

Guia docent

300097 - STCDATA - Gestió de Dades i Transformació Digital en Automatització de Processos Industrials

Última modificació: 04/07/2026

Unitat responsable: Escola d'Enginyeria de Telecomunicació i Aeroespacial de Castelldefels
Unitat que imparteix: **Titulació:** MÀSTER UNIVERSITARI EN INTEL·LIGÈNCIA ARTIFICIAL PER A INDÚSTRIES CONNECTADES (AI4CI) (Pla 2025). (Assignatura optativa).

Curs: 2026 **Crèdits ECTS:** 3.0 **Idiomes:** Anglès

PROFESSORAT

Professorat responsable: José Luis Jabato (ITCL), Lorena Saiz (ITCL)

Altres: José Luis Jabato (ITCL), Lorena Saiz (ITCL)

CAPACITATS PRÈVIES

Academic training in fields related to engineering, industrial automation, computing, information technology or related disciplines.

Basic knowledge of industrial automation principles and industrial processes may be required. Familiarity with concepts of data management, data analysis and digital transformation. Experience in the field of industrial automation or data management may be an additional requirement.

REQUISITS

Academic training in fields related to engineering, industrial automation, computing, information technology or related disciplines.

Basic knowledge of industrial automation principles and industrial processes may be required. Familiarity with concepts of data management, data analysis and digital transformation. Experience in the field of industrial automation or data management may be an additional requirement.

METODOLOGIES DOCENTS

Lectures, assignments, autonomous work, project

OBJECTIUS D'APRENTATGE DE L'ASSIGNATURA

Explain the different layers that can coexist in IoT architectures in the industrial environment.

Know the main existing hardware solutions for data capture.

Know the main wireless communication technologies that can be found in the industrial IoT.

Know the possible functionalities offered by data integration platforms: ITCL BITAL

HORES TOTS DE DEDICACIÓ DE L'ESTUDIANTAT

Tipus	Hores	Percentatge
Hores aprenentatge autònom	48,0	64.00
Hores grup gran	27,0	36.00

Dedicació total: 75 h

CONTINGUTS

Data Management and Digital Transformation in Industrial Process Automation

Descripció:

1- Industry 4.0:

Raise awareness of the importance of data, of data analysis.

Main sources of IIoT information:

2- Main data sources existing in industrial facilities. Functions that cover Aspects to take into account in the capture layer:

Programmable controllers.

Specific controllers, IoT probes.

HMI, SCADA, explain the differences and what each one covers

Layers and architectures

3- Describe existing layers and architectures. Expose the elements and functions they cover and the interrelationship between them.

Sensory layer.

Control layer.

IT layer.

Cloud

IT Architecture (Closed Bus, Open Bus, Open Bus+NAT).

Main protocols of each layer:

4- Describe the main protocols of each of the layers, characteristics, advantages / disadvantages.

Analog/digital signals.

Manufacturer-specific protocols: S7, FINS, MELSEC, METTLER TOLEDO, MARCHESSINE.

Industrial standard protocols: PROFINET/PROFIBUS, MODBUS RTU/TCP, OPC UA.-DA

MQTT, REST API...

Industrial IoT Gateways:

5- Explain the current state of some of the main commercial HW for protocol capture and adaptation, differences, advantages and disadvantages. VNODE, IBH, EWON, SIEMENS IoT2040

New wireless communication technologies

6- Expose the main LPWA technologies, architectures, differences. Advantages and disadvantages. LORA, SIGFOX, NB IoT

Dedicació: 75h

Grup gran/Teoria: 27h

Aprenentatge autònom: 48h



SISTEMA DE QUALIFICACIÓ

Continuous monitoring and exam.