

Microcontroller



SCHOOL

Polytech Graduate School of
Engineering



CAMPUS

Belle-Beille



LEVEL

3rd year Bachelor's degree



OPEN TO EXCHANGE STUDENTS

Yes



SEMESTER

Spring (S2)

- > **Degree course:** Graduate School of Engineering - Automation and Computer Engineering
- > **Teaching unit:** UE 6.3 Sciences de l'ing nieur
- > **Course language:** English
- > **Duration (hours):** 24
- > **ECTS:** 2
- > **Teacher(s):** Nicolas Delanoue

> Assessment:

- Continuous assessment
- Final exam

> Teaching methods:

- | | | | |
|---|----|-------|-------------------------------------|
| <input checked="" type="checkbox"/> Lecture course | 4 | hours | <input type="checkbox"/> Case study |
| <input checked="" type="checkbox"/> Tutorial course | 12 | hours | <input type="checkbox"/> Project |
| <input checked="" type="checkbox"/> Practical work | 8 | hours | |

COURSE DESCRIPTION

Recalls on the binary description of numbers for processors (signed/unsigned integers, floats)

- Description of the execution cycle of a processor
- What is a microcontroller ? processor + memory + IO
- Integrated IO devices on a microcontroller : digital IO, timers/counters, interrupts, Analog to Digital Converter, Two Wire Interface, Applications in C language for ARDUINO
- Labs : small applications using switches, LED, 7-segment displays, rotary encoders

OBJECTIVES

This lecture aims at tackling some elementary notions about programmable digital systems. First, we recall some usual descriptions of numbers in digital systems and we explain how processors execute programs. Then we introduce microcontrollers and their usual integrated input-output devices. All the examples are given with the Arduino UNO board.

PREREQUISITES

basics in digital systems