


# UE Instrumentation and metrology

 ECTS  
6 credits

 Component  
UFR PhITEM  
(physique,  
ingénierie, terre,  
environnement,  
mécanique)

 Semester  
Printemps

- > **Teaching language(s):** French
- > **Open to exchange students:** Yes
- > **Code d'export Apogée:** PAX8RIAA

## Presentation

### Description

In geoscience, it is important to know how to appreciate the precision and the accuracy of a physical measurement, to correctly interpret and compare it with other measurements. This module begins with a short introduction to the theory of measurement (metrology) (course 6h) which will be put into practice (TP 9h) by the statistical analysis of datasets of measurements that you will acquire yourself in the TP.

In a second part, the module deals with instrumentation, firstly in a general way (the principles and the problems specific to geosciences, 6h) illustrated by a TP where you will assemble a simple instrument (temperature logger) from the electronic components .

All this will then be put into practice in a concrete and real case of measures (24h total). You will perform precise positioning measurements on a landslide in Trièves, by GPS and by tacheometry (field trip of one day). When analyzing the data obtained, we will benefit from the redundancy of the measurements and the independence of the two techniques to quantify the distances between several measurement points with their uncertainties. The results in terms of distances will be compared with measurements from previous years to assess if the landslide is active, and if so, how and how fast it is moving. This module allows you to acquire the basics of GPS operation and tachometry (course 6h), to obtain a field measurement experience (one day), and to test several freely available software as well as webservices to analyze GPS data (TD 12h).

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## Course parts

CM	Lectures (CM)	36h
TP	Practical work (TP)	12h

**Period** : Semester 8

## Useful info

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### Contacts

Program director

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### Place

› Grenoble

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### Campus

› Grenoble - Saint-Martin d'Hères