



# Geotechnics and natural risks

## Objectives

This programme provides **specialist engineering training in geotechnics and natural risks**, in order to develop a professional approach to various geotechnical tasks, that range from **recognition techniques to diagnostics** and include **the sizing and completion of various constructions** (foundations, support, earth structures, etc.), in view of the different risks (earthquakes, volcanoes, underground cavities, etc.).

## Who is the programme for?

This programme is for engineering students who have taken the "planning and environment" option and wish to undertake advanced training in geotechnics and natural risks.

## Career opportunities

>> **Sectors:** Opportunities are available for graduate engineers in both geotechnical research centres and departments and private companies.

>> **Geological engineering assignments:** Major structures (dams, dykes, water treatment plants), linear structures (roads, motorways, railways), supporting structures (embankments, tunnels), buildings and engineering structures.

## Content

### > Natural risks

- General topics: risks, contingencies and challenges
- Natural risks and planning management
- Land movement
- Seismic and volcanic risks and risks related to underground cavities

### > Geophysics applied to geotechnics

- Electrical measurements
- Gravimetry measurements
- Radar measurements
- Electromagnetic measurements

### > Geotechnical materials

- Concrete: constituents, composition, durability
- Deterioration mechanisms and pathologies
- Brief overview of reinforced concrete
- Sizing of simple elements

### > Geotechnical practices

- Geotechnical assignments
- Eurocodes
- Gauging the size of structures
- Tenders and quotations

### > Marine geotechnics

- Sampling tools
- *In situ* measurement tools
- Sample measurement
- Engineering problems

> **Collective or individual project:** resolution of a problem in the student's area of specialization.

Six-month company placement

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