

# Course Specifications

Valid as from the academic year 2018-2019

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

Credits	5.0	Study time	135 h	Contact hrs	60.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 2)	English	lecture	30.0 h
		fieldwork	30.0 h

Lecturers in academic year 2018-2019

Finke, Peter	LA20	lecturer-in-charge
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Offered in the following programmes in 2018-2019

	crdts	offering
<a href="#">Master of Science in Physical Land Resources (main subject Soil Science)</a>	5	A
<a href="#">Master of Science in Geology</a>	5	A
<a href="#">Master of Science in Geology</a>	5	A
<a href="#">Master of Science in Bioscience Engineering: Land and Water Management</a>	5	A

Teaching languages

English

Keywords

Soil formation, soil processes, soil evolution, formation of diagnostic horizons and materials

Position of the course

The aim of the course is to improve the knowledge and the understanding of the naturally-occurring chemical reactions and physical changes, which are at the origin of the most important soil-forming processes, resulting in observable properties, specific diagnostic horizons and materials in different environmental conditions.

Contents

*Theory*

1. Some physico-chemical aspects of soil formation

In this chapter attention is paid to naturally-occurring chemical reactions (hydrolysis, influence of pH on dissociation and solubility of salts and hydroxides occurring in soils, influence of Eh and pH on the behaviour of some elements in soils); the physical behaviour of soil colloids with a surface charge and to the origin and distribution of acidity in mineral soils.

2. Processes of soil evolution

This chapter treats the most important soil-forming processes (weathering, oxido-reduction, biological activity, swelling and shrinking and, translocation and accumulation of organic-compounds and of clay) and their observable features.

3. Formation of specific diagnostic horizons and materials

This chapter treats the formation of specific epipedons (mollic, umbric, ...), diagnostic subsurface horizons (cambic, argillic, oxic, spodic, placic), and plinthite.

4. Soil processes and soil evolution under specific conditions

Soil processes in forest ecosystems, in arid conditions, in marine deposits and in paddy rice fields.

*Practical exercises*

Excursions

Initial competences

Soil Genesis builds on certain learning outcomes of course unit 'Soil Science' ; or the learning outcomes have been achieved differently. Students also must have a

thorough basis in chemistry (BSc-level or MSc-level), preferably soil chemistry.

#### Final competences

- 1 Students can identify and understand the different soil-forming processes that occur in soils, including the conditions which are responsible for these processes.
- 2 Students understand the properties and the formation of specific diagnostic horizons and materials, and can link these to analytical data and visual observations.

#### 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

#### Extra information on the teaching methods

Theory: oral lectures  
Exercises: fieldwork

#### Learning materials and price

A syllabus is available. Cost: 10.00 EUR

#### References

Soil Formation, N. Van Breemen & P. Buurman, 1998  
Environmental Soil Chemistry, D. L. Sparks, 1995  
Chemical Processes in Soils, W.A. Dick (ed.), Soil Science Society of America Book Series 8, 2005

#### Course content-related study coaching

Professor can be consulted.

#### Evaluation methods

end-of-term evaluation

#### 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

#### Possibilities of retake in case of permanent evaluation

not applicable

#### Extra information on the examination methods

Theory: written examination (closed book, 100%) Exercises: written examination (closed book); discussions during fieldwork: these are not evaluated as such but because they support and illustrate the theory, they are included in the period aligned evaluation.

#### Calculation of the examination mark

Students who eschew period aligned and/or non-period aligned evaluations for this course unit (or do not participate to the fieldwork) may be failed by the examiner.