USEES9 - Robot Predictive Maintenance

Mis à jour le 25-02-2026

Code : USEES9

Unité spécifique de type cours

3 crédits

Responsabilité nationale :
EPN05 - Informatique / Stefano SECCI

Présentation

Prérequis

Basic Programming Knowledge: Students are expected to have at least basic programming knowledge. 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 how to carry out and predict maintenance tasks on Robots main constituent elements, in order to define and implement a preventive maintenance plan with a robot according to the empirical test and the manufacturer's specifications.

This includes learning the electrical-motor elements that comprise an articulated robot and understanding its operation and function, how to carry out an error diagnosis based on the robot's operation log, and hence designing AI to prevent accidents during the maintenance of robotic equipment.

Programme

Contenu

Carry out maintenance tasks on its main constituent elements, in order to define a preventive maintenance plan with a robot according to the empirical test and the manufacturer's specifications. Know the main predictive maintenance tools.

Topics:

- Refresh on morphological foundations: Types of robots and movement control systems.
- Composition of a robot, access and maintenance of main constituent elements.
- Refresh on mathematical fundamentals of programming and calibrating a robot.
- Corrective maintenance of a robot. Identification of errors and correction of common incidents.
- Preventive and predictive maintenance. Forecast of incidents and creation of maintenance programs.

Complementary content:

- Know the electrical-motor elements that comprise an articulated robot and understand its operation and function.
- Know the control elements that direct and manage a robot, understand its operation and learn the basic notions of operation.
- Learn to carry out an error diagnosis based on the robot's operation log.
- Acquire the necessary knowledge to prevent accidents during the maintenance of robotic equipment.
- Learn to carry out maintenance tasks on the main electromechanical elements of a robot.

Topics:

- Electronic composition of an articulated robot, access and maintenance of main constituent elements.
- Introduction to communication and control systems. Hierarchies and dependencies with peripheral systems.
- Security systems and devices in automated facilities.
- Adjustment and parameterization operations. Refresh on PID control.
- Verification and quality control of the operation.
- 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.