

Environmental Inventory Techniques (I002170)

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

Credits	3.0	Study time	75 h	Contact hrs	30.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	English	lecture	15.0 h
		fieldwork	5.0 h
		seminar: practical PC	10.0 h
		room classes	

Lecturers in academic year 2018-2019

Van Meirvenne, Marc	LA20	staff member
Van De Vijver, Ellen	LA20	lecturer-in-charge

Offered in the following programmes in 2018-2019

	crdts	offering
International Master of Science in Sustainable and Innovative Natural Resource Management	3	A

Teaching languages

English

Keywords

environmental sampling, geostatistics, proximal soil sensors

Position of the course

Advanced course This course focuses on the techniques for the inventory of the spatial variability of the environment (with a main focus on soil & water). Also the detection and evaluation of (anthropogenic) disturbances are considered.

Contents

Spatial sampling: simple random, stratified random, systematic, unaligned, sampling for detection, sampling for proportions, sample size, sampling design using existing maps, sampling for regression models, Latin hypercube sampling, sampling for spatial predictions.

Spatial sensing: concepts of soil and water sensing, geophysical sensors (electrical resistivity, ground penetrating radar, electromagnetic induction, magnetometry), and geochemical sensors (vis-NIR systems, pH-sensor).

Data processing: spatial statistics, geostatistical interpolation, GIS

Initial competences

Basic knowledge statistics, physics and earth sciences

Final competences

- 1 To be able to design and lay out a spatial sampling scheme.
- 2 To be able to use several proximal soil sensors and know their limitations.
- 3 To be able to process data into usable maps.

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, seminar: practical PC room classes

Learning materials and price

Course notes are available

References

- Webster, R. & Lark, M. (2013). *Field Sampling for Environmental Science and Management*. Oxon, United Kingdom: Routledge. ISBN: 978-1-84971-368-9
- de Gruijter, J., Brus, D. J., Bierkens, M. F. P., & Knotters, M. (2006). *Sampling for Natural Resources Monitoring*. Springer. ISBN:540-22486-6.
- Goovaerts, P. (1997). *Geostatistics for Natural Resources Evaluation*, New York, NY: Oxford University Press.
- Webster, R. & Oliver M. A. (2007). *Geostatistics for Environmental Scientists. 2nd Edition*. Chichester, United Kingdom: John Wiley & Sons Ltd.
- Viscarra Rossel, R. A., McBratney, A., & Minasny, B. (Eds.). (2010). *Proximal Soil Sensing*. Progress in Soil Science. New York, NY: Springer.. ISBN: 978-90-481-8858-1.

Course content-related study coaching

The lectures are supported by MS PowerPoint presentations. The exercises include field work and supervised PC-practicals.

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

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

Extra information on the examination methods

*Written examination with open questions (knowledge and insight questions);
Permanent evaluation: reports of practical exercises*

Calculation of the examination mark

Final score = 80 % score periodic evaluation + 20 % score non-periodic evaluation.
Students who withdraw from periodic and/or non-periodic evaluations for this course may be declared failed by the examiner.