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**COURSE: GEOPHYSICAL PROSPECTING**

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**ACADEMIC YEAR: 2016-2017**

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**TYPE OF EDUCATIONAL ACTIVITY: Basic**

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**TEACHER: Enzo Rizzo**

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e-mail: **enzo.rizzo@imaa.cnr.it**

website:

phone: **+39 0971 427 402**mobile (optional):

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Language: **English**

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ECTS: **6 (4 lessons e 2  
tutorials/practice)**n. of hours: **56 (34h lessons  
e 24h tutorials/practice)**Campus: Potenza  
Dept./School: Dipartimento di  
Scienze  
CdS: Geosciences-and -  
Georisources (**LM74**)Semester: I  
start: 03/10/2016  
end: 15-31/01/2017

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**EDUCATIONAL GOALS AND EXPECTED 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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**PRE-REQUIREMENTS**

It is necessary that students have knowledge of physics and mathematics basic. In addition, a basic of hydrology should be help the students to understand some parts. Finally, a good capacity in the use of the PC is welcomed.

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**SYLLABUS**

The main thematics are:

1. INTRODUCTION on the Geophysical prospecting
  2. GEOPHYSICAL METHODS: 2.1 Geoelectrical methods, 2.2 Induced polarization (IP) method, 2.3 Electromagnetic surveying, 2.4 Ground-penetrating radar, 2.5 Magnetic method, 2.6 Self-potential (SP) method, 2.7 Magnetotelluric field methods, 2.8 Seismic surveying,
  3. GEOPHYSICAL DATA: The principles and limitations of geophysical exploration methods, Data Analysis, Data elaboration, Data interpretation, Technical Geophysical Report
  4. GEOPHYSICAL APPLICATION: Exploration Geophysics, Energy Resource geophysics, Environmental Geophysics, Hydro-Geophysics, Engineering Geophysics, Archaeo-Geophysics
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**TEACHING METHODS**

The course is organized as follows:

- Lectures on all subjects of the course;
  - Exercises in the classroom through the use of specific software
  - Exercise in the field with the use of geophysical instrumentations
  - Drafting of a geophysical report.
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**EVALUATION METHODS**

Practical tests with open or closed questions and exercises. At the end, the discussion of a project work.

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**TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL**

- 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.
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**INTERACTION WITH STUDENTS**

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At the beginning of the course, I collect a list of students who intend to enroll in the course, together with name, serial number and email.

Discussion and questions will be for one hour after class

Over time of receipt, the instructor is available at all times for a contact with the students by e-mail.

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EXAMINATION SESSIONS (FORECAST)<sup>1</sup>

21/02/2017, 22/03/2017, 19/04/2017, 24/05/2017, 21/06/2017, 19/07/2017, 21/09/2017, 25/10/2017, 22/11/2017, 21/02/2018

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SEMINARS BY EXTERNAL EXPERTS    YES     NO

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FURTHER INFORMATION

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<sup>1</sup> Subject to possible changes: check the web site of the Teacher or the Department/School for updates.