

[GJH204] ROBOTIC SYSTEMS AND ARTIFICIAL VISION

GENERAL INFORMATION

Studies	DEGREE IN MECHATRONICS ENGINEERING	Subject	?
Semester	1	Course	4
Character	COMPULSORY	Mention / Field of specialisation	
Plan	2022	Modality	Face-to-face
Credits	4,5	Language	CASTELLANO/EUSKARA
		Total hours	67.5 class hours + 45 non-class hours = 112.5 total hours

PROFESSORS

ALONSO NIETO, MARCOS
SEIJO BARQUIN, IRAIDE

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
FUNDAMENTALS OF COMPUTING SCIENCE	(No previous knowledge required)
MATHEMATICS I	
MATHEMATICS II	

LEARNING RESULTS

LEARNING RESULTS	KC	SK	AB	ECTS
GJR404 - To know and apply the principles of robotic systems and artificial vision			x	4,02
G-RTR1 - To develop interdisciplinary projects specific to their specialty and of gradual complexity, - becoming aware of respect for human rights and fundamental rights, and analyzing and assessing the impact of the proposed solutions on the SDGs - to acquire and/or apply basic, advanced and /or avant-garde, demonstrating the ability to work in multidisciplinary teams and/or undertake further studies with a high degree of autonomy		x		0,24
G-RTR2 - To express information, ideas and the arguments that support them in an orderly, clear and coherent manner, orally and in writing, based on quality information, self-made or obtained from different sources, using inclusive and non-discriminatory language		x		0,24
Total:				4,5

KC: Knowledge or Content / SK: Skills / AB: Abilities

CONTENTS

Industrial robot programming and simulation

- Basics about the simulation environment.
- Cartesian reference systems: pose and frame transformations.
- Targets and paths. -Creating and calibrating a new tool onan industrial robot.
- Programming robots using scripting language.
- Socket communication.

Computer vision:

- Introduction to cameras and images.
- Image filtering, thresholding, convolutional filters.
- Morphological operations.
- 2D metrology.
- Programming a camera assisted robotic system.

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
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Labs

Moodle Platform

Class presentations

ABB Robotics Technical reference manual RAPID Instructions, Functions and Data types (Online, fopen access)

ABB Robotics Operating manual RobotStudio (Online, open access).

Richard Szeliski - Computer Vision Algorithms and Applications

Rafael C. Gonzalez and Richard E. Woods - Digital Image Processing 4th Ed.

MVTEC Halcon Documentation - (Online, open access)

John J. Craig. introduction to Robotics: Mechanics and Control. Pearso, 3rd editon. 2005