TITOLO DEL CORSO FIELD GEOPHYSICS			
Settore Scientifico - Disciplinare: GEO/11		**CFU: 6** (4 LF + 1 LAB + 1 AC)	**Ore: 60**
Ore di studio per attività:	**Lezioni frontali:** 2	**Laboratorio:** 1	**Attività di campo:** 0.56
Tipologia di attività formativa: caratterizzante			

SYLLABUS

Prerequisiti: Physics, Geophysics, Applied Geophysics.

Lezioni frontali

numero di ore 6	Argomento: *Introduction to Field Geophysics:* Active and passive geophysical methods, limits of applicability, ambiguity. Methods of interpretation. Measuring instruments and their properties. Noise and its sources, Filters, Stacking, Aliasing.
numero di ore 4	Argomento: *The Gravimetric Method:* Introduction on the gravimetric method. Instrumentation. Types of survey. Planning of surveys. Field procedure. Data processing. Application to real data examples.
numero di ore 6	Argomento: *The Magnetometric Method:* Introduction on the magnetometric method. Instrumentation. Types of survey (marine, aeromagnetic, land). Planning of surveys. Field procedure. Data processing. Application to real data examples.
numero di ore 6	Argomento: *The Geoelectric Methods:* Introduction on the geoelectric methods. Instrumentation. Electrode configurations. Planning of surveys. Field procedures. Data processing. Application to real data examples.
numero di ore 4	Argomento: *The Seismic Refraction Method:* Introduction on seismic surveys. Instrumentation. Planning and execution of seismic refraction surveys. Seismic tomography. Remarks on borehole seismic methods. Data processing
numero di ore 4	Argomento: *Ground Penetrating Radar (GPR):* Introduction on EM/GPR prospecting. Instrumentation. Planning of surveys. Field procedures. Data processing. Application to real data examples.
numero di ore 2	Argomento: Multi-disciplinar case studies.

Laboratorio

numero di ore 12	Attività: Data Analysis through the following software: *MATLAB, Surfer, Reflex, Res2Dinv, ProsysII, Pickwin95, PlotRefa, Excel*. Plot of the obtained maps and interpretative sections. Joint interpretation of the different datasets (gravimetric, magnetometric, geoelectric, seismic and GPR).

Attività di campo	
numero di ore 16	<u>Attività</u>: Field measurements of gravimetric, magnetometric, geoelectric, seismic and GPR data.

Risultati di apprendimento attesi

Knowledge and understanding
The student must demonstrate that he/she understands the problems related to a correct planning (in terms of cost/benefit ratio) of field geophysics. He/she must also show to be able to pick up the geophysical methodologies that are best suited to the goal, based on the theoretical principles of each methodology.

Applying knowledge and understanding
The student must show to be able to correctly carry on applied geophysics measurements using different types of instruments (e.g., gravimeter, magnetometer, seismograph), aimed at environmental, geological, engineering and archaeological studies.

Making judgements
The student should be able to independently assess the quality of the acquired data, in terms of noise/errors and in relation to the objectives set during the design phase. He/she must also be able to propose solutions to improve the quality of data and/or their effectiveness. He/she must finally be able to correctly evaluate the meaning of interpretative results.

Communication
The student must be able to explain to non-expert people the basics of the main applied geophysical methodologies. He/she will have to present a report (during the examination) summarizing exhaustively and concisely data acquisition and processing of a geophysical method among those illustrated during the course. He/she must be able to correctly use a technical language and demonstrate that he/she understood the limits and possible applications of the discussed method.

Learning skills
The student must be able to deepen his/her knowledge by autonomously researching on texts, scientific articles and the web. He/she must gradually acquire the ability to attend seminars, conferences and masters, in the field of measurements and data processing of applied geophysics methods.

Modalità di verifica dell'apprendimento

Prove intercorso:
Preparation of a Report in *Power Point* about the field measurements and the data analysis for one of the above-mentioned methods. Grades in 30/30.

Esame finale:
Discussion of the Report, discussion on the field procedures and data analysis performed during the Laboratory activities. Oral exam on the above-mentioned methods.