GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00061831		
Field of study	Management and Production Engineering		
Date of commencement of studies	February 2024	Academic year of realisation of subject	2024/2025
Education level	second-cycle studies	Subject group	
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	ECTS credits	4.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Zakład Technologii Maszyn i Automatyzacji Produkcji -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Stefan Dzionk	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	15.0	0.0	0.0	45

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	45	0.0	0.0	45

Subject objectives

With the increasing importance of sustainability policies being introduced in every aspect of life, it is essential to understand what life cycle analysis is. In addition to the general goals and applications, it is necessary for students to learn more deeply about the mechanisms of the assessment itself but also how to reduce the environmental impact at the stage of production, use as well as disposal of the product.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K02] is aware of the importance and understanding of non-technical aspects and effects of engineering activities, including its impact on the environment, and the related responsibility for decisions made demonstrates knowledge of actions to reduce risk and anticipate the social impact of engineering and manufacturing activities	The knowledge gained will enable the student to understand the environmental consequences of decisions made at each stage of the product's life. The effect of the course is to expand the student's awareness not only of technical aspects such as eco-design, but also the demand for human labor, materials or waste management. Life Cycle	[SK5] Assessment of ability to solve problems that arise in practice
[K7_K01] is aware of the need to expand knowledge and verify the methods of solving problems by consulting experts	The student will learn about the complexity of the issue and the continuous development of methods and databases used in the analysis. The continuous evolution of the way environmental assessment is done will be made clear to the course participants.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U01] can obtain information from literature, databases and others sources, also in English or another foreign language recognized as the language of international communication in a given engineering discipline; is able to integrate the obtained information, interpret it, as well as draw conclusions and formulate and justify opinions.	The student is able to determine the different stages of the product life cycle. At each stage, student is able to identify environmental impacts and, using software, databases and external sources, estimate environmental impacts. The student is able to identify and use sources of information on development trends of manufacturing machinery and materials in the production and market decision-making process.	[SU3] Assessment of ability to use knowledge gained from the subject

<table>
<tr><td>Subject contents</td><td>Lecture Topics:

What is LCA
Raw material extraction and water consumption, etc.
Pre-processing of materials. Smelters, refining, etc.
Technological, manufacturing processes.
Packaging.
Transportation, supply chains.
Assembly
Operation, planned and ad hoc services.
Dismantling
Recycling
Tools for analysis
Environmental impact, impact categories
Life cycle extension
Life cycle analysis by example
Life cycle analysis by example 2

Labs:

Collaborative and independent LCA analysis</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td></td><td>56.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td><table>
<tr><td>Basic literature</td><td>1) SimaPro database manual, Methods library, June 2020, Written by: Various authors, PRé Sustainability

2) Overview and methodology, Data quality guideline for the ecoinvent database version 3, Weidema B P, Bauer C, Hischier R, Mutel C,

3) ILCD Handbook General guide for LCA DETAILED GUIDANCE, European Commission Joint Research Centre Institute for Environment and Sustainability</td></tr>
<tr><td>Supplementary literature</td><td>Recommended work with current scientific papers</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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