

Pedology (I002775)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

Course size (nominal values; actual values may depend on programme)
Credits 5.0 Study time 150 h Contact hrs 50.0 h

Course offerings and teaching methods in academic year 2020-2021

Offering	Language	Location	Teaching Methods	Hours
A (semester 1)	English	Gent	lecture	25.0 h
			self-reliant study activities	5.0 h
			fieldwork	20.0 h
B (semester 1)			self-reliant study activities	5.0 h
			lecture	25.0 h

Lecturers in academic year 2020-2021

Finke, Peter LA20 lecturer-in-charge

Offered in the following programmes in 2020-2021

Programme	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
International Master of Science in Environmental Technology and Engineering	3	B
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. Precipitation. Cementation. Hydration, Hydrolysis, Acid attack. Oxidoreduction. Acidity-alkalinity. 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 2nd semester) in:

- soil site and profile description
- use of standard soil survey equipment
- link between soilscape and environment

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, fieldwork, self-reliant study activities

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 unrarried student) will be foreseen

Only for course offering 'A':

In the easter period, a field practical is organised, during which students can practice their knowledge and skills. This practical also counts for the Soil prospection and Classification course.

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 Minerva.

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.

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 with multiple choice questions

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

Written examination with open questions, written examination with multiple choice questions

Examination methods in case of permanent evaluation

Job performance assessment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Extra information on the examination methods

Course offering 'A': end-of-term evaluation and continuous assesment

Course offering 'B': end-of-term evaluation

Calculation of the examination mark

Course offering 'A':

60% of the final score is determined by the evaluation of the theoretical exam;

30% is determined by the evaluation of the (individual) excursion (field practical) report;

10% of the final score is determined by an evaluation of the student's participation during the field practical.

Course offering 'B':

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.