



COURSE SYLLABUS

Circular Economy, 7.5 credits

Cirkulär Ekonomi, 7,5 högskolepoäng

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| Course Code: TCEN14 | Education Cycle: First-cycle level |
| Confirmed by: Dean Mar 1, 2024 | Disciplinary domain: Technology |
| Revised by: Oct 15, 2024 | Subject group: IE1 |
| Valid From: Aug 1, 2025 | Specialised in: G2F |
| Version: 2 | Main field of study: Production Systems |

Intended Learning Outcomes (ILO)

After a successful course, the student shall;

Knowledge and understanding

- display knowledge of key principles and concepts of circular economy and sustainable supply chain and operations management.
- demonstrate comprehension of circular economy and sustainable supply chain and operations management approaches.
- demonstrate understanding of the application of circular economy and sustainable supply chain and operations management concepts in various industries.

Skills and abilities

- demonstrate skills of identification and application of circular economy and sustainability principles and concepts in operations and supply chains.
- demonstrate the ability in speech and writing to clearly report and discuss circular economy and sustainability concepts in supply chains.
- demonstrate the ability to develop persuasive arguments for the adoption of circular economy and sustainable supply chain and operations management principles in industries.

Judgement and approach

- demonstrate the ability to assess and analyze real-world examples of circular economy and sustainable supply chain and operations management initiatives in various industries.
- demonstrate the ability to critically analyze the economic, environmental, and social impacts of adopting circular economy and sustainable supply chain operations practices and tools.
- demonstrate the ability to critically evaluate emerging technologies and their potential impact on circular economy and sustainable supply chain operations practices.

Contents

The course covers the topics below in relation to principles and concepts of circular economy and sustainability in the context of supply chain and operations management.

The course includes the following elements:

- Introduction to circular economy and sustainable supply chain and operations management
- Circular economy and sustainable supply chain and operations management in industries and applications
- Policy and regulations (global and local, challenges and opportunities)
- Circular economy and sustainability (SDG's, social, economic, environmental impacts)
- Circular economy tools – life cycle approach and product life cycle management
- Circular economy and sustainability metrics and indicators
- Circular economy and Industry 4.0 (automation, digitalization, digitization)

Type of instruction

Active learning and participation of students are encouraged; therefore, the course is designed to include seminars and assignments in connection with industry examples. Students are required to work in groups on case studies. The teaching consists of lectures, where concepts and frameworks are presented; seminars for discussion of journal articles and cases; exercises for opportunities to apply the tools and methodologies; and regular supervision to support the assignments.

The teaching is conducted in English.

Prerequisites

Passed courses of at least 90 credits within the major subject Industrial Engineering and Management, Mechanical Engineering, Civil Engineering, Computer Engineering (or the equivalent), and 15 credits in mathematics.

Optional: Passed the one-week module of Summer School titled International Operations Management and Sustainability at Università Degli Studi Di Udine in Udine, Italy.

Examination and grades

The course is graded 5,4,3 or Fail.

The course is examined through group and individual assignments, and a written exam. In order to pass the course, the students need to be approved in all three parts: group and individual assignments, and written examination.

Registration of examination:

| Name of the Test | Value | Grading |
|--------------------------|-------------|---------|
| Examination ¹ | 3 credits | 5/4/3/U |
| Assignment | 4.5 credits | U/G |

¹ Determines the final grade of the course, which is issued only when all course units have been passed.

Other information

All course information and communication throughout the course are managed through the

education platform Canvas. Each student must register to participate in the Inspera examination.

Course literature

The literature list for the course will be provided 8 weeks before the course starts.

Course book: Circular Economy in Engineering Design and Production – Concepts, Methods and Applications, Samira Keivanpour, Springer, 2024.

<https://link.springer.com/book/10.1007/978-3-031-44652-8>

A list of articles will be supplied at the course introduction.