

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Transport equipment		Code 1010612311010617444
Field of study Transport	Profile of study (general academic, practical) general academic	Year /Semester 1 / 1
Elective path/specialty Food Transport	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 Classes: - Laboratory: 1 Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: dr inż. Jędrzej Kasprzak email: jedrzej.kasprzak@put.poznan.pl tel. +48616652232 Wydział Inżynierii Transportu ul. Piotrowo 3 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Has knowledge in the field of understanding basic physical issues, the basics of chemistry, the fundamentals of construction and operation of functional systems of motor vehicles, the basics of thermodynamics, the basics of electrical engineering.
2	Skills	He can draw a technical diagram, perform basic calculations of basic elements and assemblies.
3	Social competencies	He is aware of the responsibility for his own work
Assumptions and objectives of the course: Acquiring knowledge in the field of: principles of operation, basics of construction and servicing of vehicle equipment elements, gaining the ability to select consumables for selected vehicle equipment components, getting to know the functions that meet vehicle equipment and their impact on safety and driving comfort		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has advanced detailed knowledge of selected issues in the field of transport engineering - [T2A_W03] 2. Has knowledge about development trends and the most important new achievements of means of transport and other, selected, related scientific disciplines - [T2A_W04]		
Skills:		
1. Can acquire information from literature, databases and other sources (in Polish and English), integrate them, make their interpretation and critical evaluation, draw conclusions and formulate and fully justify opinions - [T2A_U01] 2. Is able to make a critical analysis of existing technical solutions and propose their improvements (improvements) - [T2A_U08]		
Social competencies:		
1. Understands the importance of using the latest knowledge in the field of transport engineering in solving research and proctological problems - [T2A_K02]		
Assessment methods of study outcomes		
Written final test (last week of the semester), covering questions on issues covered during the lecture: equipment of transport equipment - safety, comfort, control and ongoing control of preparation for laboratory exercises and evaluation of their course		

Course description		
<p>Discussing the scope of the subject, providing literature and rules for passing. ABS anti-lock systems; construction and description of the operation. ASR and ESP antiskid systems: construction and operation description. Retarders and engine brakes in commercial vehicles: principles of operation, construction and service. Gas cushions: construction and operation description. Seat belts and belt pretensioners: construction and operation description. Air conditioning systems: construction, operation and service. Refrigerants and lubricating oils used in car air conditioning systems. Parking heater systems: construction, operation and service. Electrical control systems for mirrors, seats and equipment development: Control and assistance systems for parking and reversing the vehicle. The use of GPS in commercial vehicles: the purposes of using the location of the vehicle using GPS, the basics of the GPS system.</p>		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Herner A., Riehl H.J.: Elektrotechnika i elektronika w pojazdach samochodowych. WKiŁ. Warszawa 2006 2. Rokosch U.: Poduszki gazowe i napinacze pasów. WKiŁ. Warszawa 2003 3. Deh U.: Klimatyzacja w samochodzie . WKiŁ. Warszawa 2008 4. Red. Gaziński B.: Technika klimatyzacyjna dla praktyków. Klimatyzacja pojazdów samochodowych. SYSTHERM D. Gazińska s.j. Poznań 2009 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Grzebielec A., Pluta Z., Ruciński A., Rusowicz . Czynniki chłodnicze i nośniki energii. Oficyna Wydawnicza Politechniki Warszawskiej. Warszawa 2011 2. Pacholski K.: Elektryczne i elektroniczne wyposażenie pojazdów samochodowych. WKiŁ. Warszawa 2011 		
Result of average student's workload		
Activity	Time (working hours)	
1. Presence at the lectures	15	
2. Preparation to the laboratories	5	
3. Presence at the laboratories	15	
4. Elaboration of the content of exercises, reports	5	
5. Preparation to the test	5	
6. Presence at the pass	2	
7. Consultations	3	
Student's workload		
Source of workload	hours	ECTS
Total workload	50	2
Contact hours	35	2
Practical activities	18	0