Course Specifications
Valid as from the academic year 2018-2019

Ecotechnique and Nature Construction (I000827)

Course

Credits 4.0  Study time 120 h  Contact hrs 45.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 2)  English  guided self-study 6.25 h
  excursion 15.0 h
  lecture 23.75 h

Lecturers in academic year 2018-2019

Goethals, Peter  LA22  lecturer-in-charge
Baeten, Lander  LA20  co-lecturer

Offered in the following programmes in 2018-2019

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<td>Master of Science in Bioscience Engineering: Forest and Nature Management</td>
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<td>Master of Science in Bioscience Engineering: Land and Water Management</td>
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<td>Exchange Programme in Bioscience Engineering: Agricultural Sciences (master's level)</td>
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Teaching languages

English

Keywords

Eco-technique, nature construction, terrestrial ecosystems, aquatic ecosystems

Position of the course

The course aims:
- to get insight into the importance and possibilities of eco-technique and nature building
- to get insight into the technical and quantitative aspects dealing with eco-technique and nature building in terrestrial and aquatic ecosystems
- to apply techniques in order to apply nature building in different circumstances

This course aims in addition 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.

Contents

Theory & Context
1. Introduction
2. Terrestrial eco-technique and nature building
   2.1. Mitigation in conservation
2.2. Ecosystem restoration management
3. Aquatic eco-techniques and nature building
   3.1. Natural systems of waste water treatment
      3.1.1. Constructed wetlands
      3.1.2. Waste stabilization ponds
4. Technical restoration management of water courses

Exercises
1. Excursions to practical realisations relating to eco-technique and nature building

(Approved)
2. Exercise on quantitative aspects of ecosystem restoration
3. Dimensioning of natural systems for wastewater treatment

Initial competences
No specific knowledge is required.

Final competences
1. Have insight into the importance and possibilities of eco-technique and nature building
2. Have insight into the technical and quantitative aspects dealing with eco-technique and nature building in terrestrial and aquatic ecosystems.
3. Applying techniques in order to apply nature building in different circumstances
4. Has the capacity to evaluate different natural and constructed systems as waste water and surface water treatment systems
5. 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

Extra information on the teaching methods
The theoretical part consists of lectures, supplemented with guest lectures and discussions. There is an integrated exercises in the terrestrial ecology part. Using exercise and excursions, the students elaborate on a concrete example of ecosystem restoration.
The theory of the aquatic part 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
A syllabus (slides) is available which is completed by a selection relevant scientific papers Cost: 12 EUR

References
Anoniem (1998). Beken voor de toekomst: kansen en mogelijkheden voor ecologisch verantwoord beheer. AMINAL-afdeling Natuur i.s.m. Natuurreservaten vzw, 49 pp

Course content-related study coaching
Oral presentations, discussions in groups, forum in Minerva, guided exercises, contact hours for individual guidance upon request.

Evaluation methods
end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period
Written examination, oral examination, assignment

Examination methods in case of periodic evaluation during the second examination period
Written examination, oral examination, assignment

(Approved)
Examination methods in case of permanent evaluation
Assignment, report

Possibilities of retake in case of permanent evaluation
examination during the second examination period is not possible

Extra information on the examination methods

1) Terrestrial part
   Assignment linked to the exercises (permanent evaluation) and oral exam with written preparation.
2) Aquatic part
   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.

Calculation of the examination mark
Each partim (terrestrial/aquatic) is scored with an identical weight, so each partim counts for 50 % of the total mark.
Terrestrial partim: a combination of periodic evaluation (60-100%) and permanent evaluation (0-40%) linked to the exercises.
Aquatic partim: merely 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.
Unjustified absence in the exercises and excursions gives rise to a total maximum score (theory + practical exercises) of 9/20, irrespective of the score for the theoretical part.