Course guide
320193 - RA - Applied Robotics

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: 2023 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>
</tr>
</thead>
<tbody>
<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>
<tr>
<td>Hours small group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
</tbody>
</table>

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

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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

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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**

**BIBLIOGRAPHY**

**Basic:**

**Complementary:**

Available on:
RESOURCES

Computer material:
- RobotStudio. Robot Simulator Software