYKI POJAZDÓW. POLITECHNIKA RADOMSKA. 2005, RADOM.
4. CH. WHITE, M. RANDALL: KODY USTEREK. WKIŁ. 2007, WARSZAWA.
5. J. MERKISZ, S. MAZUREK, J. PIELECHA: POKŁADOWE URZĄDZENIA REJESTRUJĄCE W SAMOCHODACH. WYDAWNICTWO POLITECHNIKI POZNAŃSKIEJ. 2007, POZNAŃ.
6. Z. LOZIA: DIAGNOSTYKA SAMOCHODOWA. LABORATORIUM. OFICYNA WYDAWNICZA POLITECHNIKI WARSZAWSKIEJ. 2007 WARSZAWA.