### Degree competences to which the subject contributes

**Specific:**
1. Enter the student / the concepts of the various industrial communication techniques, terminology and the reference standards
2. To enable the student / a to discern the functional characteristics of wireless communications and communication networks to plan based industrial field buses.
3. Enter the student / the basic concepts of systems Supervisory Control and Data Acquisition and enable the student / a to define and configure the functionality of the (input-output historical databases, synoptic charts, etc.)

**Transversal:**
- **06 URI N2. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2.** Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.
- **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.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>45h</th>
<th>30.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>15h</td>
<td>10.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

### (ENG) Tema 1: Information systems

<table>
<thead>
<tr>
<th>Description</th>
<th>Learning time: 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1. Information systems.</td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td>1.2. Manufacturing Operation Management (MOM).</td>
<td>Self study: 6h</td>
</tr>
<tr>
<td>1.3. Information systems in Industry 4.0.</td>
<td></td>
</tr>
<tr>
<td>1.4. Human-machine information. GEMMA guideliine. Start and stop modes.</td>
<td></td>
</tr>
</tbody>
</table>

**Related activities:**
- Autonomous study
- Exercises
- Report

**Specific objectives:**
Students will be able to:
- identify trends in modern automation systems

### (ENG) Tema 2: SCADA systems

<table>
<thead>
<tr>
<th>Description</th>
<th>Learning time: 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Definition of supervisory control. From plant to control room.</td>
<td>Theory classes: 6h</td>
</tr>
<tr>
<td>2.2 Main features of supervision systems.</td>
<td>Self study: 6h</td>
</tr>
<tr>
<td>2.3 SCADA modules.</td>
<td></td>
</tr>
<tr>
<td>2.4 Functionality.</td>
<td></td>
</tr>
<tr>
<td>2.5 Exercises and examples.</td>
<td></td>
</tr>
<tr>
<td>2.6. Design of SCADA applications.</td>
<td></td>
</tr>
</tbody>
</table>

**Related activities:**
- Written exam
- Exercises
- Report
- Practice Laboratory

**Specific objectives:**
Students will be able to:
- Apply a SCADA solution in automation systems.
### (ENG) Tema 3: Communications Systems

#### Description:
- 3.1. Introduction to Communication Systems.
- 3.2. Digital Communications.
- 3.3. Networks topology.
- 3.4. Reference models. OSI, TCP/IP.
- 3.5. The connected enterprise.

#### Related activities:
- Autonomous study
- Exercises
- Practice Laboratory

#### Specific objectives:
- Students will be able to classify Network communications.

### Learning time: 12h
- Theory classes: 6h
- Self study: 6h

### (ENG) Tema 4: Industrial networks

#### Description:
- 4.1 Process control networks.
- 4.3. Serial communications.
- 4.4. Ethernet/IP.
- 4.5. Programmable Logic Controllers networks.
- 4.6. PLC programming.

#### Related activities:
- Examen
- Exercises
- Practice laboratory

#### Specific objectives:
- Students will be able to configure LAN networks and field buses.

### Learning time: 12h
- Theory classes: 6h
- Self study: 6h
### Planning of activities

#### AD: Connected Industry

<table>
<thead>
<tr>
<th>Description:</th>
<th>Hours: 57h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The skill in this subject is search of Information resources. Following examples and technical study cases, the students will be able to search information about the connected enterprise (industry 4.0).</strong></td>
<td><strong>Theory classes: 21h</strong></td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
<td><strong>Self study: 36h</strong></td>
</tr>
<tr>
<td>Papers in technical journals.</td>
<td></td>
</tr>
</tbody>
</table>

**Descriptions of the assignments due and their relation to the assessment:**

Month assessment and deadline (report) at the end of the semester.

**Specific objectives:**

Understand the new industrial paradigm.

Writing a polite technical report in automation.

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### Qualification system

- First exam: 30%
- Second exam: 25%
- Practice Lab: 25%
- Other controls AD: 20%

**Regulations for carrying out activities**

The evaluation method of this course meets the current academic regulations to be qualified: NO REVALUABLE.
Bibliography

Basic:


Complementary:


Others resources:

Teaching material in Virtual Campus.
Teaching help support (Wonderware, Rockwell Automation, SMC),