

ME-516

Lifecycle performance of product systems

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Cursus	Sem.	Type
Electrical and Electronical Engineering	MA2, MA4	Opt.
Energy Science and Technology	MA2, MA4	Opt.
Mechanical engineering minor	E	Opt.
Mechanical engineering	MA2, MA4	Opt.
Minor in Engineering for sustainability	E	Opt.
Robotics, Control and Intelligent Systems		Opt.
Robotics	MA2, MA4	Opt.
Systems Engineering minor	E	Opt.

Language of teaching	English
Credits	3
Withdrawal	Unauthorized
Session	Summer
Semester	Spring
Exam	During the semester
Workload	90h
Weeks	14
Hours	3 weekly
Courses	2 weekly
Exercises	1 weekly

Number of positions

Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.

Summary

Provide the conceptual, technical and methodological understanding for evaluating the environmental, and social performance of products and services over their life cycle.

Content

- Overview of the performance challenges of products and services over their life cycle.
- Key Performance Indicators (KPI) of products and services
- Overview of methodologies and approaches including Life Cycle Assessment (LCA), Life Cycle Costing (LCC), Social Life Cycle Assessment (SLCA), eco-design and circular manufacturing/circular economy.
- Overview of design & assessment tools.
- Hands-on practical LCA experience

Keywords

Product Lifecycle, Life Cycle Assessment, Life Cycle Costing, Circular economy

Learning Prerequisites**Important concepts to start the course**

- Principles of mechanical design
- Principles of materials

Learning Outcomes

By the end of the course, the student must be able to:

- Choose suitable methods and tools for (a) the development of, (b) the modelling and simulation of, (c) the analysis of and (d) the choice of solution for assessing the environmental and social performance of a system (product design, manufacturing process and system production)
- Interpret existing studies and adapt them to the conditions of a specific analysis

- Assess / Evaluate the environmental and social impacts of companies, projects and products
- Assess / Evaluate the impact reduction potential of solutions

Transversal skills

- Make an oral presentation.
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.
- Write a scientific or technical report.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Negotiate effectively within the group.

Teaching methods

The course is organized in theoretical sessions and a project (Environmental Life Cycle Assessment) to be realized in groups.

Expected student activities

- Participation in the course
- Study documents and do presentations
- Prepare and ask questions
- Do a project
- Write a project report

Assessment methods

Grading will be based on 3 components:

- Individual quantitative assignment: 20%
- Class participation: 20%
- Group assignment (report and presentation): 60%

Resources

Bibliography

Documentation is distributed on the Moodle platform during the semester.

Notes/Handbook

Documentation is distributed on the Moodle platform during the semester.

Moodle Link

- <https://go.epfl.ch/ME-516>