ME-516

Lifecycle performance of product systems

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Cursus	Sem.	Type
Mechanical engineering	MA2, MA4	Opt.
Mineur STAS Chine	E	Opt.
Systems Engineering minor	E	Obl.

Language of teaching	English
Credits	3
Session	Summer
Semester	Spring
Exam	Oral
Workload	90h
Weeks	14
Hours	**3 weekly**
Lecture	2 weekly
Exercises	1 weekly
Number of positions	

Summary

Provide the conceptual, scientific, technical and methodological understanding of measuring and evaluating the impact of engineering decisions on economic and environmental performance in the lifecycle of a product-system.

Content

- Overview of lifecycle performance challenges of product systems today
- Lifecycle characteristics of products in Beginning of Life (BOL), Middle of Life (MOL) and End of Life (EOL) phases
- Key Performance Indicators (KPI) of product systems in BOL, MOL and EOL
- Methodologies for Lifecycle Economic & Environmental Performance Evaluation of product systems
- Overview of lifecycle design & assessment tools including LCA/LCC
- Case Studies of Lifecycle Economic & Environmental Performance Evaluation of alternative lifecycle product system configurations

Keywords

Product Lifecycle, LCA, LCC

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 the development, the modelling and simulation, the analysis and sol ution selection of an engineering problem in the mechanical engineering domain (product design, manufacturing process and system production), CP1
- Formulate the modelling hypotheses to tackle a problem and choose the respective solution methods and tools considering the available resources, CP6
- Carry out a multi - criterion (technological, economic and environmental) analysis of the solutions, CP10

Transversal skills

- Communicate effectively, being understood, including across different languages and cultures.
- Make an oral presentation.
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.
- Write a scientific or technical report.

Teaching methods

The course is organised in theoretical sessions and the Lifecycle Modelling and Performance Evaluation to be realised using appropriate software in team projects.

Expected student activities

Participation in the course.
Study documents and do presentations.
Prepare and ask questions.
Do a project using a software tool.
Write a project report

Assessment methods

Group project reports on Lifecycle Modeling and Performance Evaluation of selected cases using appropriate software.
An oral exam will concern the application of the theory in the projects.

Resources

Bibliography

Course documentation is distributed during the semester.