

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Recycling of transport means</b>		Code <b>1010624271010612411</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>4 / 7</b>
Elective path/specialty <b>Ecology of Transport</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>10</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 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		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Student has a basic knowledge of design and construction of transport means
2	<b>Skills</b>	Student is able to associate and integrate the information, draw conclusions, formulate and justify opinions.
3	<b>Social competencies</b>	Student is able to do a literature research and knows the rules of discussion
<b>Assumptions and objectives of the course:</b> Understanding the recycling issues including legal, technical, economic and social context of sustainable socio-economic development.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
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]		
<b>Skills:</b>		
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]		
<b>Social competencies:</b>		
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]		
<b>Assessment methods of study outcomes</b>		

Average rating taking into account assessment of the student activity during lectures and a written final test.		
<b>Course description</b>		
<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>		
<b>Basic bibliography:</b>		
<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>		
<b>Additional bibliography:</b>		
<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>		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Participation in lectures	10	
2. Learning of lectures content	5	
3. Preparation for the final test	5	
4. Participation in the final test	1	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	21	1
Contact hours	11	1
Practical activities	0	0