GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Vehicle dynamics, PG_00057401						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2024		Academic year of realisation of subject	2024/2025			
Education level	second-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	1		Language of instruction	Polish			
Semester of study	2		ECTS credits	4.0			
Learning profile	general academic profile		Assessment form	exam			
Conducting unit	Department of Machine Design and Vehicles -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Ryszard Woźniak					
	Teachers	dr inż. Ryszard Woźniak					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	15.0	15.0	0.0	0.0	45
	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	45		8.0	47.0		100
Subject objectives	Gaining basic knowledge of braking and cornering of vehicles.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_W11] possesses organized knowledge useful in understanding ex-technical conditioning connected with performing the profession of an engineer and taking it into consideration in engineering practice; possesses well-established knowledge within the range of intellectual property, management and organization of manufacturing processes, including the management and life-cycle of a product	Student presents the adhesion coefficient. Describes the braking of a two-axle vehicle. It shows the distribution of braking forces. It describes braking on uphill and downhill slopes. Defines the braking deceleration. He explains the phenomenon of lateral tire drift. It describes the movement of the vehicle in a curve without tire sideslip. He explains the movement of a vehicle on a bend with the phenomenon of lateral tire drift. Measures braking forces and braking distance.	[SW1] Assessment of factual knowledge
[K7_W08] possesses widened knowledge within the range of design methods of hydraulic systems, heating and fluid-flow machines and transport devices	Student presents the adhesion coefficient. Describes the braking of a two-axle vehicle. It shows the distribution of braking forces. It describes braking on uphill and downhill slopes. Defines the braking deceleration. He explains the phenomenon of lateral tire drift. It describes the movement of the vehicle in a curve without tire sideslip. He explains the movement of a vehicle on a bend with the phenomenon of lateral tire drift. Measures braking forces and braking distance.	[SW3] Assessment of knowledge contained in written work and projects
[K7_U08] is able to design a procedural equipment or device compliant with the specifications using a design aid system in the form of a design documentation, selecting the appropriate model, performing critical analysis with the proper selection of tools and technologies	Student presents the adhesion coefficient. Describes the braking of a two-axle vehicle. It shows the distribution of braking forces. It describes braking on uphill and downhill slopes. Defines the braking deceleration. He explains the phenomenon of lateral tire drift. It describes the movement of the vehicle in a curve without tire sideslip. He explains the movement of a vehicle on a bend with the phenomenon of lateral tire drift. Measures braking forces and braking distance.	[SU3] Assessment of ability to use knowledge gained from the subject

Subject contents

LECTURE Friction coefficient. Two axle vehicle braking. Front axle braking. Rear axle braking. Braking forces distribution. Braking on gradiend (up and down). Braking deceleration. Side slipping of tyres. Vehicle cornering without side slipping of tyres. Vehicle cornering taking side slipping of tyres into account. LABORATORY Braking forces measurement. Braking distance measurement. Vehicle rolling radius measurement. Vehicle rolling resistance coefficient measurement. Vehicle air drug coefficient measurement.

Prerequisites and co-requisites

Knowledge from subjects: mathematics I i II i III (07000W0 i 07000C0) and physics I i II (07001W0 i 07001C0).

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Practical exercise	75.0%	50.0%
Midterm colloquium	50.0%	50.0%

Recommended reading

Basic literature	1. Prochowski L.: Mechanika ruchu. WKiŁ, Warszawa, 2005. 2. Arczyński S.: Mechanika ruchu samochodu. WNT, Warszawa, 1993. 3. Lanzendoerfer J., Szczepaniak C.: Teoria ruchu samochodu. WKiŁ, Warszawa, 1980. 4. Mitschke M.: Dynamika samochodu. WKiŁ, Warszawa, 1977.
Supplementary literature	No requirements
eResources addresses	Adresy na platformie eNauczanie: Mechanika ruchu pojazdów - W-15/Ć-15/L-15/P-0, WIMiO, II st., sem. 02, stacjonarne (PG_00057401), semestr zimowy 2024/2025 - Moodle ID: 38951 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=38951

Example issues/ example questions/ tasks being completed

Work placement

Not applicable

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