Course : ESP32, ESP8266, IoT prototyping

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

The ESP32 is a processor used in many IoT and industrial applications. It offers unique advantages in terms of flexibility and power. This training course will enable you to put it to work and understand the range of possibilities offered by this processor.

Teaching objectives

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

- Espressif card developments
- Mastering the possibilities of ESP32
- ESP32 programming skills in Python and C
- Developing embedded applications on ESP32
- Be able to prototype connected objects with ESP32

Intended audience

Developers wishing to create IoT applications with ESP32.

Prerequisites

Basic knowledge of the C/C++ language, with basic knowledge of Python and electronics a plus.

Practical details

Hands-on work
In the classroom, practical work is carried out on ESP32 cards, which participants keep at the end of the course.

Course schedule

① IoT and development

- State of the art of the Internet of Things (IoT).
- Projects representative of the IoT and wearables market.
- Electronics reminder.
- Programming languages used in the IOT.
- Development environment.
- Espressif products.
- Cloud architectures.
- Real-time programming with RTOS.

Hands-on work
Install and use the PlateformIO environment. Use RTOS in a program. Programming: connect 3 (or more) LEDs to the ESP32 and create a chase program.

② ESP32 and WiFi

- Network protocols.
- Identify available networks.
- Connect to a network by SSID.
- Create an access point (AP).
- IPV4 and IPV6 connections.
- MQTT protocol for message management, Mosquitto software.

Hands-on work
Scan available networks, connect to a Wifi network. Create an access point and set up a web server. Send messages to and subscribe to an MQTT broker. Application on the caterpillar.

③ Local communication technologies

- Local communication technologies: BT, BLE, RFID, LoRa, Sigfox.
- Bluetooth protocol, BT LE.
- Bluetooth MESH network.
- The LoRa network: the Things Network.

Hands-on work
Send messages to a cell phone. Create a local MESH network. Receive measurements on LoRa TTN network, with modules available on line to return a measurement used locally.

④ Implementing cloud services

- OTA (Over The Air Updates) software updates.
- Energy management for a battery-powered project.
- Use of REST APIs.
- Data visualization: dashboards, Grafana software.

Hands-on work
Implementation of an OTA update via WiFi. Measurement of temperature and presence (IR) on the ESP32, sending data (WiFi) to a server (via API) and creating a dashboard (Grafana).

TEACHING AIDS AND TECHNICAL RESOURCES
- The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
- At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
- A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES
Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES
Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.