

Environmental Biotechnology (I700168)

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

Credits	4.0	Study time	110 h	Contact hrs	36.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	Dutch	practicum	4.0 h
		group work	1.5 h
		lecture	24.0 h
		guided self-study	1.5 h
		seminar	6.0 h

Lecturers in academic year 2018-2019

De Gelder, Leen	LA25	lecturer-in-charge
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Offered in the following programmes in 2018-2019

Master of Science in Biochemical Engineering Technology	crdts	offering
	4	A

Teaching languages

Dutch

Keywords

Environmental biotechnology, Environmental microbiology

Position of the course

This advanced course provides the student with a thorough insight concerning the microbiological processes applied in environmental biotechnology. It also situates environmental biotechnology within a broader context of striving towards a sustainable resource usage and biobased economy

Contents

Biological processes in water treatment:

- activated sludge: process control and configurations
- nitrogen removal with focus on emerging technologies (SHARON, anammox)
- biological phosphorous removal
- granular sludge

Algae technology in waste water treatment

Anaerobic waste and waste water treatment

- microbial community
- process control

Bioremediation of polluted soils

Molecular techniques in environmental biotechnology

Initial competences

Environmental Sciences and Microbiology

Final competences

- 1 Insight in the application of microbial metabolisms towards environmental biotechnology
- 2 Being able to monitor and control environmental biotechnology processes
- 3 Being able to apply molecular techniques towards environmental biotechnology research
- 4 Evaluating and parameterising an activated sludge system
- 5 Being able to measure characteristics of an activated sludge system and perform and interpret microscopic analysis

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, group work, lecture, practicum, seminar

Extra information on the teaching methods

Practical excersises entail microbiological and physicochemical analysis on influent, effluent and activated sludge samples from a waste water treatment plant, in order to evaluate the plant performance.

Students will perform several dimensioning excersises based on one or more introductory sessions, after which they need to apply the course material to one or more case studies.

Learning materials and price

English course notes available

References

Environmental biotechnology : theory and application / by GarethM. Evans, Judith C. Furlong. John Wiley & Sons Ltd

Lawrence K. Wang, Volodymyr Ivanov, Tay Joo Hwa, Yung-Tse Hung (2010)

Environmental biotechnology. Springer Science+Business Media, LLC 2010

Lawrence K. Wang, Volodymyr Ivanov, Tay Joo Hwa, Yung-Tse Hung (2011)

Environmental bioengineering. Springer Science+Business Media, LLC 2010

Course content-related study coaching

Evaluation methods

end-of-term evaluation and continuous assessment

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

Written examination

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

Written examination

Examination methods in case of permanent evaluation

Oral examination, participation, assignment, peer assessment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Calculation of the examination mark

theory: 70%

excercises: 30%