



## Advanced Waste Gas Treatment (I000675)

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

Studiepunten 3.0      Studietijd 75 u      Contacturen 30.0 u

Aanbodssessies en werkvormen in academiejaar 2018-2019

A (semester 1)	Engels	excursie	3.75 u
		hoorcollege	10.0 u
		microteaching	3.75 u
		zelfstandig werk	12.5 u

Lesgevers in academiejaar 2018-2019

Demeestere, Kristof      LA24      Verantwoordelijk lesgever

Aangeboden in onderstaande opleidingen in 2018-2019

	stptn	aanbodssessie
<a href="#">Master of Science in Environmental Sanitation</a>	3	A
<a href="#">International Master of Science in Environmental Technology and Engineering</a>	3	A
<a href="#">Uitwisselingsprogramma bio-ingenieurswetenschappen: milieutechnologie (niveau master-na-bachelor)</a>	3	A

Onderwijstalen

Engels

Trefwoorden

air pollution, volatile organic compounds, nitrogen and sulphur oxides, carbon dioxide, particulate matter, advanced physical-chemical and biological treatment techniques

Situering

This course focuses on the principles and applications of state-of-the-art and advanced biological and physical-chemical treatment techniques to remove a broad variety of both gaseous and particulate, inorganic and organic pollutants from waste gases. Students are informed about recent evolutions in internationally applied prevention and reduction methods and strategies; and practical examples and specific case studies are discussed to illustrate the content of this course.

Inhoud

1. Introduction: air pollutants and control strategies
2. Removal of Volatile Organic Compounds (VOCs)
  - 2.1 Phase-Transfer removal technology
  - 2.2 Thermal-chemical removal technology
  - 2.3 Biological removal technology: biofilter, bioscrubber, biotrickling filter
3. Removal of nitrogen and sulphur oxides (NO<sub>x</sub> and SO<sub>x</sub>)
4. Removal of carbon dioxide
5. Removal of particulate matter
6. Advanced Oxidation Processes (AOPs) for waste gas treatment
7. Advanced concepts for biological waste gas treatment
8. Case studies

Begincompetenties

- A background in natural sciences and engineering.
- Advanced Waste Gas Treatment builds on certain learning outcomes of course unit Analysis and Abatement of Air Pollution; or the learning outcomes have been achieved differently.

Eindcompetenties

- 1 Describe and have insight in modern approaches to reduce inorganic (NO<sub>x</sub>, SO<sub>x</sub>,

- CO<sub>2</sub>) and organic (VOCs) gaseous pollutants and particulate matter in waste gases with the aid of state-of-the-art and advanced strategies and techniques.
- 2 Critically assess advantages and disadvantages of different methods and be able to make argued choices between them.
  - 3 Deal in an individual and independent way with a specific environmental problem related to waste gas emissions in the students' home country, and be able to critically report on it through a plenary oral presentation and discussion.

#### 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

Excursie, hoorcollege, microteaching, zelfstandig werk

#### Toelichtingen bij de didactische werkvormen

Theory is taught through plenary lectures. Next, each individual student has to work on a specific case study related to a waste gas emission problem in his home country, and report on it through a plenary didactic presentation followed by a discussion with the whole class. Finally, an excursion to an industrial company having different waste gas treatment technologies working in practice is organized.

#### Leermateriaal

Lecture notes and handout papers are made available through Minerva. Cost is estimated at 10 €.

#### Referenties

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#### Vakinhoudelijke studiebegeleiding

Contact hours with the lecturers for individual guidance

#### Evaluatiemomenten

periodegebonden en niet-periodegebonden evaluatie

#### Evaluatievormen bij periodegebonden evaluatie in de eerste examenperiode

Schriftelijk examen met open vragen

#### Evaluatievormen bij periodegebonden evaluatie in de tweede examenperiode

Schriftelijk examen met open vragen

#### Evaluatievormen bij niet-periodegebonden evaluatie

Mondeling examen, participatie

#### Tweede examenkans in geval van niet-periodegebonden evaluatie

Examen in de tweede examenperiode is enkel mogelijk in gewijzigde vorm

#### Toelichtingen bij de evaluatievormen

The theoretical knowledge is evaluated through period aligned evaluation by means of a written closed-book exam. Non-period aligned evaluation consists of an oral exam (presentation and discussion of the own case study) and participation during the excursion and the plenary discussions of the case studies.

#### Eindscoreberekening

The final examination mark is calculated as the average of the two submarks obtained for the period aligned and non-period aligned evaluation, with an equal weight for both submarks.

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.