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Social competencies:

1. Student can cooperate with others members of the working group - [K2A_K04]

- 2. He has an increased environmental awareness, resulting from the skillful anticipation of the negative environmental
- impacts, related with the manufacturing and use of the technical objects [K2A_K05]
- 3. He can present the results of the LCA analyse [K2A_K06]

Assessment methods of study outcomes

Written examination, presentation of the results of the individual or group work

Course description

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

Basic bibliography:

1. Lectures

2. Norma PN-EN ISO 14040:2009 Zarządzania środowiskowe ? Ocena cyklu życia ? Zasady i struktura

3. Norma PN-EN ISO 14044:2009 Zarządzania środowiskowe ? Ocena cyklu życia ? Wymagania i wytyczne

4. Kłos Z., Kurczewski P., Kasprzak J., Środowiskowe charakteryzowanie maszyn i urządzeń. Podstawy ekologiczne, metody i przykłady. Poznań 2005, ISBN 83-7143-386-7.

Additional bibliography:

1. Adamczyk W., Ekologia wyrobów. Jakość. Cykl życia. Projektowanie. PWE, Warszawa 2004.

2. 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

3. Kowalski Z., Kulczycka J., Góralczyk M.: Ekologiczna ocean cyklu życia procesów wytwórczych. Wydawnictwo Naukowe PWN, Warszawa 2007, ISBN 978-83-01-15184-3

4. Kurczewski P., Lewandowska A (red.): Zasady prośrodowiskowego projektowania obiektów technicznych dla potrzeb zarządzania ich cyklem życia; Wyd. KMB Druk; Poznań 2008; ISBN 978-83-61352-20-4

5. Lewandowska A.: Środowiskowa ocena cyklu życia na przykładzie wybranych typów pomp przemysłowych; Wyd. UEP; 2006, ISBN 83-7417-133-2

6. Przegląd roczników czasopisma ?The International Journal of Life Cycle Assessment?

Result of average student's workload

Activity		Time (working hours)				
1. Presence at the lectures		15				
2. Review of the lectures	7					
3. Consultations	7					
4. Preparation to examinatio	10					
5. Presence at the examination	2					
6. Preparation to the classes	5					
7. Presence at the classes	30					
8. Project preparation		15				
Student's workload						
Source of workload	hours	ECTS				

Source of workload	hours	ECTS
Total workload	91	3
Contact hours	54	2
Practical activities	37	1