

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Environment and Ecology		Code 1010624181010623054
Field of study Mechanical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 8
Elective path/specialty Internal Combustion Engines	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 10 Classes: 8 Laboratory: 10 Project/seminars: -		No. of credits 4
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		ECTS distribution (number and %) 4 100%
Responsible for subject / lecturer: dr hab. inż. Paweł Fuć email: pawel.fuc@put.poznan.pl tel. 61 665 2045 Faculty of Machines and Transport Piotrowo 3 Street, 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	student learns the classification of harmful compounds to human health and to their characteristics, the student acquires general knowledge of environmental factors causing danger to the environment, to know how to prevent the entry of harmful substances into the atmosphere, acquire general knowledge in the construction and operation of the mitigation into the atmosphere, take in practice the methodology of measuring emissions from internal combustion engines, can handle the latest equipment for testing in real conditions and engine test bench can count emissions according to EU standards
2	Skills	student is able to integrate obtained information, to make their interpretation, draw conclusions, formulate and justify opinions, have a general knowledge of health and safety
3	Social competencies	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: -Introduction to the theme of ecology in the industry and the automotive industry, general knowledge of the risks associated with human activities now and the possible consequences in the future.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. He knows the classification of harmful and toxic compounds. - [K1A_W03] 2. He knows the rules associated with emissions of harmful exhaust gases. - [K2A_W21] 3. He knows the methods to prevent the emission of harmful substances into the atmosphere. - [K2A_W20] 4. He knows the general outline of environmental determinants of transport. - [K2A_W20] 5. He knows the quality of road transport conditions. - [K2A_W20]		
Skills:		
1. 1. He can a classified categories of vehicles. - [K2A_U02] 2. 2. He can analyze the major factors shaping the environmental performance of the transport. - [K2A_U09] 3. 3. Know how to interpret the provisions of toxic gases - [K2A_U16] 4. 4. He can make a preliminary assessment of the environmental performance of vehicle. - [K2A_U16]		
Social competencies:		
1. 1. Recognizes the importance of protecting the environment. - [K2A_K01] 2. 2. He can point to important social factors affecting environmental awareness. - [K2A_K02]		

Assessment methods of study outcomes		
-Test of knowledge of the toxicity of exhaust gas regulations, standards, and general environmental awareness in transport. Two tests during the semester.		
Course description		
-Lecture ? environmental conditions for transport, natural resources, social and economic factors, classification of vehicles, standards toxic gases.		
Basic bibliography:		
1. 1. Stanisław Wiąckowski, Toksykologia środowiska człowieka. Wydawnictwo: Branta, 2010 ISBN: 978-83-616-6806-0.		
2. 2. Merkisz Jerzy, Mazurek Stanisław, Pokładowe Systemy Diagnostyczne Pojazdów Samochodowych. Wydawnictwa Komunikacji i Łączności WKŁ, 2006-01-01.		
3. 3. Jerzy Merkisz, Ekologiczne problemy silników spalinowych, Wyd. Politechniki Poznańskiej, Poznań 1998.		
4. 4. Merkisz J., Pielecha I., Alternatywne napędy pojazdów. Wydawnictwo Politechniki Poznańskiej, Poznań 2006.		
5. 5. Nagórski Z., Teodorczyk A., Bernhard M., Regeneracja samochodowych filtrów cząstek stałych ? tendencje rozwojowe, modelowanie i badania symulacyjne. Politechnika Warszawska, Instytut Pojazdów, Instytut Techniki cieplnej. Wydawnictwo WsiMR PW, Warszawa 2003.		
6. Kruczyński S.W., Trójfunkcyjne reaktory katalityczne. Politechnika Warszawska, Warszawa ? Radom 2004		
Additional bibliography:		
1. 1. Wojciech Serdecki, Badania silników spalinowych. Wyd. Politechniki Poznańskiej, Poznań 2012.		
2. 2. Witold M. Lewandowski, Proekologiczne źródła energii odnawialnej. WNT, Warszawa 2002.		
3. 3. Zdzisław Chłopek, Ochrona środowiska naturalnego. Pojazdy samochodowe. WKŁ, Warszawa 2003.		
Result of average student's workload		
Activity	Time (working hours)	
1. Prepare to the class	5	
2. Activity	15	
3. Knowledge	10	
4. Consultation	8	
5. Prepare to the test	5	
6. Test activity	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	45	4
Contact hours	30	2
Practical activities	15	0