


# Digital signal acquisition architectures and computed controlled systems

 **ECTS**  
4 credits **Component**  
INSTITUT  
NATIONAL  
DES SCIENCES  
APPLIQUEES  
TOULOUSE **Number of  
hours**  
60h

## Presentation

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At the end of this module, the student will have understood and be able to explain (main concepts):

## Description

Programme (detailed contents):

Lecture is divided in three complementary axes:

- \* **Electronics design:** different techniques used in analog and digital converters, with their associated architectures are detailed. Companding techniques are presented (A-law). The complete chain gauging techniques are studied based on the signal noise ratio extraction.
- \* **Command design:** discrete time linear models: input/output model, state space models. Sampling with zero holder. Stability criteria. How to obtain a discrete time controller from a continuous time one. RST controller: Regulation and tracking. Relation with state space methods.
- \* **Project:** the purpose is to cover several items such as treating an analogue sensor, controlling an A/N converter, the necessary digital processing (minimal control law) and finally the N/A conversion to drive the actuator. The whole chain will be operated by a microcontroller.

The complete modelling from sensor to actuator is presented, associated with digital control technics. A specific labwork deal with the implementation of a complete chain of acquisition and digital processing in order to carry out the control of an actuator.

## Useful info

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### Place

> Toulouse

## Objectives

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