



## Subject card

Subject name and code	, PG_00061831						
Field of study	Management and Production Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
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 Automatykacji Produkcji -> Institute of Manufacturing and Materials Technology -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Doerffer				
	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_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
	[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_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_W01] knows and understands to a greater extent selected issues in the field of management and quality sciences and mechanical engineering, their location in the field of social sciences and engineering and technical sciences, as well as relationships with related disciplines, and sees the possibility of applying the knowledge in practice.	The complexity of LCA ( Life cycle Assessment) issues requires the deepening of many multidisciplinary issues for application in analysis.	[SW3] Assessment of knowledge contained in written work and projects	
Subject contents	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		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		56.0%	50.0%
		56.0%	50.0%

Recommended reading	Basic literature	<p>1) SimaPro database manual, Methods library, June 2020, Written by: Various authors, PRé Sustainability</p> <p>2) Overview and methodology, Data quality guideline for the ecoinvent database version 3, Weidema B P, Bauer C, Hirschier R, Mutel C,</p> <p>3) ILCD Handbook General guide for LCA DETAILED GUIDANCE, European Commission Joint Research Centre Institute for Environment and Sustainability</p>
	Supplementary literature	Recommended work with current scientific papers
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	