

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Recycling of transport means</b>		Code <b>1010621371010612411</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>4 / 7</b>
Elective path/specialty <b>Railway 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>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>other</b>		(university-wide, from another field) <b>university-wide</b>
Education areas and fields of science and art <b>technical sciences</b> <b>Technical sciences</b>		ECTS distribution (number and %) <b>1 100%</b> <b>1 100%</b>
<b>Responsible for subject / lecturer:</b>  prof. dr hab. Agnieszka Merkisz-Guranowska email: agnieszka.merkisz-guranowska@put.poznan.pl tel. 61 647 59 58 Wydział Inżynierii Transportu 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 - [T1A_W06]		
2. Has the knowledge of the recycling network specificity on the example of end-of-life vehicles recycling network - [T1A_W06]		
3. Has the knowledge of basic technologies used in recovery and recycling of technical objects - [T1A_W06]		
4. Has the knowledge of the factors affecting the efficiency of the recycling process - [T1A_W06]		
<b>Skills:</b>		
1. Is able to describe the negative effects of inadequate treatment of means of transport - [T1A_U05]		
2. Is able to analyze the process of recycling - [T1A_U09]		
3. Is able to identify the right way of recovery and recycling depending on the type of mean of transport and its components - [T1A_U04]		
4. Is able to develop his knowledge in the field of waste recovery - [T1A_U19]		
<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 - [T1A_K02]		
2. Is able to formulate opinions on treatment of end-of-life products - [T1A_K03]		

<b>Assessment methods of study outcomes</b>		
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 of product and material recycling.</p> <p>3 Recycling system. Typical process of recovery including material flows. Types of recycling network.</p> <p>4 Economic operators of recycling network: dismantlers (organisation, equipment, legal requirements), collecting points (legal requirements and equipment), shredders (shredding process).</p> <p>5 Organisation of recycling network for end-of-life vehicles in selected countries.</p> <p>6 Role of the manufacturers: eco-design, involvement in recycling network organization.</p> <p>7 Organization of recycling network for rail vehicles.</p> <p>8 Organization of recycling network for aircrafts.</p>		
<b>Basic bibliography:</b>		
1. Merkisz-Guranowska A., Recykling samochodów w Polsce, Instytut Technologii Eksploatacji, Radom 2007		
<b>Additional bibliography:</b>		
1. Merkisz-Guranowska A., Stawecka H., Recykling pojazdów szynowych, Instytut Pojazdów Szynowych Tabor, Poznań 2018		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Preparation for the final test	10	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	25	1
Contact hours	15	1
Practical activities	0	0