

Guía docente

300112 - STCSMART - Sistemas Inteligentes de Industria 4.0

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Unidad responsable: Escuela de Ingeniería de Telecomunicación y Aeroespacial de Castelldefels
Unidad que imparte: **Titulación:** MÁSTER UNIVERSITARIO EN INTELIGENCIA ARTIFICIAL PARA INDUSTRIAS CONECTADAS (AI4CI) (Plan 2025). (Asignatura optativa).

Curso: 2026 **Créditos ECTS:** 3.0 **Idiomas:** Inglés

PROFESORADO

Profesorado responsable: Khaldoun Al-Agha (Green Communications), Guy Pujolle (Green Communications)

Otros:

CAPACIDADES PREVIAS

Computer networks, Introduction to Machine Learning, basic principles of security and linux.

REQUISITOS

Computer networks, Introduction to Machine Learning, basic principles of security and linux.

METODOLOGÍAS DOCENTES

Lectures, assignments, lab

OBJETIVOS DE APRENDIZAJE DE LA ASIGNATURA

The main goal of this course is to cover the main aspects related to Smart Industries 4.0 systems. Students will be capable of understanding the importance of AI to Industry 4.0 as well as the different kinds of applications. The course also presents security and sustainability issues concerning Smart Industry scenarios.

HORAS TOTALES DE DEDICACIÓN DEL ESTUDIANTE

Tipo	Horas	Porcentaje
Horas grupo grande	27,0	36.00
Horas aprendizaje autónomo	48,0	64.00

Dedicación total: 75 h

CONTENIDOS

Smart Industry 4.0 Systems

Descripción:

The course is divided into two parts. In the first part, the students will learn all the theoretical aspects as described below. In the last part they will focus on practical aspects with directed studies on an Edge distributed platform with green nodes.

Topics:

1- Artificial intelligence

The Role of Artificial Intelligence in Industry 4.0

Machine learning, deep learning,

Behavioral and generative Artificial Intelligence

Big Data Analytics and Industry 4.0

Some examples of AI for the Industry 4.0

2- Cloud services

Cloud Networking and Computing for Industry 4.0

Digital Twin for Industry 4.0

Additive Manufacturing

3- Connected worker

Human-Machine Collaboration in Industry 4.0

Networks for connected workers

The role of public and private 5G

Digital twin

Digital twin potential

Digital twin schemes

Digital twin examples

4- Edge

Edge Computing and Edge Analytics in Industry 4.0

Embedded Edge for the Industry 4.0

Networks for the Edge

5- Extended reality

Augmented Reality and Virtual Reality in Industrial Settings

Metaverse for Industry 4.0

6G vision for Industry 4.0

6- Industrial IOT (IIOT)

IoT Applications in Smart Manufacturing

Robotics and Automation in Modern Factories

Predictive Maintenance and Condition Monitoring

7- Security and sustainability

Cybersecurity Challenges in the Era of Industry 4.0

Blockchain Technology and Supply Chain Management

Sustainable Practices in Industry 4.0

Complementary content: Metaverse, blockchain.

Dedicación: 75h

Grupo grande/Teoría: 27h

Aprendizaje autónomo: 48h



SISTEMA DE CALIFICACIÓN

Lab reports.