



COURSE SHEET

Degree	II level degree in Geological Sciences and Technologies
Course:	Applied Geophysics. Module B
Number of CFU:	6
Semester:	I
Official teacher:	Rosalba Maresca
Tutoring hours:	14 - 16
Address:	Via dei Mulini 59/A - Benevento

OVERVIEW:

Module B of the Applied Geophysics course deals with near-surface exploration techniques applied to seismic microzoning, environmental geology and geoarchaeology. The course includes theoretical lessons, field and laboratory exercises, to train the student to the geologist profession.

EDUCATIONAL GOALS

The student will learn some near-surface prospecting techniques, through theoretical and practical lessons. The student will be able to solve simple problems for the detection of near-surface structures, and for seismic microzoning. The student will learn the use of field instrumentation and software for acquisition processing of geophysical data.

REQUIREMENTS

First level course of Geophysics

ATTENDANCE AT LESSONS

Highly recommended

COURSE CONTENT

Classification and purposes of geophysical prospecting methods. Seismic hazard, seismic micro-zoning and seismic site response. Microtremors and HVSR Technique. The surface waves. Dispersion function. Elliptic function for Rayleigh waves. MASW method and its applications. Georadar method (GPR) and its applications.

TEACHING METHODS

The course includes lectures, field and laboratory exercises. Theoretical and practical lessons contribute to the student's education, which will be able to solve simple geological problems through the use of geophysical techniques.

REFERENCES

1. Romeo R. W. La risposta sismica locale per la progettazione strutturale. International Centre for Mechanical Sciences. Monografie CISM, 2007.
2. Conyers L.B., Goodman D. Ground Penetrating Radar. Un'introduzione per gli archeologi. Aracne Ed., 2007. ISBN 978-548-0951-2.
3. Corrao M., Coco G. Geofisica Applicata con particolare riferimento alle prospezioni sismiche, elettriche, elettromagnetiche e geotermiche. Flaccovio, 2009.
4. Dal Moro G., Tre divagazioni: il mito dell'inversione, MASW in Friuli, esempi di applicazione congiunta MASW rifrazione. <https://www.academia.edu/23620607/>
5. S. L. Kramer - Geotechnical Earthquake Engineering - Prentice Hall, 1996.
6. G. Lanzo, F. Silvestri - Risposta Sismica Locale. Teoria ed esperienze - Hevelius Edizioni, 1999.
7. Leucci G., 2004. I metodi elettromagnetico impulsivo, elettrico e sismico tomografico a rifrazione per lo studio di problematiche ambientali : sviluppi metodologici e applicazioni. Tesi di dottorato, Università di Lecce. <http://www.idrogeologia.net/network/tesi/uploads/metodi-elettromagnetico-impulsivo.pdf>
8. Reynolds J. M. An Introduction to Applied and Environmental Geophysics. Wiley, 1997.
9. T. Lay, T.C. Wallace - Modern Global Seismology - Academic Press, 1995. Capitolo 4, paragrafi 4.1, 4.2, 4.3.

EXAMINATION

Oral exam. The acquired knowledge, the way of exposure, the ability to solve simple problems will be evaluated.

TIMETABLE OF EXAMINATION

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PRENOTAZIONE ESAMI

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SYLLABUS

Topics	No. hours	References	Kind of lesson
Introduction to the course	2	1-9	oral
Seismic hazard and microzoning	2	1	oral
Seismic site response. Experimental approach. 1D modelling. Equivalent linear approach.	12	1, 5, 6, 9	oral, lab
HVSR method	8	1	oral, field, lab
MASW method	10	3, 4, 9	oral, field, lab
Inversion of Vs profile from dispersion data	4	3	oral, lab
EM waves. Attenuation. Reflection and transmission coefficients. Antennas	4	3, 7, 8	oral
GPR method	14	3, 7, 8	oral, field, lab