

[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	Hours/week	3.75
		Language	EUSKARA/CASTELLANO/ENGLISH
		Total hours	67.5 class hours + 45 non-class hours = 112.5 total hours

2030 AGENDA GOALS



PROFESSORS

ANDONEGI ARTEGUI, IMANOL
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

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Conceptos básicos de simulación y programación de robots

- Fundamentos del entorno de simulación.
- Fundamentos de posición y orientación relativos y transformaciones entre distintos sistemas cartesianos de referencia.
- Programación básica de un robot industrial, puntos y trayectorias.
- Definición y calibración de una herramienta embarcada en un robot.
- Fundamentos de programación en el lenguaje de programación específico del robot.
- Programación de Sockets.

Visión artificial

- Fundamentos de imágenes y cámaras.
- Filtrado de imagen.
- Operadores morfológicos.
- Metrología 2D.

-Programación de un sistema robot-cámara.

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources

- [!] *Laboratorios*
- [!] *Plataforma Moodle*
- [!] *Presentaciones en clase*

Bibliography

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