

Guia docent

300120 - ROBOTOS - Sistemes Operatius per Robots

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

CAPACITATS PRÈVIES

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

REQUISITS

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

METODOLOGIES DOCENTS

Lectures, assignments, lab

OBJECTIUS D'APRENTATGE DE L'ASSIGNATURA

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.

HORES TOTS DE DEDICACIÓ DE L'ESTUDIANTAT

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

Dedicació total: 75 h



CONTINGUTS

Robot Operating Systems

Descripció:

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.

Dedicació: 75h

Grup gran/Teoria: 27h

Aprenentatge autònom: 48h

SISTEMA DE QUALIFICACIÓ

Continuous monitoring (portfolio).