

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Protection of Environment</b>		Code <b>1010611151010610271</b>
Field of study <b>Mechanical Engineering</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>3 / 5</b>
Elective path/specialty <b>Food Industry Machines and Refrigeration</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>full-time</b>	
No. of hours Lecture: <b>1</b> Classes: <b>-</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>1</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>		ECTS distribution (number and %) <b>1 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Jędrzej Kasprzak email: JEDRZEJ.KASPRZAK@put.poznan.pl tel. 61 665 22 32 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 food industry machines and devices		
<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 K1A_W24]		
2. Has a basic knowledge about the main sources of air and water pollution and ways of their protection - [ K1A_W20 K1A_W24]		
3. Has a basic knowledge about the noise and vibrations sources and their influences on environment - [ K1A_W20 K1A_W24]		
4. Knows the environmental impacts of the energetic sector - [ K1A_W20 K1A_W24]		
5. Knows, how to treat the waste generated by the food industry enterprises and agricultural sector - [ K1A_W20 K1A_W24]		
6. Has a basic knowledge about the economic and law aspects of environmental protection - [ K1A_W20 K1A_W24]		
<b>Skills:</b>		
1. Is able to assess the material, environmental and labor input for an assembly of a food industry and refrigeration machines and devices, 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. Waste management, especially concerning food industry waste. Specific environmental threats generated by refrigeration. 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		
4. Bartkiewicz B. 2006: Oczyszczanie ścieków przemysłowych. Wydawnictwo Naukowe PWN, Warszawa		
<b>Additional bibliography:</b>		
1. W. Nierzwicki, Zarządzanie środowiskowe. PWE, Warszawa 2006		
2. Agenda 21. The earth summit shategy to save our planet. ed. D. Sitarz. Earthpress, Boulder 1993		
<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	1
Contact hours	18	1
Practical activities	0	0