Course code: **Course item:**

1. INFORMATION ABOUT THE COURSE A. Basic information

Course title	Vehicle construction
Field of study	Mechanical engineering
Cycle	First cycle
Study profile	Academic
Study mode	Full-time
Specialisation	Cars and tractors
Unit responsible for the field of study	Faculty of Mechanical engineering
Lecturer	PhD. Tomasz KAŁACZYŃSKI, PhD. Marcin ŁUKASIEWICZ
Introductory courses	Technical mechanics, strength of materials Machine construction basics
Prerequisites	no prerequisites

B. Semester/ weekly timetable

Semester	Lectures	Classes	Laboratories	Project classes	Seminars	Fieldwork	ECTS credits
winter / summer	30	15	15				5

C. Assumed outcomes and aims - aims bind the course programme with the study programme and are referred to in learning outcomes point 2

2. LEARNING OUTCOMES (acc. to National Qualifications Framework)

No.	Description of learning outcomes	Reference to learning outcomes for the field of study	Reference to learning outcomes for the area of study
KNOWLEDGE			
K1	has knowledge of the construction and operation of systems included in cars and tractors	MBM1_W53	T1A_W01 T1A_W04 T1A_W05
SKILLS			
S1	can design systems included in cars and tractors	MBM1_U53	T1A_U09 T1A_U13
S2	is able to plan and analyze the properties of consumables	MBM1_U56	T1A_U16
S3	can plan automotive facilities	MBM1_U58	1A_U10

			T1A_U16
SOCIAL COMPETENCES			
SC1	can use the acquired knowledge in a practical way	MBM1_K51	T1A_K01 T1A_K05 T1A_K06
SC2	is able to use the acquired knowledge and skills in professional work	MBM1_K57	T1A_K07

3. TEACHING METHODS

multimedia lecture, laboratory classes, project, presentation, discussion

4. METHODS OF EXAMINATION

written exam, colloquium, test – once in semester; written report, short paper – every laboratory classes

5. COURSE CONTENT

Specify the content separately for each type of classes in accordance with point I.B.	**Lecture** Types of motor vehicles and their classification. Directions of vehicles development. Forces acting on the vehicle Safety components in vehicles Types, construction and principle of operation of propulsion systems Construction of an internal combustion engine Clutch characteristics Gearboxes type and construction Vehicles and trailers braking systems Vehicles Steering systems Vehicles suspension systems Vehicles electrical installations Vehicles tires Exploitation materials used in vehicles Comfort system in vehicles **Classes** Introductory classes Implementation of computational tasks in the field of forces acting on the vehicle Implementation of calculation tasks in the range of gear selection in gearboxes Designing the propulsion system Designing of braking systems Implementation for the design of selected elements of automotive vehicles by the LMS VirtualLab software. 10 Implementation for the design of selected elements of motor vehicles by the LMS software. AmeSIM Simulation tests in specialized engineering applications **Laboratories** Introductory classes to the laboratory Vehicles Construction of the body and chassis Construction and operation of power systems Construction and operation of the braking system Construction and operation of the steering system Construction of vehicle suspensions Construction of road wheels and vehicle tires

	Construction and operation of the lighting

system **6. VALIDATION OF LEARNING OUTCOMES**

Learning outcome	Form of assessment					
	Oral examination	Written examination	Colloquium	Project	Report	……
K1		X				
S1					X	
S2					X	
S3			X			
SC1			X			
SC2					X	

7. LITERATURE

Basic literature	1. Reński A.:" Car construction: braking, steering and suspension systems, "Warsaw University of Technology Publishing House, 2004 2.Ruben A.: " Construction of motor vehicles: construction and design of car suspension systems ", Publishing House of Rzeszów University of Technology, 1995 3.Zając M.: „Transmission systems for trucks and buses ", WKiŁ, Warsaw 2003.
Supplementary literature	1. Siłka W.:" Theory of car movement "WNT, Warsaw 2002 2.Wajand J.A., Wajand T.J.:" Medium- and high-speed piston internal combustion engines, WNT, Warsaw 2000

8. TOTAL STUDENT WORKLOAD REQUIRED TO ACHIEVE EXPECTED LEARNING OUTCOMES EXPRESSED IN TIME AND ECTS CREDITS

Student's activity		Student workload– number of hours
Classes conducted under a direct supervision of an academic teacher or other persons responsible for classes	Participation in classes indicated in point 1B	60
	Supervision hours	
Student's own work	Preparation for classes	45
	Reading assignments	20
	Other (preparation for exams, tests, carrying out a project etc)	25
Total student workload		150
	Final number of ECTS credits	7