Applied Sustainability Assessment

Educational subject description sheet

Basic information

Field of study Joint Bachelor in Sustainability	**Education cycle** 2025/26
Speciality Economics, Management & Engineering	**Subject code** UJ.WPAJBSEMES.8100.16497.25
Organizational unit Faculty of Law and Administration	**Lecture languages** english
Study level first cycle (joint degree programme)	**Subject related to scientific research** Yes
Study form full-time degree programme	**Disciplines** Chemical engineering
Education profile General academic	**ISCED classification** 0711 Chemical engineering and processes
Mandatory obligatory	**USOS code**

Subject coordinator	Piotr Szwedo
Lecturer	Wim Dewulf, Jo Van Caneghem

Period Semester 5	**Examination** graded credit **Activities and hours** Lecture: 56	**Number of ECTS points** 4.0

Goals

C1	Students gain insight in the basics of life cycle thinking and learn how to critically assess the overall environmental impact of products and processes from a holistic perspective using Life Cycle Assessment (LCA). They hence integrate insights on sustainability with the technological courses in year 1 and 2 during a concrete project.

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	the basics of life cycle thinking and the different phases of a life cycle assessment	JBS_K1_W07	credit with grade
W2	the most important environmental impact categories	JBS_K1_W07	credit with grade
W3	the methodologies to quantify environmental impacts	JBS_K1_W07	credit with grade
Skills – Student can:			
U1	gather, select, and synthesize independently scientific and technological information required to assess the environmental impact of engineering solutions	JBS_K1_U01	credit with grade, report
U2	quantify the overall environmental impact of life cycles using LCA	JBS_K1_U01, JBS_K1_U03	credit with grade, report
U3	report life cycle impact assessment results and conclusions in writing	JBS_K1_U02, JBS_K1_U04	report
Social competences – Student is ready for:			
K1	to take a position with respect to the conclusions he draws from life cycle impact assessment	JBS_K1_K03	report
K2	to take on social responsibility	JBS_K1_K01	report
K3	to critically approach their knowledge and its sources	JBS_K1_K04	report
K4	to reflect on the environmental impact of engineering solutions also from a holistic perspective	JBS_K1_K03	report

Calculation of ECTS points

Activity form	Activity hours*
Lecture	56
report preparation	30
preparation for final test	34

Student workload	Hours	ECTS
	120	4.0

* hour means 45 minutes

Study content

No.	Course content	Subject's learning outcomes
1.	Introduction to LCA: framework, stages + Goal and scope definition incl. functional unit	W1
2.	Supervised group assignment – Goal and scope	W1, K3

No.	Course content	Subject's learning outcomes
3.	Life cycle inventory: principles, marginal versus average, dealing with multi-functionality	U1
4.	Life cycle inventory: modelling approaches, databases	U1
5.	Life cycle inventory: modelling approaches, databases	U1, K3
6.	Impact Assessment: principles, mid-point methods	W2, W3
7.	Impact Assessment: mid-point methods (cont.) and end-point methods	W2, W3
8.	Supervised group assignment (cont.) – Impact assessment	U2, K3
9.	Interpretation, case studies and applications	K1, K3, K4
10.	Supervised group assignment (cont.) – Interpretation and sensitivity analysis	U2, K1, K3
11.	Supervised group assignment (cont.) – Presentation	U3, K1, K2, K3, K4

Course advanced

Teaching methods :

project method, conversation lecture

Activities	Examination methods	Credit conditions
Lecture	credit with grade, report	final test – mark at least 50%; active preparation and participation; soundness of the approach; critical reflection on goal and scope of the study, on data sources used, on assumptions and validity, and on LCA results (report); quality of oral and written reporting.

Entry requirements

None

Literature

Obligatory

1. Slides of lectures and supportive material made available on Toledo

Effects

Code	Content
JBS_K1_K01	The graduate can encourage sustainability-driven practices in the workplace and appraise sustainability of own values, perceptions, roles, and actions, with a special focus on environmental wellbeing.
JBS_K1_K03	The graduate can consider different visions of the future and develop own evidence-based opinions in reference to the balance of values linked to economic development, social welfare, and environmental protection.
JBS_K1_K04	The graduate can critically assess and verbalize own competencies and skills related to different aspects of sustainability as well as their need for development.
JBS_K1_U01	The graduate can critically analyse academic literature, formulate research questions and conduct research under supervision.
JBS_K1_U02	The graduate can present and report knowledge, methodologies, ideas, problems and solutions, clearly and comprehensively, in different forms destined for different audiences – including discussions and debates which require defending a substantiated opinion, as well as conversations in a foreign language at the CEFR B2 level.
JBS_K1_U03	The graduate can apply adequate methods and tools, including selected IT tools, to solve problems related to data collection, analysis, and management in the context of sustainability.
JBS_K1_U04	The graduate can plan and effectuate simple sustainability-related projects under supervision and in the context of personal lifelong learning, both individually and in a team, using appropriate transversal skills and taking shared responsibility for the outcome.
JBS_K1_W07	The graduate can apply the theory and methodology of disciplines included in the selected specialisation track to sustainability-related problems, taking into consideration practical limitations such as protection of intellectual property.