

UNIVERSITA' DEGLI STUDI DELLA BASILICATA  
DIPARTIMENTO DI SCIENZE

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**Programma di insegnamento per l'a.a. 2015-2016**

Insegnamento: Geophysical Prospecting

Docente: Dr. Enzo Rizzo

Corso di studio: Geoscience and Reoresourse

Anno di corso: I Magistrale

Periodo didattico: I Semestre

Tipologia: C

Totale crediti: 6

Tipo esame: Orale

Valutazione: Voto

Lingua di insegnamento: Inglese

Inizio corso ottobre 2015 Fine corso Gennaio 2016

**APPELLI DI ESAME**

Mese	Anno	Appello previsto
Febbraio	2016	23/02/2016
Marzo	2016	22/03/2016
Aprile	2016	26/04/2016
Maggio	2016	24/05/2016
Giugno	2016	28/06/2016
Luglio	2016	26/07/2016
Settembre	2016	20/09/2016
Ottobre	2016	25/10/2016
Novembre	2016	22/11/2016
Dicembre	2016	13/12/2016
Gennaio	2017	24/01/2017

COMMISSIONE ESAME:

Presidente: Dr. Enzo Rizzo

Componente: Prof. Prosser

Componente: Prof. Bentivenga

Componente: \_\_\_\_\_

**ORARIO RICEVIMENTO STUDENTI**

<i>GIORNO</i>	<i>DALLE ORE</i>	<i>ALLE ORE</i>	<i>PRESSO</i>
LUNEDI'			
MARTEDI'	10:00	11:30	Aula Cartografia
MERCOLEDI'			
GIOVEDI'			
VENERDI'	10:00	11:30	Aula Cartografia

**Eventuali prerequisiti:**

Fisica e  
Matematica

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**Obiettivi formativi:**

Gli studenti avranno una buona conoscenza teorica e pratica delle prospezioni geofisiche con aspetti specifici sulla geofisica applicata in diversi settori: Geologia e Idrogeologia, Ambiente, Ingegneria. Inoltre, apprenderanno l'utilizzo di alcuni software specifici sia di elaborazioni che di inversione dati. Attraverso alcune lezioni in campo, gli studenti utilizzeranno diverse tipologie di strumentazioni geofisiche permettendo di avere una conoscenza diretta degli stessi attraverso un passaggio dal teorico al pratico-applicativo.

**Programma del corso**

**1. INTRODUCTION**

- Geophysical prospecting.
- Environmental Geophysics and Hydrogeophysics
- Examples.

**2. GEOPHYSICAL METHODS: ACTIVE AND PASSIVE**

*2.1 Geoelectrical methods*

- Basic principles.
- Vertical electrical soundings (VES) and resistivity mapping.
- 2D and 3D measurements
- Field equipment
- Field measurements
- Data Processing and Interpretation
- Examples

*2.2 Induced polarization (IP) method*

- Basic principles.
- Mechanisms of induced polarization.
- Induced polarization measurements and Field operations
- Examples

*2.3 Electromagnetic surveying*

- Basic principles and Depth of penetration of electromagnetic fields
- Non-contacting conductivity measurement.
- Interpretation of electromagnetic data
- Limitations of the electromagnetic method
- Examples

#### *2.4 Ground-penetrating radar*

- Basic principles.
- Electric permittivity and conductivity.
- Electromagnetic wave propagation
- Estimation of exploration depth
- Processing and interpretation of GPR data
- Technical aspects of GPR
- Examples.

#### *2.5 Magnetic method*

- Basic principles.
- Magnetic properties of rocks.
- Field equipments and procedures.
- Data evaluation and interpretation
- Examples.

#### *2.6 Self-potential (SP) method.*

- Basic principles.
- Mechanism of self-potential.
- Self-potential equipment and survey procedure.
- Interpretation of self-potential anomalies.
- Examples

#### *2.7 Magnetotelluric field methods*

- Basic principles.
- Resistività apparente in magnetotellurica.
- Surveying with telluric currents.
- Interpretation of Magnetotelluric data.
- Examples.

#### *2.8 Seismic surveying.*

- Basic principles.
- Reflection and refraction surveying
- Seismic data acquisition systems
- Problems
- Examples.

#### *2.9 Geophysical survey*

- The principles and limitations of geophysical exploration methods
- Data Analysis.
- Data elaboration
- Data interpretation
- Technical Geophysical Report

### 3. GEOPHYSICAL SURVEY

- Exploration Geophysics
  - Energy Resource geophysics
- Environmental Geophysics
- Hydro-Geophysics
- Engineering Geophysics
- Archaeo-Geophysics

#### **Metodi didattici**

Lezioni frontali, esercitazioni, laboratorio

#### **Modalità di verifica dell'apprendimento**

Relazioni su attività pratiche e/o di laboratorio

Esame Finale

#### **Testi di Riferimento**

- Reynolds John M.: An Introduction to Applied and Environmental Geophysics, John Willey and sons, (1997).
- Rubin Yoram and Hubbard Susan S.: Hydrogeophysics, Springer (2005).
- Sharma, P.M., Environmental and Engineering Geophysics, Cambridge University Press. (1997).
- Telford, W.M., Geldart, L.P., Sheriff, R.E., Keys, D.A.: Applied Geophysics, Cambridge University Press, (1990).
- Reinhard Kirsch, Groundwater Geophysics.A Tool for Hydrogeology. Springer (2006)
- Harry Vereecken, Andrew Binley, Giorgio Cassiani, Andre Revil, Konstantin Titov, Applied Hydrogeophysics
- Papers

#### **Altre informazioni:**

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**Syllabus a.a. 2015-2016**

Course: Geophysical Prospecting

Professor: Dr. Enzo Rizzo

Course of studies: Geoscience and Georesource

Academic Year: I Magistrale

ECTS: \_\_\_\_\_

Teaching Methods: Lectures – Lab. Activities

Evaluation Method: Oral

Evaluation: Score (score on 30 points/qualificazioni)

Semester: I

Language: English

Course beginning on Oct 2015 ending on Jan 2016

**CALLS FOR EXAMINATION**

Month	Year	Expected call
February	2016	23/02/2016
March	2016	22/03/2016
April	2016	26/04/2016
May	2016	24/05/2016
June	2016	28/06/2016
July	2016	26/07/2016
September	2016	20/09/2016
October	2016	25/10/2016
November	2016	22/11/2016
December	2016	13/12/2016
Juanary	2017	24/01/2017

**EXAMINATION PANEL:**

President: Dr. Enzo Rizzo

Member: Prof. Prosser

Member: Prof. Bentivenga

Member: \_\_\_\_\_

**Previous requirements:**

**Learning Outcomes:**

Students will have a good theoretical and practical knowledge of the geophysical prospecting with specific aspects on applied geophysics in several fields: Geology, Hydrogeology, Environment, Engineering. Moreover, they learn the use of some specific software on the elaborations and inversion data. Through the lessons in the field, students will use some geophysical instruments in order to have direct knowledge of the same through a passage from the theoretical to the practical use.

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**Further information:**

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