

## Handling

Academic Year: ( 2022 / 2023 )

Review date: 15/01/2023 23:54:15

Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher: BALAGUER BERNALDO DE QUIROS, CARLOS

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 2

## OBJECTIVES

Robots are designed to perform difficult and repetitive tasks to replace the human operator, and in doing that they have to come into contact with their environment and manipulate objects through specially developed grippers or complex robotics hands. A substantial amount of work in robotics have been devoted to compute optimal grasps based on the geometry of the objects, but other aspects can also be taken into account. Nowadays, robots are expected to form more tasks like assisting and collaborating directly with people. Therefore, the movements have to be planned adequately and controlled to account for or compensate the unforeseen reaction forces. This subject is to cover aspects of robotics related to the manipulation of objects and interaction with the environment from the motion and control point of views.

## LEARNING ACTIVITIES AND METHODOLOGY

- Lectures covering the contents detailed in the program and lab visits.
- Individual tutorials and personal work of the student in subjects of robotic manipulation and interaction

## ASSESSMENT SYSTEM

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|---|----|
| <b>% end-of-term-examination/test:</b>                                      | 40 |
| <b>% of continuous assessment (assignments, laboratory, practicals...):</b> | 60 |

An assignment will be carried out, treating a relevant application of robotic manipulation. It will be presented in class and delivered in the form of a report. The mark of this part represents 60% of the final grade.

There will also be an exam to evaluate the acquired theoretical knowledge, with a weight of 40% of the final grade.

## BASIC BIBLIOGRAPHY

- Albert Causo et al. (Editors) Advances on Robotic Item Picking, Springer Nature Switzerland AG, 2020
- Bruno Siciliano (Ed.) Advanced Bimanual Manipulation, Springer-Verlag, 2012
- Eris Chinellato, Angel P. del Pobil The Visual Neuroscience of Robotic Grasping, Springer International Publishing Switzerland, 2016
- Giuseppe Carbone (Editor) Grasping in Robotics, Springer-Verlag, 2013
- Noriaki Ando, et al. (Eds.) Simulation, Modeling, and Programming for Autonomous Robots, Springer-Verlag, 2010

- Noriaki Ando, et al. (Eds.) Simulation, Modeling, and Programming for Autonomous Robots, Springer-Verlag, 2010
- Yu Sun, Joe Falco (Eds.) Robotic Grasping and Manipulation, Springer, 2018