

<b>BLOCK NAME</b>	ROBOTICS
<b>BLOCK CODE</b>	CS-L5B3
<b>COURSE</b>	3
<b>LEVEL</b>	5
<b>CREDITS</b>	2
<b>CLASS HOURS</b>	20
<b>HOMEWORK</b>	30
<b>TOTAL HOURS</b>	50

#### DESCRIPTION

This block introduces the basic concepts of robotics.

We will face the challenge of designing and programming (under ROS) a robot able to follow a line on the ground. For this to be done, students will first choose the convenient sensors and actuators, and then implement a feedback control algorithm to cope with the objective.

#### PRE-REQUISITES

Basic programming skills are needed.

**CS-L1B1**

#### OBJECTIVES

The goal is for students to be familiar with robotics technology, design and operation.

#### SKILLS TO BE DEVELOPED

##### 1 - Dynamic system modelling.

1.1 - Model dynamic systems.

##### 2 - Feedback control.

2.1 - Understand feedback control.

2.2 - Be able to implement some basic algorithms for feedback control.

##### 3 - Sensors.

3.1 - Differentiate the distinct kinds of sensors.

3.2 - Choose the appropriate sensor for each specific purpose.

##### 4 - Actuators.

4.1 - Differentiate the distinct kind of actuators.

4.2 - Choose the appropriate actuator for each specific purpose.

##### 5 - ROS (Robot Operating System)

5.1 - Program robots under ROS, controlling actuators based on feedback received from sensors.

#### SYLLABUS

1 - Dynamic system modelling.

2 - Feedback control.

3 - Sensors.

4 - Actuators.

5 - ROS (Robot Operating System)

#### METHODOLOGY

Resolution of practical activities supervised by the mentor. Compulsory attendance.

## DEDICATION AND EVALUATION

The student must pass the mandatory activities (challenges/projects) that are covered in the block.

Each challenge/project produces its own score and has been designed to cover certain block percentages.

Such score is 80% objective (the program that solves the challenge/project works without errors and producing the expected results) and 20% subjective (solution elegance, how clean the code is, documentation).

Block scores are finally calculated by prorating individual activities with respect to their block coverage percentages.