

HEADS OF PROGRAM

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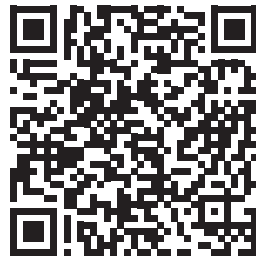
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APPLICATION

For more information on how to apply:

www.univ-grenoble-alpes.fr/education/how-to-apply/applying-and-registering/



CONTACT

PhITEM

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PhITEM

MASTER PROGRAM NATURAL GEOLOGICAL HAZARDS AND RISKS

■ This program aims at training students in the assessment of natural hazards using quantitative methods and geophysical tools.



FACULTÉ DES
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Description

Natural geological hazards (earthquakes, landslides, volcanoes) are a major issue in our societies. This is reflected in a growing demand for understanding, controlling and managing telluric risks, both in France and internationally. This program was created to meet this need and **trains students in the assessment of natural hazards using quantitative methods and geophysical tools**. Students are prepared to work either for research (academic, semi-public or private), or for engineering offices in charge of natural hazard assessment or geophysical reconnaissance of surface terrain, or for local authorities.

The training is organized over two years and includes courses shared with the other programs of the master. It combines **theoretical and practical approaches, and provides a range of cross-disciplinary skills for the various natural hazards**. The first-year courses allow students to master the use of geophysical, seismological, remote sensing and numerical modeling tools. In the second year, the focus is on the use of these tools for the quantification of seismic, landslide and volcanic hazards and risks. In the second year, a large number of training hours are given in the form of projects (a mix of lectures, case studies and applications, evaluation on reports and oral presentations).

Training in the field, in companies or in research laboratories, plays a key role in this program. The end-of-master's internship (lasting between 4 and 6 months) takes place either in an engineering office, or in academic research (~25% of students), or in local authorities, in France or abroad (~20% of students each year).

Objectives

This course prepares students either to continue in the private or semi-state sector (consultancies, EPIC, local authorities), or to go on to do a PhD. The skills acquired in this course will provide the student with the experience needed to successfully pursue either of these two directions.

Admission requirements

This course is intended for students in Geosciences with a strong interest in working in the natural risks sector. Students have solid training in Physics, Geosciences and/or Civil engineering.

The 1st year is open to students who have obtained a national diploma equivalent to a Bachelor degree (*licence*) in a field compatible with that of the program, or via a validation of their studies or experience.

Entry to the 2nd year may be selective. It is open to candidates who have completed the 1st year of a Master in the field, subject to a review of their application.

Public continuing education

Candidates fall into the continuing education if they:

- resume your studies after 2 years of interruption
- followed training under the continuous training regime one of the previous 2 years
- are an employee, job seeker, self-employed



Academic program

■ 1st semester

- Signal processing
- Introductory Field Course - Professional project
- Programming and computing environments
- 3 options among the following:
 - Geophysical observation of the Earth
 - Tectonics and surface processes
 - Geomechanics
 - Geophysical prospecting
 - Professional and Scientific Communication
 - Risk management: Regulatory and alternative approaches
 - Waves Physics
 - Physics and Chemistry of the Earth

■ 2nd semester

- Introduction to Seismic Risk
- Volcanic dynamics and hazards
- Advanced volcanic dynamics and hazards
- Landslides, avalanches, protective structures
- 4-6 options among the following:
 - Graduate School Risk
 - Exploration geophysics
 - Remote sensing and GIS project
 - Data sciences & Inverse problems
 - Instrumentation for geophysics
 - Introduction: Machine learning in Earth sciences
 - Scientific computing
 - Induced seismicity

■ 3rd semester

- Advanced gravitational risk
- Engineering seismology
- Project in engineering seismology
- Project in gravitational risk
- 3-4 options among the following:
 - Graduate School Risk
 - Active Faults
 - Risk management
 - Near surface geophysics
 - Quantitative seismology
 - Signal processing
 - Tectonics and surface processes
 - Advanced machine learning in Earth sciences
 - Computing and data analysis project
 - Numerical modeling

■ 4th semester

- Short internship
- Long internship