

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Ecobalancing</b>		Code <b>1010622321010610383</b>
Field of study <b>Transport</b>	Profile of study (general academic, practical) <b>general academic</b>	Year /Semester <b>1 / 2</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>Second-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>1</b> Classes: <b>2</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>		No. of credits <b>4</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>4 100%</b> <b>4 100%</b>
<b>Responsible for subject / lecturer:</b>  dr inż. Jędrzej Kasprzak email: jedrzej.kasprzak@put.poznan.pl tel. +48616652232 Faculty of Transport Engineering 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, and environmental protection
2	<b>Skills</b>	Student is able to use MS Word, Excel and PowerPoint software (or other similar). He can collect and transform information acquired from Internet or other digital or traditional sources
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. He can work in the workgroup, and clearly distribute the tasks. He can do the verbal presentation of the results obtained.
<b>Assumptions and objectives of the course:</b> Commitment and broadening the knowledge about the environmental impacts of technical objects. History, applications and methodological assumptions of the ecobalancing methods, especially the life cycle assessment (LCA) method. Commitment of the practical skills in the field of ecobalancing analyses preparation and use of the specific environmental software		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		
1. Has a structured and theoretically founded general knowledge related to key issues in the field of transport engineering - [T2A_W02]		
2. Has advanced and detailed knowledge of the processes taking place in the life cycle of transport systems - [T2A_W05]		
<b>Skills:</b>		
1. Can acquire information from literature, databases and other sources (in Polish and English), integrate them, make their interpretation and critical evaluation, draw conclusions and formulate and fully justify opinions - [T2A_U01]		
2. Can - when formulating and solving engineering tasks - integrate knowledge from different transport areas (and if necessary also knowledge from other scientific disciplines) and apply a systemic approach, also taking into account non-technical aspects - [T2A_U05]		
<b>Social competencies:</b>		
<b>Assessment methods of study outcomes</b>		
Exam (written - 5 open questions), presentation of the results of the individual or group work (environmental analysis of life cycle of selected objects or processes, using dedicated software)		

<b>Course description</b>		
Terminology concerning ecobalancing and environmental issues. General questions related with the term of environment (structure, resources, threats). The life cycle of technical objects. History of ecobalances. Methodology of the ecobalances. Application and tools of ecobalances. The examples of the ecobalancing analyses with the particular consideration of the specificity of the operations, potential problems, interpretation. Simplified ecobalances. LCA as the component of LCM. Self-preparation of the environmental analysis of the chosen technical object.		
<b>Basic bibliography:</b>		
1. Lectures		
2. ISO 14040:2009 Environmental management - Life cycle assessment - Principles and framework		
3. ISO 14044:2009 Environmental management - Life cycle assessment - Requirements and guidelines		
4. Goedkoop, M.; Spriensma, R.S., The Eco-indicator 99, a Damage oriented method for LCIA, Ministry VROM, the Hague 1999		
<b>Additional bibliography:</b>		
1. Baumann H., Tillman A.: The Hitch Hiker's Guide to LCA. An orientation in life cycle assessment methodology and application Sweden, 2004, ISBN ISBN 91-44-02364-2		
2. The International Journal of Life Cycle Assessment - review of the journal's annuals		
<b>Result of average student's workload</b>		
<b>Activity</b>	<b>Time (working hours)</b>	
1. Presence at the lectures	15	
2. Review of the lectures	10	
3. Consultations	10	
4. Preparation to exam	10	
5. Presence at the exam	2	
6. Presence at the exercises	30	
7. Project preparation	23	
<b>Student's workload</b>		
<b>Source of workload</b>	<b>hours</b>	<b>ECTS</b>
Total workload	100	4
Contact hours	57	4
Practical activities	0	0