



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Environmental evaluation tools [S2TIIZM1E>NOŚ]

Course

Field of study

Information Technology for Smart and Sustainable Mobility

Year/Semester

2/3

Area of study (specialization)

–

Profile of study

general academic

Level of study

second-cycle

Course offered in

English

Form of study

full-time

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

0

Other

0

Tutorials

15

Projects/seminars

15

Number of credit points

3,00

Coordinators

dr inż. Jędrzej Kasprzak

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Lecturers

Prerequisites

Knowledge: Student has a basic knowledge about the questions of environmental impacts of technical objects and technologies, and environmental protection Skills: 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 Social competencies: 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.

Course objective

Commitment and broadening the knowledge about the environmental impacts of technical objects and processes, including transport processes. 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

Course-related learning outcomes

Knowledge:

1. The student possesses advanced and in-depth knowledge in the field of transport engineering, including theoretical foundations, tools, and means used to solve basic engineering problems, in particular, is familiar with the fundamental assumptions, principles, and procedures of environmental impact assessment.
2. The student has knowledge of development trends and the most significant recent achievements in the design of machines and means of transport and the assessment of their impact on the environment and human life
3. The student has advanced and detailed knowledge of the processes occurring throughout the life cycle of machines and means of transport

Skills:

1. The student is able to obtain information from literature, databases, and other sources, integrate it, interpret and critically evaluate it, draw conclusions, and formulate well-justified opinions in the area of environmental impact assessment throughout the life cycle
2. The student is able to use information and communication technologies applied in the area of environmental impact assessment
3. The student is able to critically analyze existing technical solutions and propose their improvements (enhancements) that reduce environmental burdens.
4. The student is able to collaborate within a team, taking on various roles, including leading a team

Social competences:

1. The student is prepared to critically assess their knowledge and understands that in transport engineering and computer science, knowledge and skills become outdated very quickly
2. The student understands the importance of using the latest knowledge in the field of environmental impact assessment of machines and devices.
3. The student understands the importance of dissemination activities related to the latest achievements in machine and equipment design and is ready to initiate actions for the public interest

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Evaluation based on the control work (written test) and presentation of the results of the individual or group work

Programme content

Terminology in the field of life cycle assessment (LCA) and environmental issues. Life cycle of technical objects and processes. Life cycle assessment (LCA) methodology. Applications of LCA and analytical and IT tools for environmental assessment.

Course topics

Terminology concerning ecobalancing and environmental issues.

General questions related with the term of environment (structure, resources, threats).

The life cycle of technical objects and processes, including the main stages.

History of ecobalances. Methodology of the ecobalances. Application and tools of ecobalances, including methods and informatic tools.

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.

Teaching methods

Lecture: multimedia presentation, illustrated with examples on the board

Tutorials: individual exercises supported by the dedicated software, done under the supervision of the lecturer

Bibliography

Basic:

ISO 14040:2009 Environmental management - Life cycle assessment - Principles and framework

ISO 14044:2009 Environmental management - Life cycle assessment - Requirements and guidelines

Kurczewski P. (2014), Life cycle thinking in small and medium enterprises: the results of research on the implementation of life cycle tools in Polish SMEs-part 1: background and framework. The International Journal of Life Cycle Assessment volume 19, pages 593-600

Witczak J., Kasprzak J., Klos Z., Kurczewski P., Lewandowska A., Lewicki R. (2014), Life cycle thinking in small and medium enterprises: the results of research on the implementation of life cycle tools in Polish SMEs-part 2: LCA related aspects. The International Journal of Life Cycle Assessment volume 19, pages 891-900

Goedkoop, M.; Spriensma, R.S., The Eco-indicator 99, a Damage oriented method for LCIA, Ministry VROM, the Hague 1999

Additional:

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

The International Journal of Life Cycle Assessment - review of the annuals.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00