GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2023-2024

Pedology (I002775)

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

Credits 5.0 **Study time 150 h**

Course offerings and teaching methods in academic year 2023-2024

A (semester 1)	English	Gent	lecture
			independent work

Lecturers in academic year 2023-2024

Finke, Peter	LA20	lecturer-in-charge

Offered in the following programmes in 2023-2024	**crdts**	**offering**
International Master of Science in Soils and Global Change (main subject Physical Land Resources and Global Change)	5	A
International Master of Science in Soils and Global Change (main subject Soil Biogeochemistry and Global Change)	5	A
Exchange Programme in Bioscience Engineering: Environmental Technology (master's level)	5	A
Exchange Programme in Bioscience Engineering: Land and Forest management (master's level)	5	A

Teaching languages

English

Keywords

Soils, soil characteristics, soil processes, soil reactions, environment, plant growth, ecosystem, soilscape

Position of the course

Deliver basic knowledge about the various orientations in this profession, the most important characteristics, reactions and properties and associated terminology. How are soils and soil sites described according to standard guidelines. The common analytical data and the limitations when consulting these data. Particular attention for the link with the environment, aspects important for both plant growth and the soilscape approach. What are some of the most important gaps in this discipline.

Contents

Theory

1. Introduction. Pedosphere, where lithosphere, atmosphere, biosphere and hydrosphere interact, soilscape, soil system dynamics, soil science, pedology, the 4 dimensions, spatial and temporal variability
2. Basic soil components. Solid mineral. Solid organic. Porosity and soil density. Soil air. Soil water
3. Important reactions, processes and properties. Swelling, shrinking, pressure. Solubilization. Preciptation. Cementation. Hydration, Hydrolysis, Acid attack. Oxido-reduction. Acidity-alcalinity. Ion exchange. Chelation. Dispersion-flocculation. Salinity-sodicity; Aggregate stability. Structure, Color, Temperature
4. Selection of important processes of soil genesis. Weathering. Migration-accumulation (clay, organic substances, CaCO3, salts). Structuration. Turbation. Freeze-thaw. Cycle of organic matter. Horizonation
5. Factors of soil understanding
6. Soil characteristics important for plant growth
7. Soil profile description and tables of standard analytical data

Indoor exercises, training in:

- basic calculations with soil data (unit and mass/volume conversions)

- interpretation of standard analytical data

Only included in course offering 'A':

Field training sessions (excursion, in 1st semester) in:
- soil recognition
- use of standard soil survey equipment
- link between soilscape and environment (i.e. soil threats)

Initial competences

It is necessary to have a basic understanding of Geography, Climatology, Chemistry and Physics (BSc-level).

Final competences

1 The student can read and interpret soil reports, tables with soil analytical data and soil maps, and can apply soil terminology in oral and written form.
2 **Only for course offering 'A':** The student can recognize the activity of pedogenetic processes by morphological observational evidence.

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

Lecture, Independent work

Extra information on the teaching methods

During the plenary lectures, exercises are introduced; these can be done individually and are discussed the next lecture.
This course will be taught on-line as well as on-site to enable late arrivals and students in quarantine to follow all classes. Per class 2 chat sessions (depending on the time-zone of the unarrived student) will be foreseen

Only for course offering 'A':

In the week before the start of the academic year, a field practical "Primer event" is organised, during which students can experience some soils and their response to soil threats.

Learning materials and price

Cost: 10 EUR
Finke, P.A. 2016. Pedology. Syllabus Department Soil Management. 143 pp, includes exercises.
The powerpoints are available the day after the lecture on Ufora.

References

Van Breemen, N. and P. Buurman, 2002. Soil formation (2nd edition). Kluwer Academic Publishers, Dordrecht.

Course content-related study coaching

Interactive support via Ufora, by e-mail or in person.
For course offering 'A': Assistants collaborate for the field training sessions.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Written assessment with multiple-choice questions, Written assessment with open-ended questions

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

Written assessment with multiple-choice questions, Written assessment with open-ended questions

Examination methods in case of permanent assessment

Professional practice, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Extra information on the examination methods

end-of-term evaluation

Calculation of the examination mark

100% of the final score is determined by the evaluation of the theoretical exam;

Students who eschew periodic and/or permanent evaluations for this course unit may be failed by the examiner.