UNIVERSITEIT GENT

Studiefiche

Vanaf academiejaar 2024-2025

Clean Technology: Theory and Concepts (I002701)

Cursusomvang *(nominale waarden; effectieve waarden kunnen verschillen per opleiding)*

Studiepunten 3.0 **Studietijd 90 u**

Aanbodsessies en werkvormen in academiejaar 2024-2025

A (semester 1)	Engels	Gent	werkcollege
			groepswerk
			peer teaching
			hoorcollege

Lesgevers in academiejaar 2024-2025

Huysveld, Sophie	LA24	Verantwoordelijk lesgever
Cadena Martinez, Erasmo	LA24	Medelesgever
Nachtergaele, Pieter	LA24	Medelesgever

Aangeboden in onderstaande opleidingen in 2024-2025	**stptn**	**aanbodsessie**
Bachelor of Science in de bio-ingenieurswetenschappen	3	A
Bachelor of Science in Environmental Technology	3	A
Master of Science in de bio-ingenieurswetenschappen: levensmiddelenwetenschappen en voeding	3	A
Master of Science in Environmental Science and Technology	3	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: chemie en bioprocestechnologie (niveau master-na-bachelor)	3	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: Food Science and Nutrition (niveau master-na-bachelor)	3	A
Uitwisselingsprogramma bio-ingenieurswetenschappen: milieutechnologie (niveau master-na-bachelor)	3	A

Onderwijstalen

Engels

Trefwoorden

sustainability, circular economy, process integration, product design, life cycle thinking, life cycle sustainability assessment

Situering

This course focuses on the sustainability (assessment) of technological operations (human activities) and how to make them more sustainable from an environmental perspective in the first place, but also attention is paid to economic and social aspects. On the one hand, relevant concepts are covered in a theoretical way. On the other hand, process integration is taught how to conduct it in a practical way.

Inhoud

- Introduction: technology and sustainability
- The natural environment: resource base and sink for emissions
- Metabolism of anthroposphere (incl. circular economy)
- Life cycle thinking and prospective assessment
- Process optimization and product design

Begincompetenties

Students are expected to have a scientific background at a university level (physics, chemistry, life sciences) and basic engineering skills (such as unit conversions, mass and energy balances).

Eindcompetenties

1 Explain how resource consumption and emissions from technological operations affect environmental sustainability.
2 Have knowledge of the nowadays (global) relevant environmental issues.
3 Explain the concepts of clean technology, industrial ecology, circular economy, life cycle thinking and process integration.
4 Apply life cycle thinking when analyzing the sustainability of technological operations.
5 Explain the challenges of prospective sustainability assessment of technological operations.
6 Distinguish environmental, economic and social effects of technological operations.
7 Explain approaches that improve the sustainability of technological operations at the process level, the product design level, as well as the company/management level.
8 Apply mass and energy integration for process optimization.

Creditcontractvoorwaarde

Toelating tot dit opleidingsonderdeel via creditcontract is mogelijk mits gunstige beoordeling van de competenties

Examencontractvoorwaarde

Dit opleidingsonderdeel kan niet via examencontract gevolgd worden

Didactische werkvormen

Groepswerk, Werkcollege, Hoorcollege, Peer teaching

Toelichtingen bij de didactische werkvormen

Lectures: theory. Some lectures can be supplemented with online video material.
Seminar - coached exercises: 1 exercise session to solve exercises on process integration.
Groupwork: one lecture to explain the assignment and one feedback moment with lecturer.
Peer teaching: presentation assignment to other students in week 13.

Studiemateriaal

Geen

Referenties

Background material will be made available through the student platform (Ufora).

Vakinhoudelijke studiebegeleiding

Contact hours with the lecturers for individual guidance

Evaluatiemomenten

periodegebonden en niet-periodegebonden evaluatie

Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Schriftelijke evaluatie met open vragen

Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijke evaluatie met open vragen

Evaluatievormen bij niet-periodegebonden evaluatie

Participatie, Werkstuk

Tweede examenkans in geval van niet-periodegebonden evaluatie

Examen in de tweede examenperiode is enkel mogelijk in gewijzigde vorm

Toelichtingen bij de evaluatievormen

Periodic evaluation:

- written exam
- study material: theory lectures + exercise session

Non-periodic evaluation:

- Presence/participation at 1 lecture with assignment explanation
- Report and presentation of assignment (groupwork): The assignment is to discuss an emerging clean technology based on literature review of the technology and a relevant evaluation tool. Students can start the assignment after the lecture in which it is explained (around week 2). Deadline for submission of the assignment (around week 11 or week 12) and the date of the presentation (week 13) will be provided through the student platform.
- Presence/participation at assignment presentations of other students

Eindscoreberekening

Periodic evaluation (written exam): 65% or 13/20
Non-periodic evaluation (assignment, and participation at 1 lecture with task explanation and participation at the assignment presentations): 35% or 7/20

Students who eschew one or more parts of the evaluation may be failed by the examiner. Final scores of 10/20 and above may be reduced to the highest failing mark (9/20).
Peer assessment will be performed for the groupwork, hence the final mark per student belonging to the same group may differ. The deadlines for the assignment must be respected. If not, the final mark may be reduced. If the student obtains a total mark lower than 10/20, the mark obtained for the non-periodic evaluation during the first examination period can be transferred to the second examination period only if the student did not fail, i.e. he/she did not have a mark lower than 3.5/7.