

Sustainable Management of Resources in the Circular Economy (I002882)

Course size *(nominal values; actual values may depend on programme)*

Credits 4.0 **Study time 120 h**

Course offerings and teaching methods in academic year 2025-2026

A (Year)	English	Gent	seminar peer teaching lecture excursion
----------	---------	------	--

Lecturers in academic year 2025-2026

Du Laing, Gijs **LA24** lecturer-in-charge

Offered in the following programmes in 2025-2026	crdts	offering
International Master of Science in Sustainable and Innovative Natural Resource Management	4	A
Exchange Programme in Bioscience Engineering: Environmental Technology (master's level)	4	A

Teaching languages

English

Keywords

circular economy, sustainable materials, recycling, reuse, raw materials, sustainability

Position of the course

This course forms the mandatory component of the major on sustainable materials and resource recovery in the SINReM MSc programme. It makes the students aware of recent innovations in sustainable materials, resource recovery / recycling, and the circular economy, further building on the basic knowledge on the circular economy and sustainable management of natural resources (social, economic, and environmental aspects, including tools to assess these aspects), and advanced knowledge in chemistry.

Contents

The students should participate throughout the semester in an online course on circular economy and sustainable management of waste streams, answer a number of questions and carry out short assignments related to this course. Furthermore, they should follow an elective activity, to be approved by the lecturer and related to the sustainable management of raw materials in the circular economy. Subsequently, they should summarize the knowledge and skills built up by participating in this activity in a presentation/lecture to be given for their fellow-students and discuss these with them.

In several discussion fora, the students should also select or develop in small groups an innovative concept or technology in the domain of sustainable management of natural resources or sustainable materials, to offer a solution for a given problem, thereby taking into account the risks associated with the choice for a specific approach as well as the technical, economic, social and environmental impact, and the different perspectives of stakeholders involved. Subsequently, all possible solutions for the given problem are compared.

Furthermore, this course includes a number of seminars, guest lectures and/or a company visit related to recent innovations in the circular economy.

Initial competences

Basic knowledge on the circular economy and sustainable management of natural resources (social, economic, and environmental aspects, including tools to assess these aspects), and advanced knowledge in chemistry

Final competences

- 1 Have systematic and applied insights in different physical and (bio)chemical processing technologies and industrial processes to extract resources from ores, solid, liquid and gaseous waste materials, generated throughout the value chain, and transform them into valuable products;
- 2 Have insights in factors affecting the sustainable supply of raw materials and (technological) solutions for optimising material flows in the different parts of the value chain, and be able to compare them, taking technical and economic aspects as well as social and environmental impacts into account;
- 3 Be able to select, apply and develop innovative technologies for optimising material flows in the value chain;
- 4 Express openness to innovative scientific developments and their applications in a broad scientific, economic and social context;
- 5 Be able to identify the short- and long-term future consequences of plans and decisions along the entire value chain from an integrated scientific, economical, ethical and intergenerational perspective, and merge this into a solution-focused approach, moving towards a sustainable society;
- 6 Have awareness regarding global and long-term dimensions of sustainability and a capacity to identify sustainability issues at local, regional and global scales, involving different stakeholder perspectives;
- 7 Assess risks related to different approaches that can be used to increase resource sustainability in the value chain, develop scenarios and mitigation strategies, and assess environmental and social impacts, as well as technical and economic feasibility of these approaches and strategies.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, Seminar, Excursion, Lecture, Independent work, Peer teaching

Study material

None

References

Course content-related study coaching

Assessment moments

continuous assessment

Examination methods in case of periodic assessment during the first examination period

Examination methods in case of periodic assessment during the second examination period

Examination methods in case of permanent assessment

Oral assessment, Participation, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

The students are given tasks related to each of the course components, which are evaluated by the lecturer in charge.

Calculation of the examination mark

Marks are distributed over the different tasks and participation in the different course components, taking into account the workload.

Students who eschew period aligned and/or non-period aligned evaluations for this

course unit may be failed by the examiner.