USEEV3 - Programming and Communication of a Robotic Arm

Mis à jour le 06-10-2025

Code : USEEV3

Unité spécifique de type cours

3 crédits

Responsabilité nationale : EPN05 - Informatique / Stefano SECCI

Présentation

Prérequis

Robotics Basics: Having a basic understanding of robotics concepts, such as the kinematics and dynamics of robotic arms, can be beneficial.

Electronics Fundamentals: Understanding basic electronics concepts such as resistance, voltage, current, and having experience with common electronic components could be essential for working with robotic hardware.

Objectifs pédagogiques

The goal of this STC is to learn the mathematical principles that govern the movement of a robot and how to apply them in simple programs. This includes programming simple trajectories and correcting pre-programmed operations in a robot using AI, and understanding the different communication strategies that a robot has with its environment. We give insights about how to acquire the necessary knowledge to carry out low-level communications with sensorised systems.

Programme

Contenu

Know the mathematical principles that govern the movement of a robot and learn to apply them in simple programs.

Learn to program simple trajectories and correct pre-programmed operations in a robot.

Know the different types and levels of communication that a robot has with its environment.

Acquire the necessary knowledge to carry out low-level communications with sensorised systems.

Learn to carry out communications with SIEMENS PLCs (Programmable Logic Controllers).

- Mathematical and mechanical principles of the operation of a robot.
- Languages of communication. Differences in the programming of different brands.
- Low level programming – logical structure of Python.
- Communication of a robot with its control system.
- Communication of a robot with peripheral equipment.
- PLCs and other programmable controllers. Control hierarchy.
- Communication of automated installations through advanced common control systems.
- Preventive and corrective maintenance. Identification and diagnosis of errors.

Modalités de validation

- Contrôle continu
- Examen final

Description des modalités de validation

Continuous monitoring and exam.