Module Nr.	Credits	Workload	Semester	Frequency	Duration
SE-O-6	3 CP	90 h	3	Yearly (WS)	1 Semester
Courses			**Contact time**	**Self-study**	**Group size**
Introduction to Applied Geostatistics			2 h/week	60 h	---

Introduction to Applied Geostatistics

Learning outcomes

After successfully completing the modules, the students are able to

- understand the context of uncertainty in multivariate spatial analysis required in geotechnical engineering,
- interpret the results of the processing, evaluation and analysis of random spatial data with practical applications

Content

A reliable application of geostatistics for modelling regionalised subsoil properties requires knowledge of geostatistical methods. Introduction to Applied Geostatistics provides background knowledge and practical techniques for geostatistical estimation methods from limited data. This lecture aims to optimize geotechnical numerical models to reduce the involved uncertainty. This optimisation can be obtained by employing different uncertainty quantification and spatial interpolation methods. Moreover, students will be familiarized with some currently available software packages to conduct stochastic analysis in practice.

The lecture contents cover the following topics:

- Terminology and basics of geostatistics
- Spatial interpolation methods (deterministic and geostatistical methods)
- Mathematical techniques for modelling spatial variability (random field theory)
- Stochastic and deterministic processes to optimize monitoring design
- Possible applications and limits of geostatistical software

Teaching methods / Language

Lectures (2 SWS) and exercises in the computing lab / English

Modes of assessment

Final written exam (60 min)

Home Assignment project work (45 h) with oral presentation (15 min)

Requirements for the award of credit points

Pass final written examination and project work

Module applicability (in other programs)

-

Weight of the mark for the final score

2.5 %

Module coordinator and lecturer(s)

Prof. Dr.-Ing. habil. T. Wichtmann (coordinator) Dr.-Ing. E. Mahmoudi
Other information Recommended previous knowledge: completed module in Computational Methods-1 (including lecture: Soil behaviour and simple constitutive models for soils) and Computational Methods-2 (including the lecture: Numerical Methods and Stochastics).