

Guía docente

300113 - STCGREE - Computación de IA Ecológica para Industrias Conectadas

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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: Pauline Loygue (Green Communications), Guy Pujolle (Green Communications)

Otros: Pauline Loygue (Green Communications), Guy Pujolle (Green Communications)

CAPACIDADES PREVIAS

Computer networks, equivalent to Network Architecture (NETARCH)

REQUISITOS

Computer networks, equivalent to Network Architecture (NETARCH)

METODOLOGÍAS DOCENTES

Lectures, Lab reports

OBJETIVOS DE APRENDIZAJE DE LA ASIGNATURA

The main goal of this course is to cover the main aspects related to the design of green solutions for AI computing applied to connected industries. Students will learn not only the basic issues but also different applications. Finally, the course will also cover important challenges and future trends in this domain.

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

Green AI computing for Connected Industries

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:

Understanding Green environment and environmental impact.
Introduction to energy consumption and environmental impact
Overview of the concept and importance of green AI computing.
Principles of sustainability and environmental responsibility.
Environmental impacts of traditional computing and AI.
Fundamentals of AI and Sustainability
Basics of artificial intelligence and machine learning.
Basics of Generative and Behavioral artificial Intelligence
Energy-Efficient Computing Techniques
Techniques for energy-efficient AI model training and inference.
Optimization strategies for reducing computational resource usage.

Applications in Connected Industries
Industry 4.0 and Connected Systems
Overview of Industry 4.0 and the integration of AI in industrial processes.
Importance of connectivity and data exchange in modern industrial settings.
Green AI Applications in Manufacturing
Energy-efficient process optimization using AI.
Predictive maintenance and asset management for sustainable operations.
Smart Energy Management
AI-driven solutions for optimizing energy consumption in industrial settings.
Integration of renewable energy sources and demand-side management.

Implementing Green AI Solutions
Case Studies and Best Practices
Real-world examples of successful implementations of green AI in connected industries.
Lessons learned and best practices for achieving sustainability goals.
Challenges and Opportunities
Identification of challenges in implementing green AI solutions.
Opportunities for innovation and collaboration in the field.
Future Directions and Research Trends
Emerging technologies and research directions in green AI computing.
Potential impacts of green AI on the future of connected industries.

Complementary content: New AI techniques and security energy consumption.

Dedicación: 75h

Grupo grande/Teoría: 27h

Aprendizaje autónomo: 48h

SISTEMA DE CALIFICACIÓN

Tests, Lab reports