Course Specifications
Valid as from the academic year 2019-2020

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

Course offerings and teaching methods in academic year 2019-2020
- A (semester 2)
- Dutch
- practicum: 4.0 h
- guided self-study: 1.5 h
- seminar: 6.0 h
- group work: 1.5 h
- lecture: 24.0 h

Lecturers in academic year 2019-2020
- De Gelder, Leen
- LA25 lecturer-in-charge

Offered in the following programmes in 2019-2020
- Master of Science in Biochemical Engineering Technology
- 4 crdts
- A offering

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
(Approved)
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 exercises 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 exercises 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 Gareth M. Evans, Judith C. Furlong. John Wiley & Sons Ltd

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 possible in modified form

Calculation of the examination mark
theory: 70%
excercises: 30%

(Approved)