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| Module Number:  **B 408** | Module Title:  **Geophysik / Geophysics** | | | | | | Type of Module:  B.Sc. Compulsory / Elective | | | |
| Credits (ECTS) | 6 | | | | | | | | | |
| Workload  - Contact Time  - Private Study | Workload:  180 h | Contact Time:  90 h / 6 SWS | | | | | Private Study:  90 h | | | |
| Duration  Module Coordinator | 1 semester | | | | Drews | | | | | |
| Regular Cycle | Every summer semester | | | | | | | | | |
| Language | English | | | | | | | | | |
| Learning- / Teaching Forms | The module uses a combination of in-class lectures, in-class exercises, applied field exercises and online videos. | | | | | | | | | |
| Module Content | This module offers a broad introduction into the principles of applied geophysics with a focus on sub-surface imaging techniques using gravimetry, magnetics, seismics, geoelectrics and electromagnetics. Field based exercises are conducted in small groups offering ‘hands on’ experiences in collecting, processing and interpretation of geophysical data. In-class exercises include theoretical problem-solving, self-designed practical setup (e.g., using minicomputers and smart phones), and computational methods. | | | | | | | | | |
| Qualification Goals | 1. Obtain a basic understanding of geophysical sub-surface imaging techniques in theory & practice, and understand relevant earth-system processes and parameters where these techniques can be applied. 2. Develop transferable skills in quantitative data analysis and rigorous problem solving strategies using physics and mathematics. | | | | | | | | | |
| Requirements for Obtaining Credit, Grading, Weight if appl. | *Courses* | *Type of Lecture* | *Status* | *CH* | | *CP* | *Type of Exam / Study Requirement* | *Duration of Exam* | *Grading System* | *Weighting* |
| *Geophysik / Geophysics* | *L* | *c* | *4* | | *4* | *WE+A* | *90* | *g* | *1* |
| *FE* | *c* | *2* | | *2* | *A* | *-* | *-* | *-* |
| Applicability | Compulsory: B.Sc. Geowissenschaften, B.Sc. Umweltnaturwissenschaften, Elective: M.Sc. Applied & Environmental Geoscience | | | | | | | | | |
| Prerequisites | A firm background in mathematics and physics is expected. | | | | | | | | | |

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| Module Number:  **M 212** | Module Title:  **Advanced Geophysics** | | | | | | Type of Module:  M.Sc. Elective | | | |
| Credits (ECTS) | 6 | | | | | | | | | |
| Workload  - Contact Time  - Private Study | Workload:  180 h | Contact Time:  90 h / 6 SWS | | | | | Private Study:  90 h | | | |
| Duration  Module coordinator | 1 semester | | | | Drews | | | | | |
| Regular Cycle | Every winter semester | | | | | | | | | |
| Language | English | | | | | | | | | |
| Learning- / Teaching Forms | The module uses a combination of in-class lectures, in-class & applied exercises, and online videos. | | | | | | | | | |
| Neuesetzung Module Content | This module teaches advanced methods in geophysics including data acquisition, processing and modelling. In each semester we will typically explore one or two methods in-depth (e.g., refraction seismics, electrical resistivity tomography, ground-penetrating radar, magnetics) and develop a full processing chain from first principals, e.g., including survey planning, data acquisition, forward modeling and data integration using computational inverse techniques. | | | | | | | | | |
| Qualification Goals | 1. Gain an advanced understanding for specific geophysical methods. 2. Understand the principals of forward and inverse modelling and apply it with computational methods. 3. Build-up transferable skills (e.g., signal analysis and numerical modeling) also applicable in many other geo- and environmental disciplines. | | | | | | | | | |
| Requirements for Obtaining Credit, Grading, Weight if appl. | *Courses* | *Type of Lecture* | *Status* | *CH* | | *CP* | *Type of Exam / Study Requirement* | *Duration of Exam* | *Grading System* | *Weighting* |
| *Advanced Geophysics* | *L* | *o* | *4* | | *4* | *WE/OE* | *90* | *g* | *1* |
| *FC* | *o* | *2* | | *2* |
| Applicability | M.Sc. Geowissenschaften/Geosciences, M.Sc. Applied & Environmental Geoscience | | | | | | | | | |
| Prerequisites | Solid understanding of basic geophysical sub-surface imaging taught at the BSc levels. Programming skills are helpful but not strictly essential and can also be acquired in class. | | | | | | | | | |