

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Protection of Environment</b>		Code <b>1010614181010610271</b>
Field of study <b>Mechanical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>4 / 8</b>
Elective path/specialty <b>Motor Vehicles and Tractors</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>part-time</b>	
No. of hours Lecture: <b>14</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>2</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>1 50%</b> <b>1 50%</b>
<b>Responsible for subject / lecturer:</b> Prof. Zbigniew Kłos, Ph.D.(Eng.), D.Sc. email: zbigniew.klos@put.poznan.pl tel. 61 665 2231 Faculty of Machines and Transport ul. Piotrowo 3, 60-965 Poznań		<b>Responsible for subject / lecturer:</b> Jedrzej Kasprzak, Ph.D. (Eng). email: jedrzej.kasprzak@put.poznan.pl tel. 616652232 Faculty of Machines and Transport ul. Piotrowo 3, 60-965 Poznań
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Student has a basic knowledge about the questions of environmental impacts of technical objects and technologies
2	<b>Skills</b>	Student is able to integrate the interdisciplinary information acquired; he can interpret them, draw conclusions, formulate opinions
3	<b>Social competencies</b>	Student is aware of the importance of human activities in relationship with the environment, he understands their general aspects and consequences
<b>Assumptions and objectives of the course:</b> Acquaintance of basic threats for environment resulting from the different industrial activities and the ways of environment elements protection, especially resulting from the production and exploitation of the transportation means		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has a basic knowledge of machines and technology impact on the natural environment and global energy balance - [K1A_W20]		
2. Has a basic knowledge about the main sources of air and water pollution and ways of their protection - [K1A_W21]		
3. Has a basic knowledge about the noise and vibrations sources and their influences on environment - [K1A_W24]		
4. Knows the environmental impacts of the energetic sector - [-]		
5. Knows, how to treat the waste generated by the motorization and end-of-life vehicles - [-]		
6. Has a basic knowledge about the economic and law aspects of environmental protection - [-]		
<b>Skills:</b>		
1. Is able to assess the material, environmental and labor input for an assembly of a simple machine, is able to apply basic technical standards for unification, safety and recycling - [K1A_U20 K1A_U21]		
<b>Social competencies:</b>		
1. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment and responsibility for own decisions - [K1A_K02]		
<b>Assessment methods of study outcomes</b>		

Pass on the base of the control work (written test)		
<b>Course description</b>		
Environment, its elements and interrelations between them. Legal aspects of environment protection. Water, its resources, main sources of pollution, water protection. Air, kinds of air pollution, water protection. Noise and vibration in industry and transportation. Energetics and its influence on pollution of different environmental elements. Used elements of machines and vehicles and their utilization. Wastes management. Economical aspects of environment protection.		
<b>Basic bibliography:</b>		
1. Zarzycki R., Imbierowicz M., Stelamachowski M., Wprowadzenie do inżynierii i ochrony środowiska. WNT, Warszawa 2007		
2. Czech E. (red.), Uwarunkowania ochrony środowiska: aspekty krajowe, unijne, międzynarodowe. Difin, Warszawa 2006		
3. Kłos Z., Feder S. Ochrona środowiska w budowie maszyn i transporcie. Wyd. PP, Poznań 2002		
<b>Additional bibliography:</b>		
1. W. Nierzwicki, Zarządzanie środowiskowe. PWE, Warszawa 2006		
2. Agenda 21. The earth summit strategy to save our planet. ed. D. Sitarz. Earthpress, Boulder 1993		
3. Głowiak B., Kempa E., Winnicki T. Podstawy ochrony środowiska. PWN, Warszawa 1985		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Presence at the lectures	15	
2. Lectures content repetition and comprehension	1	
3. Consultations	1	
4. Preparation to test	10	
5. Presence at the test	2	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	29	2
Contact hours	18	2
Practical activities	0	0