

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Ecology of Transport		Code 1010612211010620632
Field of study Transport	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty Logistics of 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: 2 Classes: - Laboratory: - Project/seminars: -		No. of credits 1
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 1 100% 1 100%
Responsible for subject / lecturer: Paweł Fuć, DSc., DEng email: pawel.fuc@put.poznan.pl tel. 61 665 2045 Faculty of Machines and Transport 3 Piotrowo street, 60-965 Poznan, Poland		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	The student has knowledge in terms of logistics related to environmental protection, meets the mechanisms of harmful emissions in transport and industry, the student has a basic knowledge of environmental factors causing hazards to the environment. He knows how to prevent the entry of harmful substances into the atmosphere and he knows the classification compounds harmful to human health and their safety.
2	Skills	The student is able to integrate the information, to make their interpretation, draw conclusions, formulate and justify opinions, has a general knowledge of the environment, is able to obtain information from literature and web sources.
3	Social competencies	The student is able to make judgments on social issues, he has aware of the importance and understanding of non-technical aspects and impacts of engineering on the environment, the student is aware of the risks associated with the emission of harmful substances into the atmosphere and has a negative environmental awareness social behavior on health and human security in transport and industry.
Assumptions and objectives of the course: -general knowledge of the risks associated with human activities currently and the possible consequences in the future, refer to the topics of ecology in industry and transport; hazard classification, general knowledge about alternative sources of propulsion and power of modern vehicles.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. He has knowledge of the chemistry of compounds toxic and harmful. - [K2A_W01]		
2. He knows the basics of the logistics process optimization in terms of ecological service of vehicles. - [K2A_W20]		
3. He knows the methods of increasing rates of organic companies using logistics systems. - [K2A_W20]		
4. He knows the general outline of environmental determinants of mass transit. - [K2A_W20]		
5. It has a general knowledge of the risks of development of the transport industry for the environment - [K2A_W20]		
Skills:		
1. He can make a preliminary assessment of ecological risks in transport and industry. - [K2A_K01]		
2. He can analyze the factors shaping environmental performance in transport. - [K2A_K02]		
3. He can analyze the provisions of the toxicity of exhaust gases and gases based on the literature. - [K2A_K04]		
4. He can analyze categories of vehicles in terms of their level of environmental performance. - [K2A_K01]		
5. He knows how to interpret and draw conclusions and justify opinions. - [K2A_K01]		
Social competencies:		

1. The possibility of formation of ecological awareness in the social environment. - [K2A_K01]
2. Awareness of social risks in terms of the protection of environment and the associated responsibility for decisions. - [K2A_K02]

Assessment methods of study outcomes		
-The test of having knowledge of harmful emissions into the atmosphere, operation of new technologies to limit emissions from heavy duty vehicles, optimization of logistic processes in improving company environmental factors, structures, norms and toxicity of exhaust gases. One test during the semester.		
Course description		
-Lecture: environmental risks by industry, the base transport systems in terms of ecology, classification propulsion systems; basic knowledge of exhaust gas aftertreatment systems, environmentally friendly technologies in transport, the impact of macroeconomic factors on the implementation of environmentally friendly technologies in transport.		
Basic bibliography:		
1. Edyta Zielińska, Kazimierz Lejda, Analiza i modelowanie procesów logistycznych w zapleczu technicznym transportu samochodowego w aspekcie problemów ekologicznych. ISBN: 978-83-7199-597-2.		
2. Stanisław Wiąckowski, Toksykologia środowiska człowieka. Wydawnictwo: Branta, 2010 ISBN: 978-83-616-6806-0.		
3. Merkiż Jerzy, Mazurek Stanisław, Pokładowe Systemy Diagnostyczne Pojazdów Samochodowych. Wydawnictwa Komunikacji i Łączności WKŁ, 2006		
4. Merkiż J., Pielecha I., Alternatywne napędy pojazdów. Wydawnictwo Politechniki Poznańskiej, Poznań 2006.		
Additional bibliography:		
1. Wojciech Serdecki, Badania silników spalinowych. Wyd. Politechniki Poznańskiej, Poznań 2012.		
2. Witold M. Lewandowski, Proekologiczne źródła energii odnawialnej. WNT, Warszawa 2002.		
3. Zdzisław Chłopek, Ochrona środowiska naturalnego. Pojazdy samochodowe. WKŁ, Warszawa 2003.		
Result of average student's workload		
Activity	Time (working hours)	
1. Lecture	32	
Student's workload		
Source of workload	hours	ECTS
Total workload	34	1
Contact hours	32	1
Practical activities	2	0