GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2019-2020

Exhaust Gas Treatment (O000102)

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

Credits	5.0	Study time	150 h
Contact hrs	60.0 h		

Course offerings and teaching methods in academic year 2019-2020

A (semester 1)	English	lecture	30.0 h
		practicum	20.0 h
		guided self-study	10.0 h

Lecturers in academic year 2019-2020

Zhuiykov, Serge	KR01	lecturer-in-charge

Offered in the following programmes in 2019-2020	crdts	offering
Bachelor of Science in Environmental Technology	5	A

Teaching languages

English

Keywords

Air quality management; the atmosphere, air pollution, exhaust gases, unit processes in waste gas technology

Position of the course

Introduction in the field of atmospheric pollutions and exhaust gases treatment

Contents

1. Air pollution (gaseous pollutants and particular matter)
2. Atmospheric dispersion
3. Carbon absorbers
4. Wet scrubbers
5. Incinerators
6. Post combustion treatment
7. Refrigerated condensers
8. Advanced oxidation processes
9. Gravity settling chambers
10. Cyclones
11. Baghouses and filters
12. Wet scrubbers for PM control
13. Electrostatic precipitators

1. Biological technique for waste gas purification
2. Indoor and outdoor air pollution

Initial competences

Basic knowledge of chemistry, physics physical chemistry and mathematics, environmental chemistry.
Physics 3 (O000091) and Physics 4 (O000094) courses.

Final competences

1 *In-depth knowledge of the natural atmospheric cycles, main exhaust pollutants and their critical concentrations.*
2 *Possess understanding the ways the main exhaust pollutants can be reduced and eliminated.*
3 *In-sight knowledge of the main modern sources of atmospheric pollution and comprehend the impact of the exhaust emissions on environment and humans.*
4 *Have insight in supporting disciplines, in particular environmental chemistry, physical chemistry, physics and process control.*

5 *Have skills and critical approach in designing air pollution abatement systems.*
6 *Demonstrate an understanding of the main principles of modern exhaust gas sensors.*

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

Guided self-study, lecture, practicum

Learning materials and price

Power-point slides will be available on Minerva

References

1. E.C. Moretti, Practical Solutions for Reducing Volatile Organic Compounds and Hazardous Air Pollutants. AIChE CWRT, New York, 2001, 150p.
2. S. Zhuiykov, Electrochemistry of Zirconia Gas Sensors, CRC Press, USA, 2007, 297p.
3. R.H. Perry, D.W. Green, and J.O. Maloney, Perry's Chemical Engineers' Handbook. McGraw-Hill, New York, 1997.
4. S. Zhuiykov, Sensors in the Measurement of Toxic Gases in the Air, Encyclopedia of Analytical Chemistry, John Wiley & Sons, Ltd., 2014, 1-34.

Course content-related study coaching

Availability via office hours

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination with open questions, oral examination

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

Written examination with open questions, oral examination

Examination methods in case of permanent evaluation

Participation

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

Final exam. Exirsises.

Calculation of the examination mark

Final written examination with open questions.
90% for exam and 10% for participation.