



Subject card

Subject name and code	Vehicle dynamics, PG_00057401						
Field of study	Mechanical Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
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_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
	[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_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
Subject contents	LECTURE Friction coefficient. Two axle vehicle braking. Front axle braking. Rear axle braking. Braking forces distribution. Braking on gradient (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 drag 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
	Midterm colloquium	50.0%	50.0%
	Practical exercise	75.0%	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 (M:320350W0), semestr zimowy 2023/2024 - Moodle ID: 31246 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=31246	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		