Degree competences to which the subject contributes

Specific:

2. CE15. Basic knowledge of production and fabrication systems.

3. CE29. Ability to design automation control systems.

Transversal:

1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

4. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

Learning objectives of the subject

Identify and analyze the elements of a robot, their specifications and terminology.

Describe and analyze the models of a robot.

Describe the robot control techniques.

Know the robot programming techniques.

Know the criteria, methodology and standards about the implantation of robots, evaluating their integration capability in a social or industrial environment.
### Study load

<table>
<thead>
<tr>
<th>Total learning time</th>
<th>150h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>30h</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>0h</td>
</tr>
<tr>
<td>Hours small group</td>
<td>30h</td>
</tr>
<tr>
<td>Guided activities</td>
<td>0h</td>
</tr>
<tr>
<td>Self study</td>
<td>90h</td>
</tr>
</tbody>
</table>
1 Background

Degree competences to which the content contributes:

**Description:**
- Definition
- Classification
- Brief history
- Robots morphology
- Joints
- Industrial applications

**Related activities:**
- PR1

**Specific objectives:**

### -2 Geometrics, Kinematics and dynamics

Degree competences to which the content contributes:

**Description:**
- Positional and orientation representation
- Kinematic modelling
- Dynamic modelling

**Related activities:**
- PR2

**Specific objectives:**

### -3 Control and robots programming

Degree competences to which the content contributes:

**Description:**
- Control architectures
- Control based in dynamic model
- Adaptative control
- Effort control
- Path generation
- Gestual and textual programming

**Related activities:**
- PR1, PR2, PR3

**Specific objectives:**
### (ENG) -4 Mobile Robotics

**Degree competences to which the content contributes:**

**Description:**
- Introduction to mobile robotics

**Related activities:**
- PR4

**Specific objectives:**

### (ENG) PR1 Industrial robots programming

**Degree competences to which the content contributes:**

**Description:**
- Introduction to programming robot system
- Programming tools
- Edition and programming
- Examples
- Portfolio

**Specific objectives:**

### (ENG) PR2 Robots: Modeling and simulation

**Degree competences to which the content contributes:**

**Description:**
- Introduction to the robotics toolbox Matlab
- Study of the Spacial transformations
- Study of the kinematic model

**Specific objectives:**

### (ENG) PR3 Programming robots tools

**Degree competences to which the content contributes:**

**Description:**
- Introduction to programming and simulations robots
- Programming a robotized task
- Programming a robotized system

**Specific objectives:**

### (ENG) PR4 Mobile robots

**Degree competences to which the content contributes:**

**Specific objectives:**
Programming wheeled mobile robots

Specific objectives:

Qualification system

Individual tests in the middle of the course (45%)  
Presentations in group about a theme or project related to robotics (15%)  
Laboratory Practiquum and activities proposed during the course (40%)

Bibliography

Basic:


Complementary:


Others resources:
Hyperlink
Robòtica Industrial Multimedia. Ponsa, P., Yebra, J. y Lagos, N