

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Recycling of transport means		Code 1010621271010612411
Field of study Transport	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty Railway Transport	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 1 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		ECTS distribution (number and %) 1 100%
Responsible for subject / lecturer: dr hab. Agnieszka Merkisz-Guranowska email: agnieszka.merkisz-guranowska@put.poznan.pl tel. 61 647 59 58 Faculty of Working Machines and Transportation ul. Piotrowo 3 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Student has a basic knowledge of design and construction of transport means
2	Skills	Student is able to associate and integrate the information, draw conclusions, formulate and justify opinions.
3	Social competencies	Student is able to do a literature research and knows the rules of discussion
Assumptions and objectives of the course: Understanding the recycling issues including legal, technical, economic and social context of sustainable socio-economic development.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has the knowledge of basic concepts of recovery and recycling - [K1A_W21] 2. Has the knowledge of the recycling network specificity on the example of end-of-life vehicles recycling network - [K1A_W24] 3. Has the knowledge of basic technologies used in recovery and recycling of technical objects - [K1A_W21] 4. Has the knowledge of the factors affecting the efficiency of the recycling process - [K1A_W24]		
Skills:		
1. Is able to describe the negative effects of inadequate treatment of means of transport - [K1A_U01] 2. Is able to analyze the process of recycling - [K1A_U01] 3. Is able to identify the right way of recovery and recycling depending on the type of mean of transport and its components - [K1A_U08]		
Social competencies:		
1. Is aware of the risks associated with the inadequate treatment of technical objects and understands the need for adequate recovery - [K1A_K02] 2. Is able to develop his knowledge in the field of waste recovery - [K1A_K01] 3. Is able to formulate opinions on treatment of end-of-life products - [K1A_K06]		
Assessment methods of study outcomes		

Average rating taking into account assessment of the student activity during lectures and a written final test.		
Course description		
<p>1 Scope of recycling. Negative environmental impact of means of transport with emphasize to the end-of-life phase. Role and objectives of waste management and recovery. Types of recovery.</p> <p>2 Types of recycling. Scope and characteristics of product and material recycling.</p> <p>3 Recycling network. Typical process of recovery including material flows. Economic operators and their role. Types of recycling network.</p> <p>4 Recycling technologies: including regeneration, biological and mechanical recycling. Recovery technologies of plastic, tires, waste oils.</p> <p>5 Organisation of recycling Part 1. Organization of recycling network for end-of-life vehicles.</p> <p>6 Organization recycling Part 2. Organization of recycling network for other of means of transport - air, rail and sea.</p>		
Basic bibliography:		
<p>1. Merkisz-Guranowska A., Recykling samochodów w Polsce, Instytut Technologii Eksploatacji, Radom 2007.</p> <p>2. Merkisz-Guranowska A., Aspekty rozwoju recyklingu, Instytut Technologii Eksploatacji, Radom 2005.</p>		
Additional bibliography:		
<p>1. Osiński J., Zach P., Wybrane zagadnienia recyklingu samochodów, Wydawnictwo Komunikacji i Łączności, Warszawa 2009.</p> <p>2. Czasopismo Recykling</p> <p>3. Sawwa R., Recykling samochodów. Ekologia, Prawo, Praktyka, Perspektywy, Przemysłowy Instytut Automatyki i Pomiarów, Warszawa 2001.</p> <p>4. Oprzędkiewicz J., Stolarski B., Technologia i systemy recyklingu samochodów, Wydawnictwa Naukowo-Techniczne, Warszawa 2003.</p>		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Learning of lectures content	5	
3. Preparation for the final test	5	
4. Participation in the final test	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	21	1
Contact hours	11	1
Practical activities	0	0