GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Mechatronics and Automation in Vehicles, PG_00055517		
Field of study	Mechanical Engineering		
Date of commencement of studies	October 2021	Academic year of realisation of subject	2023/2024
Education level	first-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	6	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Institute of Mechanics and Machine Design -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Grzegorz Ronowski	
	Teachers	dr inż. Wojciech Owczarzak dr hab. inż. Grzegorz Ronowski	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	30	2.0	18.0	50

Subject objectives

The aim of the course is to introduce students to issues related to the construction and exploitationofelectrical and electronic systems of modern vehicles and basic automated systems used in these vehicles.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W08] possesses basic knowledge including the methodology of designing machine parts, mechanical devices, selection of construction materials, manufacturing and operation, with the lifetime cycle	The student has a basic knowledge covering the principle of operation of selected electrical components of the vehicle.	[SW1] Assessment of factual knowledge
[K6_W06] possesses elementary knowledge on automatics and robotics of mechanical systems	The student has a basic knowledge covering basics of electrical engineering.	[SW1] Assessment of factual knowledge
[K6_U05] is able to plant an experiment within the range of measuring the basic operating parameters of mechanical devices using a specialized equipment, interpret the results and reach the correct conclusions	The student has a basic knowledge of selected electrical equipment of the vehicle.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

DC circuits. AC circuits. The overall concept of the electrical installation in vehicles. Wires, cables,pipeconnectors, relays, meters, fuses. The balance of power for the vehicle electrical system. Battery, itsdesign,operation, service. Starters combustion engines, their construction and diagnostics. Power supplyofelectricity. Dynamos and alternators. Voltage Regulators electromechanical and electronic. Diagnosisofpower systems. Ignition Systems classic. Electronic ignition systems. Spark plugs. Ignitionadvance.Injection-ignition systems, the construction, operation and diagnostics. Exhaust emission controlsystems.On-board computer. Vehicle lighting. Construction spotlight. High beam, low beam, fog andsearchlights.Headlights unconventional. The "smart" headlamps. Antiblock brake systems - ABS. Anti-skidsystems - TC.Signaling devices emergency vehicles.

Prerequisites and co-requisites

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Exam	56.0%	100.0%
Recommended reading	Basic literature	Konopiński M. "Elektronika w technice motoryzacyjnej"Ocioszyński J."Elektrotechnika i elektronika pojazdówsamochodowych"Merkisz J.,Mazurek S. "Pokładowe systemy diagnostycznepojazdówsamochodowych"	
	Supplementary literature	Pr. zbior. "Bosch - informator motoryzacyjny"Pr. zbior. "AutomotiveElectric/Electronic Systems"	
	eResources addresses	Adresy na platformie eNauczanie: Mechatronika i Automatyka Pojazdów / Wykład / MiBM / sem. VI / I st. / sem. letni 2023/2024 (PG:00055517) - Moodle ID: 38611 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38611	
Example issues/ example questions/ tasks being completed	Construction of the spark plug. Construction of alternator. The principle of operation of the ignition system.		
Work placement	Not applicable		