

## Robotics

Academic Year: ( 2021 / 2022 )

Review date: 22-06-2021

Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher: MORENO LORENTE, LUIS ENRIQUE

Type: Compulsory ECTS Credits : 3.0

Year : 4 Semester : 1

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Students should have basic knowledge in mathematics, mechanics, electronics, electrical engineering, programming and systems engineering.

## OBJECTIVES

Students acquire basic knowledge about robotics and biomedical applications deepens.

## DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
2. Robot morphology
3. Robot control
4. Robot programming
5. Medical robotics I
  - Surgical robotics
6. Medical robotics II
  - Robotics medical instrumentation
  - Body exploratory robotics
7. Biomedical applications
  - Hexoskeletons
  - Bionics hands
8. Assistive robotics
  - Personal assistance
  - Therapy robotics

## LEARNING ACTIVITIES AND METHODOLOGY

Training activities are divided into 4 parts: theory, practice, laboratories (with real robots and systems) and personal tutorials.

## ASSESSMENT SYSTEM

Evaluation criteria (ordinary)

A - continuous evaluation

	%	Minimum thresholds
1st evaluation	50%	3/10
2nd evaluation	50%	3/10
Overall necessary threshold		5/10

Practices assistance is mandatory

B - final exam (for whom not pass A or want to rise the mark)

Final exam 100% 5/10

Practices assistance is mandatory

Evaluation criteria (extraordinary exam)

Minimum thresholds

Exam 5/10

<b>% end-of-term-examination:</b>	0
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	100

#### BASIC BIBLIOGRAPHY

- A. Barrientods, L.F. Peñin, C. Balaguer, R. Aracil Fundamentos de Robótica, McGraw Hill, 2007
- J. P. Desai, S. Agrawal, A. Ferreira, R. V. Patel (Editors) The Encyclopedia of Medical Robotics 4 Volumes, World Scientific, 2019

#### ADDITIONAL BIBLIOGRAPHY

- J.F. Engelberger Robotics in Service, MIT Press, 1989
- R. P. Paul Robot Manipulators. Mathematics, Programming and Control, MIT Press, 1981