Course Specifications
Valid as from the academic year 2017-2018

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

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time</th>
<th>Contact hrs</th>
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<tbody>
<tr>
<td>4.0</td>
<td>120 h</td>
<td>45.0 h</td>
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Course offerings and teaching methods in academic year 2018-2019

A (semester 1) Dutch

- lecture 25.0 h
- lecture: plenary exercises 6.25 h
- guided self-study 6.25 h
- seminar: coached exercises 3.75 h
- excursion 3.75 h

Offered in the following programmes in 2018-2019

- Bachelor of Science in Bioscience Engineering (main subject Agricultural Sciences) 4 A
- Bachelor of Science in Bioscience Engineering (main subject Cell and Gene Biotechnology) 4 A
- Bachelor of Science in Bioscience Engineering (main subject Chemistry and Food Technology) 4 A
- Bachelor of Science in Bioscience Engineering (main subject Environmental Technology) 4 A
- Bachelor of Science in Bioscience Engineering (main subject Land and Forest Management) 4 A
- Joint Section Bachelor of Science in Bio-Engineering 4 A

Teaching languages
Dutch

Keywords
Ecosystems, energy flow, cycles, populations, climate

Position of the course
Provide to Bachelor students basic insight with respect to ecosystem functioning, including structure, operation (basic laws and population dynamics) and the interrelationships with the abiotic environment (e.g. climate). This serves as a basis for further analysis of actual ecological problems and for critical evaluation of possibilities for repair.

Contents

**Theory**

1. Introduction
   - Historical development of ecological science
   - Ecological sub-disciplines, concepts and terminology
   - Principles of systems ecology
   - Organization in ecosystems: structural levels, time steps and response times
   - Mathematical models for ecological research

2. Functional systems ecology
   - Basic laws and thermodynamic background
   - Functional groups and trophic networks

(Approved)
Access to this course unit via a credit contract is determined after successful competences assessment. This course unit cannot be taken via an exam contract.

**Teaching methods**
- Guided self-study, excursion, lecture, lecture: plenary exercises, seminar: coached exercises

**Learning materials and price**
- Lecture notes are available. Cost: 15 EUR

**Exercises**
1. Visit to the forest ecosystem Aelmoeseneie (measuring tower of the experimental forest at Gontrode)
   - Introduction of ecosystem research
   - Demonstration of instruments used to determine abiotic characteristics of the experimental forest
   - Discussion about climate change in ecosystems
2. Calculations
   - Structure, quantitative representation and use of production and growth models
   - Ecological efficiencies in tropical chains
   - Determination of the leaf area index with inversion techniques, interceptometers and hemispheric photography

**Initial competences**
- Basic knowledge about biology, physiology, thermodynamics and mathematical analysis is a plus.

**Final competences**
1. Insight about the development of ecological science
2. Knowledge about basic ecological laws, the structure and functioning of ecosystems
3. Understanding the interrelationships between ecosystems and their climate, including major plant formations and their abiotic characteristics
4. Knowledge about structure and dynamics of the living organisms in ecosystems, together with their interactions
5. Insight about actual ecological problems and ways for providing solutions

**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.

**Lecture notes are available. Cost: 15 EUR**

(Approved)
References


Course content-related study coaching

Individual coaching is possible

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, written examination

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

Written examination with open questions, written examination

Examination methods in case of permanent evaluation

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 exam: periodic evaluation (67.5%)
Exercises: periodic evaluation (22.5%)
Reports excursion: non-periodic evaluation (10%)

Students who eschew period aligned and/or non-period aligned evaluations for this course unit may be failed by the examiner.