



UNIVERSITÀ DEGLI STUDI DI TORINO

ID

VP42\_DIP\_SCITER

## Visiting Professor Program Academic year 2020/2021

### **DEPARTMENT OF EARTH SCIENCES**

**TEACHING COMMITMENT:** 12 hours

### **COURSE TITLE**

Seismology and Earthquake Mechanics

### **TEACHING PERIOD**

2nd term

### **SCIENTIFIC AREA**

Geophysics

### **LANGUAGE USED TO TEACH**

English

### **COURSE SUMMARY**

Earthquakes mechanics in laboratory. Experimental determination of mechanical parameters in uniaxial, triaxial, extension and shear strength. Elastic deformation, brittle and ductile. Mechanical anisotropy and micromechanical models. Deformation mechanisms and physical properties. Experimental determination of physical parameters (density, porosity, elastic waves velocity). Friction and laboratory experiments.

### **LEARNING OBJECTIVES**

Identification and experimental characterisation of mechanical processes related to earthquakes occurrence.

Quantitative experimental and analytical measurements to describe the mechanical parameters underlying earthquake ruptures propagation.

Discuss and link methods and seismological data analysis both in terms of theoretical and experimental aspects.

#### **TUTORSHIP ACTIVITIES (IF APPLICABLE)**

#### **LAB ACTIVITIES (IF APPLICABLE)**

One practical on physical properties measurements on rocks

#### **OTHER ACTIVITIES BESIDES THE COURSE**

One departmental seminar open to Staff, Research Fellows and PhD students

### **ADDITIONAL COURSE**

#### **COURSE TITLE**

Rheological Properties of Natural Systems and Their Modelling: Implications for Eruptive Dynamics and Geophysical Monitoring

#### **TEACHING PERIOD**

2nd term

#### **SCIENTIFIC AREA**

Geophysics

#### **LANGUAGE USED TO TEACH**

English

#### **COURSE SUMMARY**

The course aims at developing a solid understanding of the fundamental principles of rock mechanics as applied to the understanding of deformation mechanisms leading to ruptures with implication to the seismic monitoring and geophysical signals identification.

#### **LEARNING OBJECTIVES**

To identify the mechanical processes fundamentally controlling seismic ruptures generation and define the reference seismological models.

To apply rock mechanics to seismological methods, with particular reference to seismic monitoring.

**TUTORSHIP ACTIVITIES (IF APPLICABLE)**

**LAB ACTIVITIES (IF APPLICABLE)**

**OTHER ACTIVITIES BESIDES THE COURSE**

**VISITING PROFESSOR PROFILE**

Well recognised Geophysicist/Seismologist with strong background in experimental rock physics and rock mechanics

**CONTACT PERSON AT THE DEPARTMENT**

Prof. Sergio Carmelo Vinciguerra

[sergiocarmelo.vinciguerra@unito.it](mailto:sergiocarmelo.vinciguerra@unito.it)