

ME-203

Sustainable products and supply chains

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| Cursus | Sem. | Type |
|------------------------|-------------|-------------|
| Mechanical engineering | BA4 | Obl. |

| | |
|----------------------------|---------------------|
| Language of teaching | English |
| Credits | 3 |
| Session | Summer |
| Semester | Spring |
| Exam | During the semester |
| Workload | 90h |
| Weeks | 14 |
| Hours | 3 weekly |
| Courses | 2 weekly |
| Project | 1 weekly |
| Number of positions | |

Summary

The course is designed to provide a foundational understanding of sustainability principles and equip students with practical skills and tools to develop sustainable products and optimize supply chains.

Content**Content****Module 1: Introduction to sustainable products and supply chains**

- Course introduction
- Introduction to sustainability frameworks
- Towards sustainable products & supply chains

Module 2: Sustainable products and supply chains

- Circular economy and decarbonization
- Managing products and supply chains in a changing world
- Addressing hard to abate and critical materials

Module 3: Quantifying the impacts

- Monetary flows and finance
- Product life cycle analysis and impacts
- Supply chain analytics for circular economy

Module 4: Communicating for systemic change

- Global issues on sustainability
- Change management & stakeholder engagement
- Business ethics

Module 5: Advanced Topics

- Modelling sustainability strategies
- Real world case studies
- Best practices

Keywords

Sustainability, Circular economy, Decarbonization, Products, Supply chains

Learning Prerequisites

Required courses

None

Recommended courses

None

Learning Outcomes

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

- Describe key concepts in sustainability
- Analyze the impacts of products and supply chains (P&SC)
- Propose strategies to decarbonize P&SC
- Construct sustainable P&SC initiatives

Transversal skills

- Demonstrate the capacity for critical thinking
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.
- Communicate effectively, being understood, including across different languages and cultures.
- Make an oral presentation.
- Take account of the social and human dimensions of the engineering profession.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Take responsibility for environmental impacts of her/ his actions and decisions.
- Identify the different roles that are involved in well-functioning teams and assume different roles, including leadership roles.

Teaching methods

- Formal lectures
- Group activities
- Class discussions
- Hands-on exercises
- Project-based learning
- Games and simulations
- Guest lectures by leading academic and industry figures

Expected student activities

Individual: Self-study, class discussions, assignments, simulations

In-group: In-class exercises, team case study project, video presentations, simulations

Assessment methods

50% Case booklet (Assignments & team work)

20% Video presentation of your case (Video 1 & Video 2)

30% Final written test (30 multiple choice questions)

Resources

Moodle Link

- <https://go.epfl.ch/ME-203>