

SYLLABUS

Name: Eco-innovation and eco-product development
Name in Polish: Eko-innowacje i rozwój eko-produktów
Name in English: Eco-innovation and eco-product development

Information on course:

Course offered by department: Faculty of Organisation and Management
Course for department: Silesian University of Technology
Study level and form: Master's degree, Full-time
Term: summer semester 2024/2025
Coordinator of course edition: dr inż. Adam Ryszko

Default type of course examination report:

Exam

Language:

English

Course homepage:

<https://platforma.polsl.pl/roz/>

ECTS

4

Short description:

The aim of the course and its program content are aimed at acquiring structured knowledge, skills and social competences in the development and implementation of eco-innovations and developing eco-products.

Description:

Detailed program content

Lecture:

The essence and classifications of eco-innovation.

Eco-innovation in the context of sustainable development goals.

The role of eco-innovation in sustainable development on a global, local and enterprise level.

Managing eco-innovations at the strategic, tactical and operational levels.

Phases of developing and implementing eco-innovations.

Eco-innovation project management.

Eco-innovative business models.

The role of eco-innovation in green supply chains.

The role of open innovation in the development of eco-innovative solutions.

Methods and tools supporting eco-design of innovative solutions.

Environmental product assessment methods as support for the eco-innovative process.

Analysis of costs and benefits of implementing eco-innovations.

Possibilities of financial support for eco-innovation solutions.

Best practices - case studies of eco-innovative solutions.

Exercises

Discussion on selected activities and implementations of eco-innovative solutions in Poland and worldwide.

Eco-innovation management in the enterprise – tools and implementation.

The use of inventive techniques to develop the concept of eco-innovative solutions.

The use of inventive techniques to propose eco-development solutions for existing products and technologies.

Metrics for measuring and assessing eco-innovation.

Evaluation of the effectiveness of eco-innovative solutions.

Project

A group project based on the concept of developing and implementing exemplary eco-innovative solutions. Organization of an eco-innovation team.

Application of inventive methods to develop a concept of an eco-innovative solution. Building of an eco-innovative business model. Determination of stages and milestones for the development and implementation of selected eco-innovation. Application of methods for assessing eco-innovative solutions. Cost-benefit analysis. Strategy and action plan for implementing the proposed solution.

Number of hours of classes with direct participation of academic teachers or other people conducting classes

- Lecture: 30 hours

- Exercise: 15 hours

- Project: 30 hours

Student's own work

- Preparation for passing the exam/test: 15 hours.
- Preparation for exercise classes: 10 hours.
- Project preparation: 20 hours

Total number of hours: 120

Number of ECTS credits: 4

including

Number of ECTS credits obtained in classes conducted with the direct participation of academic teachers or other persons conducting classes: 2.5

Bibliography:

Akkucuk U. ed. Disruptive technologies and eco-innovation for sustainable development. IGI Global, 2021.

Bossink, B. Eco-Innovation and Sustainability Management. Routledge, London, UK, 2013.

Debref R. Environmental Innovation and Ecodesign: Certainties and Controversies. John Wiley & Sons, 2018.

O'Hare J.A., McAloone T.C., Pigosso D.C.A., Howard T.J. Eco-innovation manual: working version for pilot application. 2014.

Open Eco-Innovation Manual for Circular Economy Enablers. RAC/SCP. Barcelona 2021.

Eco-innovation - When business meets the environment <http://ec.europa.eu/environment/eco-innovation/>

Ryszko, A. Proactive Environmental Strategy, Technological Eco-Innovation and Firm Performance—Case of Poland. Sustainability 2016, 8, 156.

Learning outcomes:

KNOWLEDGE: knows and understands

K1A_W3: Basic engineering processes and technologies in the life cycle of technical equipment, objects and systems and ways of solving typical engineering tasks, particularly in relation to the development and implementation of eco-innovations.

K1A_W6: Basic principles and objectives of sustainable development and their importance in the product life cycle.

SKILLS: is able to

K1A_U2: Identify, analyze and interpret social and economic phenomena and processes using knowledge in the field of social sciences and standard methods and tools of management and quality sciences in engineering management activities aimed at development and implementation of eco-innovations.

K1A_U4: When identifying and formulating specifications for engineering tasks and solving them:

- select and use analytical, simulation and experimental methods, including computer-aided methods,
- recognize their system and non-technical aspects, including ethical aspects
- make preliminary economic assessment of the proposed solutions and engineering actions taken,
- analyze and assess eco-innovation performance.

K1A_U6: Design - in accordance with the given specification – eco-innovative solution, using appropriate methods, techniques, tools and materials.

K1A_U10: Integrate and apply interdisciplinary knowledge from engineering and technical sciences incorporating principles and objectives of sustainable development to product life cycle management.

SOCIAL COMPETENCE: is ready for

K1A_K1: Critical evaluation of knowledge and received content, recognition of the importance of knowledge in solving cognitive and practical problems, and consulting experts in the event of difficulties in solving problems on their own

Assessment methods and assessment criteria:

Teaching methods

Lecture: multimedia presentation, discussion, case study and analysis of examples of developing and implementing eco-innovations and the development of eco-products.

Exercises: group work, analysis and interpretation of source texts, use of inventive methods, presentation of the results of group work.

Project: group project based on the concept of developing and implementing an exemplary eco-innovation.

Lecture

Passing the lecture is based on a positive grade in the written exam (selection test).

It is possible to obtain additional points for activity during the lecture.

The condition for positive evaluation is receiving more than 50% obtainable points.

It is possible to improve the written exam twice, however, it is done orally.

Exercises:

Evaluation of developed and presented final assignment carried out individually or in small groups (receiving over 50% of possible points).

Final assignment is assessed in formal and substantive terms.

Incorrectly prepared final assignment may be corrected twice.

Project:

Elaboration and presentation of a study on the development and implementation of the selected eco-innovation (receiving over 50% of possible points).

The study is assessed in formal and substantive terms.

The study prepared incorrectly may be corrected twice.

The final grade for classes includes 30% of the grade from the lecture, 30% of the grade from the exercises and 40% of the grade from the project.

Practical placement:
Not applicable