Course syllabus

Fundamentals of Sustainability and Circular Economy
Grunderna för hållbarhet och cirkulär ekonomi

MTTA01, 3.0 credits, G1 (First Cycle)

Valid for: 2025/26
Faculty: Faculty of Engineering LTH
Decided by: PLED I
Date of Decision: 2025-03-03
Effective: 2025-05-05

General Information

Depth of study relative to the degree requirements: First cycle, has only upper-secondary level entry requirements
Elective for: TILLF1
Language of instruction: The course will be given in English

Aim

The aim of this course is to equip students with a foundational understanding of sustainability and circular economy principles, enabling them to critically assess environmental challenges and explore solutions that promote long-term sustainability. The course fosters a systems-thinking approach and encourages responsible decision-making in various professional and everyday contexts by highlighting sustainability's interdisciplinary nature and its relevance across different sectors.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- 1. Explain the core principles of sustainability and the circular economy.
  2. Describe major environmental challenges such as climate change, resource depletion, and pollution.
  3. Describe different sustainability frameworks (e.g., UN Sustainable Development Goals, Life Cycle Thinking).
  4. Understand how human activities impact natural systems and how sustainability can mitigate these effects.

Competences and skills
For a passing grade the student must

- 1. Assess the sustainability of products, services, and systems based on key indicators.
  2. Apply basic circular economy strategies in real-world problem-solving.
  3. Analyze simple sustainability case studies using life cycle perspectives.

Judgement and approach
For a passing grade the student must

- 1. Reflect on ethical considerations in sustainability decision-making.
  2. Critically evaluate sustainability claims and distinguish between genuine sustainability efforts and greenwashing.

Contents

1. Introduction to Sustainability

- Definition and key concepts
- Environmental, social, and economic dimensions of sustainability
- The importance of sustainability in global development

1. Sustainable Development Goals (SDGs)

- Overview of the UN SDGs and their relevance to various sectors
- Examples of sustainability initiatives across different industries

1. Circular Economy Principles

- The transition from a linear economy to a circular economy
- Circular business models and sustainable consumption patterns

1. Life Cycle Thinking and Environmental Impact

- Introduction to Life Cycle Assessment (LCA)
- Carbon footprint, water footprint, and material efficiency

1. Sustainable Materials and Design Strategies

- Eco-design and sustainable material selection
- Strategies to minimize waste and improve product longevity

1. Sustainable Energy and Resource Management

- Renewable vs. non-renewable resources
- Energy efficiency and sustainable production methods

1. Challenges and Implementation of Circular Economy

- Barriers to sustainability adoption
- Policy, regulation, and economic incentives for sustainability
- Future trends in sustainability and the circular economy

Examination details

Grading scale: UG - (U, G) - (Fail, Pass)
Assessment:

Students will be assessed on a pass/fail basis through:

- Quizzes and Knowledge Checks: Short multiple-choice quizzes to reinforce key concepts.
- Case Study Analysis: Students analyze a real-world sustainability case study and apply circular economy principles.
- Reflection Assignment: A short written reflection on personal or professional responsibilities in achieving sustainability.
- Final Online Assessment: A combination of short-answer questions and problem-solving exercises to test understanding.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Modules
Code: 0125. **Name:** Fundamentals of Sustainability and Circular Economy.
Credits: 3.0. **Grading scale:** UG - (U, G). **Assessment:** Students will be assessed on a pass/fail basis through: 1. Quizzes and Knowledge Checks: Short multiple-choice quizzes to reinforce key concepts. 2. Case Study Analysis: Analyze a real-world sustainability case study and apply circular economy principles. 3. Reflection Assignment: A short written reflection on personal or professional responsibilities in achieving sustainability. 4. Final Online Assessment: A combination of short-answer questions and problem-solving exercises to test understanding. **Further information:** 1. The course is fully online and self-paced, with scheduled deadlines for assessments. 2. All learning materials, including video lectures, readings, and assignments, will be available on the university’s learning platform. 3. Students are encouraged to engage in discussion forums for collaborative learning.

Admission

The number of participants is limited to: 5
Selection: Completed university credits within the programme. Priority is given to students enrolled on programmes that include the course in their curriculum.

Reading list

- Scientific articles and other source materials.

Contact

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