Course : Embedded systems, development on the Arduino platform

Practical course - 4d - 28h00 - Ref. ARD
Price : 2550 € E.T.

★★★★½ 4,4 / 5

This training course will enable you to create new products using the Arduino electronics kit. In particular, you'll learn how to set up the development environment, the architecture of ATmega microcontrollers and the various interrupt, timer and communication interface techniques.

🎯 Teaching objectives

At the end of the training, the participant will be able to:

- ✔ Understand the architecture of ATmega family microcontrollers
- ✔ Implementing a development environment
- ✔ Input-output management
- ✔ Handling interruptions
- ✔ Managing communications

Intended audience
Computer scientists wishing to develop applications using Arduino technology.

Prerequisites
Good knowledge of C language. Knowledge of electronic logic desirable.

Practical details

Hands-on work
You will carry out developments in C and C++ based on an Arduino kit that you will be able to take away with you at the end of the course.

Course schedule

1 Presentation

- Open Source in electronics.
- Arduino and Wiring projects.
- Arduino kits and shields (extension boards…).

Hands-on work
Get to grips with the Arduino environment (electronics kit, test board, components, etc.).

2 ATmega 328 family

- Overview of logic electronics.
- ATmega microcontroller family.
- ATmega architecture: memory model, I/O…
- Interrupt management.
- Power consumption management.

Hands-on work
Read simple electronic schematics, simulate logic operators.

3 Development tools

- The Arduino integrated development environment.
- Atmel Studio 6 IDE.
- Arduino libraries.
- The compilation chain.

Hands-on work
Set up development environments. Write an initial example, then load the executable onto the kit for execution.

4 Input-output

- Logic levels of digital inputs/outputs.
- TOR inputs/outputs.
- Analog-to-digital conversion: sampling principle.
- Analog-to-digital conversion on Arduino.
- Pulse Width Modulation (PWM) channels.
- Use of a PWM channel to create an analog signal.

Hands-on work
Use a PWM channel to create an analog signal. Create a digital I/O management application.

5 Interruptions

- Hardware and software interruptions, internal and external. Interruption vectors.
- Timers: reference clock, counters.
- Timer and PWM.

Hands-on work
Creation of an interrupt management application.

6 Communications

- Synchronous and asynchronous serial interfaces.
- Serial link, I2C and SPI bus.

Hands-on work
Create a serial link application.

7 Supplements

- Principle and loading of the Arduino bootloader.
- Create your own maps and shields.
- Assembly language.

Hands-on work
Create an application in C language and use assembler.

Dates and locations

PARIS LA DÉFENSE
2026 : 23 June, 3 Nov.