

Guía docente

300120 - ROBOTOS - Sistemas Operativos para Robots

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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: Óscar Casas
Otros: Óscar Casas (UPC), Birte Glimm (Univ. Ulm)

CAPACIDADES PREVIAS

Linear algebra and analysis, programming in Python or C++

REQUISITOS

Linear algebra and analysis, programming in Python or C++

METODOLOGÍAS DOCENTES

Lectures, assignments, lab

OBJETIVOS DE APRENDIZAJE DE LA ASIGNATURA

Students will understand the fundamental theoretical and algorithmic principles behind robotic systems. Students are able to solve robot specific learning problems involving, for example, navigation and mapping, grasping and manipulation, and interaction with humans. They understand the ROS Ecosystem (topics, nodes, messages, services, actionlib) and are able to develop simple applications to control robot motion.

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

Robot Operating Systems

Descripción:

This course gives an introduction to the Robot Operating System (ROS) including available tools that are commonly used in robotics. With the help of examples, the course provides a starting point for working with robots. The course covers how to create software including simulation, to interface sensors and actuators, and to integrate control algorithms.

ROS architecture: Master, nodes, topics, messages, services, parameters and actions.

Console commands: Navigating and analyzing the ROS system and the catkin workspace.

Creating ROS packages: Structure, launch-â□□files, and best practices.

Simulating with ROS: robot models (URDF) and simulation environments.

Working with visualizations and user interface tools.

Introduction to ROS2.

Dedicación: 75h

Grupo grande/Teoría: 27h

Aprendizaje autónomo: 48h

SISTEMA DE CALIFICACIÓN

Continuous monitoring (portfolio).