Environmental Soil Science (O000110)

Course Specifications
Valid as from the academic year 2018-2019

Course offerings and teaching methods in academic year 2019-2020

A (semester 2)               English
seminar                  23.75 h
microteaching          6.25 h
guided self-study      7.5 h
lecture                 22.5 h

Lecturers in academic year 2019-2020
Tack, Filip              LA24
De Neve, Stefaan        LA20

Offered in the following programmes in 2019-2020
Bachelor of Science in Environmental Technology 5 A

Teaching languages
English

Keywords
Soils, soil characteristics, soil processes, soil reactions, soil-water relationships, environment, plant growth, ecosystem, soil fertility, soil contamination

Position of the course
This course aims to deliver relevant knowledge about the soil for students in environmental sciences. Basic concepts of the physical and chemical nature and properties of soils are introduced. Plant nutrients, contaminants and their interaction with soil and plants are studied.

Contents
A. General Soil Science
1. Functions of soils
2. Weathering and parent materials
3. Soil genesis
4. Clay mineralogy: structure, origin, importance
5. Organic matter: origin, composition, evolution, determination
6. Colloidal soil properties
7. Soil reaction
8. Physical soil properties: granulometry and soil texture, soil structure, soil colour, soil temperature
9. Introduction to soil classification

B. Soil contamination and soil fertility
1. Chemical composition of soils
2. Fate and pathway of soil nutrients
3. Soil contamination and remediation
4. Trace elements in soils
5. Soil-plant relationships
6. Chemical analysis of soils and plants

Initial competences
General knowledge of chemistry, general analytical chemistry and physics.

Final competences
1 Ability to read and interpret soil reports, tables with soil analytical data and soil maps.

Course size (nominal values; actual values may depend on programme)
Credits 5.0  Study time 150 h  Contact hrs 60.0 h

Teaching languages

(Approved)
2 Ability to recognize the activity of pedogenetic processes by morphological observational evidence.
3 Apply standard methods to determine physical, hydrophysical and chemical soil properties.
4 Understanding of basic chemical and physical processes in normal soils and alterations caused by pollution.
5 Be able to interpret physical and chemical soil analysis in the context of soil quality, soil functioning and soil use.

Conditions for credit contract
Access to this course unit via a credit contract is unrestricted: the student takes into consideration the conditions mentioned in 'Starting Competences'

Conditions for exam contract
This course unit cannot be taken via an exam contract

Teaching methods
Guided self-study, lecture, microteaching, seminar

Extra information on the teaching methods
The part "A. General Soil Science" is by distance learning. There is a general lecture of about 2 hrs through video conferencing. Students then have to study the provided materials (guided self study). The material is discussed interactively during contact moments (microteaching: 6 hrs). Exercises are solved under guidance (4 hr work seminar).
Part B "B. Soil contamination and soil fertility" involves 20 hours of classical teaching. During the work seminars, cases on environmental soil issues are worked out. An important part is also dedicated to studying analytical methods involved in soil analysis

Learning materials and price
Electronic version of the slides

References
de Haan, F.A.M. and M.I. Visser - Reyneveld (Editors), 1996. Soil Pollution and Soil Protection, PHLO Wageningen Agricultural University

Course content-related study coaching
Interactive support via Minerva, by e-mail or in person.

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, report

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

Examination methods in case of permanent evaluation
Report

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

Calculation of the examination mark
33% of the score is determined by evaluation of part A, 66% of the score is determined by evaluation of part B. Of this part, 1/4th is determined through permanent evaluation.

(Approved)