

## Faculty of Applied Sciences



### MECA2710 Instrumentation and measurement techniques.

[30h+15h exercises] 4 credits

This course is not taught in 2006-2007

This course is taught in the 2nd semester

**Teacher(s):** Paul Fiset, Jean-Claude Samin  
**Language:** French  
**Level:** Second cycle

#### Aims

Measurement is an essential activity in every branch of technology and science. The aim of the course is to provide a basic understanding of measurement methods applied to physical quantities. These methods are generally based on the transformation in electrical signals by means of sensors and the use of an appropriate electronic instrumentation for signal processing.

Applications are proposed in the field of mechanical engineering.

#### Main themes

- Function and characterization of sensors in measurement systems.
- Piezoelectric and thermoelectric sensors, resistance thermometers and strain gauges.
- Transducers of mechanical quantities (displacement, speed, acceleration, force, pressure#).
- Introduction to semiconductor devices and integrated sensors.
- Analog instrumentation.
- Digital instrumentation.
- Mechanical metrology.

#### Content and teaching methods

The study of measurement systems emphasizes applications of sensors, associated electronic instrumentation and signal processing.

It is based on lectures completed by practical laboratory training and case studies.

#### Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

##### Prerequisites

Basic knowledge in electricity, mechanics and automatic control.

A course text and transparencies are available in French.

##### Bibliographic references

- Introduction à l'Electronique et à ses application en Instrumentation, by H. Buyse, F. Labrique et P. Sente  
Ed. TEC&DOC, Paris 2001.
- Principles of measurement systems, by J.P. Bentley  
Ed. Longman Scientific & Technical, UK 1995.

#### Other credits in programs

<b>MECA22</b>	Deuxième année du programme conduisant au grade d'ingénieur civil mécanicien	(4 credits)
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