Course guide  
320193 - RA - Applied Robotics

Last modified: 22/04/2022

Unit in charge: Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control.
Degree: BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Optional subject).
Academic year: 2022  ECTS Credits: 6.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Rita Maria Planas Dangla
Others: Juan Carlos Hernandez

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
</tbody>
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Total learning time: 150 h
## CONTENTS

### Robotics: basic concepts

**Description:**
1. History of the robotics
2. Fields of applications
3. Industrial Robotics
4. Manipulators and Robots: basic concepts.
5. Types of Robots:
   5.1 Industrial Robots: Fundamental features.
   5.2 Mobile Robots: Fundamental features.
   5.3 Medic Robots: Fundamental features.
   5.4 Zoomorphic Robots: Fundamental features.
   5.5 Android Robots: Fundamental features.
   5.6 Teleoperated Robots: Fundamental features.
6. Sensors and actuators for the robotics

**Full-or-part-time:** 14h
Theory classes: 6h
Self study: 8h

### Relevant parameters for robot design

**Description:**
- Static Parameters
- Dynamic Parameters
- Study of the required functionalities
- Tasks to do

**Full-or-part-time:** 34h
Theory classes: 4h
Laboratory classes: 8h
Self study: 22h

### Relevant parameters for end effectors design

**Description:**
End effectors: Fundamental features.
Adapting End Effectors to the robotized tasks.
Specific design of End effectors.

**Full-or-part-time:** 34h
Theory classes: 4h
Laboratory classes: 8h
Self study: 22h
## Robot Programming

**Description:**
- Introduction to Robot programming
- TRAPs and Time Control
- Input-Output signal Management in order to integrate Robots in production lines
- Multitasking Robot Programming.
- Operator interface design

**Full-or-part-time:** 46h
- Theory classes: 8h
- Laboratory classes: 14h
- Self study : 24h

## Robot-Environment connection

**Description:**
- Robotized tasks:
  - Adapting the environment to the robot. Design of the environment
  - Adapting the robot to the environment: sensory control.

**Full-or-part-time:** 12h
- Theory classes: 4h
- Self study : 8h

## Robot Safety components design

**Description:**
- Robot safety components.
- Robotized task safety components
- Safety regulations inside the robotic field

**Full-or-part-time:** 10h
- Theory classes: 4h
- Self study : 6h

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**GRADING SYSTEM**

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**BIBLIOGRAPHY**

### Basic:

### Complementary:
RESOURCES

Computer material:
- RobotStudio. Robot Simulator Software