TITOLO DEL CORSO SEISMIC MICROZONING			
Settore Scientifico - Disciplinare: GEO/10		**CFU: 6** (2 LF + 4 LAB)	**Ore: 64**
Ore di studio per attività:	**Lezioni frontali:** 2	**Laboratorio:** 1	**Attività di campo:** 0

Tipologia di attività formativa: caratterizzante

SYLLABUS

Prerequisiti: Sismologia e Pericolosità Sismica.

Lezioni frontali

numero di ore 16	Argomento: Refraction seismic survey: source, receivers and data analysis. Down-hole tests: source, receivers and data analysis. Surface waves and methods to measure phase and group velocities: SASW, f-k, MASW, FTAN. Inverse problem in geophysics. Linear and non-linear inversion of geophysical data. Inversion of surface wave dispersion data. Inversion of phase velocity data with GEOPSY software. Non-linear inversion of group velocity dispersion curve of fundamental mode. H/V spectral ratios. Noise measurements and windowing of data. H/V measurements and velocity models with Geopsy program. Zoning and microzoning aimed to the respect of Italian building code (NTC).

Laboratorio

numero di ore 48	Attività: Analysis of signals of a refraction seismic survey: picking first arrivals, time-distance graph, earth model. Analysis of down-hole signals for the definition of compressional and shear wave velocity profiles with depth. Analysis of SASW measurements with Matlab to get phase velocity dispersion curve of Rayleigh waves. MASW and f-k analysis of recorded signals along arrays with GEOPSY program: picking of fundamental-mode Rayleigh waves, average dispersion curve with error bar and its inversion to get velocity profiles with depth. FTAN analysis of earthquakes and active seismic signals. Non-linear inversion of group velocity dispersion curve of fundamental mode extracted from active seismic signals. Noise measurements and analysis to measure spectral ratio H/V and their analysis and inversion with Geopsy program to get velocity models. Downloading of earthquake recordings from INGV monitoring network for a site of interest. Response spectra of accelerograms and comparison with those of NTC for different soil types and limit states.

Risultati di apprendimento attesi

Knowledge and understanding*:*
The student must demonstrate knowledge of the problems related to the estimation of microzoning studies. He must be able to discern the more appropriate methods for a correct definition of shear wave velocity models in an area and select representative earthquake

recordings to respect the national building code (NTC).

Applying knowledge and understanding:
The student must be able to apply the studied methodologies to design a seismic microzoning study according to the national building code (NTC).

Making judgements:
The student must be able to plan the appropriate surveys to measure shear wave velocity profiles with depth and define the soil type according to the national building code. He must be also able to suggest non-conventional methods that are more robust and cheaper.

Communication:
The student must be able to plan a microzoning study and to describe it in a simple and clear way even to those who do not have a specific preparation on the subject.

Learning skills:
The student is guided in search of useful material for in-depth study to be able to expand knowledge in full autonomy.

Modalità di verifica dell'apprendimento

Prove intercorso:
YES.

Esame finale:
Evaluation of laboratory activity on the topics of the course.