Introduction to Geophysics

Geow-B402-V2

Instructor Info

Reinhard Drews

Office Hrs: on demand.

GUZ 3M07/3U03/3F03

Website

reinhard.drews@uni-tuebingen.de

Course Info

Prereq: None

Tues & Thurs

16:15-18.00

Online

Field Exercises

In sub-groups of 6

Three field exercises with individual timing for groups. It will be approximately six hours of field work per exercise.

Outside.

Add. Instructors

Prof. P. Dietrich

Office Hrs: On demand

UFZ, Leipzig

R. Ershadi

GUZ Level 3

Overview

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This course provides a broad overview in applied geophysics with a focus on the most common sub-surface imaging techniques: gravimetry, magnetics, geoelectrics, electromagnetic induction, ground-penetrating radar and seismics. We will discuss applications in industry as well as for general scientific questions in the geo- and environmental sciences.

Everything is subject to change with news University regulations regarding the pandemic, but at this stage I anticipate a large in-person component.

Lecture Format

The lecture is accompanied with three mandatory, hands-on field exercises that will be conducted in small groups. The field measurements take approximately six hours and will be concluded by a joint group report. The lecture format contains frontal lectures on Tuesdays in 3M07, group work on experimental & theoretical exercises on Thursdays in 3U03 and 3F03 and online videos.

Learning Goals

You should get a broad overview for a number of geophysical methods imaging the sub-surface. You should understand the underlying physical principles, which will enable you to go deeper into specific methods that you may encounter later on. Most importantly you should learn to think straightforwardly, to ask the right questions, and to apply quantitative mathematical methods in problem solving.

In-class exercises

Exercises are an important part of the Geophysics lecture. They will treat some aspects of the lecture in more detail, but also cover new ground. We expect that you work on the exercises at home and we will discuss questions and solutions interactively together (typically Thursdays). The joint meetings will start with randomly chosen students presenting their approach. It is ok if the full solution is not available at this stage and there will be no interrogation. However, please don't show up unprepared because this will inevitably be awkward.

Field exercises

We will conduct field exercises for magnetics, geoelectrics and seismics. This is your maybe once-in-a-lifetime chance to work with professional geophysical equipment. The practical part of the exercises will typically take about six hours. Exercises are mandatory and absence is only permissible with a substantiated excuse approved by the instructor before the exercise takes place. The exercise will then need to be repeated another day. Don't miss the submission deadline of your group reports communicated by the instructor. If you fail, you will have a chance to revise the report.

Exercises	Location	Time Frame
Magnetics	Tübingen Morgenstelle	22-28.05 2022
Geoelectrics	Tübingen Kilchberg	08-13.06 2022
Seismics	Tübingen Lauswiesen	05-12.07.2022

Course organisation

Sign-up is required both on ALMA and ILIAS. All communication will be handled via Ilias, including video ressources, sign up for field exercises and a forum for questions pertaining to the exercises sheets. The course is open to a maximum amount of 70 students, preference is given to those for which this course is mandatory.