COURSE DESCRIPTION CARD - SYLLABUS

Course name
Materials management in Circular Economy [S2Log2E-SL>ZMwGOZ]

Course

Field of study
Logistics

Year/Semester
2/3

Area of study (specialization)
Logistics Systems

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
0

Projects/seminars
30

Number of credit points

3,00

Coordinators

dr hab. inż. Paulina Golińska-Dawson prof. PP
paulina.golinska@put.poznan.pl

Lecturers

Prerequisites

A student starting this course should have advanced knowledge of logistics, logistic processes and supply chain management. He or she should also have the ability to acquire information from the indicated sources and be ready to cooperate within a team.

Course objective

The goal of the course is to explore the Circular Economy principles and understand how to manage materials in circular supply chain. The course will cover strategic and operational aspects of the circular supply chain management. The focus will be place on the impact of the circular business models (e.g., Product as a Service PaaS) on the materials management in a company and the whole supply chain. The focus will be placed on the materials management approaches for closing the loop and increasing the resource efficiency by redesign of materials flow and its recovery.

Course-related learning outcomes

Knowledge:
1. Student knows dependencies between the Circular Economy and their relations with logistics [P7S_WG_01]

2. Student knows extended concepts for logistics and its detailed problems with regard to the materials management and circular supply chain management [P7S_WG_05]
3. Student knows extended issues in the life cycle of circular logistic systems and the life cycle of circular industrial products [P7S_WG_06]
Student knows phenomena and contemporary trends characteristic logistics in Circular Economy and its detailed issues and circular supply chain management [P7S_WK_03]
4. Student knows best practices within logistics in Circular Economy and its specific issues [P7S_WK_04]

Skills:
1. Student collects on the basis of the literature of the subject and other sources (in Polish and English) and in an orderly manner, provide information on the problem within the framework of logisticsin Circular Economy and its specific issues and circular materials management in supply chain [P7S_UW_01]
2. Student designs, using appropriate methods and techniques, the logistic process associated with Circualr Economy including defining the path of its implementation and potential threats or limitations in analyzed Circular Economy domain [P7S_UW_05]
3. Student formulates and solves tasks through interdisciplinary integration of knowledge from different fields and disciplines used to design circular logistics systems [P7S_UO_01]

Social competences:
1. Student recognizes causal relationships in achieving the set goals and grading the significance of alternative or competitive tasks in materials management in Circular Economy [P7S_KK_01]
2. Student is aware of the correct identification and resolution of dilemmas related to the profession of logistic manager, with respect for professional ethics and respect for diversity of views and cultures relevant for the Circular Economy [P7S_KK_02]
3. Student is aware of the responsibility and initiation of activities related to the formulation and information sharing and cooperation in the society in the scope of logistics in Circular Economy [P7S_KO_02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: The knowledge acquired in the lecture is verified by solving problem tasks (30 points in total) and a public presentation of a case study analysis of sustanailbe logistics or sustainable supply chain management practice (20 points). The final test will include open and multiple choice questions (50 points in total). Total mark 100 points. Pass mark: 51% of the points.
Project: Partial assessments of the progress of the project stages, defense of the project, final assessment. Total mark 100 points. Pass threshold: 51% of the points.

Programme content

Lecture: Discussion of theoretical issues concerning the impact of the closed-loop economy on the management of material flow in the enterprise, including the creation of a circular supply chain and the value recovery in the circular supply chain using various product recovery scenarios.

Project: designing practical solutions in the area of materials management in the circular supply chain, with a focus on best practices in different sectors.

Course topics

Lecture: Introduction to the Circular Economy principles and their impact on the materials management in a company. Circular business models and their strategic implications for organization of materials management in a supply chain. Characteristics of the circular supply chain. Design of the materials flow in a circular supply chain. Slowing and closing the materials loops in a supply chain. Materials efficiency in circular supply chain. Recapturing the value in a circular supply chain with different recovery scenarios (reduce, redesign, reuse, remanufacture, recycle). Resource efficiency in Circular Economy (circular logistics systems).
Project: Development of a concept for materials management in a circular supply chain with a focus on best practices in various sectors. The project will include characterizing the circular business model, analyzing the logistics processes involved in closing the material loop and putting products into more

than one cycle of use, and assessing the economic and environmental feasibility of the proposed solutions.

Teaching methods

Lecture: multimedia presentation illustrated with examples and case studies.
Project: multimedia presentation illustrated by examples given by the instructor and solving case study and the problem tasks given by the instructor.
Local education methods on the ekursy.put.poznan.pl platform.

Bibliography

Basic:
1. Golinska-Dawson P. (Ed.), Logistics operations and management for recycling and reuse, Springer, 2020.
2. De Angelis R., Howard M., Miemczyk J., Supply chain management and the circular economy: towards the circular supply chain, Production Planning & Control, 29(6), 2018, s. 425-437.

Additional:
1. García-Alcaraz J.L. (Ed.), Tools, Methodologies and Techniques Applied to Sustainable Supply Chains. MDPI, 2020.
2. González-Sánchez R., Settembre-Blundo D., Ferrari A.M., García-Muiña F.E., Main dimensions in the building of the circular supply chain: A literature review, Sustainability, 12(6), 2020, 2459.
3. Kulczycka J., Głuc K., W kierunku gospodarki o obiegu zamkniętym Perspektywa przemysłu, Instytut Gospodarki Surowcami Mineralnymi i Energią Polskiej Akademii Nauk, Warszawa, 2017.

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