STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Diagnostic of Cars		**1010614161010612452**

Field of study	Profile of study (general academic, practical)	Year /Semester
Mechanical Engineering	**(brak)**	**3 / 6**
Elective path/specialty	**Subject offered in:**	**Course (compulsory, elective)**
Motor Vehicles and Tractors	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
First-cycle studies	**part-time**

No. of hours					No. of credits
Lecture: **14**	Classes: **-**	Laboratory: **12**	Project/seminars: **-**		**3**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**2 67%**
Technical sciences	**1 33%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	the student has a basic knowledge of the construction, operation and maintenance of motor vehicles and their components have a basic knowledge of automotive electronics
2	**Skills**	student is able to integrate the information, make their interpretation, draw conclusions, formulate and justify opinions has the ability to perceive, to associate and interpret phenomena occurring during operation of individual systems
3	**Social competencies**	student is aware of the importance of vehicle technical performance and understand the technical aspects and consequences of disability for road safety

Assumptions and objectives of the course:

Provide students knowledge of automotive diagnostic options and the diagnostic methods with and without equipment, evaluation criteria, algorithms for diagnosis and modern diagnostic equipment.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. He knows the tasks and ways of diagnosing the state assemblies and mechanisms of motor vehicles. - [K1A-W24]
2. He knows diagnostic methods with and without diagnostic devices. - [-]
3. He knows the tooling and equipment necessary to comply diagnostic tasks. - [-]
4. He knows diagnostic algorithms and criteria for evaluating the results of diagnosis. - [-]

Skills:

1. He can use modern diagnostic equipment. - [K1A-U03/17]
2. He can perform the appropriate observations and measurements to diagnose the state of individual systems of a motor vehicle. - [-]
3. He can evaluate the state of diagnosed assembly / vehicle system and take a decision on further action. - [-]

Social competencies:

1. Understands the importance of evaluating the condition of the vehicle to ensure an adequate level of active and passive safety in vehicles. - [K1A-K02]
2. He understands the importance of diagnosing the state of vehicle as a means of improving the efficiency of the use of motor vehicles for the implementation of various social needs. - [-]

Assessment methods of study outcomes

Written exam of the lectures and pass the laboratory based on the current preparations control for the exercise and evaluation reports.

Course description

The scope and methods of diagnosis of the combustion chamber, timing system, cooling system and lubrication system for combustion engines. Fundamentals vibroacoustics use to diagnose an internal combustion engine. Diagnosis of power systems SI engines, diesel, LPG and CNG.

Diagnosis of ignition systems and electrical equipment: classic ignition systems and fully electronic. Diagnostic capabilities of modern ignition systems including coils, spark plugs. Oscilloscope diagnostic methods. Diagnosing the power supply circuit and boot. Vehicle lighting methods of diagnosis.

Diagnosis of the chassis and suspension of motor vehicles: the possible sources of technical deterioration of these systems, the scope and methods of suspension diagnosis, inspection, instrumented methods, diagnosis leading and combinations thereof, methods of dampers verification, the spring elements.

Diagnosis of steering system: the conditions to be met by an efficient steering system, possible sources of technical state deterioration, diagnostic parameters, methods of diagnosis, the diagnostic tools universal optical/mechanical and optical, suspension geometry, power steering diagnosis.

Diagnosis of braking systems: possible sources of technical deterioration or system malfunction, diagnostics initiation mechanisms, assist and implementing evaluation the braking system effectiveness used devices methods, roller tester, decelerometer, flat plate vehicle brake tester.

Drivetrain diagnostics: possible sources of technical state deterioration, providing general diagnostic parameters (power at the wheels, the road runs, fuel consumption), diagnosis of clutch, gearbox, drive shaft and final drive, diagnostic equipment, load and inertia dynamometers.

On-board diagnostics OBD: definition of basic terms, general principles used by OBD system, OBD system monitors, diagnostic information and communication system in OBD, development trends in vehicles, on-board diagnostics of other vehicle systems.

Basic bibliography:

1. Niziński S.:DIAGNOSTYKA SAMOCHODÓW OSOBOWYCH I CIĘŻAROWYCH, Dom wydawniczy Bellona, Warszawa 1999r.
2. Trzeciak K.: Diagnostyka samochodów osobowych, WKiŁ, Warszawa 2005r.
3. Sitek K.: Diagnostyka samochodowa, Wyd. AUTO, Warszawa 1999.
4. Bocheński C.: Badania kontrolne samochodów, WKiŁ, Warszawa 2000r.

Additional bibliography:

1. Serwis motoryzacyjny ? miesięcznik dla naprawiających i badających pojazdy, PISKP, Warszawa 2012r

Result of average student's workload

Activity	Time (working hours)
1. participation in the lecture	15
2. consultations	1
3. exam preparation	5
4. participation in the exam	2
5. preparation for laboratory	5
6. participation in laboratory exercises	15
7. fixation exercises content and report	7
8. participation in the completion of the laboratory	1

Student's workload

Source of workload	hours	ECTS
Total workload	51	3
Contact hours	34	2
Practical activities	28	1