Course Specifications
Valid as from the academic year 2017-2018

Natural Systems for (Waste)Water Treatment (I000337)

Course
Lecturers in academic year 2018-2019
Goethals, Peter
LA22 lecturer-in-charge

Course offerings and teaching methods in academic year 2018-2019
A (semester 2) English

- seminar: coached 6.25 h
- exercises
- lecture 12.5 h
- excursion 8.75 h
- guided self-study 2.5 h

Offered in the following programmes in 2018-2019

- Master of Science in Environmental Sanitation 3 A
- Exchange Programme in Bioscience Engineering: Environmental Technology (master's level) 3 A

Teaching languages
English

Keywords
Wastewater treatment, water treatment, aquatic processing units, waste stabilization ponds, lagooning, high rate algal ponds, natural and constructed wetlands, slope irrigation

Position of the course
This course aims at providing an overview of natural and constructed systems that can be used for wastewater and surface water treatment based on aquatic processing units (a.o. systems with microphytes and macrophytes, all or not combined). Besides the role and treatment efficiency of natural systems, major attention is paid to the design of these systems with emphasis on the state, decision and control variables. The practicals are dealing with the design of natural waste water treatment systems based on certain assumptions. A visit is also paid to several natural treatment systems (e.g. helophyte filters, duckweed filters).

Contents
1. Introduction
2. Aquatic eco-techniques and nature building
   2.1. Natural systems of waste water treatment
   2.1.1. Constructed wetlands
   2.1.2. Waste stabilization ponds
3. Technical restoration management of water courses

Exercises
1. Excursions to practical realisations relating to eco-technique and nature building
2. Dimensioning of natural systems for wastewater treatment

Initial competences
No specific knowledge is required

Final competences
1 has the capacity to evaluate different natural and constructed systems as waste water and surface water treatment systems

Contact hrs
Study time  75 h
Credits  3.0
Course size (nominal values; actual values may depend on programme)
Contact hrs  30.0 h

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2 can design a natural waste water treatment system based on certain assumptions

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, excursion, lecture, seminar: coached exercises

Extra information on the teaching methods
The theory consists of lectures. Exercises are coached, consisting of a theoretical background, examples and exercises to be solved by the students. Additionally, a field excursion with visits to operational treatment systems is organised

Learning materials and price
Slides, reader with review articles and a syllabus are available via Minerva.

References

Course content-related study coaching
Guided exercises, individual contact hours upon request.

Evaluation methods
end-of-term evaluation

Examination methods in case of periodic evaluation during the first examination period
Written examination with open questions

Examination methods in case of periodic evaluation during the second examination period
Written examination with open questions

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
not applicable

Extra information on the examination methods
Evaluation is completely period-bound (exam). The exam is written and closed book, consisting of several open theory questions (50 %) and exercises (50 %). A formulary is provided for the exercise part of the exam. A periodical evaluation is foreseen based on a written exam, consisting of theory (50 %) and exercises (50 %). Students who eschew periodic evaluations for this course unit may be failed by the examiner.

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